



**Derby #####**

*Version 10.4*

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# Contents

Copyright.....	7
License.....	8
#####.....	12
#####.....	12
#####.....	12
#####.....	12
SQL#####.....	13
#####.....	13
SQL####.....	13
SQL92#####.....	13
SQL92###.....	14
##.....	14
###.....	14
#####.....	15
#####.....	15
####.....	15
##.....	16
##.....	16
####.....	16
###.....	16
###.....	16
#####.....	17
TriggerName.....	17
#####.....	17
#.....	17
####.....	17
ALTER TABLE #.....	18
CALL (###) #.....	22
CREATE #.....	22
DECLARE GLOBAL TEMPORARY TABLE #.....	34
DELETE #.....	36
DROP#.....	36
GRANT #.....	38
INSERT #.....	39
LOCK TABLE #.....	40
RENAME #.....	41
REVOKE #.....	42
SET #.....	44
SELECT #.....	45
UPDATE#.....	47
SQL #.....	48
CONSTRAINT #.....	48
FOR UPDATE #.....	52
FROM #.....	53
GROUP BY #.....	53
HAVING #.....	54
ORDER BY #.....	54
WHERE #.....	55
WHERE CURRENT OF #.....	56
SQL#.....	56

###.....	58
TableExpression.....	60
VALUES#.....	60
#####.....	61
###.....	61
#####.....	63
<b>JOIN ##</b> .....	65
INNER JOIN ##.....	65
LEFT OUTER JOIN##.....	66
RIGHT OUTER JOIN ##.....	67
<b>SQL #####</b> .....	68
###.....	68
#####.....	69
#####.....	70
<b>#####</b> .....	71
#####.....	71
## (####).....	72
ABS#ABSVAL##.....	73
ACOS ##.....	73
ASIN ##.....	73
ATAN ##.....	73
AVG##.....	73
BIGINT##.....	74
CASE #.....	74
CAST ##.....	75
CEIL###CEILING##.....	78
CHAR ##.....	78
Concatenation.....	79
COS ##.....	80
COUNT ##.....	80
COUNT(*) ##.....	80
CURRENT DATE ##.....	81
CURRENT_DATE##.....	81
CURRENT ISOLATION ##.....	81
CURRENT SCHEMA##.....	81
CURRENT TIME.....	81
CURRENT_TIME##.....	81
CURRENT_TIMESTAMP##.....	82
CURRENT_TIMESTAMP##.....	82
CURRENT_USER##.....	82
DATE##.....	82
DAY ##.....	83
DEGREES ##.....	83
DOUBLE##.....	83
EXP##.....	83
FLOOR##.....	84
HOUR##.....	84
IDENTITY_VAL_LOCAL##.....	84
INTEGER##.....	86
LCASE####LOWER##.....	86
LENGTH##.....	86
LN####LOG##.....	87
LOG10 ##.....	87
LOCATE##.....	87
LTRIM##.....	88
MAX##.....	88

MIN##	88
MINUTE ##	89
MOD##	89
MONTH##	89
NULLIF#	90
PI ##	90
RADIANS ##	90
RTRIM##	90
SECOND##	91
SESSION_USER##	91
SIN ##	91
SMALLINT##	91
SQRT##	92
SUBSTR##	92
SUM##	93
TAN ##	93
TIME ##	93
TIMESTAMP##	94
TRIM ##	94
UCASE#####UPPER##	95
USER##	95
VARCHAR##	96
XMLEXISTS ###	96
XMLPARSE###	97
XMLQUERY###	98
XMLSERIALIZE ###	99
YEAR##	100
#####	100
SYSCS_UTIL.SYSCS_CHECK_TABLE#####	100
SYSCS_UTIL.SYSCS_GET_DATABASE_PROPERTY#####	100
SYSCS_UTIL.SYSCS_GET_RUNTIMESTATISTICS #####	101
#####	101
SYSCS_DIAG #####	116
####	118
SQL###	134
Derby#####SQL-92###	138
Derby#####	146
SYSALIASES #####	146
SYSCHECKS#####	146
SYSCOLPERMS #####	147
SYSCOLUMNS#####	147
SYSCONGLOMERATES #####	148
SYSCONSTRAINTS #####	148
SYSDEPENDS #####	148
SYSFILES#####	149
SYSFOREIGNKEYS#####	149
SYSKEYS#####	149
SYSROUTINEPERMS #####	149
SYSSCHEMAS #####	150
SYSSTATISTICS#####	150
SYSSTATEMENTS#####	151
SYSTABLEPERMS #####	151
SYSTABLES #####	152
SYSTRIGGERS#####	152
SYSVIEWS #####	153
Derby#####SQL state	153

SQL#####	153
<b>JDBC #####</b>	185
java.sql#####JDBC#####	185
java.sql.Driver#####	185
java.sql.DriverManager.getConnection ####	186
java.sql.Connection #####	188
java.sql.DatabaseMetaData #####	188
java.sql.Statement#####	190
java.sql.CallableStatement #####	190
java.sql.SQLException ###	192
java.sql.PreparedStatement#####	192
java.sql.ResultSet #####	193
java.sql.ResultSetMetaData #####	194
java.sql.SQLWarning ###	194
java.sql.SQLXML#####	194
SQL##java.sql.Types###	194
JDBC 2.0 ###	197
java.sql.Connection #####: JDBC 2.0#####	197
java.sql.DatabaseMetaData #####: #####JDBC 2.0#####	197
java.sql.PreparedStatement#####: JDBC2.0#####	197
java.sql.ResultSet.....	197
java.sql.ResultSetMetaData #####: JDBC 2.0#####	198
java.sql.Statement #####: #####JDBC 2.0#####	198
java.sql.BatchUpdateException ###	199
<b>Connected Device Configuration###Foundation</b>	
<b>Profile###JDBC#####(JSR169)</b>	199
<b>JDBC 3.0###</b>	199
java.sql.Connection#####: JDBC3.0#####	200
java.sql.DatabaseMetaData #####: JDBC 3.0#####	200
java.sql.ParameterMetaData#####:JDBC3.0#####	201
java.sql.PreparedStatement#####: JDBC3.0#####	201
java.sql.Savepoint #####	201
java.sql.Statement#####: JDBC 3.0#####	202
<b>JDBC 4.0###</b>	203
#####SQLException#####	204
java.sql.Connection#####:JDBC4.0#####	204
java.sql.DatabaseMetaData#####: JDBC4.0###	204
java.sql.Statement#####: JDBC 4.0#####	205
javax.sql.DataSource #####: JDBC 4.0###	205
<b>JDBC#####</b>	205
#####JDBC#####	205
JDBC#####	206
LIKE##JDBC#####	206
fn#####JDBC#####	206
#####JDBC#####	209
#####JDBC#####	210
#####JDBC#####	210
#####JDBC#####	210
<b>#####URL#####</b>	212
bootPassword=key##	212
collation=collation ##	212
create=true ##	213
createFrom=Path##	213
databaseName=nameofDatabase##	213
dataEncryption=true##	214

<b>encryptionKey=key##</b> .....	214
<b>encryptionProvider=providerName##</b> .....	215
<b>encryptionAlgorithm=algorithm ##</b> .....	215
<b>logDevice=logDirectoryPath ##</b> .....	216
<b>newEncryptionKey=key ##</b> .....	216
<b>newBootPassword=newPassword ##</b> .....	216
<b>password=userPassword</b> .....	216
<b>restoreFrom=path##</b> .....	217
<b>rollForwardRecoveryFrom=path ##</b> .....	217
<b>shutdown=true##</b> .....	217
<b>territory=ll_CC ##</b> .....	218
<b>traceDirectory=path ##</b> .....	218
<b>traceFile=path ##</b> .....	219
<b>traceFileAppend=true ##</b> .....	219
<b>traceLevel=value ##</b> .....	220
<b>upgrade=true attribute</b> .....	221
<b>user=username ##</b> .....	221
<b>ssl=sslMode ##</b> .....	221
<b>#####</b> .....	221
<b>J2EE####:Java Transaction API#javax.sql #####</b> .....	222
<b>JTA API</b> .....	222
<b>#####</b> .....	222
<b>javax.sql:JDBC#####</b> .....	223
<b>Derby API</b> .....	224
<b>#####</b> .....	224
<b>JDBC#####</b> .....	224
JDBC driver.....	224
<b>#####</b> .....	224
<b>#####</b> .....	225
<b>#####</b> .....	226
<b>Derby#####</b> .....	227
<b>#####</b> .....	227
<b>DATE#TIME#TIMESTAMP###</b> .....	227
<b>#####</b> .....	228
<b>#####</b> .....	228
<b>#####</b> .....	229
<b>XML###</b> .....	229
<b>Trademarks</b> .....	230

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Derby #####

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Derby#####Derby#####

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##Derby #####Derby#####

#####Derby#SQL####Derby####JDBC####Derby#####Derby#####Derby####SQL###

#####

#####Derby##### SQL####Java#####

#Derby#####Derby#####Derby #####

#####

#####

#####

- [SQL#####](#)

Derby#SQL#####

- [SQL###](#)

SQL-92#####SQL#####

- [Derby#####SQL-92###](#)

SQL-92#####Derby#####

- [Derby#####](#)

Derby#####

- [Derby#####SQL state](#)

Derby#####

- [JDBC #####](#)

Derby####JDBC#####JDBC 2.0 #####

- [#####URL#####](#)

Derby#JDBC#####URL#####

- [J2EE####Java Transaction API#javax.sql #####](#)

Java Transaction API####Derby#####

- [Derby API](#)

Derby###API#####

Derby #####

## SQL#####

Derby#SQL-92#####SQL-99#####  
#####SQL#####

### #####

JDBC#####SQL#####Derby#SQL#####  
SQL#####Unicode#####  
• #####SQL-92#####  
• #####  
• #####2#####(#####)  
#####Java#####  
#:  
-- #####-- #####  
VALUES 'Joe''s umbrella'  
-- ij#####  
VALUES 'He said, "hello!"'  
n = stmt.executeUpdate(  
    "UPDATE aTable setStringcol = 'He said, \"hello!\\\"'";  
• SQL#####SELECT#####SELECT#Select#select#sELECT#####  
• SQL-  
92#####(SQL92########)  
• Java#####  
• \*##*SelectExpression*.#####\*#####  
#####0#####  
• %#\_##LIKE#####(#####)######  
• SQL-92#####(--  
)#####(/\*)#####(\*/  
)#####

## SQL####

#####  
SQL#####  
#####SQL-  
92#####SQL92########.

## SQL92#####

#####  
#####(\_\_\_\_)#0-9#####0-9#####Unicode####0-  
9#####Derby#####  
#####  
#####  
#####

Derby #####

"A.B"

#####

"A"."B"

#####(###A##B#####)

## SQL92###

SQL92#####SQL-92#####SQL-

92#####128#####(#####)#####

X0X11#####

Derby###SQL-92#####(SQL#####)

#

-- #####

-- ANIDENTIFIER###

CREATE VIEW AnIdentifier (RECEIVED) AS VALUES 1

-- #####

-- #####

CREATE VIEW "ACaseSensitiveIdentifier" (RECEIVED) AS VALUES 1

#####SQL92#####

#####

#####

##

SQL#####

#####

- ####(CREATE TABLE #)

- #####

- SELECT#####(#####)

- TableExpression##### (TableExpression###)

#####SQL#####

SELECT c11 AS col1, c12 AS col2, c13 FROM t1 FOR UPDATE of c11,c13

#####c11#col1##### c11#FOR UPDATE

#####c12#####FOR UPDATE#####

##

[ { table-Name | correlation-Name } . ] SQL92Identifier

#

-- C.Country #

#####

--#####

SELECT C.Country

FROM APP.Countries C

###

####FROM#####



Derby #####

#####SQL#####

SELECT c11 AS col1, c12 AS col2, c13 FROM t1 FOR UPDATE of c11,c13

#####c11#col1#####c11#FOR UPDATE#####

#####c12#####FOR UPDATE#####

##

SQL92###

#

-- C#####  
SELECT C.NAME  
FROM SAMP.STAFF C

#####

#####

##

SQL92###

#

-- FlightBooks #####  
RENAME TABLE FLIGHTAVAILABILITY TO FLIGHTAVAILABLE

#####

#####

#####APP#####(#####)

SYS#####

#####S

#####

Syntax

SQL92###

#

-- SAMP.EMPLOYEE #####  
SELECT COUNT(\*) FROM SAMP.EMPLOYEE  
-- #####SYS#####  
SELECT COUNT(\*) FROM SYS.SysColumns

####

#####CREATE

TABLE#####

##

SQL92###

#

-- country #####

Derby #####

```
CREATE TABLE CONTINENT (COUNTRY VARCHAR(26) NOT NULL PRIMARY KEY,  
COUNTRY_ISO_CODE CHAR(2), REGION VARCHAR(26))
```

##

#####

##

[ #####. ] SQL92###

##

#####

##

[ #####. ] SQL92###

#

```
-- SAMP.PROJECT #####  
SELECT COUNT(*) FROM SAMP.PROJECT
```

####

#####

##

[ #####. ] SQL92###

Example

```
-- #####  
SELECT COUNT(*) FROM SAMP.EMP_RESUME
```

###

#####SYS#####

##

[ #####. ] SQL92###

#

```
DROP INDEX APP.ORIGININDEX;  
-- OrigIndex#####  
CREATE INDEX ORIGININDEX ON FLIGHTS (ORIG_AIRPORT)
```

###

#####

##

SQL92###

#

```
-- country_fk2 #####
```

Derby #####

```
CREATE TABLE DETAILED_MAPS (COUNTRY_ISO_CODE CHAR(2)
CONSTRAINT country_fk2 REFERENCES COUNTRIES)
```

#####

```
#####SQL#####JDBC
API#####Derby #####
#####SQL#####
```

#####

##

[SQL92###](#)

#

```
stmt.executeUpdate("UPDATE SAMP.STAFF SET COMM = " +
"COMM + 20 " + "WHERE CURRENT OF " + ResultSet.getCursorName());
```

## TriggerName

#####

##

[ ##### . ] [SQL92###](#)

#

DROP TRIGGER TRIG1

#####

```
Derby#####
#####Derby#####
#####Derby #####
```

##

[SQL92###](#)

## Example

```
CALL SYSCS_UTIL.SYSCS_SET_DATABASE_PROPERTY(
'derby.database.fullAccessUsers', 'Amber,FRED')
```

#

```
#####
####CREATE
INDEX#####JDBC#####SQL#####
BY##WHERE#####Select# #####
#####
#####JDBC#####
#####
#####
```

Derby #####

####

Derby

#####SQL#####(#####)#####

#####(#####)

#####Derby#####

#####

#####(#####)#####D

#####-UPDATE WHERE CURRENT#####UPDATE

WHERE CURRENT#####

#####DDL#####

#####

###Derby#ij#####

```
ij> CREATE TABLE mytable (mycol INT);
0 rows inserted/updated/deleted
ij> INSERT INTO mytable VALUES (1), (2), (3);
3 rows inserted/updated/deleted
-- #####ij#prepare#####
-- #####
ij> prepare p1 AS 'INSERT INTO MyTable VALUES (4)';
-- pl#mytable#####
ij> execute p1;
1 row inserted/updated/deleted
-- Derby#####
ij> CREATE INDEX i1 ON mytable(mycol);
0 rows inserted/updated/deleted
-- #####pl#####
ij> execute p1;
1 row inserted/updated/deleted
-- Derby#####pl#####
ij> DROP TABLE mytable;
0 rows inserted/updated/deleted
-- Derby#####
-- ##pl#####
-- #####pl#####
ij> CREATE TABLE mytable (mycol INT);
0 rows inserted/updated/deleted
ij> INSERT INTO mytable VALUES (1), (2), (3);
3 rows inserted/updated/deleted
ij> execute p1;
1 row inserted/updated/deleted
-- pl#####Derby#####
-- #####
ij> DROP TABLE mytable;
0 rows inserted/updated/deleted
-- pl#####
-- #####pl#####
-- #####
ij> execute p1;
ERROR 42X05: Table/View 'MYTABLE' does not exist.
```

## ALTER TABLE #

The ALTER TABLE #####

- #####
- #####
- #####
- #####
- VARCHAR, CHAR VARYING, and CHARACTER VARYING #####
- #####(#####)

Derby #####

- #####
- ##Null#####
- #####

##

```
ALTER TABLE ##
{
    ADD COLUMN ### |
    ADD CONSTRAINT# |
    DROP [ COLUMN ] ## [ CASCADE | RESTRICT ]
    DROP { PRIMARY KEY | FOREIGN KEY ### | UNIQUE
    ### | CHECK ### | CONSTRAINT ### }
    ALTER [ COLUMN ] ##### |
    LOCKSIZE { ROW | TABLE }
}
```

###

```
#####
[ ##### ]*
[ [ WITH ] DEFAULT ##### ]
```

#####

#####

```
## SET DATA TYPE VARCHAR(integer)
|
column-name SET INCREMENT BY ###
|
column-name RESTART WITH ###
|
column-name [ NOT ] NULL
|
column-name [ WITH ] DEFAULT ###
```

#####SET INCREMENT BY

#####IDENTITY

RESTART WITH #####RESTART WITH##GENERATED

BY DEFAULT#####GENERATED

BY

DEFAULT#####

WITH#####

```
CREATE TABLE tauto(i INT GENERATED BY DEFAULT AS IDENTITY, k INT)
CREATE UNIQUE INDEX tautoInd ON tauto(i)
INSERT INTO tauto(k) values 1,2
```

#####

```
INSERT INTO tauto VALUES (3,3)
INSERT INTO tauto VALUES (4,4)
INSERT INTO tauto VALUES (5,5)
```

#####1##5#####3#####

WITH 6 #ALTER TABLE#####

```
ALTER TABLE tauto ALTER COLUMN i RESTART WITH 6
```

ALTER TABLE

#####SELECT##"\*"#####

####

Derby #####

#####  
#####CREATE TABLE#####ALTER  
TABLE ADD COLUMN#####NOT  
NULL#####ALTER  
TABLE#####

CREATE TABLE#####null#####NOT  
NULL#####(SQLSTATE 42831)

**Note:**

#####UPDATE#####UPDATE#####

#####

ALTER TABLE ADD CONSTRAINT#####ALTER  
TABLE#####

- #####Derby#####Derby####
- #####null#####

ALTER TABLE ADD UNIQUE#PRIMARY  
KEY#####PRIMARY  
KEY#C#####PRIMARY  
KEY(C)#####null#####NOT  
NULL#####

#####CONSTRAINT ###### ADD TABLE ADD  
CONSTRAINT#####

#####

ALTER TABLE DROP COLUMN#####

COLUMN#####

CASCADE#RESTRICT#####CASCADE###

RESTRICT#####

CASCADE#####

DROP COLUMN RESTRICT#####

#####DROP  
COLUMN RESTRICT#####

#####

sqlAuthorization#####(DERBY-1909#####) )

#####CASCADE/  
RESTRICT#####

#####

ALTER TABLE DROP

CONSTRAINT#####SYS.SYSCONSTRAINTS#####

#####(#####)

#####

#####

- VARCHAR#####VARCHAR#####CHARACTER  
VARYING#CHAR VARYING#####

#####

#####

- #####

Derby #####

```
#####(SQLSTATE
42837)#####SET INCREMENT default#####
• ##Null##### ##Null#####
NOT NULL#####NULL#####
NOT NULL#####PRIMARY
KEY#UNIQUE#####
• #####

#####
#####NULL#
#####CREATE TABLE #####
#####
#####LOCKSIZE#####(#####
#####ALTER TABLE##LOCKSIZE#####
#

-- #####
-- #####NULL#####
-- #####
ALTER TABLE CITIES ADD COLUMN REGION VARCHAR(26)
CONSTRAINT NEW_CONSTRAINT CHECK (REGION IS NOT NULL);

-- #####
-- #####
ALTER TABLE SAMP.DEPARTMENT
ADD CONSTRAINT NEW_UNIQUE UNIQUE (DEPTNO);

-- Cities#####
-- #####
-- #####
-- #####
ALTER TABLE CITIES ADD CONSTRAINT COUNTRY_FK
Foreign Key (COUNTRY) REFERENCES COUNTRIES (COUNTRY);

-- #####
-- #####
CREATE TABLE ACTIVITIES (CITY_ID INT NOT NULL,
SEASON CHAR(2), ACTIVITY VARCHAR(32) NOT NULL);
-- #####null#####
-- #####
ALTER TABLE Activities ADD PRIMARY KEY (city_id, activity);

-- #####city_id#####
ALTER TABLE Cities DROP COLUMN city_id RESTRICT;
-- #####city_id#####
ALTER TABLE Cities DROP COLUMN city_id CASCADE;

-- CITIES#####
ALTER TABLE Cities DROP CONSTRAINT Cities_PK;
-- CITIES#####
ALTER TABLE Cities DROP CONSTRAINT COUNTRIES_FK;
-- ###1##DEPTNO#####
ALTER TABLE SAMP.EMP_ACT ADD COLUMN DEPTNO INT DEFAULT 1;
-- VARCHAR#####
ALTER TABLE SAMP.EMP_PHOTO ALTER PHOTO_FORMAT SET DATA TYPE VARCHAR(30);
-- #####
ALTER TABLE SAMP.SALES LOCKSIZE TABLE;

-- MANAGER##NOT NULL#####
ALTER TABLE Employees ALTER COLUMN Manager NULL;
-- SSN##NOT NULL#####
ALTER TABLE Employees ALTER COLUMN ssn NOT NULL;
```

Derby #####

```
-- SALARY#####  
ALTER TABLE Employees ALTER COLUMN Salary DEFAULT 1000.0
```

####

ALTER TABLE

#####ALTER  
TABLE#####

## CALL (###) #

CALL (###)#####

##

```
CALL ### ( [ # [, #]* ] )
```

#

```
CREATE PROCEDURE SALES.TOTAL_REVENUE(IN S_MONTH INTEGER,  
IN S_YEAR INTEGER, OUT TOTAL DECIMAL(10,2))  
PARAMETER STYLE JAVA READS SQL DATA LANGUAGE JAVA EXTERNAL NAME  
'com.acme.sales.calculateRevenueByMonth';  
CALL SALES.TOTAL_REVENUE(?,?,?);
```

## CREATE #

#####CREATE#####

CREATE FUNCTION #

CREATE FUNCTION#####Java#####

#####EXECUTE#####

##

```
CREATE FUNCTION ### ( [ #####  
[, FunctionParameter] ] * ) RETURNS ##### [ ##### ] *
```

###

```
[ #####. ] SQL92###
```

#####SYS#####

#####

```
[ ### ] ###
```

#####

#####

**Note:** CREATE FUNCTION#####BLOB#CLOB#LONG  
VARCHAR#LONG VARCHAR FOR BIT DATA#XML####

#####

```
## | ###
```

#####

##



Derby #####

TABLE( ### [ , ### ]\* )

#####Derby#####JDBC#ResultSet#####  
#####Derby#####Derby#####  
###

SQL92#####

#####

Note: #####XML#####

#####

```
{  
  LANGUAGE { JAVA }  
  EXTERNAL NAME ###  
  PARAMETER STYLE #####  
  { NO SQL | CONTAINS SQL | READS SQL DATA }  
  { RETURNS NULL ON NULL INPUT | CALLED ON NULL INPUT }  
}
```

## LANGUAGE

JAVA- ###Java#####public static#####

EXTERNAL NAME *string*

#####Java#####

####.####

#####

#####

JAVA | DERBY\_JDBC\_RESULT\_SET

###Java#####SQL#####INOUT#OUT#####

Derby #####(#####Long Varchar#BLOB#####)#####

#####

Derby#####PARAMETER

STYLE###DERBY\_JDBC\_RESULT\_SET#####JDBC#ResultSet###

#####PARAMETER STYLE###JAVA###

NO SQL, CONTAINS SQL, READS SQL DATA

#####SQL#####SQL#####

CONTAINS SQL

#####SQL#####

NO SQL

###SQL#####

READS SQL DATA

#####SQL#####

#####

RETURNS NULL ON NULL INPUT or CALLED ON NULL INPUT

#####null#####null#####

RETURNS NULL ON NULL INPUT

#####null#####null#####

CALLED ON NULL INPUT

#####null#####null#####null#####

#####

Derby #####

- LANGUAGE
- PARAMETER STYLE
- EXTERNAL NAME

### Example

```
CREATE FUNCTION TO_DEGREES(RADIANS DOUBLE) RETURNS DOUBLE
PARAMETER STYLE JAVA NO SQL LANGUAGE JAVA
EXTERNAL NAME 'java.lang.Math.toDegrees'
```

### CREATE INDEX #

CREATE INDEX#####

##

```
CREATE [UNIQUE] INDEX ###
ON ## ( ### [ ASC | DESC ]
      [ , ### [ ASC | DESC ]] * )
```

The Derby#####16###

####128#####

#####CREATE INDEX##2#####

Derby#####(Derby#####)#

###UNIQUE#####

#####(#####Derby#####)

#####

###Derby#####ASC#####

#####DESC#####Derby#####

#####SYS#####

#####

#####(#####)#####UNIQUE##

KEY#####Derby#####

##UNIQUE#####UNIQUE

FLIGHTS\_PK#####

```
SELECT CONGLOMERATENAME FROM SYS.SYSCONGLOMERATES,
SYS.SYSCONSTRAINTS WHERE
SYS.SYSCONGLOMERATES.TABLEID = SYSCONSTRAINTS.TABLEID
AND CONSTRAINTNAME = 'FLIGHTS_PK'
```

```
CREATE INDEX OrigIndex ON Flights(orig_airport);
-- #####
-- #####
CREATE INDEX PAY_DESC ON SAMP.EMPLOYEE (SALARY);
-- #####
call
  SYSCS_UTIL.SYSCS_SET_DATABASE_PROPERTY('derby.storage.pageSize','8192');
CREATE INDEX IXSALE ON SAMP.SALES (SALES);
call
  SYSCS_UTIL.SYSCS_SET_DATABASE_PROPERTY('derby.storage.pageSize',NULL);
```

#####

Note:

#####

####

Derby #####

SELECT#INSERT#UPDATE#UPDATE WHERE  
CURRENT#DELETE#DELETE#####CREATE  
INDEX#####

**CREATE PROCEDURE #**

CREATE PROCEDURE####CALL PROCEDURE#####Java#####

#####EXECUTE#####EXECUTE#####

##

```
CREATE PROCEDURE ### ( [ #####  
    [ , ##### ] * )  
[ ##### ] *
```

###

[ #####. ] SQL92###

#####SYS#####

#####

[ { IN | OUT | INOUT } ] [ ### ] ####

#####IN#####

#####

**Note:** BLOB#CLOB#LONG VARCHAR#LONG VARCHAR FOR BIT  
DATA#XML#####CREATE PROCEDURE#####

#####

```
{  
  [ DYNAMIC ] RESULT SETS INTEGER  
  LANGUAGE { JAVA }  
  EXTERNAL NAME string  
  PARAMETER STYLE JAVA  
  { NO SQL | MODIFIES SQL DATA | CONTAINS SQL | READS SQL DATA }  
}
```

**DYNAMIC RESULT SETS ##**

#####(0)###

**LANGUAGE**

**JAVA-** ###Java#####public static#####

**EXTERNAL NAME ###**

### #####Java#####

####.####

#####

**PARAMETER STYLE**

**JAVA -**

###Java#SQL#####INOUT###OUT#####

Derby #####(###Long Varchar, BLOB#####)#####

#####

**NO SQL, CONTAINS SQL, READS SQL DATA, MODIFIES SQL DATA**

###SQL#####SQL#####

Derby #####

## CONTAINS SQL

#####SQL#####

## NO SQL

#####SQL#####

## READS SQL DATA

#####SQL#####

## MODIFIES SQL DATA

#####SQL#####

#####

- LANGUAGE
- PARAMETER STYLE
- EXTERNAL NAME

#

```
CREATE PROCEDURE SALES.TOTAL_REVENUE(IN S_MONTH INTEGER,
IN S_YEAR INTEGER, OUT TOTAL DECIMAL(10,2))
PARAMETER STYLE JAVA READS SQL DATA LANGUAGE JAVA EXTERNAL NAME
'com.acme.sales.calculateRevenueByMonth'
```

## CREATE SCHEMA #

#####

##

```
CREATE SCHEMA { [ ##### AUTHORIZATION #### ] | [ ##### ] |
[ AUTHORIZATION #### ] }
```

## CREATE SCHEMA

#####128#####

## CREATE

SCHEMA#####derby.database.sqlAuthorization#true#####

AUTHORIZATION *user-name*

#####

derby.database.sqlAuthorization#####Derby#####

## CREATE SCHEMA##

#####anita#####

CREATE SCHEMA FLIGHTS AUTHORIZATION anita

#####

## CREATE SCHEMA EMP

takumi#####

CREATE SCHEMA AUTHORIZATION takumi

EMP#FLIGHTS#####availability#####

## CREATE TABLE FLIGHTS.AVAILABILITY

```
(FLIGHT_ID CHAR(6) NOT NULL, SEGMENT_NUMBER INT NOT NULL,
FLIGHT_DATE DATE NOT NULL, ECONOMY_SEATS_TAKEN INT,
BUSINESS_SEATS_TAKEN INT, FIRSTCLASS_SEATS_TAKEN INT,
CONSTRAINT FLT_AVAIL_PK
PRIMARY KEY (FLIGHT_ID, SEGMENT_NUMBER, FLIGHT_DATE))
```

## CREATE TABLE EMP.AVAILABILITY

```
(HOTEL_ID INT NOT NULL, BOOKING_DATE DATE NOT NULL, ROOMS_TAKEN INT,
CONSTRAINT HOTELAVAIL_PK PRIMARY KEY (HOTEL_ID, BOOKING_DATE))
```

Derby #####

**CREATE SYNONYM #**

CREATE SYNONYM#####

#####

#####SELECT#INSERT#UPDATE#DELETE#LOCK TABLE#####

#####

#####(SQLSTATE  
01522) DML#####

#####(#####)#####(SQLSTATE  
42916)

#####'SYS'#####Derby#####

#####(SQLSTATE XCL51)

**##**

CREATE SYNONYM **###** FOR { **####** | **##** }

**######**#####**####****##**#####

**#**

CREATE SYNONYM SAMP.T1 FOR SAMP.TABLEWITHLONGNAME

**CREATE TABLE #**

CREATE

TABLE#####

**#####**

- INSERT
- SELECT
- REFERENCES
- TRIGGER
- UPDATE

#####

#####**CONSTRAINT #**#####

#####NULL#####**####**#####

SYSCS\_UTIL.SYSCS\_SET\_DATABASE\_PROPERTY#####

#####SYS#####

**##**

CREATE

TABLE#####

**CREATE TABLE ##**

```
( {### | ####}  
[ , {### | ####} ] * )  
|  
[ ( ## [ , ## ] * ) ]  
AS #####  
WITH NO DATA  
}
```

**#**

CREATE TABLE HOTELAVAILABILITY

(HOTEL\_ID INT NOT NULL, BOOKING\_DATE DATE NOT NULL,  
ROOMS\_TAKEN INT DEFAULT 0, PRIMARY KEY (HOTEL\_ID, BOOKING\_DATE));

-- #####2#####

Derby #####

```
PRIMARY KEY (hotel_id, booking_date))
-- #####INTEGER#####
-- #####
CREATE TABLE PEOPLE
(PERSON_ID INT NOT NULL GENERATED ALWAYS AS IDENTITY
CONSTRAINT PEOPLE_PK PRIMARY KEY, PERSON VARCHAR(26));
-- #####SMALLINT#####
-- #####5#####5#####
CREATE TABLE GROUPS
(GROUP_ID SMALLINT NOT NULL GENERATED ALWAYS AS IDENTITY
(START WITH 5, INCREMENT BY 5), ADDRESS VARCHAR(100), PHONE
VARCHAR(15));
```

Note: #####CREATE TABLE####CONSTRAINT #####

CREATE TABLE ... AS ...

#####CREATE

TABLE#####/

#####

#####

WITH NO DATA#####

WITH NO DATA#####Derby##WITH

DATA#####WITH

NO DATA#####

#

-- #####

CREATE TABLE T3 AS SELECT \* FROM T1 WITH NO DATA;

-- #####

CREATE TABLE T3 (A,B,C,D,E) AS SELECT \* FROM T1 WITH NO DATA;

-- #####

CREATE TABLE T3 (A,B,C) AS SELECT V,DP,I FROM T1 WITH NO DATA;

-- #####

CREATE TABLE T3 (X,Y) AS SELECT 2\*I,2.0\*F FROM T1 WITH NO DATA;

###:

#####

```
[ ##### ]*
[ [ WITH ] DEFAULT #####
  |##### ]
[ ##### ]*
```

#####

#####CONSTRAINT #####

#####

#####

#####null###

####:

```
NULL
| CURRENT { SCHEMA | SQLID }
| USER | CURRENT_USER | SESSION_USER
| DATE
| TIME
| TIMESTAMP
| CURRENT DATE | CURRENT_DATE
| CURRENT TIME | CURRENT_TIME
| CURRENT_TIMESTAMP | CURRENT_TIMESTAMP
| literal
```

Derby#####

Derby #####

#####

- USER#CURRENT\_USER#SESSION\_USER#####8#####
- CURRENT SCHEMA#CURRENT SQLID#####128#####
- #####
- ##10#####

#####:

```
[ GENERATED { ALWAYS | BY DEFAULT } AS IDENTITY
[ ( START WITH ###
[ ,INCREMENT BY ###] ) ] ] ]
```

#####

SMALLINT#INT#BIGINT#####Derby#####  
#####Derby#####

IDENTITY#####

- SMALLINT
- INT
- BIGINT

Derby#####GENERATED ALWAYS#####GENERATED BY  
DEFAULT###

**GENERATED ALWAYS**

GENERATED

ALWAYS#####GENERATED

ALWAYS#####DEFAULT#####

#####

```
create table greetings
(i int generated always as identity, ch char(50));
insert into greetings values (DEFAULT, 'hello');
insert into greetings(ch) values ('bonjour');
```

GENERATED ALWAYS#####

**GENERATED BY DEFAULT**

GENERATED BY

DEFAULT#####GENERATED

ALWAYS#####

#####DEFAULT#####

```
create table greetings
(i int generated by default as identity, ch char(50));
-- "1"#####:
insert into greetings values (1, 'hi');
-- #####
insert into greetings values (DEFAULT, 'salut');
-- #####
insert into greetings(ch) values ('bonjour');
```

GENERATED ALWAYS#####GENERATED

BY

DEFAULT#####hi###salut#####"1"#####

WITH#####GENERATED BY

DEFAULT#####

#####1#####1### #####START

WITH#INCREMENT

BY#####Derby#####

#####Derby##### ##0#####

Derby #####

#####

**Table 1. #####**

###	###	###
SMALLINT	32767 ( <i>java.lang.Short.MAX_VALUE</i> )	-32768 ( <i>java.lang.Short.MIN_VALUE</i> )
INT	2147483647 ( <i>java.lang.Integer.MAX_VALUE</i> )	-2147483648 ( <i>java.lang.Integer.MIN_VALUE</i> )
BIGINT	9223372036854775807 ( <i>java.lang.Long.MAX_VALUE</i> )	-9223372036854775808 ( <i>java.lang.Long.MIN_VALUE</i> )

#####

#

IDENTITY\_VAL\_LOCAL#####IDENTITY\_VAL\_LOCAL#####

**Note: #####**

Derby#####SYS.SYSCOLUMNS#####AUTOINCREMENT#####

#####

Derby

#####SYS.SYSCOLUMNS#####

#####SQL#####SQL#####ConnectionInfo#####

#####

#####SQL#####

#####(##)#####

SQL####T1#####T1####SQL###T2#####T1#T2#####

#####16#####

#

```
create table greetings
  (i int generated by default as identity (START WITH 2, INCREMENT BY 1),
  ch char(50));
-- 1#####
insert into greetings values (1, 'hi');
-- #####
insert into greetings values (DEFAULT, 'salut');
-- #####
insert into greetings(ch) values ('bonjour');
```

**CREATE TRIGGER #**

#####

#####

#####

#####e-mail#####

#####

#####

#####TRIGGER#####

#####

#####

#####SYS#####

##



Derby #####

```
CREATE TRIGGER ###
{ AFTER | NO CASCADE BEFORE }
{ INSERT | DELETE | UPDATE [ OF ## [, ##]* ] }
ON ##
[ ### ]
[ FOR EACH { ROW | STATEMENT } ] [ MODE DB2SQL ]
#####SQL#
```

#####

#####

- #####  
#####(#####)
- #####  
#####(#####)

#####

#####(#####

- INSERT
- UPDATE
- DELETE

#####

#####:###

#####SQL#####

#####SQL#####(#####)#####

Derby#####SQL#####

#####OLD/NEW AS #####

#####

REFERENCING OLD AS DELETEDROW

#####SQL#####

DELETE FROM HotelAvailability WHERE hotel\_id = DELETEDROW.hotel\_id

#####OLD#NEW#####java.sql.ResultSet#####

**Note:** #####(#####)

#####OLD#####NEW#####

#####SQL#####

#####OLD\_TABLE/NEW\_TABLE AS #####

####

REFERENCING OLD\_TABLE AS DeletedHotels

#####(DeletedHotels)#####SQL#####

DELETE FROM HotelAvailability WHERE hotel\_id IN  
(SELECT hotel\_id FROM DeletedHotels)

#####java.sql.ResultSet#####

**Note:** #####(#####)

INSERT#####OLD#####DELETE#####NEW#####

#####

#####

#####

##### CREATE TRIGGER##FOR  
EACH#####

Derby #####

- #####

#####

- #####

#####

**Note:** #####(####UPDATE T SET C =

C#####)#####

**#####SQL#**

#####SQL#####(########)

#####SQL#####

- #####(?)#####
- #####
- #####
- #####
- #####
- #####INSERT/UPDATE/DELETE#####
- #####

#####SQL#####

#####

#####SQL#####Derby #####

**#####**

#####Derby#####

- ### No Cascade Before#####
- #####(#####)#####
- #####
- ### After#####

#####(#####)#####

-- #####

```
CREATE TRIGGER t1 NO CASCADE BEFORE UPDATE ON x
  FOR EACH ROW MODE DB2SQL
  values app.notifyEmail('Jerry', 'Table x is about to be updated');
```

```
CREATE TRIGGER FLIGHTSDELETE
  AFTER DELETE ON FLIGHTS
  REFERENCING OLD_TABLE AS DELETEDFLIGHTS
  FOR EACH STATEMENT
  DELETE FROM FLIGHTAVAILABILITY WHERE FLIGHT_ID IN
  (SELECT FLIGHT_ID FROM DELETEDFLIGHTS);
```

```
CREATE TRIGGER FLIGHTSDELETE3
  AFTER DELETE ON FLIGHTS
  REFERENCING OLD AS OLD
  FOR EACH ROW
  DELETE FROM FLIGHTAVAILABILITY WHERE FLIGHT_ID = OLD.FLIGHT_ID;
```

**Note:** Derby #####

**#####**

#####16#####

**#####**

#####

- CURRENT\_DATE##
- CURRENT\_TIME##
- CURRENT\_TIMESTAMP##
- CURRENT\_USER##

Derby #####

- **SESSION\_USER##**
- **USER##**

**###:**

REFERENCING

```
{  
  { OLD | NEW } [ ROW ] [ AS ] correlation-Name [ { OLD | NEW } [ ROW ] [  
    AS ] correlation-Name ] |  
  { OLD TABLE | NEW TABLE } [ AS ] Identifier [ { OLD TABLE | NEW TABLE }  
    [AS] Identifier ] |  
  { OLD_TABLE | NEW_TABLE } [ AS ] Identifier [ { OLD_TABLE | NEW_TABLE }  
    [AS] Identifier ]  
}
```

**Note:** OLD\_TABLE |

NEW\_TABLE#####DB2#####SQL#####

**CREATE VIEW #**

#####

#####SYS#####

#####SELECT#####SELECT##########SELECT

#####SELECT#####

#####user2#####user1

SELECT#####

**##**

**CREATE VIEW ###**

```
[ ( ### [ , ### ] * ) ]  
AS #####
```

#####

#####

**CREATE VIEW SAMP.V1 (COL\_SUM, COL\_DIFF)**

AS SELECT COMM + BONUS, COMM - BONUS

FROM SAMP.EMPLOYEE;

**CREATE VIEW SAMP.VEMP\_RES (RESUME)**

AS VALUES 'Delores M. Quintana', 'Heather A. Nicholls', 'Bruce Adamson';

**CREATE VIEW SAMP.PROJ\_COMBO**

(PROJNO, PRENDATE, PRSTAFF, MAJPROJ)

AS SELECT PROJNO, PRENDATE, PRSTAFF, MAJPROJ

FROM SAMP.PROJECT UNION ALL

SELECT PROJNO, EMSTDATE, EMPTIME, EMPNO

FROM SAMP.EMP\_ACT

WHERE EMPNO IS NOT NULL;

**####**

#####DML(data

manipulation language)#####

#####

#####

**CREATE TABLE T1 (C1 DOUBLE PRECISION);**

**CREATE FUNCTION SIN (DATA DOUBLE)**

RETURNS DOUBLE EXTERNAL NAME 'java.lang.Math.sin'

LANGUAGE JAVA PARAMETER STYLE JAVA;

**CREATE VIEW V1 (C1) AS SELECT SIN(C1) FROM T1;**

Derby #####

#####

```
SELECT * FROM V1
```

V1#####T1#####SIN

## DECLARE GLOBAL TEMPORARY TABLE #

The DECLARE GLOBAL TEMPORARY TABLE statement defines a temporary table for the current connection.

#####

#####

#####

- #####
- #####
- #####
- #####

##

```
DECLARE GLOBAL TEMPORARY TABLE ##
```

```
{ ### [ , ### ] * }
```

```
[ ON COMMIT {DELETE | PRESERVE} ROWS ]  
NOT LOGGED [ON ROLLBACK DELETE ROWS]
```

##

#####SESSION#####(SQLSTATE  
428EK) #####SESSION#####

#####

SESSION#####

SESSION#####

###

#####[###](#)CREATE TABLE##### DECLARE GLOBAL TEMPORARY  
TABLE#####

####

#####

- BIGINT
- CHAR
- DATE
- DECIMAL
- DOUBLE
- DOUBLE PRECISION
- FLOAT
- INTEGER
- NUMERIC
- REAL
- SMALLINT
- TIME
- TIMESTAMP
- VARCHAR

ON COMMIT

COMMIT#####

Derby #####

## DELETE ROWS

```
#####ON COMMIT##### ##ON ROLLBACK
DELETE ROWS##### ON COMMIT DELETE
ROWS#####(#####)#
```

## PRESERVE ROWS

```
#####
```

## NOT LOGGED

```
#####
```

```
ROLLBACK(####ROLLBACK TO
```

```
SAVEPOINT)#####(#####)#####(#####)#####
```

## ON ROLLBACK DELETE ROWS

```
###NOT LOGGED#####NOT LOGGED [ON ROLLBACK
```

```
DELETE ROWS ]#####ROLLBACK####ROLLBACK TO
```

```
SAVEPOINT#####
```

```
#
```

```
set schema myapp;
```

```
create table t1(c11 int, c12 date);
```

```
declare global temporary table SESSION.t1(c11 int) not logged;
```

```
-- ####SESSION#####
```

```
-- SESSION#####
```

```
declare global temporary table t2(c21 int) not logged;
```

```
-- ####SESSION#####
```

```
-- #####SESSION#####
```

```
insert into SESSION.t1 values (1);
```

```
-- #####"myapp."#####SESSION#####
```

```
select * from t1;
```

```
-- ##SESSION#####
```

```
-- ##select##"myapp.t1"#####
```

**Note:** ####SESSION##### ##DB2 UDB####DECLARE GLOBAL TEMPORARY TABLE####Derby#####

- IDENTITY column-options
- IDENTITY attribute in copy-options
- AS (fullselect) DEFINITION ONLY
- NOT LOGGED ON ROLLBACK PRESERVE ROWS
- IN tablespace-name
- PARTITIONING KEY
- WITH REPLACE

## Declared Global Temporary Tables####

Derby#####Derby#####

```
#####
```

- ALTER TABLE
- CREATE INDEX
- CREATE SYNONYM
- CREATE TRIGGER
- CREATE VIEW
- GRANT
- LOCK TABLE

Derby #####

- RENAME
- REVOKE

#####

- SESSION#####(#####)#####
- SESSION#####
- #####
- #####SQL#####
- #####
- #####
- #####

#####

#####

- BLOB
- CHAR FOR BIT DATA
- CLOB
- LONG VARCHAR
- LONG VARCHAR FOR BIT DATA
- VARCHAR FOR BIT DATA
- XML

## DELETE #

##

```
{  
    DELETE FROM ##  
        [WHERE #] |  
    DELETE FROM ## WHERE CURRENT OF  
}
```

#####WHERE #####

#####SELECT  
#####

#

DELETE FROM SAMP.IN\_TRAY

```
stmt.executeUpdate("DELETE FROM SAMP.IN_TRAY WHERE CURRENT OF " +  
    resultSet.getCursorName());
```

####

#####(#####)#####CREATE#D  
INDEX#####

#####JDBC#cl

#####CREATE#DROP INDEX#####

## DROP#

#####Drop#####

DROP FUNCTION #

##

DROP FUNCTION ###

Derby #####

```
#####
42704) #####

DROP INDEX #
DROP INDEX #####
##

DROP INDEX ###

DROP INDEX OrigIndex

DROP INDEX DestIndex

####

#####DROP INDEX
#####

DROP PROCEDURE #
##

DROP PROCEDURE ###

#####
#####(SQLSTATE 42704)
#####

DROP SCHEMA #
DROP SCHEMA #####
APP####(#####)#SYS#####
##

DROP SCHEMA ##### RESTRICT

RESTRICT#####RESTRICT#####

-- SAMP #####
-- SAMP#####
-- #####
DROP SCHEMA SAMP RESTRICT

DROP SYNONYM #
#####
##

DROP SYNONYM ###

DROP TABLE #
DROP TABLE #####
##

DROP TABLE ##

####

#####(#####)#####DROP
TABLE#####
#####(#####)#####
```

Derby #####

## DROP TRIGGER #

DROP TRIGGER removes the specified trigger.

##

DROP TRIGGER ####

DROP TRIGGER TRIG1

####

#####(#####)

## DROP VIEW #

#####

##

DROP VIEW ####

DROP VIEW AnIdentifier

####

#####DROP  
VIEW#####

## GRANT #

GRANT #####

#####

- #####
- #####
- #####
- #####
- #####
- #####
- #####

GRANT#####derby.database.sqlAuthorization###true#####derby.databa

#####

#####CREATE#####

GRANT#####

#####

GRANT ##### ON [TABLE] { ## | #### } TO #####

#####

GRANT EXECUTE ON { FUNCTION | PROCEDURE } ##### TO #####

###

DELETE |  
INSERT |  
REFERENCES [###] |  
SELECT [###] |  
TRIGGER |  
UPDATE [###]

###



Derby #####

```
( #### {, ####}* )

ALL
PRIVILEGES#####
DELETE#####
INSERT#####
REFERENCES#####REFERENCES#####
SELECT#####SELECT#####SELECT#####
TRIGGER#####
UPDATE#####UPDATE#####WHERE#####
#####

{ ##### | PUBLIC } [, { ##### | PUBLIC } ] *

##### PUBLIC
#####PUBLIC#####
PUBLIC##### t#####SELECT####PUBLIC#harry#####
#####

{
  ## | #####
}

#
t#####SELECT###maria # harry#####

GRANT SELECT ON TABLE t TO maria,harry

t#####UPDATE#TRIGGER####anita#zhi#####

GRANT UPDATE, TRIGGER ON TABLE t TO anita,zhi

s.v#####SELECT#####

GRANT SELECT ON TABLE s.v to PUBLIC

p#####george#####

GRANT EXECUTE ON PROCEDURE p TO george
```

## INSERT #

```
INSERT#####
INSERT#####

##

INSERT INTO ##
  [ (#### [ , ####]* ) ]
  ###

#####
  • ###
  • VALUES##
  • ###VALUES#
    #####DEFAULT#####DEFAULT#####
  • UNION#
```

Derby #####

#####

```
INSERT INTO COUNTRIES
VALUES ('Taiwan', 'TW', 'Asia')

-- DEPARTMENT#####
-- #####
INSERT INTO DEPARTMENT (DEPTNO, DEPTNAME, ADMRDEPT)
VALUES ('E31', 'ARCHITECTURE', 'E01')
-- 2#####DEPARTMENT#####
-- #####
INSERT INTO DEPARTMENT (DEPTNO, DEPTNAME, ADMRDEPT)
VALUES ('B11', 'PURCHASING', 'B01'),
('E41', 'DATABASE ADMINISTRATION', 'E01')
-- EMP_ACT#####MA_EMP_ACT###
-- #####
-- MA_EMP_ACT#EMP_ACT#####
-- #####(PROJNO)#'MA'#####
CREATE TABLE MA_EMP_ACT
(
EMPNO CHAR(6) NOT NULL,
PROJNO CHAR(6) NOT NULL,
ACTNO SMALLINT NOT NULL,
EMPTIME DEC(5,2),
EMSTDATE DATE,
EMENDATE DATE
);

INSERT INTO MA_EMP_ACT
SELECT * FROM EMP_ACT
WHERE SUBSTR(PROJNO, 1, 2) = 'MA';
-- LOCATION#####DEFAULT#####
INSERT INTO DEPARTMENT
VALUES ('E31', 'ARCHITECTURE', '00390', 'E01', DEFAULT)
```

####

INSERT

#####(#####)#####INSERT#####

## LOCK TABLE #

LOCK TABLE#####

#####

#####

#####

- #####(#####)
- #####

#####

##

LOCK TABLE ## IN { SHARE | EXCLUSIVE } MODE

#####Flights#

#####(SQLState  
X0X02)

#

#####Flights#####

```
LOCK TABLE Flights IN SHARE MODE;
SELECT *
```

Derby #####

```
FROM Flights
WHERE orig_airport > '000';
```

###UPDATE#####

#####UPDATE#####  
#####

```
LOCK TABLE FlightAvailability IN EXCLUSIVE MODE;
UPDATE FlightAvailability
SET economy_seats_taken = (economy_seats_taken + 2)
WHERE flight_id = 'AA1265' AND flight_date = DATE('2004-03-31');
```

```
UPDATE FlightAvailability
SET economy_seats_taken = (economy_seats_taken + 2)
WHERE flight_id = 'AA1265' AND flight_date = DATE('2004-04-11');
```

```
UPDATE FlightAvailability
SET economy_seats_taken = (economy_seats_taken + 2)
WHERE flight_id = 'AA1265' AND flight_date = DATE('2004-04-12');
```

```
UPDATE FlightAvailability
SET economy_seats_taken = (economy_seats_taken + 2)
WHERE flight_id = 'AA1265' AND flight_date = DATE('2004-04-15');
```

##### #:

```
LOCK TABLE Maps IN EXCLUSIVE MODE;
SELECT MAX(map_id) + 1 FROM Maps;
-- INSERT INTO Maps . . .
```

## RENAME #

#####RENAME #####

**RENAME COLUMN #**

RENAME COLUMN #####

RENAME COLUMN#####(SYS#####)

#####

#####ALTER TABLE #####

##

RENAME COLUMN **##.###** TO **###**

#

*employee#####manager##### supervisor#####*

RENAME COLUMN EMPLOYEE.MANAGER TO SUPERVISOR

ALTER TABLE#RENAME COLUMN#####

#####c1#####NEWTYPE#####

```
ALTER TABLE t ADD COLUMN c1_newtype NEWTYPE
UPDATE t SET c1_newtype = c1
ALTER TABLE t DROP COLUMN c1
RENAME COLUMN t.c1_newtype TO c1
```

#####

**Note:** #####

**Note:** #####RENAME COLUMN#####

**Note:** #####

Derby #####

## RENAME INDEX #

#####SY#####

##

RENAME INDEX ## TO ###

RENAME INDEX DESTINDEX TO ARRIVALINDEX

####

#####RENAME INDEX #####

## RENAME TABLE #

RENAME TABLE#####(#####)

#####

##

RENAME TABLE ## TO ###

#####

#####

RENAME TABLE SAMP.EMP\_ACT TO EMPLOYEE\_ACT

#####ALTER TABLE #####

####

#####

#####RENAME TABLE#####

## REVOKE #

REVOKE#####

#####

- #####
- #####
- #####
- #####
- #####
- #####
- #####

REVOKE#####derby.database.sqlAuthorization###true#####derby.datab

#####

REVOKE#####

#####

REVOKE ##### ON [ TABLE ] { ## | #### } FROM #####

#####

#####

REVOKE EXECUTE ON { FUNCTION | PROCEDURE } ##### FROM #####  
RESTRICT

#####REVOKE#####RESTRICT#####RESTRICT#####

Derby #####

####

ALL PRIVILEGES |  
####

####

### {, ### }\*

###

DELETE |  
INSERT |  
REFERENCES [###] |  
SELECT [###] |  
TRIGGER |  
UPDATE [###]

###

( #### {, ####}\* )

#####ALL

PRIVILEGES#####

DELETE#####

INSERT#####

REFERENCES#####

SELECT#####

TRIGGER#####

UPDATE#####UPDATE#####

#####

{ ##### | PUBLIC } [, { authorization ID | PUBLIC } ] \*

#####PUBLIC#####PUBLIC#####

####harry#####SELECT#####harry#####PUBLIC#####t#####

#####: #####

#####

{  
qualified-name [ signature ]  
}

#####

#####Derby

#####Derby #####"SQL standard  
authorization"#####

####

REVOKE#####

#####

#####SYSTABLEPERMS#####ID#####user2###user1.t1#SELECT#

#####Derby

#####SYSTABLEPERMS#####

Derby #####

```
####user2#SELECT * FROM
user1.t1#####v1#####v1##GRANTEE##user2#TABLEID##user1.t1###SYSTA
#####REVOKE#####ID#####
#####
SYSCOLPERMS#####ID#####user2##use
c13#####
#####Derby#####SYSCOLPERMS#####
c11 FROM
user1.t1#####v1#####GRANTEE##user2#TABLEID##user1.t1#TYPE##S#
REVOKE#####ID#####
#####user2.v1#####
#####
#t##SELECT####maria#harry#####
REVOKE SELECT ON TABLE t FROM maria,harry
#t##UPDATE#TRIGGER###anita#zhi#####
REVOKE UPDATE, TRIGGER ON TABLE t FROM anita,zhi
#s.v##SELECT#####
REVOKE SELECT ON TABLE s.v FROM PUBLIC
#s.v#c1#c2#####UPDATE#####
REVOKE UPDATE (c1,c2) ON TABLE s.v FROM PUBLIC
p#####EXECUTE####george#####
REVOKE EXECUTE ON PROCEDURE p FROM george RESTRICT
```

## SET #

```
Set#####
SET ISOLATION #
SET
ISOLATION#####SERIALIZABLE#REPEATABLE
READ#READ COMMITTED#READ UNCOMMITTED###
#####JDBC#java.sql.Connection.setTransactionIsolation#####
#####Derby #####
#####"#####JDBC#java.sql.Connection.setTransactionIsolation#####java.
#####"#####
##
SET [ CURRENT ] ISOLATION [ = ]
{
UR | DIRTY READ | READ UNCOMMITTED
CS | READ COMMITTED | CURSOR STABILITY
RS |
RR | REPEATABLE READ | SERIALIZABLE
RESET
}
set isolation serializable;
```

Derby #####

## SET SCHEMA #

```
SET SCHEMA #####
#####

SET SCHEMA#####
#####CREATE SCHEMA #####

SET SCHEMA #####SET SCHEMA
#####SET SCHEMA #####
```

##

```
SET [CURRENT] SCHEMA [=]
{ #####|
USER | ? | '<####>' } | SET CURRENT SQLID [=]
{
####| USER | ? | '<####>' }
```

#####128#####(#####SYS#sYs#SYs#sys###

USER#####APP###(#####

? #####SET

SCHEMA#####APP##

```
-- #####
-- HOTEL#####
SET SCHEMA HOTEL
SET SCHEMA hotel
SET CURRENT SCHEMA hotel
SET CURRENT SQLID hotel
SET SCHEMA = hotel
SET CURRENT SCHEMA = hotel
SET CURRENT SQLID = hotel
SET SCHEMA "HOTEL" -- #####
SET SCHEMA 'HOTEL' -- #####--####hotel#####
--#####
SET SCHEMA = 'hotel'
--SQLID#CURRENT#####
--#####
SET SQLID hotel
-- #####ID#####
SET CURRENT SCHEMA USER
// Java#####set schema#####
PreparedStatement ps = conn.prepareStatement("set schema ?");
ps.setString(1,"HOTEL");
ps.executeUpdate();
... do some work
ps.setString(1,"APP");
ps.executeUpdate();

ps.setString(1,"app"); //error - string is case sensitive
// no app will be found
ps.setNull(1, Types.VARCHAR); //error - null is not allowed
```

## SELECT #

##

```
###
[ORDER BY #]
[FOR UPDATE #]
WITH {RR|RS|CS|UR}
```

Derby #####

```
SELECT#####ORDER BY ##FOR UPDATE
#####
SELECT#####SELECT#####(#####VALUES##UNION#INTERS
ORDER BY #####ResultSet#####FOR UPDATE
#####SELECT###FOR EACH ONLY #####FOR
EACH ONLY ##FOR READ ONLY#####
SELECT###WITH {RR|RS|CS|UR}#####
#

-- SAL+BONUS+COMM#####TOTAL_PAY#####
-- #####
SELECT FIRSTNME, SALARY+BONUS+COMM AS TOTAL_PAY
    FROM EMPLOYEE
    ORDER BY TOTAL_PAY
-- FOR UPDATE#####
-- PROJECT#####(PRSTDATE)#####(PRENDATE)#####
-- #####
SELECT PROJNO, PRSTDATE, PRENDATE
    FROM PROJECT
    FOR UPDATE OF PRSTDATE, PRENDATE
-- #####RR####
SELECT *
FROM Flights
WHERE flight_id BETWEEN 'AA1111' AND 'AA1112'
WITH RR

SELECT##ResultSet#####
#####ResultSet#####Java#####ResultSets#####SQL#####
UPDATE
#####SQL#####SELECT#####
Note: ORDER BY####SELECT#####ORDER
BY#####

#####ResultSet###
#####SELECT#####
#####ResultSet#####SELECT#####:
    • SELECT###ORDER BY#####
    • #####
    • #####
        • DISTINCT
        • ##
        • GROUP BY #
        • HAVING #
        • ORDER BY #
    • #####FROM#####
        • #####
        • #####
        • ###s
        • #####

Note:
#####ResultSet#####ResultSet.CONCUR
UPDATE#####(FOR UPDATE #####)

SQL#####JDBC
API#####Derby #####
#####
####
```



Derby #####

```
SELECT#####(#####)#####
CREATE INDEX#####SELECT##### DROP
INDEX#####SELECT#####
##SELECT#####(CREATE VIEW
#####)

SELECT#####UPDATE WHERE CURRENT####DELETE WHERE
CURRENT##SELECT#####java.sql.Statement.close ###SELECT#####UPDATE
WHERE CURRENT ### DELETE WHERE CURRENT#####

SELECT#####SELECT#####
```

## UPDATE#

##

```
{
    UPDATE ##
        SET ## = #
        [ , ## = # } ] *
        [WHERE#] |
    UPDATE ##
        SET ## = #
        [ , ## = # ] *
        WHERE CURRENT OF
}
```

#####

# | DEFAULT

#####WHERE#####

#####SELECT##FOR  
UPDATE ######SELECT##FOR  
UPDATE#####

#####DEFAULT#####

#

```
-- 'E21'###(WORKDEPT)#####
-- #####EMPLOYEE#####(JOB)#NULL##
-- #####(SALARY, BONUS, COMM)#0#####
UPDATE EMPLOYEE
    SET JOB=NULL, SALARY=0, BONUS=0, COMM=0
    WHERE WORKDEPT = 'E21' AND JOB <> 'MANAGER'

-- #####
UPDATE EMPLOYEE
    SET JOB = 'MANAGER'
    WHERE JOB IS NULL;
// #####(PRSTAFF)#1.5####
stmt.executeUpdate("UPDATE PROJECT SET PRSTAFF = "
    "PRSTAFF + 1.5" +
    "WHERE CURRENT OF" + ResultSet.getCursorName());

-- EMPLOYEE#####(EMPNO)#'000290'#####(JOB)##
-- #####NULL#####
UPDATE EMPLOYEE
    SET JOB = DEFAULT
    WHERE EMPNO = '000290'
```

####

Derby #####

```
#####(#####)#####WHERE##SET#####
INDEX#DROP INDEX##ALTER TABLE#####
#####JD
#####CREATE INDEX#DROP INDEX##ALTER
TABLE#####
#####
#####
```

## SQL #

### CONSTRAINT #

```
CONSTRAINT###CREATE TABLE ##ALTER TABLE
#####
#####
• #####
#####(#####)#####
• #####
#####0#####
#####
• NOT NULL
#####NULL#####(#####)
• PRIMARY KEY
#####NOT NULL#####
Note: ALTER
TABLE#####ALTER
TABLE ######
• UNIQUE
#####NULL#####
• FOREIGN KEY
#####NULL#####
• CHECK
#####
#####
• PRIMARY KEY
#####NULL#####
• UNIQUE
#####NOT NULL#####
• FOREIGN KEY
#####NULL#####
Note:
#####NULL#####NULL#####NULL#####
• CHECK
#####
```

Derby #####

```
#####PRIMARY
KEY#UNIQUE#CHECK#FOREIGN
KEY#####(#####)#####

##
#####

#####

#####NULL#####NULL#####

#####NOT NULL#####ALTER
TABLE ADD PRIMARY KEY
#####NULL#####NULL#####ALTER
TABLE #####

###PRIMARY KEY#####UNIQUE#####

#####

#####(#####)#####

#####

####(#####)#####
#####

#####(#####)#####

#####NULL#
Note:
SQL-
92#####
NULL#####

#####DML

#####Derby#####
#####Derby#####

#####(#####)#####Derby#####
#####Derby#####

Derby#####

#####

UNIQUE#PRIMARY KEY#FOREIGN
KEY#####(#####)
UNIQUE###PRIMARY KEY#####FOREIGN
KEY#####UNIQUE###PRIMARY
KEY###FOREIGN
KEY#####Derby#########

#####(CREATE INDEX
#####)#####

#####DROP INDEX#####

#####

#####(#####)#####

#####

#####CREATE
TABLE#####
```

Derby #####

```
#####
  • ##### (?)
  • ##### (CURRENT_DATE#CURRENT_TIME#CURRENT_TIMESTAMP)
  • #####
  • ##### (###USER#SESSION_USER#CURRENT_USER)

#####

#####(CASCADE#RESTRICT#SET NULL###NO ACTION)#####ON
DELETE##/ON UPDATE#####
#####

#####

#####NO ACTION####RESTRICT###

#####RESTRICT#####Derby#####

#####NO
ACTION#####Derby#####

#####NO
ACTION#####NO
ACTION#####

#####

#####NO ACTION#RESTRICT#CASCADE####SET NULL###SET
NULL#####null#####

#####

NO
ACTION##Derby#####

RESTRICT###Derby#####

CASCADE#####(#####)

SET
NULL#####(#####)

#####
#####RESTRICT#NO ACTION#####
#####RESTRICT#NO
ACTION#####

#####
  • #####RESTRICT####NO
    ACTION#####(###Derby#####)
  • #####SET NULL#####
  • #####CASCADE#####
  • #####

#

-- OUT_TRAY_PK#####:
CREATE TABLE SAMP.OUT_TRAY
(
  SENT TIMESTAMP,
  DESTINATION CHAR(8),
  SUBJECT CHAR(64) NOT NULL CONSTRAINT OUT_TRAY_PK PRIMARY KEY,
  NOTE_TEXT VARCHAR(3000)
);

-- #####
```

Derby #####

```
-- #####
CREATE TABLE SAMP.SCHED
(
  CLASS_CODE CHAR(7) NOT NULL,
  DAY SMALLINT NOT NULL,
  STARTING TIME,
  ENDING TIME,
  PRIMARY KEY (CLASS_CODE, DAY)
);

-- #####
-- #####
-- #####
CREATE TABLE SAMP.EMP
(
  EMPNO CHAR(6) NOT NULL CONSTRAINT EMP_PK PRIMARY KEY,
  FIRSTNAME CHAR(12) NOT NULL,
  MIDINIT VARCHAR(12) NOT NULL,
  LASTNAME VARCHAR(15) NOT NULL,
  SALARY DECIMAL(9,2) CONSTRAINT SAL_CK CHECK (SALARY >= 10000),
  BONUS DECIMAL(9,2),
  TAX DECIMAL(9,2),
  CONSTRAINT BONUS_CK CHECK (BONUS > TAX)
);

-- MEAL#####
CREATE TABLE FLIGHTS
(
  FLIGHT_ID CHAR(6) NOT NULL ,
  SEGMENT_NUMBER INTEGER NOT NULL ,
  ORIG_AIRPORT CHAR(3),
  DEPART_TIME TIME,
  DEST_AIRPORT CHAR(3),
  ARRIVE_TIME TIME,
  MEAL CHAR(1) CONSTRAINT MEAL_CONSTRAINT
  CHECK (MEAL IN ('B', 'L', 'D', 'S')),
  PRIMARY KEY (FLIGHT_ID, SEGMENT_NUMBER)
);

CREATE TABLE METROPOLITAN
(
  HOTEL_ID INT NOT NULL CONSTRAINT HOTELS_PK PRIMARY KEY,
  HOTEL_NAME VARCHAR(40) NOT NULL,
  CITY_ID INT CONSTRAINT METRO_FK REFERENCES CITIES
);

-- #####
-- #####
CREATE TABLE FLTAVAIL
(
  FLIGHT_ID CHAR(6) NOT NULL,
  SEGMENT_NUMBER INT NOT NULL,
  FLIGHT_DATE DATE NOT NULL,
  ECONOMY_SEATS_TAKEN INT,
  BUSINESS_SEATS_TAKEN INT,
  FIRSTCLASS_SEATS_TAKEN INT,
  CONSTRAINT FLTAVAIL_PK PRIMARY KEY (FLIGHT_ID, SEGMENT_NUMBER),
  CONSTRAINT FLTS_FK
  FOREIGN KEY (FLIGHT_ID, SEGMENT_NUMBER)
  REFERENCES Flights (FLIGHT_ID, SEGMENT_NUMBER)
);

-- #####
ALTER TABLE SAMP.PROJECT
ADD CONSTRAINT P_UC UNIQUE (PROJNAME);

-- #####
-- city_id##Cities#####
CREATE TABLE CONDOS
(
  CONDO_ID INT NOT NULL CONSTRAINT hotels_PK PRIMARY KEY,
```

Derby #####

```
CONDO_NAME VARCHAR(40) NOT NULL,  
CITY_ID INT CONSTRAINT city_foreign_key  
REFERENCES Cities ON DELETE CASCADE ON UPDATE RESTRICT  
);
```

#####

```
INSERT##UPDATE#####  
DELETE#####  
#####
```

####

```
{  
    NOT NULL |  
    [ [CONSTRAINT ###]  
    {  
        CHECK (####) |  
        {  
            PRIMARY KEY |  
            UNIQUE |  
            REFERENCES #  
        }  
    }  
}
```

#####

```
[CONSTRAINT ###]  
{  
    CHECK (####) |  
    {  
        PRIMARY KEY ( #### [ , #### ]* ) |  
        UNIQUE ( #### [ , #### ]* ) |  
        FOREIGN KEY ( #### [ , #### ]* )  
REFERENCES #  
    }  
}
```

####

```
REFERENCES ## [ ( #### [ , #### ]* ) ]  
[ ON DELETE {NO ACTION | RESTRICT | CASCADE | SET NULL}]  
[ ON UPDATE {NO ACTION | RESTRICT }]  
|  
[ ON UPDATE {NO ACTION | RESTRICT } ] [ ON DELETE  
{NO ACTION | RESTRICT | CASCADE | SET NULL}]
```

####

A #####

#####Derby#####(#####)#####

## FOR UPDATE #

```
SELECT##FOR UPDATE#####FOR  
UPDATE#####SELECT#####  
#####
```

##

```
FOR  
{  
    READ ONLY | FETCH ONLY |  
    UPDATE [ OF #### [ , #### ]* ]  
}
```

Derby #####

#### FROM#####

**Note:** #####JDBC#ResultSet#####FOR UPDATE#####  
JDBC#ResultSet#####JDBC  
Statement#####ResultSet.CONCUR\_UPDATABLE#JDBC  
ResultSet#####

#####Derby#####

SELECT RECEIVED, SOURCE, SUBJECT, NOTE\_TEXT FROM SAMP.IN\_TRAY FOR UPDATE

## FROM #

FROM##~~###~~#####

##

FROM ## [ , ## ] \*

```
SELECT Cities.city_id
FROM Cities
WHERE city_id < 5
-- #####
SELECT TABLENAME, ISINDEX
FROM SYS.SYSTABLES T, SYS.SYSCONGLOMERATES C
WHERE T.TABLEID = C.TABLEID
ORDER BY TABLENAME, ISINDEX
-- #####
SELECT *
FROM Flights, FlightAvailability
WHERE FlightAvailability.flight_id = Flights.flight_id
AND FlightAvailability.segment_number = Flights.segment_number
AND Flights.flight_id < 'AA1115'
-- #####
--#####FROM#####
SELECT COUNTRIES.COUNTRY, CITIES.CITY_NAME, FLIGHTS.DEST_AIRPORT
FROM COUNTRIES LEFT OUTER JOIN CITIES
ON COUNTRIES.COUNTRY_ISO_CODE = CITIES.COUNTRY_ISO_CODE
LEFT OUTER JOIN FLIGHTS
ON Cities.AIRPORT = FLIGHTS.DEST_AIRPORT
```

## GROUP BY #

GROUP BY

~~###~~#####  
##### NULL#####

#####GROUP BY#####

##

GROUP BY ## [ , ## ] \*

~~##~~##### GROUP  
BY#####

GROUP BY####~~###~~#####

```
-- airport#####flights##
-- flying_times#####
SELECT AVG (flying_time), orig_airport
FROM Flights
GROUP BY orig_airport

SELECT MAX(city_name), region
```

Derby #####

```
FROM Cities, Countries
WHERE Cities.country_ISO_code = Countries.country_ISO_code
GROUP BY region
-- smallint####
SELECT ID, AVG(SALARY)
FROM SAMP.STAFF
GROUP BY ID
-- AVGSALARY#EMPCOUNT###DEPTNO##AS#####
-- ###OTHERS#####WORKDEPT#####
SELECT OTHERS.WORKDEPT AS DEPTNO,
AVG(OTHERS.SALARY) AS AVGSALARY,
COUNT(*) AS EMPCOUNT
FROM SAMP.EMPLOYEE OTHERS
GROUP BY OTHERS.WORKDEPT
```

## HAVING #

```
HAVING####GROUP
BY#####WHERE#####HAVING#####GROUP
BY#####HAVING##### SELECT###GROUP
BY#####
```

##

HAVING ###

```
#####(GROUP BY #####)#####
#####SALARY#####
```

```
-- SELECT COUNT(*)
-- FROM SAMP.STAFF
-- GROUP BY ID
-- HAVING SALARY > 15000
```

```
HAVING#####SELECT#####
##HAVING#####
```

```
-- 2#####
SELECT SUM(ECONOMY_SEATS_TAKEN), AIRLINE_FULL
FROM FLIGHTAVAILABILITY, AIRLINES
WHERE SUBSTR(FLIGHTAVAILABILITY.FLIGHT_ID, 1, 2) = AIRLINE
GROUP BY AIRLINE_FULL
HAVING COUNT(*) > 1
```

## ORDER BY #

ORDER BY##SELECT##### ORDER BY###ResultSet#####

### Syntax

```
ORDER BY { ## | ColumnPosition | Expression }
[ ASC | DESC ]
[ , ## | ### | #
[ ASC | DESC ] ] *
```

##

```
#####SELECT##### ORDER
BY#####SELECT#####
```

###

```
SELECT#####
```

```
#####0#####SELECT#####
```

#



Derby #####

```
#####
#####CASE#####
ASC
#####ASC#####
DESC
#####

####
• SELECT DISTINCT#####SELECT##GROUP BY#####ORDER
  BY####SELECT#####
• ORDER
  BY#####SELECT#####ResultSet#####
  #####INTEGER#####NULL#1#####NULL#####

#####

#####CITIES#####COUNTRY##NATION#####

SELECT CITY_NAME, COUNTRY AS NATION
      FROM CITIES
      ORDER BY NATION

#####
#####

SELECT name, salary, bonus FROM employee
      ORDER BY salary+bonus

#####salary#bonus##DECIMAL#####

#####
#####

SELECT i, len FROM measures
      ORDER BY sin(i)
```

## WHERE #

```
WHERE########DELETE ##UPDATE #####
WHERE#####
###DELETE#####UPDATE#####

##

WHERE ###

WHERE#####
#####10#####

#

-- #####
-- #####
SELECT *
FROM FlightAvailability
WHERE business_seats_taken IS NULL
OR business_seats_taken = 0
-- EMP_ACT#EMPLOYEE#####
-- EMP_ACT####EMPLOYEE#####(LASTNAME)###
-- #####
SELECT SAMP.EMP_ACT.*, LASTNAME
      FROM SAMP.EMP_ACT, SAMP.EMPLOYEE
      WHERE EMP_ACT.EMPNO = EMPLOYEE.EMPNO
-- #####
```

Derby #####

```
--###
-- #####(DINFO)###AS#####
-- AVGSALARY#EMPCOUNT###WHERE#####DEPTNO#
-- #####
SELECT THIS_EMP.EMPNO, THIS_EMP.SALARY, DINFO.AVGSALARY, DINFO.EMPCOUNT
FROM EMPLOYEE THIS_EMP,
     (SELECT OTHERS.WORKDEPT AS DEPTNO,
        AVG(OTHERS.SALARY) AS AVGSALARY,
        COUNT(*) AS EMPCOUNT
     FROM EMPLOYEE OTHERS
     GROUP BY OTHERS.WORKDEPT
    )AS DINFO
WHERE THIS_EMP.JOB = 'SALESREP'
      AND THIS_EMP.WORKDEPT = DINFO.DEPTNO
```

## WHERE CURRENT OF #

```
WHERE CURRENT OF##UPDATE#DELETE#####
#####SELECT #####
##
```

WHERE CURRENT OF #####

```
Statement s = conn.createStatement();
s.setCursorName("AirlinesResults");
ResultSet rs = conn.executeQuery(
    "SELECT Airline, basic_rate " +
    "FROM Airlines FOR UPDATE OF basic_rate");
Statement s2 = conn.createStatement();
s2.executeUpdate("UPDATE Airlines SET basic_rate = basic_rate " +
    "+ .25 WHERE CURRENT OF AirlinesResults");
```

## SQL#

```
#####
#####
#####
```

- ORDER BY #
- ###
- UPDATE# (SET###)
- VALUES#
- WHERE#

```
#####
```

```
#####SQL#####
```

```
#####
```

```
#####
```

```
# 2. #####
```

####	##	
####	##### ##### FROM ##### ###s#UPDATE##DML##WHERE#####	#####
##	#####(#####)	

Derby #####

####	##	
NULL	NULL##### CAST##INSERT#VALUES#####UPDATE#SET#####CAST#####	
	#####	#####SQL##### ##### ##### ##### #####
CAST #	NULL##### CAST #######	
#####	##### #####	
#####	##### ##### FROM##EXISTS#IN#####	

### Boolean#

#####  
####WHERE#####SQL#####SQL  
#####

##

#####

- BIGINT
- DECIMAL
- DOUBLE PRECISION
- INTEGER
- REAL
- SMALLINT

# 3. ####

###	#####
####	##
-*#/####+#-##	##### ##### ###+#####(###+4#4#####)###-##-1#####
AVG	#####AVG##
SUM	#####SUM##
LENGTH	##### LENGTH#####
LOWER	LCASE####LOWER#####
COUNT	#####COUNT ##COUNT(*) #####

###

#####CHAR###VARCHAR#####CHAR###VARCHAR#####

Derby #####

#### # 4. #####

####	##
#####CHAR#VARCHAR##	#####%#_#####LIKE#####
###	#####"  "##### Concatenation#####
#####	##### LTRIM###LCASE####LOWER###RTRIM###TRIM ###SUBSTR#####refsqj29930#####
USER##	User#####CURRENT_USER###SESSION_ USER#####

##/###

##/#####DATE#TIME#TIMESTAMP#####/#####

#### # 5. ##/#####

####	##
CURRENT_DATE	#####CURRENT_DATE#####
CURRENT_TIME	#####CURRENT_TIME#####
CURRENT_TIMESTAMP	#####CURRENT_TIMESTAMP#####

###

####SELECT-FROM-WHERE#####

##

```
SELECT [ DISTINCT | ALL ] #### [ ,  
      ###]*  
FROM #  
[ WHERE #]  
[ GROUP BY # ]  
[ HAVING # ]
```

####:

```
{  
  * |  
  { ## | ### } .* |  
  # [AS ####]  
}
```

SELECT#####FROM#WHERE###### DISTINCT#####

#####

FROM#####WHERE######

WHERE#####

GROUP BY#####GROUP  
BY#####

GROUP

BY#####SELECT#####SELECT#####

Derby #####

```
-- #####(WORKDEPT)#####(SALARY)#
-- #EMPLOYEE#####
-- #####
SELECT WORKDEPT, AVG(SALARY)
      FROM EMPLOYEE
      GROUP BY WORKDEPT
      ORDER BY 1
```

GROUP

BY#####

HAVING#####(WHERE#####)#####H  
BY#####

Derby #####

- FROM #
- WHERE #
- GROUP BY (#####GROUP BY)
- HAVING #
- SELECT #

#####

####FROM#####)#####VALUES##### #:

VALUES CURRENT\_TIMESTAMP

VALUES#####

#####\*

\*###FROM#####

##.\*# ##.\*#####FROM#####

####

AS#####AS#####

#####

- JDBC#ResultSetMetaData#####
- FROM#####
- ORDER BY#####

```
-- #####ORDER BY#####
-- SELECT-FROM-WHERE#####
SELECT CONSTRAINTNAME, COLUMNNAME
FROM SYS.SYSTABLES t, SYS.SYSCOLUMNS col,
SYS.SYSCONSTRAINTS cons, SYS.SYSCHECKS checks
WHERE t.TABLENAME = 'FLIGHTS' AND t.TABLEID = col.
REFERENCEID AND t.TABLEID = cons.TABLEID
AND cons.CONSTRAINTID = checks.CONSTRAINTID
ORDER BY CONSTRAINTNAME
-- ####DISTINCT#####
SELECT DISTINCT ACTNO
FROM EMP_ACT
-- #####
-- EMPLOYEE#####
-- ####(WORKDEPT)#BOSS#####(SALARY)#
-- #####
SELECT WORKDEPT AS DPT, MAX(SALARY) AS BOSS
FROM EMPLOYEE EMP_COR
GROUP BY WORKDEPT
HAVING MAX(SALARY) < (SELECT AVG(SALARY)
      FROM EMPLOYEE
      WHERE NOT WORKDEPT = EMP_COR.WORKDEPT)
ORDER BY BOSS
```

Derby #####

## TableExpression

```
#####FROM #####
#####
#####
FROM#####FROM#####
###AS#####
  • VALUES#####VALUES#####
  • #####
From#####
#####Derby#####
##

{
##### | ###
}

#

-- #####
SELECT E.EMPNO, E.LASTNAME, M.EMPNO, M.LASTNAME
  FROM EMPLOYEE E LEFT OUTER JOIN
        DEPARTMENT INNER JOIN EMPLOYEE M
    ON MGRNO = M.EMPNO
    ON E.WORKDEPT = DEPTNO

#####

{## | #### | #####}
  [ [ AS ] ###
    [ (#### [ , ####]* ) ] ] ]

#####:

TABLE ##( [ [ ##### ] [ , ##### ]* ] )

#### #####

SELECT s.*
FROM TABLE( externalEmployees( 42 ) ) s
```

## VALUES#

```
VALUES#####
VALUES#####
  • ResultSet####
  • #####
  • INSERT###(INSERT#####VALUES#####)

##

VALUES ( # { , # }* )
      [ , ( # { , # }* ) ]* |
VALUES # [ , # ]*
}
```

Derby #####

#####

# | DEFAULT

#####

VALUES##INSERT#####DEFAULT#####

##DEFAULT#####

#####INSERT#####

#

-- 1#3#

VALUES (1),(2),(3)

-- 1#3#

VALUES 1, 2, 3

-- 3#1#

VALUES (1, 2, 3)

-- 2#3#

VALUES (1,21),(2,22),(3,23)

-- #####

VALUES ('orange', 'orange'), ('apple', 'red'),  
('banana', 'yellow')

-- ###DEPARTMENT#####

-- #####

INSERT INTO DEPARTMENT (DEPTNO, DEPTNAME, ADMRDEPT)

VALUES ('B11', 'PURCHASING', 'B01'),  
( 'E41', 'DATABASE ADMINISTRATION', 'E01')

-- MAJPROJ#####

INSERT INTO PROJECT (PROJNO, PROJNAME, DEPTNO, RESPEMP, PRSTDATE,  
MAJPROJ)

VALUES ('PL2101', 'ENSURE COMPAT PLAN', 'B01', '000020', CURRENT\_DATE,  
DEFAULT)

-- #####

VALUES CURRENT\_DATE

-- #####

VALUES (3\*29, 26.0E0/3)

-- #####

values char(1)

#####

#####

- (), ?, ## (#####), NULL, ###, #####, CAST
- LENGTH, CURRENT\_DATE, CURRENT\_TIME, CURRENT\_TIMESTAMP,  
#####
- #####+###-
- \*, /, || (##)
- #####+###-
- ### ##### EXISTS, IN, IS NULL, LIKE, BETWEEN, IS
- NOT
- AND
- OR

#####

#

(3+4)\*9

(age < 16 OR age > 65) AND employed = TRUE

###

```
####WHERE#####
###CONSTRAINT #####
WHERE#####WHERE#####
#####SQL #####
# 6. SQL #####
```

#####  
#####  
#####  
#####  
#####  
#####(\*)#####



Derby #####

###	####	##
	WHERE EXISTS (SELECT * FROM Flights WHERE dest_airport = 'SFO' AND orig_airport = 'GRU')	
####	#####ALL#ANY#SOME##### (<,<=,>,>=,<>)##### ##### ALL#####  WHERE normal_rate < ALL (SELECT budget/550 FROM Groups)	# ##### { ALL   ANY   SOME } ##### #SOME#####

#####

JDBC

API#PreparedStatement#####?####

JDBC API#####IN#INOUT#OUT#####SQL##IN#####

New: Derby ##JDBC

3.0#####ParameterMetaData#####

#####Derby #####

#####

#####

```
PreparedStatement ps2 = conn.prepareStatement(
    "UPDATE HotelAvailability SET rooms_available = " +
    "(rooms_available - ?) WHERE hotel_id = ? " +
    "AND booking_date BETWEEN ? AND ?");
-- #####
-- #####
ps2.setInt(1, numberRooms);
ps2.setInt(2, theHotel.hotelId);
ps2.setDate(3, arrival);
ps2.setDate(4, departure);
updateCount = ps2.executeUpdate();
```

#####

#####

1. BETWEEN#####

```
WHERE ? BETWEEN DATE('1996-01-01') AND ?
-- ##DATE#####
```

2. BETWEEN#####

```
WHERE DATE('1996-01-01') BETWEEN ? AND ?
-- ##DATE#####
```

3. IN#####

```
WHERE ? NOT IN (?, ?, 'Santiago')
-- ##CHAR#####
```

Derby #####

4. IN#####IN#####  
#####  
  
WHERE FloatColumn IN (?, ?,  
?)  
-- ##FLOAT#####
5. #####2#####+##\*##/##AND#OR#<#>#  
=<#>#<=#>#>#####  
#####  
  
WHERE ? < CURRENT\_TIMESTAMP  
-- ##TIMESTAMP#####
6. CAST#####  
  
CALL valueOf(CAST (? AS VARCHAR(10)))
7. LIKE#####  
(LIKE##CHAR#VARCHAR#####Concatenation#####)  
  
WHERE ? LIKE 'Santi%'  
--#####java.lang.Integer.MAX\_VALUE#  
--CHAR#####
8. #####?##|#####  
#####"? ||  
?"#####|#####?#####|#####CHAR####  
#####CHAR FOR BIT DATA####VARCHAR FOR BIT  
DATA#####VARCHAR FOR BIT DATA##  
  
SELECT BITcolumn || ?  
FROM UserTable  
-- ##BITcolumn#####CHAR FOR BIT DATA#####
9. #####?#####  
  
SELECT c1 IS NULL ? ? : c1  
-- #####  
-- #####c1#####  
-- :#####
10. INSERT##values####select#####  
#####  
  
INSERT INTO t VALUES (?)  
-- #####  
-- t#####  
INSERT INTO t SELECT ?  
FROM t2  
-- #####
11. #####?#####  
  
SELECT \*  
FROM tab1  
WHERE ? = (SELECT x FROM tab2)  
  
SELECT \*  
FROM tab1  
WHERE ? = ANY (SELECT x FROM tab2)  
-- #####  
-- tab2.x#####
12. UPDATE#####  
  
UPDATE t2 SET c2 =? -- c2#####
13. #####-#+#####  
  
CREATE TABLE t1 (c11 INT, c12 SMALLINT, c13 DOUBLE, c14 CHAR(3))  
SELECT \* FROM t1 WHERE c11 BETWEEN -? AND +?  
-- #####INT#####

Derby #####

```
-- (#####c11#INT#####INT#####)
14. LENGTH#####VARCHAR#####

SELECT LENGTH(?)
15. ####

? = SOME (SELECT 1 FROM t)
-- #####INTEGER#####
1 = SOME (SELECT ? FROM t)
-- #####INTEGER#####
16. IS#####

#####
```

## JOIN ##

JOIN###FROM ## *TableExpression*#####2#####(WHERE###"WHERE  
t1.col1 = t2.col2"#####)

##

*JOIN#*

JOIN#####

- INNER JOIN ##

join####2#####INNER JOIN #####

- LEFT OUTER JOIN##

join####2#####LEFT OUTER  
JOIN#####

- RIGHT OUTER JOIN ##

join####2#####RIGHT OUTER  
JOIN #####

#####outer join####WHERE ######

JOIN#####

#####Derby#####

## INNER JOIN ##

INNER JOIN#####JOIN #####

##

## [ INNER ] JOIN ## { ON ### }

ON#####

ON#####SELECT#####  
#####ON#####

```
SELECT *
FROM SAMP.EMPLOYEE INNER JOIN SAMP.STAFF
ON EMPLOYEE.SALARY < STAFF.SALARY
```

ON#####(#####)

```
-- EMP_ACT#EMPLOYEE#####
-- EMP_ACT#####
-- EMPLOYEE##### (LASTNAME) #####
-- #####
```

Derby #####

```
SELECT SAMP.EMP_ACT.*, LASTNAME
FROM SAMP.EMP_ACT JOIN SAMP.EMPLOYEE
ON EMP_ACT.EMPNO = EMPLOYEE.EMPNO
-- EMPLOYEE#DEPARTMENT#####
-- 1930#####(BIRTHDATE)#####
-- #####(EMPNO)#####(LASTNAME)#
-- #####(EMPLOYEE#####WORKDEPT##DEPARTMENT#####DEPTNO)#
-- ###(DEPTNAME)#####
SELECT EMPNO, LASTNAME, WORKDEPT, DEPTNAME
FROM SAMP.EMPLOYEE JOIN SAMP.DEPARTMENT
ON WORKDEPT = DEPTNO
AND YEAR(BIRTHDATE) < 1930

-- VALUES#####(select####)#####"###"#####
-- #####"R1"#"R2"###2##"x"#####
-- #####
SELECT *
FROM (VALUES (3, 4), (1, 5), (2, 6))
AS VALUETABLE1(c1, c2)
JOIN (VALUES (3, 2), (1, 2),
(0, 3)) AS VALUETABLE2(c1, c2)
ON VALUETABLE1.c1 = VALUETABLE2.c1
-- This results in:
-- c1          |c2          |c1          |2
-- -----
-- 3           |4           |3           |2
-- 1           |5           |1           |2

-- #####

SELECT DEPTNO, DEPTNAME, EMPNO, LASTNAME
FROM DEPARTMENT INNER JOIN EMPLOYEE
ON MGRNO = EMPNO

-- #####
-- #####
SELECT E.EMPNO, E.LASTNAME, M.EMPNO, M.LASTNAME
FROM EMPLOYEE E INNER JOIN
DEPARTMENT INNER JOIN EMPLOYEE M
ON MGRNO = M.EMPNO
ON E.WORKDEPT = DEPTNO
```

## LEFT OUTER JOIN##

```
LEFT OUTER JOIN####join#####JOIN#####
#####(##)#####(##)#####NULL#####
##
```

```
## LEFT [ OUTER ] JOIN ##
{
    ON ###
}
```

```
ON#####
ON#####(#####)
```

# 1

--#####

```
SELECT CITIES.COUNTRY, CITIES.CITY_NAME, REGION
FROM Countries
LEFT OUTER JOIN Cities
ON CITIES.COUNTRY_ISO_CODE = COUNTRIES.COUNTRY_ISO_CODE
WHERE REGION = 'Asia'
```

Derby #####

```
-- LEFT JOIN#####
-- #####

SELECT  COUNTRIES.COUNTRY, CITIES.CITY_NAME,REGION
FROM COUNTRIES
LEFT JOIN CITIES
ON CITIES.COUNTRY_ISO_CODE = COUNTRIES.COUNTRY_ISO_CODE
WHERE REGION = 'Asia'
```

## # 2

```
-- EMPLOYEE#DEPAETMENT#####
-- 1930#####(BIRTHDATE)#####
-- ####(EMPNO)##
-- ####(LASTNAME)##
-- ####(EMPLOYEE#####WORKDEPT##DEPARTMENT#####DEPTNO)##
-- ####(DEPTNAME)#####

SELECT EMPNO, LASTNAME, WORKDEPT, DEPTNAME
      FROM SAMP.EMPLOYEE LEFT OUTER JOIN SAMP.DEPARTMENT
      ON WORKDEPT = DEPTNO
      AND YEAR(BIRTHDATE) < 1930

-- #####
-- #####

SELECT DEPTNO, DEPTNAME, EMPNO, LASTNAME
      FROM DEPARTMENT LEFT OUTER JOIN EMPLOYEE
      ON MGRNO = EMPNO
```

## RIGHT OUTER JOIN ##

```
RIGHT OUTER JOIN####JOIN#####JOIN#####
#####(#####)#####NULL#####A
LEFT OUTER JOIN B # B RIGHT OUTER JOIN A#####
```

##

```
## RIGHT [ OUTER ] JOIN ##
{
    ON ###
}
```

```
ON#####SELECT#####
ON#####(#####)
```

## #1

```
-- #####
-- #####

SELECT COUNTRIES.COUNTRY, CITIES.CITY_NAME
FROM CITIES
RIGHT OUTER JOIN COUNTRIES
ON CITIES.COUNTRY_ISO_CODE = COUNTRIES.COUNTRY_ISO_CODE

-- #####
-- #####

SELECT COUNTRIES.COUNTRY, CITIES.CITY_NAME
FROM CITIES
RIGHT OUTER JOIN COUNTRIES
ON CITIES.COUNTRY_ISO_CODE = COUNTRIES.COUNTRY_ISO_CODE
WHERE Countries.region = 'Africa'
```

Derby #####

```
-- RIGHT JOIN#####
-- #####
SELECT COUNTRIES.COUNTRY, CITIES.CITY_NAME
FROM CITIES
RIGHT JOIN COUNTRIES
ON CITIES.COUNTRY_ISO_CODE = COUNTRIES.COUNTRY_ISO_CODE
WHERE Countries.region = 'Africa'
```

## #2

```
-- #####
-- #####FRON#####
-- #####
-- #####

SELECT E.EMPNO, E.LASTNAME, M.EMPNO, M.LASTNAME
FROM EMPLOYEE E RIGHT OUTER JOIN
DEPARTMENT RIGHT OUTER JOIN EMPLOYEE M
ON MGRNO = M.EMPNO
ON E.WORKDEPT = DEPTNO
```

## SQL #####

### ###

#####

#### Syntax

```
{
  ( Query )
|
  Query INTERSECT [ ALL | DISTINCT ]
  Query
|
  Query EXCEPT [ ALL | DISTINCT ] Query |
  Query UNION [ ALL | DISTINCT ] Query |
### | VALUES#
}
```

#####INTERSECT#EXCEPT#UNION#####INTERSECT

UNION#INTERSECT#EXCEPT ALL#####

ALL#DISTINCT##### DISTINCT#####ALL

ALL#####

#####L#####R#####(ALL#

- UNION: ( L + R )#
- EXCEPT: ( L - R )#0(#####
- INTERSECT: L#R#####

#

```
-- ###
SELECT *
FROM ORG

-- ####
SELECT *
FROM (SELECT CLASS_CODE FROM CL_SCHED) AS CS

-- ####
SELECT *
FROM (SELECT CLASS_CODE FROM CL_SCHED) AS CS (CLASS_CODE)
```

Derby #####

```
-- UNION###
-- ORG#####
-- DEPTNUMB#MANAGER#####
-- (1,2)#(3,4)####
-- ###DEPTNUMB#MANAGER#smallint#####
SELECT DEPTNUMB, MANAGER
FROM ORG
UNION ALL
VALUES (1,2), (3,4)

-- ###
VALUES (1,2,3)

-- EMPLOYEE#####(WORKDEPT)#'E'#####
-- EMP_ACT#####(PROJNO)#
-- 'MA2100' #'MA2110'#### 'MA2112'#####
-- ####(EMPNO)#####
SELECT EMPNO
  FROM EMPLOYEE
  WHERE WORKDEPT LIKE 'E%'
UNION
SELECT EMPNO
  FROM EMP_ACT
  WHERE PROJNO IN('MA2100', 'MA2110', 'MA2112')
-- #####EMPLOYEE#####'emp' #
-- EMP_ACT#####'emp_act'#####"#####
-- #####"#####
-- #####EMPNO#####
SELECT EMPNO, 'emp'
  FROM EMPLOYEE
  WHERE WORKDEPT LIKE 'E%'
UNION
SELECT EMPNO, 'emp_act' FROM EMP_ACT
  WHERE PROJNO IN('MA2100', 'MA2110', 'MA2112')
-- #####
-- UNION ALL#####
SELECT EMPNO
  FROM EMPLOYEE
  WHERE WORKDEPT LIKE 'E%'
UNION ALL
SELECT EMPNO
  FROM EMP_ACT
  WHERE PROJNO IN('MA2100', 'MA2110', 'MA2112')
-- #####
-- #####
-- ####"new"#####
SELECT EMPNO, 'emp'
  FROM EMPLOYEE
  WHERE WORKDEPT LIKE 'E%'
UNION
SELECT EMPNO, 'emp_act'
  FROM EMP_ACT
  WHERE PROJNO IN('MA2100', 'MA2110', 'MA2112')
UNION
VALUES ('NEWAAA', 'new'), ('NEWBBB', 'new')
```

#####

```
#####
#####  
#####
```

Sometimes also called an expression subquery.

##

(###)

Derby #####

## Examples

```
-- avg #####
-- #####
SELECT NAME, COMM
  FROM STAFF
 WHERE EXISTS
    (SELECT AVG(BONUS + 800)
     FROM EMPLOYEE
     WHERE COMM < 5000
     AND EMPLOYEE.LASTNAME = UPPER(STAFF.NAME)
    )
-- VALUES#####
-- #####"###"#####
-- #####"R1"#"R2"#####
-- "X"#####
SELECT R1,R2
  FROM (VALUES('GROUP 1','GROUP 2')) AS X(R1,R2)
```

#####

```
#####
#####
  • FROM ###
  • EXISTS#IN#####
FROM #####
EXISTS###*#####
IN#####
##
(###)
#
```

```
-- FROM#####
SELECT VirtualFlightTable.flight_ID
FROM
  (SELECT flight_ID, orig_airport, dest_airport
   FROM Flights
   WHERE (orig_airport = 'SFO' OR dest_airport = 'SCL') )
AS VirtualFlightTable
-- FROM#####(values#)####
SELECT mycol1
FROM
  (VALUES (1, 2), (3, 4))
AS mytable (mycol1, mycol2)
-- EXISTS#####
SELECT *
FROM Flights
WHERE EXISTS
  (SELECT * FROM Flights WHERE dest_airport = 'SFO'
   AND orig_airport = 'GRU')
-- IN#####
SELECT flight_id, segment_number
FROM Flights
WHERE flight_id IN
  (SELECT flight_ID
   FROM Flights WHERE orig_airport = 'SFO'
   OR dest_airport = 'SCL')
-- #####
SELECT NAME, COMM
FROM STAFF
WHERE COMM >
```



Derby #####

```
(SELECT AVG(BONUS + 800)
FROM EMPLOYEE
WHERE COMM < 5000)
```

#####

#####SQL#####

#####SQL92##### TIMESTAMPADD#TIMESTAMPDIFF#####J

#####

Derby#####

- ABS#ABSVAL##
- ACOS ##
- ASIN ##
- ATAN ##
- BIGINT##
- CAST ##
- CEIL###CEILING##
- CHAR ##
- Concatenation
- COS ##
- NULLIF#
- CURRENT\_DATE##
- CURRENT ISOLATION ##
- CURRENT\_TIME##
- CURRENT\_TIMESTAMP##
- CURRENT\_USER##
- DATE##
- DAY ##
- DEGREES ##
- DOUBLE##
- EXP##
- FLOOR##
- HOUR##
- IDENTITY\_VAL\_LOCAL##
- INTEGER##
- LENGTH##
- LN####LOG##
- LOG10 ##
- LOCATE##
- LCASE####LOWER##
- LTRIM##
- MINUTE ##
- MOD##
- MONTH##
- PI ##
- RADIANS ##
- RTRIM##
- SECOND##
- SESSION\_USER##
- SIN ##
- SMALLINT##
- SQRT##
- SUBSTR##

Derby #####

- TAN ##
- TIME ##
- TIMESTAMP##
- TRIM ##
- UCASE#####UPPER##
- USER##
- VARCHAR##
- YEAR##

## (####)

#####(ANSI  
SQL-

92#####)

#####

# 7. #####

	####	#####
COUNT	X	X
MIN	'	X
MAX	'	X
AVG	'	X
SUM	'	X

#####

- #####
- HAVING#
- #####ORDER BY  
#(#####)#######ORDER BY #####

#####(GROUP BY #####) (GROUP  
BY #####HAVING#####)

########ResultSet#####(##)#####(##)#####(#####)

```
-- not valid
SELECT MIN(flying_time), flight_id
FROM Flights
```

#####(##)#####  
####SUM#####

```
SELECT c1
FROM t1
GROUP BY c1
HAVING c2 >
    (SELECT t2.x
     FROM t2
     WHERE t2.y = SUM(t1.c3))
```

#####ResultSet#####

#####

- AVG##
- COUNT ##
- MAX##
- MIN##

Derby #####

- SUM##

## ABS#ABSVAL##

ABS # ABSVAL#####  
(DECIMAL, DOUBLE PRECISION, FLOAT, INTEGER# BIGINT# NUMERIC# REAL  
###SMALLINT)#

##

ABS ( ## )

```
-- 3####  
VALUES ABS (-3)
```

## ACOS ##

ACOS#####

#####

- #####NULL#####NULL###
- #####1#####(SQL state 22003)

#####0##pi###

### Syntax

ACOS ( # )

## ASIN ##

ASIN #####

#####

- ###NULL#####NULL###
- ###0#####0###
- #####1#####(SQL state 22003)

#####-pi/2##pi/2#####

### Syntax

ASIN ( # )

## ATAN ##

ATAN #####

#####

- ###NULL#####NULL#####
- ###0#####0#####

#####-pi/2##pi/2#####

##

ATAN ( # )

## AVG##

Derby #####

AVG#####(## (###)#####)

AVG#####

##

AVG ( [ DISTINCT | ALL ] # )

DISTICT#####

ALL#####ALL#DISTINCT#####ALL###

#####1.0#1.0#1.0#1.0#2.0#####AVG(col)#AVG(DISTINCT  
col)#####

DISTINCT#####

SELECT AVG (DISTINCT flying\_time), SUM (DISTINCT miles)  
FROM Flights

#####SQL-

92#####SQL-

92#####NULL#####

#####(#####) ##### 1#####

SELECT AVG(c1)

FROM (VALUES (1), (1), (1), (1), (2)) AS myTable (c1)

#####

SELECT AVG(CAST (c1 AS DOUBLE PRECISION))

FROM (VALUES (1), (1), (1), (1), (2)) AS myTable (c1)

## BIGINT##

BIGINT#####64#####

##

BIGINT (### | ## )

###

#####SQL#####

#####big

integer#####

##

#####big integer#####

#####

#####big integer#####null#####null###

EMPLOYEE#####big integer####EMPNO#####

SELECT BIGINT (EMPNO) FROM EMPLOYEE

## CASE #

Derby#####CASE#####

CASE####

#####CASE#####

CASE

WHEN ### THEN then#

[ WHEN ### THEN then# ]...

Derby #####

```
ELSE else#
END
```

Then##else#####

```
-- 3###
VALUES CASE WHEN 1=1 THEN 3 ELSE 4 END
```

```
-- 7###
VALUES
CASE
    WHEN 1 = 2 THEN 3
    WHEN 4 = 5 THEN 6
    ELSE 7
END
```

## CAST ##

CAST#####(?)#NULL#####

CAST#####

##

```
CAST ( [ # | NULL | ? ]
      AS #####)
```

#####

**CAST###SQL-92 #####**

#####SQL#####

#####

Y#####SMALLINT#####

#####SMALLINT#####

**# 8. SQL-92 #####**

Types	S M A L L I N T	I N T E G E R	B I G I N T	D E C I M A L	R E A L	D O U B L E	F L O A T	C H A R	V A R C H A R	L O N G V A R C H A R	C H A R F O R B I T D A T A	V A R C H A R F O R B I T D A T A	L O N G V A R C H A R F O R B I T D A T A	C L O B	B L O B	D A T E	T I M E	T I M E S T A M P	X M L
SMALLINT	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-
INTEGER	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-
BIGINT	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-
DECIMAL	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-
REAL	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
DOUBLE	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
FLOAT	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
CHAR	Y	Y	Y	Y	-	-	-	Y	Y	Y	-	-	-	Y	-	Y	Y	Y	-
VARCHAR	Y	Y	Y	Y	-	-	-	Y	Y	Y	-	-	-	Y	-	Y	Y	Y	-
LONG VARCHAR	-	-	-	-	-	-	-	Y	Y	Y	-	-	-	Y	-	-	-	-	-
CHAR FOR BIT DATA	-	-	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	-	-	-	-
VARCHAR FOR BIT DATA	-	-	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	-	-	-	-
LONG VARCHAR FOR BIT DATA	-	-	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	-	-	-	-
CLOB	-	-	-	-	-	-	-	Y	Y	Y	-	-	-	Y	-	-	-	-	-
BLOB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-

Derby #####

Types	S M A L L I N T	I N T E G E R	B I G I N T	D E C I M A L	R E A L	D O U B L E	F L O A T	C H A R	V A R C H A R	L O N G V A R C H A R	C H A R F O R B I T D A T A	V A R C H A R F O R B I T D A T A	L O N G V A R C H A R F O R B I T D A T A	C L O B	B L O B	D A T E	T I M E	T I M E S T A M P	X M L
DATE	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	Y	-	-	-
TIME	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	-	Y	-	-
TIMESTAMP	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	Y	Y	Y	-
XML	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y

#####CAST#####

####

#####Derby##SQL-92#####

- #
  - #### (SMALLINT, INTEGER, BIGINT, DECIMAL, NUMERIC)
  - #### (FLOAT, REAL, DOUBLE PRECISION)
- #
  - ### (CLOB, CHAR, VARCHAR, LONG VARCHAR)
  - ##### (BLOB, CHAR FOR BIT DATA, VARCHAR FOR BIT DATA, LONG VARCHAR FOR BIT DATA)
- ##
  - DATE
  - TIME
  - TIMESTAMP

#####

#####

#####/#####

#####O###

#####BLOB#####

#####

Derby #####

```
#####TIMESTAMP#####  
DATE#TIMESTAMP#####TIMESTAMP##TIME#####00:00:00### ##TIME#TIMESTAMP###  
TIMESTAMP#DATE#####TIME#####  
TIMESTAMP#TIME#####DATE#####
```

```
SELECT CAST (miles AS INT)  
FROM Flights  
-- timestamp#####  
INSERT INTO mytable (text_column)  
VALUES (CAST (CURRENT_TIMESTAMP AS VARCHAR(100)))  
-- NULL#####  
SELECT airline  
FROM Airlines  
UNION ALL  
VALUES (CAST (NULL AS CHAR(2)))  
-- double#decimal#####  
SELECT CAST (FLYING_TIME AS DECIMAL(5,2))  
FROM FLIGHTS  
-- SMALLINT#BIGINT#####  
VALUES CAST (CAST (12 as SMALLINT) as BIGINT)
```

**XML###**

```
#####XML###XML#####XML#####XMLSERIALIZE  
#####
```

## CEIL###CEILING##

CEIL###CEILING#####

#####

- #####NULL#####NULL###
- #####
- #####0#####0###
- #####0#####-1.0#####0###

#####(#####)#####

### Syntax

CEIL ( # )

CEILING ( # )

## CHAR ##

CHAR#####

#####

- #####
- #####
- #####
- #####DOUBLE###REAL#####
- #####SMALLINT#INTEGER#BIGINT#####

#####CHAR#####NULL#####N  
XML#####XMLSERIALIZE#####

#####

CHAR (### [, #] )

###

CHAR#VARCHAR#LONG VARCHAR#CLOB#####



Derby #####

#

#####0##254#####

#####  
VARCHAR#CLOB)#####

#####

CHAR (### )

###

#####(SMALLINT#INTEGER#BIGINT)#####

#####SQL#####10###n#####

- #####SMALLINT#####6#####6#####6#####
- #####INTEGER#####11#####11#####11#####
- #####BIGINT#####20#####20#####20#####

#####

CHAR (### )

###

#####

- ##: #####10###
- ##: #####8###
- #####: #####26###

#####

CHAR (### )

###

#####DECIMAL#####

#####

CHAR (##### )

#####

#####(DOUBLE#REAL)#####

CHAR#####EDLEVEL(smallint#####)#####

SELECT CHAR(EDLEVEL) FROM EMPLOYEE

EDLEVEL#18#####CHAR(6)##'18 '#####(18####4#####)

## Concatenation

#####|#####

#####

##

```
{
  { ### || ## } |
  { #### || #### }
}
```

#####CHAR#####CHAR#####VARCHAR###  
CHAR#VARCHAR#####

#####

Derby #####

```
#####CHAR FOR BIT DATA#####CHAR FOR  
BIT DATA#####VARCHAR FOR BIT DATA###
```

```
--####'supercalifragilisticexbealidocious(sp?)'###  
VALUES 'supercalifragilistic' || 'exbealidocious' || '(sp?)'  
-- NULL#####  
VALUES CAST (null AS VARCHAR(7)) || 'AString'  
-- '130asdf'#####  
VALUES '130' || 'asdf'
```

## COS ##

COS#####

```
#####  
• #####NULL#####NULL###
```

##

```
COS ( # )
```

## COUNT ##

COUNT#####(## (####)#####) COUNT#####

##

```
COUNT ( [ DISTINCT | ALL ] # )
```

```
DISTINCT#####ALL#####DISTINCT#ALL#####  
col)#####
```

```
######DISTINCT#####
```

```
-- #####  
SELECT COUNT (DISTINCT flying_time), SUM (DISTINCT miles)  
FROM Flights
```

```
#####
```

```
####NULL#####
```

COUNT#####INTEGER###

```
-- #####  
-- #####  
SELECT COUNT (country), region  
FROM Countries  
GROUP BY region  
HAVING COUNT (country) > 1
```

## COUNT(\*) ##

COUNT(\*) #####NULL#####COUNT(\*)#####

##

```
COUNT (*)
```

```
#####INTEGER###
```

```
-- Flights#####  
SELECT COUNT (*)  
FROM Flights
```

Derby #####

## CURRENT DATE ##

CURRENT DATE #CURRENT\_DATE#####

## CURRENT\_DATE##

CURRENT\_DATE#####

##

CURRENT\_DATE

####

CURRENT DATE

-- #####

SELECT \* FROM Flightavailability where flight\_date > CURRENT\_DATE;

## CURRENT ISOLATION ##

CURRENT ISOLATION#####char(2)#####

"(##)#"UR#"CS#"RS"####"RR"#

##

CURRENT ISOLATION

VALUES CURRENT ISOLATION

## CURRENT SCHEMA##

CURRENT SCHEMA#####

**Note:** CURRENT SCHEMA#CURRENT SQLID#####

#####128#####

##

CURRENT SCHEMA

-- ####

CURRENT SQLID

-- name#####

CREATE TABLE mytable (id int, name VARCHAR(128) DEFAULT CURRENT SQLID)

-- #####

INSERT INTO mytable(id) VALUES (1)

-- #####

SELECT name FROM mytable WHERE name = CURRENT SCHEMA

## CURRENT TIME

CURRENT TIME #CURRENT\_TIME#####

## CURRENT\_TIME##

CURRENT\_TIME#####

Derby #####

##

CURRENT\_TIME

####

CURRENT TIME

VALUES CURRENT\_TIME

-- ####

VALUES CURRENT TIME

## CURRENT\_TIMESTAMP##

CURRENT\_TIMESTAMP #CURRENT\_TIMESTAMP#####

## CURRENT\_TIMESTAMP##

CURRENT\_TIMESTAMP#####

##

CURRENT\_TIMESTAMP

###

CURRENT TIMESTAMP

VALUES CURRENT\_TIMESTAMP

-- ###

VALUES CURRENT TIMESTAMP

## CURRENT\_USER##

CURRENT\_USER ##### (#####DBMS#####)

#####APP#####

USER#SESSION\_USER#####

#####128#####

##

CURRENT\_USER

VALUES CURRENT\_USER

## DATE##

DATE#####

#####2,932,897#####CLOB/LONG

VARCHAR/XML#####7#####7#####yyynnn#####yy#####

#####

- #####
- #####n#####1#1#1###n-1#####
- #####7#####

##

Derby #####

DATE ( # )

#####'1988/12/25'#####

VALUES DATE('1988-12-25')

## DAY ##

DAY#####

#####CLOB#LONG

VARCHAR#XML#####1##31#####null#####

##

DAY ( # )

#

values day('2006-08-02');

###2#####

## DEGREES ##

DEGREES#####

#####

##: #####COS(RADIANS(90.0))###0.0#####

#####

##

DEGREES ( # )

## DOUBLE##

DOUBLE#####

- #####
- #####

#####

DOUBLE [PRECISION] (## )

##

#####

#####nul#####null#####null#####null#####

#####

DOUBLE (### )

####

#####CHAR####VARCHAR#####

#####

#####nul#####null#####null#####null###

#####

Derby #####

## EXP##

```
EXP###e#####
#####e##### ########
e#####
#####
##
EXP ( # )
```

## FLOOR##

```
FLOOR#####
########
• #####NULL#####NULL###
• #####
• #####0#####0###
#####(#####)#####
##
FLOOR ( # )
```

## HOURL##

```
HOURL#####
#####CLOB#LONG
VARCHAR#XML#####
#####null#####null#####null#####null###
##
HOURL ( # )
#
TABLE1#####
SELECT * FROM TABLE1
WHERE HOURL(STARTING) BETWEEN 12 AND 17
```

## IDENTITY\_VAL\_LOCAL##

```
Derby #IDENTITY_VAL_LOCAL#####
##:
IDENTITY_VAL_LOCAL ( )
IDENTITY_VAL_LOCAL#####VALUES####INSERT#####
IDENTITY_VAL_LOCAL#####DECIMAL (31,0)###
IDENTITY_VAL_LOCAL#####INSERT#####INSERT#####V
#####Derby#####
#####INSERT#####null#####
```

Derby #####

#####

- #####VALUES#####INSERT#
- VALUES#####INSERT#
- select###INSERT#

#####INSERT#####IDENTITY\_VAL\_LOCAL()#####

#:

```
ij> create table t1(c1 int generated always as identity, c2 int);
0 rows inserted/updated/deleted
ij> insert into t1(c2) values (8);
1 row inserted/updated/deleted
ij> values IDENTITY_VAL_LOCAL();
1
-----
1
1 row selected
ij> select IDENTITY_VAL_LOCAL()+1, IDENTITY_VAL_LOCAL()-1 from t1;
1                                     |2
-----
2                                     |0
1 row selected
ij> insert into t1(c2) values (IDENTITY_VAL_LOCAL());
1 row inserted/updated/deleted
ij> select * from t1;
C1      |C2
-----
1        |8
2        |1
2 rows selected
ij> values IDENTITY_VAL_LOCAL();
1
-----
2
1 row selected
ij> insert into t1(c2) values (8), (9);
2 rows inserted/updated/deleted
ij> -- #####
values IDENTITY_VAL_LOCAL();
1
-----
2
1 row selected
ij> select * from t1;
C1      |C2
-----
1        |8
2        |1
3        |8
4        |9
4 rows selected
ij> insert into t1(c2) select c1 from t1;
4 rows inserted/updated/deleted
-- select#####
ij> values IDENTITY_VAL_LOCAL();
1
-----
2
1 row selected
ij> select * from t1;
C1      |C2
-----
1        |8
2        |1
3        |8
4        |9
5        |1
6        |2
```

Derby #####

```
7          | 3
8          | 4
8 rows selected
```

## INTEGER##

INTEGER#####

##

INT[EGER] (## | #### )

##

#####  
#####

####

#####  
#####SQL#####  
#####

#####null#####null#####null####null##

EMPLOYEE####(SALARY)####(EDLEVEL)#####

```
SELECT INTEGER (SALARY / EDLEVEL), SALARY, EDLEVEL, EMPNO
FROM EMPLOYEE
ORDER BY 1 DESC
```

## LCASE####LOWER##

LCASE###LOWER#####

##

LCASE ### LOWER ( ### )

#####CHAR#VARCHAR####LONG  
VARCHAR####(#####)#####

#####CHAR####LONG VARCHAR#####CHAR####LONG  
VARCHAR#####VARCHAR###

#####

#####null#####null###

```
-- 'asd1#w'#####
VALUES LOWER('aSD1#w')
```

```
SELECT LOWER(flight_id) FROM Flights
```

## LENGTH##

LENGTH#####

#####

##

LENGTH ( { ##### | ##### } )

```
-- 20####
VALUES LENGTH('supercalifragilistic')
-- 1####
```



Derby #####

```
VALUES LENGTH(X'FF')
-- 4###
VALUES LENGTH(1234567890)
```

## LN####LOG##

LN####LOG#####(e#####)#####

###0#####

- #####NULL#####NULL###
- #####0#####(SQL state 22003)#####

#####

##

LN ( # )

LOG ( # )

## LOG10 ##

LOG10###10#####

###0#####

- #####NULL#####NULL###
- #####0#####(SQL state 22003)#####

#####

### Syntax

LOG10 ( # )

## LOCATE##

LOCATE#####LOCATE#####

##

LOCATE(###, ### [, ###] )

LOCATE#####

- #####
- #####
- #####LOCATE#####

LOCATE#####LOCATE#####1#####

#####LOCATE#0#####(")#####  
#####NULL#####NULL#####

```
-- 'love'#2#####2###
VALUES LOCATE('love', 'clover')
```

```
-- 'clover'##'stove'#####0###
VALUES LOCATE('stove', 'clover')
```

```
-- 5####(####4)
VALUES LOCATE('iss', 'Mississippi', 4)
```

```
-- #####1###
VALUES LOCATE('', 'ABC')
```

Derby #####

```
-- '###'AAA'#####0####  
VALUES LOCATE('AAA', '')  
  
-- 3####  
VALUES LOCATE('', '', 3)
```

## LTRIM##

```
LTRIM#####  
##  
  
LTRIM(###)  
  
A #####CHAR#VARCHAR####LONG VARCHAR#####  
#####LTRIM#NULL#####  
  
-- 'asdf '#####  
VALUES LTRIM(' asdf ')
```

## MAX##

```
MAX#####(## (####)#####)  
MAX##### (CHAR#VARCHAR#DATE#TIME#CHAR  
FOR BIT DATA#####)  
##  
  
MAX ( [ DISTINCT | ALL ] # )  
  
DISTINCT#ALL#####MAX#####  
#####DISTINCT#####  
  
SELECT COUNT (DISTINCT flying_time), MAX (DISTINCT miles)  
FROM Flights  
  
#####  
#####  
(###java.lang.Integer#int#####INTEGER#####)  
#####NULL#####  
  
CHAR#VARCHAR#####MAX##### 'z'#'z  
#####  
  
#####MAX#####(#####)  
  
-- FlightAvailability#####  
SELECT MAX (flight_date) FROM FlightAvailability  
-- #####  
-- ##10#####  
SELECT MAX(flying_time), orig_airport  
FROM Flights  
GROUP BY orig_airport  
HAVING MAX(flying_time) > 10
```

## MIN##

```
MIN##### (## (####)#####)  
MIN#####(####CHAR#VARCHAR#DATE#TIME#####)  
##
```

Derby #####

```
MIN ( [ DISTINCT | ALL ] # )
```

```
DISTINCT#ALL#####MIN#####  
########
```

```
SELECT COUNT (DISTINCT flying_time), MIN (DISTINCT miles)  
FROM Flights
```

```
#####
```

```
#####CHAR#VARCHAR###MIN#####
```

```
###'z'z
```

```
'#####
```

```
#####(#####)
```

```
-- #####
```

```
SELECT DISTINCT flying_time, MIN(DISTINCT miles) from Flights
```

```
-- #####
```

```
SELECT COUNT(DISTINCT flying_time), MIN(DISTINCT miles) from Flights
```

```
-- #####
```

```
SELECT MIN (flight_date) FROM FlightAvailability;
```

## MINUTE ##

```
MINUTE#####
```

```
#####CLOB#LONG
```

```
VARCHAR#XML#####0##59#####null#####
```

```
##
```

```
MINUTE ( # )
```

```
#
```

```
#flights#####departure_time##6:00##6:30AM#####
```

```
SELECT * FROM flights WHERE HOUR(departure_time) = 6 and  
MINUTE(departure_time) < 31;
```

## MOD##

```
MOD#####(#####
```

```
##
```

```
mod(###, ###)
```

```
#####
```

- #####SMALLINT###SMALLINT#
- #####INTEGER#####INTEGER###SMALLINT###INTEGER#
- #####BIGINT#####BIGINT###INTEGER###SMALLINT###BIGINT#

```
####NULL#####NULL#####NULL###
```

## MONTH##

```
MONTH#####
```

```
#####CLOB#LONG
```

```
VARCHAR#XML#####1##12#####null#####
```

```
##
```

Derby #####

```
MONTH ( # )
```

#

EMPLOYEE#####(BIRTHDATE)#12#####

```
SELECT * FROM EMPLOYEE
WHERE MONTH(BIRTHDATE) = 12
```

## NULLIF#

Derby#####NULLIF#####

NULLIF####

```
NULLIF ( L, R )
```

NULLIF##CASE#####

```
NULLIF(V1,V2)
```

## ##CASE#####

```
CASE WHEN V1=V2 THEN NULL ELSE V1 END
```

## PI ##

PI###pi#####

###pi#####

#####

##

```
PI ( )
```

## RADIANS ##

RADIANS#####

#####

Attention: #####

#####

##

```
RADIANS ( # )
```

## RTRIM##

RTRIM#####

##

```
RTRIM(###)
```

A #####CHAR#VARCHAR#LONG VARCHAR#####

#####null###RTRIM#####null###

```
-- ' asdf'#####
```

Derby #####

```
VALUES RTRIM(' asdf ')
-- 'asdf'#####
VALUES RTRIM('asdf ')
```

## SECOND##

SECOND#####

#####CLOB#LONG

VARCHAR#XML#####0##59#####null#####

##

SECOND ( # )

#

RECEIVED#####2005-12-25-17.12.30.000000#####

#####

SECOND(RECEIVED)

#####30#####

## SESSION\_USER##

SESSION\_USER##### APP#####

USER#CURRENT\_USER# SESSION\_USER #####

##

SESSION\_USER

VALUES SESSION\_USER

## SIN ##

SIN#####

#####

- #####NULL#####NULL###
- #####(0)#####0###

#####

##

SIN ( # )

## SMALLINT##

SMALLINT#####

##

SMALLINT ( ## | ### )

##

#####

#####

#####

###

Derby #####

```
#####
#####SQL#####
#####
#####

#####null#####null#####null#####null###
#
32767.99#####
```

```
VALUES SMALLINT ( 32767.99 )
```

```
###32767###
```

```
1#####
```

```
VALUES SMALLINT ( 1 )
```

```
###1###
```

## SQRT##

```
#####
SQRT#####
```

**Note:** #####SQRT#####

**##**

```
SQRT(#####)
```

```
-- #####
VALUES SQRT(3421E+09)
```

```
-- INTEGER#####
SELECT SQRT(myDoubleColumn) FROM MyTable
```

```
VALUES SQRT (CAST(25 AS FLOAT));
```

## SUBSTR##

```
SUBSTR#####
#####VARCHAR#####VARCHAR FOR BIT DATA###
#####
```

**##**

```
SUBSTR( { ### },
        ### [ , ### ] )
```

```
#####1###
##0#####Derby#1#####
```

```
#####CHAR#VARCHAR#LONG
VARCHAR####(#####)#####
```

```
#####
```

```
#####(#####1#####)#####
```

```
#####SUBSTR#####SUBSTR#####
#####SUBSTR#####
```

**#**

```
hello#####
```

Derby #####

```
VALUES SUBSTR('hello', 2)
```

###'ello'#####

hello#####

```
VALUES SUBSTR('hello',1,2)
```

###'he'#####

## SUM##

SUM #####(## (####)#####)

SUM#####

##

```
SUM ( [ DISTINCT | ALL ] # )
```

DISTINCT###ALL#####ALL#DISTINCT#####ALL#####  
col)#####

####DISTINCT#####

```
SELECT AVG (DISTINCT flying_time), SUM (DISTINCT miles)  
FROM Flights
```

#####NULL##

#####(#####)

```
-- #####
```

```
SELECT SUM (economy_seats) FROM Airlines;
```

```
-- SUM#####
```

```
-- (#####)
```

```
SELECT SUM (economy_seats_taken + business_seats_taken +  
firstclass_seats_taken)  
as seats_taken FROM FLIGHTAVAILABILITY;
```

## TAN ##

TAN#####

#####

- ###NULL#####NULL##
- ####(0)#####

#####

##

```
TAN ( # )
```

## TIME ##

TIME#####

#####CLOB#LONG

VARCHAR#XML#####

#####null#####null##### null#####null##

#####

- #####

Derby #####

- #####
- #####

##

TIME ( # )

values time(current\_timestamp)

#####5:03#####17:03:00##

## TIMESTAMP##

TIMESTAMP#####

#####

- #####CLOB#LONG VARCHAR#XML#####14#####
- #####

#####

- #####0
- #####
- #####14#####0#####

### Syntax

TIMESTAMP ( # [ , # ] )

#

records\_table#####(1998-12-25####)#####(17:12:30####)#####

SELECT TIMESTAMP(col2, col3) FROM records\_table

####1998-12-25-17:12:30.0#####

VALUES TIMESTAMP('1998-12-25', '17.12.30');

1

-----

1998-12-25 17:12:30.0

## TRIM ##

TRIM#####/

#####

##x

TRIM( [ trimOperands ] trimSource)

trimOperands ::= { trimType [ trimCharacter ] FROM | trimCharacter FROM }

trimType ::= { LEADING | TRAILING | BOTH }

trimCharacter ::= ###

trimSource ::= ###

trimType#####BOTH#####trimCharacter#####(')#####trimCharacter#####

- #####
- NULL

trimCharacter#trimSource#NULL#####TRIM#####NULI#####TRIM#####

- trimType#LEADING#####trimSource#####trimChar#####



Derby #####

- trimType#TRAILING#####trimSource#####trimChar#####
- trimType#BOTH#####trimSource####\*#####trimChar#####

trimSource#####CHAR####VARCHAR###TRIM#####VARCHAR#####TRIM#####CL  
#

```
-- 'derby'#####(#####)
VALUES TRIM('  derby ')
```

```
-- 'derby'##### (#####)
VALUES TRIM(BOTH ' ' FROM '  derby ')
```

```
-- 'derby '##### (#####)
VALUES TRIM(LEADING ' ' FROM '  derby ')
```

```
-- '  derby'##### (#####)
VALUES TRIM(TRAILING ' ' FROM '  derby ')
```

```
-- NULL#####
VALUES TRIM(cast (null as char(1)) FROM '  derby ')
```

```
-- NULL#####
VALUES TRIM(' ' FROM cast(null as varchar(30)))
```

```
-- ' derb'#####(#####)
VALUES TRIM('y' FROM ' derby')
```

```
-- trimCharacter#####
VALUES TRIM('by' FROM ' derby')
```

## UCASE####UPPER##

UCASE###UPPER#####

##

```
UCASE###UPPER ( ### )
```

#####CHAR#####CHAR#####VARCHAR###

**Note:** UPPER#LOWER#####[territory=tl\\_CC](#)  
#####

#####

#

#####

aSD1#w#####

```
VALUES UPPER('aSD1#w')
```

####ASD1#w###

## USER##

USER#####APP#####

USER#[CURRENT\\_USER](#)#[SESSION\\_USER](#)#####

##

```
USER
```

```
VALUES USER
```

Derby #####

## VARCHAR##

VARCHAR#####

#####

VARCHAR (#### )

####

#####32,672#####

#####

VARCHAR (### )

###

#####

EMPLOYEE####"Dolores Quintana"#####(CHAR(8)#JOB)#####

```
SELECT VARCHAR(JOB)
FROM EMPLOYEE
WHERE LASTNAME = 'QUINTANA'
```

## XMLEXISTS ###

XMLEXISTS##SQL##XML#####SQL/XML#####

XMLEXISTS#####XML####DerbyXML####

##

```
XMLEXISTS ( xquery#####
            PASSING BY REF XML## [ BY REF ] )
```

xquery#####

#####(#####)#####Derby

xquery#####Apache

Xalan#####XPath#####Derby##XML#####Apache

Xalan#####Xalan#XQuery#####Derby##### ##Xalan#####

XPath###XQuery#####<http://www.w3.org/TR/>

xpath####<http://www.w3.org/TR/xquery/>

XML##

XML#####SQL/XML##### XML##

Derby#####XML#####

#####DerbyXMLQUERY###

#####Derby#####

BY REF

#####Derby#####

BY

REF#####XMLEXISTS#####SQL/

XML#####

#####

XMLEXISTS#####xquery#####XML##SQL#####

XMLEXISTS#####

UNKNOWN

XML##null#####

TRUE

#####xml#####

FALSE

Derby #####

#####xml#####

XMLEXISTS#####XMLQUERY#####

XMLEXISTS#####SQL#####XMLEXISTS#####XML

#

x\_table#####xcol###XML###age###20#student#####

```
SELECT id, XMLEXISTS('//student[@age=20]' PASSING BY REF xcol)
      FROM x_table
```

x\_table####xcol###XML###null#####/roster/  
student#####ID#####

```
SELECT id FROM x_table WHERE XMLEXISTS('/roster/student' PASSING BY REF
      xcol)
```

x\_table#####xcol###XML#####XML#####age###25#####student#####  
#####

```
CREATE TABLE x_table ( id INT, xcol XML CHECK (XMLEXISTS ('//student[@age
      < 25]' PASSING BY REF xcol)) )
```

#####

Derby##XML#####Apache Xerces####JAXP

parser#Apache Xalan#Java##### JAXP

parser####Xalan#####XMLEXISTS#####

## XMLPARSE###

XMLPARSE#####DerbyXML####SQL/XML#####

#####Derby#XML##### XML###[XMLEXISTS](#)

##

```
XMLPARSE (DOCUMENT ##### PRESERVE WHITESPACE)
```

DOCUMENT

#####Derby#####XML#####

Derby#####XML#####

####Derby#JAXP#####

JAXP#####XML#####

#####XML#####JAXP#####

Derby#####SQLException#####

#####

CHAR#VARCHAR#LONGVARCHAR#CLOB###SQL#####

#####CAST#####CAST#####Derby#####

PRESERVE WHITESPACE

#####Derby#####XML#####

PRESERVE

WHITESPACE#####SQL/

XML#####Derby#####

####XML#####<http://www.w3.org/TR/REC-xml/#sec-well-formed> .

####:

SQL/

XML#####XMLPARSE#####Derby#XMLPARSE#####

Derby #####

#  
#####x\_table##xcolXML#####XML#####:

```
INSERT INTO x_table VALUES
(1,
 XMLPARSE(DOCUMENT '
  <roster>
    <student age="18">AB</student>
    <student age="23">BC</student>
    <student>NOAGE</student>
  </roster>'
  PRESERVE WHITESPACE)
)
```

JDBC####x\_table##xcolXML#####XML#####

```
INSERT INTO x_table VALUES
(2,
 XMLPARSE (DOCUMENT CAST (? AS CLOB) PRESERVE WHITESPACE)
)
```

#####setCharacterStream()#####JDBC###setXXX#####

#####

Derby#XML#####Apache Xerces####JAXP#####Apache Xalan#Java#####

## XMLQUERY###

XMLQUERY#SQL##XML#####SQL/XML#####

XMLQUERY#####XML#####DerbyXML####

##

```
XMLQUERY ( xquery#####
  PASSING BY REF xml##
  [ RETURNING SEQUENCE [ BY REF ] ]
  EMPTY ON EMPTY
)
```

xquery#####

#####(#####)#####

###xquery#####Apache

Xalan#####XPath#####Derby#####XML#####Apache

Xalan#####Xalan#XQuery#####Derby##### ##Xalan#####

XPath###XQuery#####Web#####<http://www.w3.org/TR/>

[xpath#http://www.w3.org/TR/xquery/](http://www.w3.org/TR/xquery/)

xml##

###XML#####SQL/XML##### xml##

Derby#####XML##### ##Derby#XMLQUERY###

BY REF

#####Derby#####BY REF#####

XML#####

RETURNING SEQUENCE

#####Derby#XMLQUERY#####XML#####SEQUENCE#####

XML#####

EMPTY ON EMPTY

#####XMLQUERY#####XMLQUERY#####

XMLQUERY#####XML#####

###XML#####XMLQUERY#####XML#####

Derby #####

```
XML#####  
###XMLSERIALIZE #####  
  
#  
x_table###xcol###XML#####age###20#####students#####
```

```
SELECT ID,  
       XMLSERIALIZE(  
           XMLQUERY('//student[@age>20]' PASSING BY REF xcol EMPTY ON EMPTY)  
       AS VARCHAR(50))  
FROM x_table
```

```
#####XMLQUERY#####x_table#####  
x_table###xcol###XML#####BC#####
```

```
SELECT ID,  
       XMLSERIALIZE(  
           XMLQUERY('string(//student[text() = "BC"]/@age)' PASSING BY REF  
           xcol EMPTY ON EMPTY)  
       AS VARCHAR(50))  
FROM x_table  
WHERE  
       XMLEXISTS('//student[text() = "BC"]' PASSING BY REF xcol)
```

```
#####x_table##BC#####  
#####
```

Derby#XML#####Apache Xerces####JAXP#####Apache Xalan#Java#####

## XMLSERIALIZE ###

```
XMLSERIALIZE#XML#####SQL/XML#####Derby  
XML#####
```

```
##: ####SQL/XML#####  
Derby#XMLSERIALIZE#####XMLSERIALIZE#####XML#####  
####[xString]#####XML#####
```

```
INSERT INTO x_table (id, xcol)  
VALUES (3, XMLPARSE(DOCUMENT '[xString]' PRESERVE WHITESPACE));  
  
SELECT id, XMLSERIALIZE(xcol AS VARCHAR(100))  
FROM x_table WHERE id = 3;
```

```
####XMLSERIALIZE#####[xString]#####  
XMLSERIALIZE####SQL/XML#####  
XMLSERIALIZE#####  
  
#####XMLSERIALIZE#####XMLSERIALIZE#####JDBC####getX  
Derby#XML#####  
  
##
```

```
XMLSERIALIZE ( xml## AS ##### )
```

```
xml##  
####Derby  
XML#####XMLQUERY#####XML#####xml#####
```

```
#####  
CHAR#VARCHAR#LONG VARCHAR####CLOB###SQL#####  
#####Derby#####
```

Derby #####

#  
x\_table####xcolXML#####

```
SELECT ID,  
       XMLSERIALIZE(  
         xcol AS CLOB)  
FROM x_table
```

JDBC#####JDBC#getCharacterStream()#getString()#####  
XMLQUERY#####

```
SELECT ID,  
       XMLSERIALIZE(  
         XMLQUERY('//student[@age>20]'  
           PASSING BY REF xcol EMPTY ON EMPTY)  
         AS VARCHAR(50))  
FROM x_table
```

#####

Derby##XML#####Apache Xerces####JAXP#####Apache Xalan#Java#####

## YEAR##

YEAR#####  
#####1##9999##### ##null#####null#####  
#####null#####null###

##

YEAR ( # )

### Example

PROJECT#####(PRSTDATE)####(PRENDATE)#####

```
SELECT * FROM PROJECT  
WHERE YEAR(PRSTDATE) = YEAR(PRENDATE)
```

#####

#####Derby#####

## SYSCS\_UTIL.SYSCS\_CHECK\_TABLE#####

SYSCS\_UTIL.SYSCS\_CHECK\_TABLE#####  
#####

##

```
SMALLINT SYSCS_UTIL.SYSCS_CHECK_TABLE(IN SCHEMANAME VARCHAR(128),  
IN TABLENAME VARCHAR(128))
```

SCHEMANAME####TABLENAME#null#####

#

```
VALUES SYSCS_UTIL.SYSCS_CHECK_TABLE('SALES', 'ORDERS');
```

## SYSCS\_UTIL.SYSCS\_GET\_DATABASE\_PROPERTY#####

SYSCS\_UTIL.SYSCS\_GET\_DATABASE\_PROPERTY#####KEY#####

Derby #####

##

VARCHAR(32762) SYSCS\_UTIL.SYSCS\_GET\_DATABASE\_PROPERTY(IN KEY  
VARCHAR(128))

KEY#null#####

#

VALUES SYSCS\_UTIL.SYSCS\_GET\_DATABASE\_PROPERTY('key\_value\_string');

## SYSCS\_UTIL.SYSCS\_GET\_RUNTIMESTATISTICS #####

SYSCS\_UTIL.SYSCS\_GET\_RUNTIMESTATISTICS####java.sql.ResultSet#####  
#####  
SYSCS\_UTIL.SYSCS\_GET\_RUNTIMESTATISTICS#####SELECT#INSERT#UPDATE##DML#

##

VARCHAR(32762) SYSCS\_UTIL.SYSCS\_GET\_RUNTIMESTATISTICS()

#

VALUES SYSCS\_UTIL.SYSCS\_GET\_RUNTIMESTATISTICS()

## SYSCS\_UTIL.SYSCS\_GET\_USER\_ACCESS #####

SYSCS\_UTIL.SYSCS\_GET\_USER\_ACCESS#####

#####derby.database.defaultConn

##

SYSCS\_UTIL.SYSCS\_GET\_USER\_ACCESS (USERNAME VARCHAR(128)) RETURNS  
VARCHAR(128)

## USERNAME

Derby#####ID#####VARCHAR(128)#####

#####fullAccess#readOnlyAccess#noAccess#####

noAccess#####derby.database.fullAccessUsers#####derby.

#####Derby#####

#

VALUES SYSCS\_UTIL.SYSCS\_GET\_USER\_ACCESS ('BRUNNER')

#####

#####SQL#####Derby#####

## SYSCS\_UTIL.SYSCS\_BACKUP\_DATABASE#####

SYSCS\_UTIL.SYSCS\_BACKUP\_DATABASE#####

##

SYSCS\_UTIL.SYSCS\_BACKUP\_DATABASE(IN BACKUPDIR VARCHAR())

#####

## BACKUPDIR

#####VARCHAR(32672)#####JV  
#####

Derby #####

## JDBC##

#####c:/backupdir#####

```
CallableStatement cs = conn.prepareCall
("CALL SYSCS_UTIL.SYSCS_BACKUP_DATABASE(?)");
cs.setString(1, "c:/backupdir");
cs.execute();
cs.close();
```

## SQL##

#####c:/backupdir#####

```
CALL SYSCS_UTIL.SYSCS_BACKUP_DATABASE('c:/backupdir');
```

## SYSCS\_UTIL.SYSCS\_BACKUP\_DATABASE\_NOWAIT #####

SYSCS\_UTIL.SYSCS\_BACKUP\_DATABASE\_NOWAIT#####

#####SYSCS\_UTIL.SYSCS\_BACKUP\_DATABASE\_NOWAIT

##

```
SYSCS_UTIL.SYSCS_BACKUP_DATABASE_NOWAIT(IN BACKUPDIR VARCHAR())
```

#####

## BACKUPDIR

#####VARCHAR(32672)#####

## JDBC##

#####c:/backupdir#####

```
CallableStatement cs = conn.prepareCall
("CALL SYSCS_UTIL.SYSCS_BACKUP_DATABASE_NOWAIT(?)");
cs.setString(1, "c:/backupdir");
cs.execute();
cs.close();
```

## SQL##

#####c:/backupdir#####

```
CALL SYSCS_UTIL.SYSCS_BACKUP_DATABASE_NOWAIT('c:/backupdir');
```

## SYSCS\_UTIL.SYSCS\_BACKUP\_DATABASE\_AND\_ENABLE\_LOG\_ARCHIVE\_MODE#####

SYSCS\_UTIL.SYSCS\_BACKUP\_DATABASE\_AND\_ENABLE\_LOG\_ARCHIVE\_MODE#####

##

```
SYSCS_UTIL.SYSCS_BACKUP_DATABASE_AND_ENABLE_LOG_ARCHIVE_MODE
(IN BACKUPDIR VARCHAR(32672), IN SMALLINT DELETE_ARCHIVED_LOG_FILES)
```

#####

## BACKUPDIR

#####VARCHAR(32672)#####JVM#user

## DELETE\_ARCHIVED\_LOG\_FILES

#####DELETE\_ARCHIVED\_LOG\_FILES#####

## JDBC##

#####c:/backupdir#####

```
CallableStatement cs = conn.prepareCall
```



Derby #####

```
("CALL SYCS_UTIL.SYCS_BACKUP_DATABASE_AND_ENABLE_LOG_ARCHIVE_MODE(?,
?)" );
cs.setString(1, "c:/backupdir");
cs.setInt(2, 0);
cs.execute();
```

#### SQL##

```
#####c:/
backupdir#####
```

```
SYCS_UTIL.SYCS_BACKUP_DATABASE_AND_ENABLE_LOG_ARCHIVE_MODE('c:/
backupdir', 0)
```

```
#####c:/
backupdir#####
```

```
SYCS_UTIL.SYCS_BACKUP_DATABASE_AND_ENABLE_LOG_ARCHIVE_MODE('c:/
backupdir', 1)
```

#### SYCS\_UTIL.SYCS\_BACKUP\_DATABASE\_AND\_ENABLE\_LOG\_ARCHIVE\_MODE\_NOWAIT#####

```
SYCS_UTIL.SYCS_BACKUP_DATABASE_AND_ENABLE_LOG_ARCHIVE_MODE_NOWAIT#####
#####
```

#### ##

```
SYCS_UTIL.SYCS_BACKUP_DATABASE_AND_ENABLE_LOG_ARCHIVE_MODE_NOWAIT
(IN BACKUPDIR VARCHAR(32672),
IN SMALLINT DELETE_ARCHIVED_LOG_FILES)
```

```
#####
```

#### BACKUPDIR

```
#####VARCHAR(32672)#####JVM#user.dir#
#####
```

#### DELETE\_ARCHIVED\_LOG\_FILES

```
#####DELETE_ARCHIVED_LOG_FILES#####
```

#### JDBC##

```
#####c:/backupdir#####
```

```
CallableStatement cs = conn.prepareCall
("CALL
SYCS_UTIL.SYCS_BACKUP_DATABASE_AND_ENABLE_LOG_ARCHIVE_MODE_NOWAIT(?,
?)" );
cs.setString(1, "c:/backupdir");
cs.setInt(2, 0);
cs.execute();
```

#### SQL##

```
#####c:/
backupdir#####
```

```
SYCS_UTIL.SYCS_BACKUP_DATABASE_AND_ENABLE_LOG_ARCHIVE_MODE_NOWAIT('c:/
backupdir', 0)
```

```
#####c:/
backupdir#####
```

```
SYCS_UTIL.SYCS_BACKUP_DATABASE_AND_ENABLE_LOG_ARCHIVE_MODE_NOWAIT('c:/
backupdir', 1)
```

#### SYCS\_UTIL.SYCS\_EMPTY\_STATEMENT\_CACHE #####

```
#####SYCS_UTIL.SYCS_EMPTY_STATEMENT_CACHE#####
```

Derby #####

##

```
SYSCS_UTIL.SYSCS_EMPTY_STATEMENT_CACHE()
```

#

```
CALL SYSCS_UTIL.SYSCS_EMPTY_STATEMENT_CACHE()
```

**SYSCS\_UTIL.SYSCS\_CHECKPOINT\_DATABASE#####**

SYSCS\_UTIL.SYSCS\_CHECKPOINT\_DATABASE#####

##

```
SYSCS_UTIL.SYSCS_CHECKPOINT_DATABASE()
```

#####

**JDBC##**

```
CallableStatement cs = conn.prepareCall
("CALL SYSCS_UTIL.SYSCS_CHECKPOINT_DATABASE()");
cs.execute();
cs.close();
```

**SQL##**

```
CALL SYSCS_UTIL.SYSCS_CHECKPOINT_DATABASE();
```

**SYSCS\_UTIL.SYSCS\_COMPRESS\_TABLE#####**

SYSCS\_UTIL.SYSCS\_COMPRESS\_TABLE#####

#####Derby#####(OS

SYSCS\_UTIL.SYSCS\_COMPRESS\_TABLE#####(OS)#####

SYSCS\_UTIL.SYSCS\_COMPRESS\_TABLE#####

##

```
SYSCS_UTIL.SYSCS_COMPRESS_TABLE (IN SCHEMANAME VARCHAR(128),
IN TABLENAME VARCHAR(128), IN SEQUENTIAL SMALLINT)
```

**SCHEMANAME**

##VARCHAR(128)#####

**TABLENAME**

##VARCHAR(128)#####Fred"#####SQL#####

#####

**SEQUENTIAL**

####SMALLINT#####0#####

**SQL ##**

SEQUENTIAL#####US#####CUSTOMER#####

```
call SYSCS_UTIL.SYSCS_COMPRESS_TABLE('US', 'CUSTOMER', 1)
```

**Java ##**

SEQUENTIAL#####US#####CUSTOMER#####

```
CallableStatement cs = conn.prepareCall
("CALL SYSCS_UTIL.SYSCS_COMPRESS_TABLE(?, ?, ?)");
cs.setString(1, "US");
cs.setString(2, "CUSTOMER");
cs.setShort(3, (short) 1);
cs.execute();
```

Derby #####

```
SEQUENTIAL#####Derby##### SEQUENTIAL#####
#####Derby##
(#####)#####COMMIT#####(OS)#####
SEQUENTIAL#####Derby#####SEQUENTIAL#####
SYSCS_UTIL.SYSCS_COMPRESS_TABLE##COMMIT#####(OS)#####
#####COMMIT#####
###: #####SYSCS_UTIL.SYSCS_COMPRESS_TABLE#####
```

#### Note:

```
#####
#####
SYSCS_UTIL.SYSCS_INPLACE_COMPRESS_TABLE#####
SYSCS_UTIL.SYSCS_INPLACE_COMPRESS_TABLE#####
#####
####Derby#####(OS)#####(OS)#####
SYSCS_UTIL.SYSCS_INPLACE_COMPRESS_TABLE#####(OS)#####
#####SQL#####
#####PURGE_ROWS#DEFRAGMENT_ROWS### TRUNCATE_END####SYSCS_UTIL.SYSCS_COMPRESS_
##
```

```
SYSCS_UTIL.SYSCS_INPLACE_COMPRESS_TABLE(
    IN SCHEMANAME VARCHAR(128),
    IN TABLENAME VARCHAR(128),
    IN PURGE_ROWS SMALLINT,
    IN DEFRAGMENT_ROWS SMALLINT,
    IN TRUNCATE_END SMALLINT )
```

#### SCHEMANAME

#####VARCHAR(128)#####

#### TABLENAME

#####VARCHAR(128)##### "Fred"#####SQL#  
#####

#### PURGE\_ROWS

PURGE\_ROWS#0#####  
#####

#### DEFRAGMENT\_ROWS

DEFRAGMENT\_ROWS#0#####  
TRUNCATE\_END#####DEFRAGMENT\_ROWS##### DEFRAGMENT\_ROWS#####

#### TRUNCATE\_END

TRUNCATE\_END#0#####(OS)#####PURGE\_ROWS#DEFR

#### SQL##

US#####CUSTOMER#####

```
call SYSCS_UTIL.SYSCS_INPLACE_COMPRESS_TABLE('US', 'CUSTOMER', 1, 1, 1);
```

#####

```
call SYSCS_UTIL.SYSCS_INPLACE_COMPRESS_TABLE('US', 'CUSTOMER', 0, 0, 1);
```

#### Java##

US#####CUSTOMER#####

```
CallableStatement cs = conn.prepareCall
("CALL SYSCS_UTIL.SYSCS_INPLACE_COMPRESS_TABLE(?, ?, ?, ?, ?)");
cs.setString(1, "US");
cs.setString(2, "CUSTOMER");
cs.setShort(3, (short) 1);
cs.setShort(4, (short) 1);
```

Derby #####

```
cs.setShort(5, (short) 1);
cs.execute();
```

#####

```
CallableStatement cs = conn.prepareCall
("CALL SYSCS_UTIL.SYSCS_INPLACE_COMPRESS_TABLE(?, ?, ?, ?, ?)");
cs.setString(1, "US");
cs.setString(2, "CUSTOMER");
cs.setShort(3, (short) 0);
cs.setShort(4, (short) 0);
cs.setShort(5, (short) 1);
cs.execute();
```

###:

SYSCS\_UTIL.SYSCS\_INPLACE\_COMPRESS\_TABLE#####

Note:

#####Derby

#####

SYSCS\_UTIL.SYSCS\_DISABLE\_LOG\_ARCHIVE\_MODE#####

SYSCS\_UTIL.SYSCS\_DISABLE\_LOG\_ARCHIVE\_MODE#####DEL

##

```
SYSCS_UTIL.SYSCS_DISABLE_LOG_ARCHIVE_MODE(IN SMALLINT
DELETE_ARCHIVED_LOG_FILES)
```

#####

DELETE\_ARCHIVED\_LOG\_FILES

##DELETE\_ARCHIVED\_LOG\_FILES#####

#####

JDBC##

#####

```
CallableStatement cs = conn.prepareCall
("CALL SYSCS_UTIL.SYSCS_DISABLE_LOG_ARCHIVE_MODE(?)");
cs.setInt(1, 1);
cs.execute();
cs.close();
```

SQL##

#####

```
CALL SYSCS_UTIL.SYSCS_DISABLE_LOG_ARCHIVE_MODE
DELETE_ARCHIVED_LOG_FILES(0);
```

#####

```
CALL SYSCS_UTIL.SYSCS_DISABLE_LOG_ARCHIVE_MODE
DELETE_ARCHIVED_LOG_FILES(1);
```

SYSCS\_UTIL.SYSCS\_EXPORT\_TABLE #####

SYSCS\_UTIL.SYSCS\_EXPORT\_TABLE#####(OS)#####

SYSCS\_UTIL.SYSCS\_EXPORT\_TABLE#####(OS)#####

#####

#####

##

Derby #####

```
SYSCS_UTIL.SYSCS_EXPORT_TABLE (IN SCHEMANAME VARCHAR(128),
IN TABLENAME VARCHAR(128), IN FILENAME VARCHAR(32672),
IN COLUMNDELIMITER CHAR(1), IN CHARACTERDELIMITER CHAR(1),
IN CODESET VARCHAR(128))
```

#####

#### SCHEMANAME

An input argument of type VARCHAR(128) that specifies the schema name of the table. Passing a NULL value will use the default schema name.

#### TABLENAME

#####VARCHAR(128)#####

#### FILENAME

#####  
(32672)#####

#### COLUMNDELIMITER

#####CHAR(1)#####

#### CHARACTERDELIMITER

#####CHAR(1)#####  
#####(")###

#### CODESET

#####VARCHAR(128)#####Java#####  
#####JVM#####

#####

###

#####Derby

#####

#

#####SAMPLE#####STAFF###myfile.del#####

```
CALL SYSCS_UTIL.SYSCS_EXPORT_TABLE (null, 'STAFF', 'myfile.del', null,
null, null);
```

#### SYSCS\_UTIL.SYSCS\_EXPORT\_TABLE\_LOBS\_TO\_EXTFILE #####

SYSCS\_UTIL.SYSCS\_EXPORT\_TABLE\_LOBS\_TO\_EXTFILE#####LO

#####

#####

##

```
SYSCS_UTIL.SYSCS_EXPORT_TABLE_LOBS_TO_EXTFILE (
IN SCHEMANAME VARCHAR(128),
IN TABLENAME VARCHAR(128),
IN FILENAME VARCHAR(32672),
IN COLUMNDELIMITER CHAR(1),
IN CHARACTERDELIMITER CHAR(1),
IN CODESET VARCHAR(128)
IN LOBSFILENAME VARCHAR(32672)
)
```

#####

#### SCHEMANAME

#####NULL#####SCHEMANAME#####VARCHAR  
(128)#####

#### TABLENAME

#####TA  
(128)#####

Derby #####

## FILENAME

```
#####  
#####NULL#####FILENAME#####  
(32672)#####
```

## COLUMNDELIMITER

```
#####NULL#####  
COLUMNDELIMITER#####CHAR (1)#####
```

## CHARACTERDELIMITER

```
#####NULL#####  
CHARACTERDELIMITER#####CHAR (1)#####
```

## CODESET

```
#####Java#####  
(128)#####
```

## LOBSFILENAME

```
#####LOB#####  
##### NULL#####  
LOBSFILENAME#####VARCHAR (32672)#####
```

```
#####
```

###

```
#####Derby  
#####
```

#####LOB#####

#####STAFF####staff.del#####pictures.dat###LOB#####

```
CALL SYSCS_UTIL.SYSCS_EXPORT_TABLE_LOBS_TO_EXTFILE(  
  'APP', 'STAFF', 'c:#data#staff.del', ' ', ' ', ' ',  
  'UTF-8', 'c:#data#pictures.dat');
```

## SYSCS\_UTIL.SYSCS\_EXPORT\_QUERY#####

The SYSCS\_UTIL.SYSCS\_EXPORT\_QUERY system procedure exports the results of a SELECT statement to an operating system file.

```
#####
```

```
#####
```

##

```
SYSCS_UTIL.SYSCS_EXPORT_QUERY(IN SELECTSTATEMENT VARCHAR(32672),  
IN FILENAME VARCHAR(32672), IN COLUMNDELIMITER CHAR(1),  
IN CHARACTERDELIMITER CHAR(1), IN CODESET VARCHAR(128))
```

```
#####
```

## SELECTSTATEMENT

```
#####VARCHAR(32672)#####(###)#####
```

## FILENAME

```
#####  
FILENAME#####VARCHAR (32672)#####
```

## COLUMNDELIMITER

```
#####CHAR(1)#####(,
```

## CHARACTERDELIMITER

```
#####CHAR(1)#####
```

## CODESET

```
#####VARCHAR(128)#####  
#####Java#####
```

Derby #####

#####

#####JVM#####

###

#####Derby

#####

#

#####SAMPLE#####STAFF####myfile.del#####

```
CALL SYSCS_UTIL.SYSCS_EXPORT_QUERY('select * from staff where dept =20',
'c:/output/awards.del', null, null, null);
```

**SYSCS\_UTIL.SYSCS\_EXPORT\_QUERY\_LOBS\_TO\_EXTFILE #####**

SYSCS\_UTIL.SYSCS\_EXPORT\_QUERY\_LOBS\_TO\_EXTFILE#####LOB#####

#####

#####

##

```
SYSCS_UTIL.SYSCS_EXPORT_QUERY_LOBS_TO_EXTFILE (
    IN SELECTSTATEMENT VARCHAR(32672),
    IN FILENAME VARCHAR(32672),
    IN COLUMNDELIMITER CHAR(1),
    IN CHARACTERDELIMITER CHAR(1),
    IN CODESET VARCHAR(128)
    IN LOBSFILENAME VARCHAR(32672)
)
```

#####

**SELECTSTATEMENT**

#####

NULL#####SELECTSTATEMENT#####VARCHAR  
(32672)#####

**FILENAME**

#####  
(32672)#####

**COLUMNDELIMITER**

#####

NULL#####COLUMNDELIMITER#####CHAR  
(1)#####

**CHARACTERDELIMITER**

#####

NULL#####CHARACTERDELIMITER#####CHAR  
(1)#####

**CODESET**

#####Java#####

NULL#####JVM#####CODESET#####VARCHAR  
(128)#####

**LOBSFILENAME**

large

object#####lob#####  
#####

NULL#####LOBSFILENAME#####VARCHAR  
(32672)#####

###

Derby #####

#####Derby

#####

**LOB#####**

#####STAFF####20#####staff.del#lob###pictures.dat#####

```
CALL SYSCS_UTIL.SYSCS_EXPORT_QUERY_LOBS_TO_EXTFILE(
  'SELECT * FROM STAFF WHERE dept=20',
  'c:#data#staff.del', ' ', ' ', ' ',
  'UTF-8', 'c:#data#pictures.dat');
```

**SYSCS\_UTIL.SYSCS\_IMPORT\_DATA#####**

SYSCS\_UTIL.SYSCS\_IMPORT\_DATA#####

#####

**##**

```
SYSCS_UTIL.SYSCS_IMPORT_DATA (IN SCHEMANAME VARCHAR(128),
IN TABLENAME VARCHAR(128), IN INSERTCOLUMNS VARCHAR(32672),
IN COLUMNINDEXES VARCHAR(32672), IN FILENAME VARCHAR(32672),
IN COLUMNDELIMITER CHAR(1), IN CHARACTERDELIMITER CHAR(1),
IN CODESET VARCHAR(128), IN REPLACE SMALLINT)
```

#####

**SCHEMANAME**

#####VARCHAR(128)#####

**TABLENAME**

#####VARCHAR

(128)#####

**INSERTCOLUMNS**

#####VARCHAR (32762)#####(#####)#####

**COLUMNINDEXES**

#####VARCHAR

(32762)#####(1#####)#####

**FILENAME**

#####VARCHAR(32672)#####

#####

**COLUMNDELIMITER**

#####CHAR(1)#####

**CHARACTERDELIMITER**

#####CHAR(1)#####

**CODESET**

#####VARCHAR(128)#####Java#####

#####(utf-

8)#####JVM#####

**REPLACE**

#####SMALLINT#####REPLACE#####INSERT#####REPLACE#####

#####REPLACE#####INSERT#####

#####

**###**

#####Derby

#####

**#**

#####data.del#####staff#####

```
CALL SYSCS_UTIL.SYSCS_IMPORT_DATA
(NULL, 'STAFF', null, '1,3,4', 'data.del', null, null, null,0)
```



Derby #####

**SYSCS\_UTIL.SYSCS\_IMPORT\_DATA\_LOBS\_FROM\_EXTFILE #####**

SYSCS\_UTIL.SYSCS\_IMPORT\_DATA\_LOBS\_FROM\_EXTFILE#####  
#####LOB#####

**##**

```
SYSCS_UTIL.SYSCS_IMPORT_DATA_LOBS_FROM_EXTFILE (
    IN SCHEMANAME VARCHAR(128),
    IN TABLENAME VARCHAR(128),
    IN INSERTCOLUMNS VARCHAR(32672),
    IN COLUMNINDEXES VARCHAR(32672),
    IN FILENAME VARCHAR(32672),
    IN COLUMNDELIMITER CHAR(1),
    IN CHARACTERDELIMITER CHAR(1),
    IN CODESET VARCHAR(128),
    IN REPLACE SMALLINT)
)
```

#####LOB#####

**SCHEMANAME**

#####NULL#####  
SCHEMANAME#####VARCHAR (128)#####

**TABLENAME**

#####  
#####NULL#####  
TABLENAME#####VARCHAR (128)#####

**INSERTCOLUMNS**

#####NULL#####  
INSERTCOLUMNS#####VARCHAR (32672)#####

**COLUMNINDEXES**

#####(1#####)#####  
#####NULL#####COLUMNINDEXES#####VARCHAR  
(32762)#####

**FILENAME**

#####  
NULL##### fileName#####VARCHAR (32672)#####

**COLUMNDELIMITER**

#####NULL#####  
COLUMNDELIMITER#####CHAR (1)#####

**CHARACTERDELIMITER**

#####NULL#####  
CHARACTERDELIMITER##### CHAR (1)#####

**CODESET**

#####Java#####  
#####(UTF-8)#####  
####JVM#####NULL#####  
CODESET#####VARCHAR (128)#####

**REPLACE**

#####0#####REPLACE#####0#####INSERT#####  
REPLACE#####  
#####NULL##### REPLACE#####SMALLINT#####

#####

**###**

#####LOB#####  
#####LOB#####lobsFileName.Offset.length/#####

- Offset#####

Derby #####

• length#####LOB#####

#####Derby

#####

#####LOB#####

#####STAFF#####

STAFF#####LOB#####

#####staff.del#####staff.del#####LOB#####

#####(")#####(")#####

#####STAFF#####

```
CALL SYSCS_UTIL.SYSCS_IMPORT_DATA_LOBS_FROM_EXTFILE
      (null, 'STAFF', 'NAME,DEPT,SALARY,PICTURE', '2,3,4,6',
+      'c:#data#staff.del', ' ',' ','','UTF-8', 0);
```

**SYSCS\_UTIL.SYSCS\_IMPORT\_TABLE#####**

SYSCS\_UTIL.SYSCS\_IMPORT\_TABLE#####

#####

**##**

```
SYSCS_UTIL.SYSCS_IMPORT_TABLE (IN SCHEMANAME VARCHAR(128),
IN TABLENAME VARCHAR(128), IN FILENAME VARCHAR(32672),
IN COLUMNDELIMITER CHAR(1), IN CHARACTERDELIMITER CHAR(1),
IN CODESET VARCHAR(128), IN REPLACE SMALLINT)
```

#####

**SCHEMANAME**

#####VARCHAR(128)#####

**TABLENAME**

#####VARCHAR (128)#####

#####

**FILENAME**

#####VARCHAR(32672)#####

#####

**COLUMNDELIMITER**

#####CHAR(1)#####

#####(,###

**CHARACTERDELIMITER**

#####CHAR(1)#####

#####(")###

**CODESET**

#####VARCHAR(128)#####Java#####

8)#####JVM#####

**REPLACE**

#####SMALLINT#####REPLACE#####INSERT#####

REPLACE#####

#####

#####

**###**

#####Derby

#####

**#**

#####myfile.del#####STAFF#####(%)#

```
CALL SYSCS_UTIL.SYSCS_IMPORT_TABLE
      (null, 'STAFF', 'c:/output/myfile.del', ';', '%', null,0);
```

Derby #####

#####Derby #####

**SYSCS\_UTIL.SYSCS\_IMPORT\_TABLE\_LOBS\_FROM\_EXTFILE #####**

SYSCS\_UTIL.SYSCS\_IMPORT\_TABLE\_LOBS\_FROM\_EXTFILE#####LOB  
#####LOB#####

**##**

```
SYSCS_UTIL.SYSCS_IMPORT_TABLE_LOBS_FROM_EXTFILE (
    IN SCHEMANAME VARCHAR(128),
    IN TABLENAME VARCHAR(128),
    IN FILENAME VARCHAR(32672),
    IN COLUMNDELIMITER CHAR(1),
    IN CHARACTERDELIMITER CHAR(1),
    IN CODESET VARCHAR(128),
    IN REPLACE SMALLINT)
)
```

#####LOB#####

**SCHEMANAME**

#####NULL#####SCHEMANAME#####VARCHAR  
(128)#####

**TABLENAME**

#####NULL#####  
(128)#####

**FILENAME**

#####

**COLUMNDELIMITER**

#####NULL#####COLUMNDELIMITER  
(1)#####

**CHARACTERDELIMITER**

#####NULL#####  
(1)#####

**CODESET**

#####Java#####  
8)#####JVM#####NULL#####CODESET#####VARCHAR  
(128)#####

**REPLACE**

0#####REPLACE#####0#####INSERT#####REPLACE

#####

**###**

#####LOB##### Derby#####LO  
#####

- Offset#####
- length#LOB#####

#####Derby

#####

**LOB#####**

#####STAFF##staff.del#####

```
CALL SYSCS_UTIL.SYSCS_IMPORT_TABLE_LOBS_FROM_EXTFILE(
    'APP', 'STAFF', 'c:\data\staff.del', ',', ' ', 'UTF-8', 0);
```

**SYSCS\_UTIL.SYSCS\_FREEZE\_DATABASE#####**

SYSCS\_UTIL.SYSCS\_FREEZE\_DATABASE#####

Derby #####

##

```
SYSCS_UTIL.SYSCS_FREEZE_DATABASE()
```

#####

#

```
String backupdirectory = "c:/mybackups/" + JCalendar.getToday();
CallableStatement cs = conn.prepareCall
("CALL SYSCS_UTIL.SYSCS_FREEZE_DATABASE()");
cs.execute();
cs.close();
// "backupdirectory"#####
// #####
CallableStatement cs = conn.prepareCall
("CALL SYSCS_UTIL.SYSCS_UNFREEZE_DATABASE()");
cs.execute();
cs.close();
```

**SYSCS\_UTIL.SYSCS\_UNFREEZE\_DATABASE #####**

#####SYSCS\_UTIL.SYSCS\_UNFREEZE\_DATABASE#####

##

```
SYSCS_UTIL.SYSCS_UNFREEZE_DATABASE()
```

#####

#

```
String backupdirectory = "c:/mybackups/" + JCalendar.getToday();
CallableStatement cs = conn.prepareCall
("CALL SYSCS_UTIL.SYSCS_FREEZE_DATABASE()");
cs.execute();
cs.close();
// "backupdirectory"#####
// #####
now unfreeze the database once backup has completed:
CallableStatement cs = conn.prepareCall
("CALL SYSCS_UTIL.SYSCS_UNFREEZE_DATABASE()");
cs.execute();
cs.close();
```

**SYSCS\_UTIL.SYSCS\_RELOAD\_SECURITY\_POLICY #####**

SYSCS\_UTIL.SYSCS\_RELOAD\_SECURITY\_POLICY#####Java#####

#####Derby

#####Derby #####

#####Derby#####

##

```
SYSCS_UTIL.SYSCS_RELOAD_SECURITY_POLICY()
```

#####

#

```
CallableStatement cs = conn.prepareCall
("CALL SYSCS_UTIL.SYSCS_RELOAD_SECURITY_POLICY()");
cs.execute();
cs.close();
```

Derby #####

#### **SYSCS\_UTIL.SYSCS\_SET\_DATABASE\_PROPERTY#####**

SYSCS\_UTIL.SYSCS\_SET\_DATABASE\_PROPERTY#####/  
#####

"VALUE"#null#####"KEY"#####"VALUE"#####"VALUE"#null####"KEY"#####

##

```
SYSCS_UTIL.SYSCS_GET_DATABASE_PROPERTY(IN KEY VARCHAR(128),
IN VALUE VARCHAR(32672))
```

#####

#### **JDBC##**

derby.locks.deadlockTimeout###10#####

```
CallableStatement cs = conn.prepareCall
("CALL SYSCS_UTIL.SYSCS_SET_DATABASE_PROPERTY(?, ?)");
cs.setString(1, "derby.locks.deadlockTimeout");
cs.setString(2, "10");
cs.execute();
cs.close();
```

#### **SQL##**

derby.locks.deadlockTimeout###10#####

```
CALL SYSCS_UTIL.SYSCS_SET_DATABASE_PROPERTY
('derby.locks.deadlockTimeout', '10');
```

#### **SYSCS\_UTIL.SYSCS\_SET\_RUNTIMESTATISTICS#####**

SYSCS\_UTIL.SYSCS\_SET\_RUNTIMESTATISTICS()#####on#off#####  
#####runtimestatistics###on#####off#####Derby#####commit##  
runtimestatistics###off#####0#####  
runtimestatistics###on#####0#####  
#####next()#0#

##

```
SYSCS_UTIL.SYSCS_SET_RUNTIMESTATISTICS(IN SMALLINT ENABLE)
```

#

```
-- #####
-- ###RUNTIMESTATISTIC#on####
CALL SYSCS_UTIL.SYSCS_SET_RUNTIMESTATISTICS(1);
-- #####
-- #####
-- #####
CALL SYSCS_UTIL.SYSCS_SET_RUNTIMESTATISTICS(0);
```

#### **SYSCS\_UTIL.SYSCS\_SET\_STATISTICS\_TIMING#####**

SYSCS\_UTIL.SYSCS\_SET\_STATISTICS\_TIMING#####on#off#####  
#####off### runtimestatistics#####on#####on#####  
runtimestatistics###off#####on#####  
#####on#####0##### off#####0#####

#####on#####Derby#####SYSCS\_UTIL.SYSCS\_GET\_RUNTIMES  
#####off###SYSCS\_UTIL.SYSCS\_GET\_RUNTIMESTATISTICS#####0#####

##

Derby #####

```
SYSCS_UTIL.SYSCS_SET_STATISTICS_TIMING(IN SMALLINT ENABLE)
```

#

runtimestatistics#####on####

```
CALL SYSCS_UTIL.SYSCS_SET_RUNTIMESTATISTICS(1);
```

```
CALL SYSCS_UTIL.SYSCS_SET_STATISTICS_TIMING(1);
```

**SYSCS\_UTIL.SYSCS\_SET\_USER\_ACCESS#####**

SYSCS\_UTIL.SYSCS\_SET\_USER\_ACCESS#####

##

```
SYSCS_UTIL.SYSCS_SET_USER_ACCESS USERNAME VARCHAR(128),  
CONNECTION_PERMISSION VARCHAR(128))
```

**USERNAME**

VARCHAR(128)#####Derby#####ID#####

**CONNECTION\_PERMISSION**

###CONNECTION\_PERMISSION#####

**fullAccess**

#####derby.database.fullAccessUsers#####

**readOnlyAccess**

#####derby.database.readOnlyAccessUse

**null**

#####null#####

#

```
CALL SYSCS_UTIL.SYSCS_SET_USER_ACCESS ('BRUNNER', 'readOnlyAccess')
```

#####null#####

```
CALL SYSCS_UTIL.SYSCS_SET_USER_ACCESS ('ISABEL', null)
```

## SYSCS\_DIAG #####

Derby#####

Derby#####

###

Derby#####

#####

Derby#####0#####SQL#####

#####Derby#####

**# 9. Derby#####**

####	####
SYSCS_DIAG.ERROR_LOG_READER	###
SYSCS_DIAG.ERROR_MESSAGES	#
SYSCS_DIAG.LOCK_TABLE	#
SYSCS_DIAG.SPACE_TABLE	###
SYSCS_DIAG.STATEMENT_CACHE	#
SYSCS_DIAG.STATEMENT_DURATION	###

Derby #####

###	###
SYSCS_DIAG.TRANSACTION_TABLE	#

####: DDL#####Derby#####

#### **SYSCS\_DIAG.ERROR\_LOG\_READER ####**

SYSCS\_DIAG.ERROR\_LOG\_READER#####derby.log#####SQL#####

#####

SYSCS\_DIAG.ERROR\_LOG\_READER#####SQL#####

#####:

```
SELECT *
  FROM TABLE (SYSCS_DIAG.ERROR_LOG_READER())
  AS T1
```

###T1#####

SYSCS\_DIAG.ERROR\_LOG\_READER#####

For example:

```
SELECT *
  FROM TABLE (SYSCS_DIAG.ERROR_LOG_READER('myderbyerrors.log'))
  AS T1
```

####: #####Derby#####Derby#####Derby#####

#### **SYSCS\_DIAG.ERROR\_MESSAGES ###**

SYSCS\_DIAG.ERROR\_MESSAGES#####SQLState#####

Derby#####

#####SYSCS\_DIAG.ERROR\_MESSAGES#####

#####

```
SELECT * FROM SYSCS_DIAG.ERROR_MESSAGES
```

#### **SYSCS\_DIAG.LOCK\_TABLE ###**

SYSCS\_DIAG.LOCK\_TABLE#####Derby#####

SYSCS\_DIAG.LOCK\_TABLE#####

#####

```
SELECT * FROM SYSCS_DIAG.LOCK_TABLE
```

SYSCS\_DIAG.LOCK\_TABLE#####

#####

#####

#### **SYSCS\_DIAG.SPACE\_TABLE ####**

SYSCS\_DIAG.SPACE\_TABLE#####

#####

SYSCS\_DIAG.SPACE\_TABLE#####SQL#####

#####

#####

```
SELECT T2.*
  FROM
    SYS.SYSTABLES systabs,
```

Derby #####

```
TABLE (SYSCS_DIAG.SPACE_TABLE(systabs.tablename)) AS T2
WHERE systabs.tabletype = 'T'
```

###T2#####

#####Java#####

#####

#####

```
SELECT *
FROM TABLE (SYSCS_DIAG.SPACE_TABLE('MYSCHEMA', 'MYTABLE'))
AS T2
```

**SYSCS\_DIAG.STATEMENT\_CACHE ###**

SYSCS\_DIAG.STATEMENT\_CACHE#####SQL#####

SYSCS\_DIAG.STATEMENT\_CACHE#####

#####

```
SELECT * FROM SYSCS_DIAG.STATEMENT_CACHE
```

**SYSCS\_DIAG.STATEMENT\_DURATION #####**

SYSCS\_DIAG.STATEMENT\_DURATION#####derby.log#####SQL#####

#####JDBC#####

SYSCS\_DIAG.STATEMENT\_DURATION#####SQL#####

#####

```
SELECT *
FROM TABLE (SYSCS_DIAG.STATEMENT_DURATION())
AS T1
```

###T1#####

####:

#####ID#####ID#####

SYSCS\_DIAG.STATEMENT\_DURATION#####

#####Java#####

#####

```
SELECT *
FROM TABLE (SYSCS_DIAG.STATEMENT_DURATION('somederby.log'))
AS T1
```

###: ####Derby#####Derby#####Derby###

#####SYSCS\_DIAG.STATEMENT\_DURATION#####

**SYSCS\_DIAG.TRANSACTION\_TABLE ###**

SYSCS\_DIAG.TRANSACTION\_TABLE#####SYSCS\_DIAG.TRANSACTION\_TABLE#####

#####

```
SELECT * FROM SYSCS_DIAG.TRANSACTION_TABLE
```

###SYSCS\_DIAG.TRANSACTION\_TABLE#####

####

#####Derby#####



Derby #####

#####

#####SQL#####

#####(NULL)#####

#####NULL#####

#####CREATE TABLE#####

###

Derby#####

#####:

#####

- ##
  - **SMALLINT** (2 bytes)
  - **INTEGER** (4 bytes)
  - **BIGINT** (8 bytes)
- #####
  - **REAL** (4 bytes)
  - **DOUBLE PRECISION** (8 bytes)
  - **FLOAT** (**DOUBLE PRECISION**####**REAL**###)
- ####
  - **DECIMAL** (#####)
  - **NUMERIC** (**DECIMAL**###)

#####:

#####Derby#####INTEGER#####Derby#####

**# 10. #####**

#####	####
DOUBLE PRECISION	DOUBLE PRECISION
REAL	DOUBLE PRECISION
DECIMAL	DECIMAL
BIGINT	BIGINT
INTEGER	INTEGER
SMALLINT	INTEGER

#:

```
-- #####  
VALUES 1 + 1.0e0  
-- #####  
VALUES 1 + 1.0  
-- #####  
VALUES CAST (1 AS INT) + CAST (1 AS INT)
```

#####:

#####

#####

```
create table mytable (r REAL, d DOUBLE PRECISION);  
0 rows inserted/updated/deleted  
INSERT INTO mytable (r, d) values (3.4028236E38, 3.4028235E38);  
ERROR X0X41: The number '3.4028236E38' is outside the range for  
the data type REAL.
```

Derby #####

#####INTEGER#####

```
INSERT INTO mytable(integer_column) values (1.09e0);
1 row inserted/updated/deleted
SELECT integer_column
FROM mytable;
I
-----
1
```

#####

#####

```
ij> insert into mytable (decimal_column)
VALUES (55555555556666666666);
ERROR X0Y21: The number '55555555556666666666' is outside the
range of the target DECIMAL/NUMERIC(5,2) datatype.
```

#####

```
INSERT INTO mytable (int_column) values 2147483648;
ERROR 22003: The resulting value is outside the range for the
data type INTEGER.
```

**Note:** NUMERIC#####Derby#####

#####:

SQL#####(#####)####(#####)#####  
#####

#####:

- lp#####
- rp#####
- ls#####
- rs#####

#####

- ###  
  
ls + rs
- ###  
  
31 - lp + ls - rs
- AVG()  
  
max(max(ls, rs), 4)
- #####  
  
max(ls, rs)

#####27###

```
11.0/1111.33
// 31 - 3 + 1 - 2 = 27
```

#####

- ###  
  
lp + rp
- ###  
  
2 \* (p - s) + s
- ###  
  
lp - ls + rp + max(ls + rp - rs + 1, 4)
- #####

Derby #####

$\max(lp - ls, rp - rs) + 1 + \max(ls, rs)$

#####

# # 11. Derby#####

#####Derby#####"Y"#####

Types	S M A L L I N T	I N T E G E R	B I G I N T	D E C I M A L	R E A L	D O U B L E	F L O A T	C H A R	V A R C H A R	L O N G V A R C H A R	C H A R F O R B I T D A T A	V A R C H A R F O R B I T D A T A	L O N G V A R C H A R F O R B I T D A T A	C L O B	B L O B	D A T E	T I M E	T I M E S T A M P	X M L
SMALL INT	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
INTEGER	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
BIGINT	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
DECIMAL	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
REAL	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
DOUBLE	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
FLOAT	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
CHAR	-	-	-	-	-	-	-	Y	Y	Y	-	-	-	Y	-	Y	Y	Y	-
VARCHAR	-	-	-	-	-	-	-	Y	Y	Y	-	-	-	Y	-	Y	Y	Y	-
LONG VARCHAR	-	-	-	-	-	-	-	Y	Y	Y	-	-	-	Y	-	-	-	-	-
CHAR FOR BIT DATA	-	-	-	-	-	-	-	-	-	-	Y	Y	Y	-	-	-	-	-	-
VARCHAR FOR BIT DATA	-	-	-	-	-	-	-	-	-	-	Y	Y	Y	-	-	-	-	-	-

Derby #####

Types	S M A L L I N T	I N T E G E R	B I G I N T	D E C I M A L	R E A L	D O U B L E	F L O A T	C H A R	V A R C H A R	L O N G V A R C H A R	C H A R F O R B I T D A T A	V A R C H A R F O R B I T D A T A	L O N G V A R C H A R F O R B I T D A T A	C L O B	B L O B	D A T E	T I M E	T I M E S T A M P	X M L
LONG VARCHAR FOR BIT DATA	-	-	-	-	-	-	-	-	-	-	Y	Y	Y	-	-	-	-	-	-
CLOB	-	-	-	-	-	-	-	Y	Y	Y	-	-	-	Y	-	-	-	-	-
BLOB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-	-	-
DATE	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	Y	-	-	-
TIME	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	-	Y	-	-
TIME STAMP	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	-	-	Y	-
XML	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y

**# 12. Derby#####**

#####Derby##### "Y"#####

Types	S M A L L I N T	I N T E G E R	B I G I N T	D E C I M A L	R E A L	D O U B L E	F L O A T	C H A R	V A R C H A R	L O N G V A R C H A R	C H A R F O R B I T D A T A	V A R C H A R F O R B I T D A T A	L O N G V A R C H A R F O R B I T D A T A	C L O B	B L O B	D A T E	T I M E	T I M E S T A M P	X M L
SMALL INT	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
INTEGER	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
BIGINT	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
DECIMAL	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
REAL	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
DOUBLE	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
FLOAT	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
CHAR	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	Y	Y	Y	-
VARCHAR	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	Y	Y	Y	-
LONG VARCHAR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHAR FOR BIT DATA	-	-	-	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	-
VARCHAR FOR BIT DATA	-	-	-	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	-
LONG VARCHAR FOR BIT DATA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CLOB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BLOB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Derby #####

Types	S M A L L I N T	I N T E G E R	B I G I N T	D E C I M A L	R E A L	D O U B L E	F L O A T	C H A R	V A R C H A R	L O N G V A R C H A R	C H A R F O R B I T D A T A	V A R C H A R F O R B I T D A T A	L O N G V A R C H A R F O R B I T D A T A	C L O B	B L O B	D A T E	T I M E	T I M E S T A M P	X M L
DATE	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	Y	-	-	-
TIME	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	-	Y	-	-
TIME STAMP	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	-	-	Y	-
XML	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**BIGINT ####**

BIGINT#####8#####

**##**

BIGINT

**#####Java##**

*java.lang.Long*

**JDBC#####(java.sql.Types)**

BIGINT

**###**

-9223372036854775808 (*java.lang.Long.MIN\_VALUE*)

**###**

9223372036854775807 (*java.lang.Long.MAX\_VALUE*)

#####

#####

9223372036854775807

Derby #####

#### **BLOB###**

BLOB(#####)####2,147,483,647#####BLOB#####

BLOB#####1024#1024\*1024#1024\*1024\*1024####K#M#G#####

**Note:** BLOB####Length#####

##

```
{ BLOB | BINARY LARGE OBJECT } [ ( length [{K | M | G}] ) ]
```

#####

###BLOB####2GB(2,147,483,647)###

**#####Java##**

*java.sql.Blob*

**JDBC#####**

BLOB

#####BLOB#####*java.sql.ResultSet#getBlob*#####

#####

*java.sql.Blob#####java.sql.Clob#####*

```
create table pictures(name varchar(32) not null primary key, pic
blob(16M));
```

```
--#####
```

```
select length(pic), name from pictures where name like '%logo%';
```

```
--#####(blob###)
```

```
select a.name as double_one, b.name as double_two
```

```
from pictures as a, pictures as b
```

```
where a.name < b.name
```

```
and a.pic = b.pic
```

```
order by 1,2;
```

**CHAR ####**

CHAR#####

**Syntax**

```
CHAR[ACTER] [(##)]
```

## #####1###

**#####Java##**

*java.lang.String*

**JDBC#####(java.sql.Types)**

CHAR

Derby#####Derby #####

CHAR#VARCHAR#####

#####CHAR###

#####

CHAR#####*java.lang.Integer.MAX\_VALUE*###

```
-- #####
```

Derby #####

```
-- #####  
VALUES 'hello this is Joe''s string'
```

**CHAR FOR BIT DATA ###**

CHAR FOR BIT

DATA#####

##

```
{ CHAR | CHARACTER }[(#)] FOR BIT DATA
```

#####

CHAR FOR BIT DATA#####1#####254#####

**JDBC #####(java.sql.Types)**

BINARY

CHAR FOR BIT

DATA#####0x20#####

CHAR FOR BIT DATA#VARCHAR FOR BIT

DATA#####

(#####DBMS#####SQL-92#####

VARCHAR FOR BIT DATA#CHAR FOR BIT DATA#####(#####)#VARCHAR FOR  
BIT DATA#####

```
CREATE TABLE t (b CHAR(2) FOR BIT DATA);
```

```
INSERT INTO t VALUES (X'DE');
```

```
SELECT *
```

```
FROM t;
```

```
-- #####
```

B

-----

de20

**CLOB###**

CLOB(#####)#####2,147,483,647#####CLOB#####

CLOB#####K#M#G#####1024#1024\*1024#1024\*1024\*1024#####

CLOB####(#####)#####

##

```
{CLOB | CHARACTER LARGE OBJECT} [ ( ## [{K |M |G}] ) ]
```

#####

#####CLOB####2##(2,147,483,647)#####

**#####Java##**

*java.sql.Clob*

**JDBC #####(java.sql.Types)**

CLOB

CLOB#####*java.sql.ResultSet*###*getClob*#####

#####

[java.sql.Blob#####java.sql.Clob#####](#)

```
import java.sql.*;
```



Derby #####

```
public class clob
{
    public static void main(String[] args) {
        try {
            String url = "jdbc:derby:clobberyclob;create=true";

            Class.forName("org.apache.derby.jdbc.EmbeddedDriver").newInstance();
            Connection conn = DriverManager.getConnection(url);

            Statement s = conn.createStatement();
            s.executeUpdate("CREATE TABLE documents (id INT, text CLOB(64
K))");
            conn.commit();

            // --- #####
            java.io.File file = new java.io.File("asciifile.txt");
            int fileLength = (int) file.length();

            // - #####
            java.io.InputStream fin = new java.io.FileInputStream(file);
            PreparedStatement ps = conn.prepareStatement("INSERT
            INTO documents VALUES (?, ?)");
            ps.setInt(1, 1477);

            // - #####
            ps.setAsciiStream(2, fin, fileLength);
            ps.execute();
            conn.commit();

            // --- #####
            ResultSet rs = s.executeQuery("SELECT text FROM documents
            WHERE id = 1477");
            while (rs.next()) {
                java.sql.Clob aclob = rs.getClob(1);
                java.io.InputStream ip = rs.getAsciiStream(1);
                int c = ip.read();
                while (c > 0) {
                    System.out.print((char)c);
                    c = ip.read();
                }
                System.out.print("\n");
                // ...
            }
        } catch (Exception e) {
            System.out.println("Error! "+e);
        }
    }
}
```

**DATE###**

**DATE####*java.sql.Date*#####**

**##**

**DATE**

**#####Java##**

*java.sql.Date*

**JDBC#####(java.sql.Types)**

**DATE**

**#####**

***java.sql.Date*#####SQL#####Derby#DATE#####**

yyyy-mm-dd  
mm/dd/yyyy

```

Derby #####
dd.mm.yyyy

#####java.sql.Date#####
####4#####
####Derby#DB2#####
#

VALUES DATE('1994-02-23')
VALUES '1993-09-01'

DECIMAL ###
DECIMAL#####
#####(#####)####(#####)#####
#####
##

{ DECIMAL | DEC } [(# [, ### ])]
###1##31#####
#####0#####5#####
DECIMAL#####
DECIMAL#####Derby#####
####

-- #####
values cast (1.798765 AS decimal(5,2));
1
-----
1.79
-- #####
values cast (1798765 AS decimal(5,2));
1
-----
ERROR 22003: The resulting value is outside the range
for the data type DECIMAL/NUMERIC(5,2).

#####
#####
###DECIMAL#####
#####Java##
java.math.BigDecimal
JDBC ##### (java.sql.Types)
DECIMAL
VALUES 123.456
VALUES 0.001
BIGINT#####DECIMAL#####
DOUBLE ###
DOUBLE#DOUBLE PRECISION#####
##

```

Derby #####

DOUBLE

DOUBLE PRECISION ####

DOUBLE PRECISION#IEEE#####8#####

##

DOUBLE PRECISION

####

DOUBLE

DOUBLE#DOUBLE PRECISION#####

##

DOUBLE#####

- DOUBLE####: -1.79769E+308
- DOUBLE####: 1.79769E+308
- DOUBLE#####: 2.225E-307
- DOUBLE#####: -2.225E-307

#####Java####java.lang.Double#####

#####  
#####

#####30#####

-- #####

values 01234567890123456789012345678901e0;

#####Java##

*java.lang.Double*

**JDBC ##### (java.sql.Types)**

DOUBLE

#####

#####

#

3421E+09

425.43E9

9E-10

4356267544.32333E+30

**FLOAT####**

FLOAT#####REAL####DOUBLE PRECISION#####

##

**FLOAT [ (##) ]**

#####53#####DOUBLE PRECISION#####

###23#####FLOAT#REAL#####24#####FLOAT#DOUBLE

PRECISION#####0#####

**JDBC ##### (java.sql.Types)**

REAL or DOUBLE

Derby #####

##

##24#####FLOAT##DOUBLE#####

##23#####FLOAT##REAL#####

**INTEGER ###**

INTEGER####4#####

##

{ INTEGER | INT }

**#####Java##**

*java.lang.Integer*

**JDBC##### (java.sql.Types)**

INTEGER

###

-2147483648 (*java.lang.Integer.MIN\_VALUE*)

###

2147483647 (*java.lang.Integer.MAX\_VALUE*)

#####

#####

3453

425

**LONG VARCHAR#**

LONG

VARCHAR#####32,700#####VARCHAR

##

LONG VARCHAR

**#####Java##**

*java.lang.String*

**JDBC##### (java.sql.Types)**

LONGVARCHAR

Java###SQL#####LONG VARCHAR#####Java#####

**LONG VARCHAR FOR BIT DATA###**

LONG VARCHAR FOR BIT

DATA#####32,700#####**VARCHAR  
FOR BIT DATA#####**

##

LONG VARCHAR FOR BIT DATA

**JDBC #####(java.sql.Types)**

LONGVARBINARY

Derby #####

**NUMERIC###**

NUMERIC#DECIMAL##### DECIMAL #####

##

NUMERIC [(## [, ### ])]

**#####Java##**

*java.math.BigDecimal*

**####JDBC#####(java.sql.Types)**

NUMERIC

123.456  
.001

**REAL ###**

REAL###IEEE#####4#####

##

REAL

**#####Java##**

*java.lang.Float*

**JDBC#####(java.sql.Types)**

REAL

##

REAL#####:

- REAL####: -3.402E+38
- REAL####: 3.402E+38
- REAL#####: 1.175E-37
- REAL#####: -1.175E-37

**#####Java##java.lang.Float#####**

#####

#####

#####30#####

-- #####

values 01234567890123456789012345678901e0;

#####

#####

**#####DOUBLE PRECISION#####REAL#####CAST#####**

**SMALLINT ###**

SMALLINT##2#####

**Syntax**

SMALLINT

**#####Java##**

*java.lang.Short*

Derby #####

## JDBC##### (java.sql.Types)

SMALLINT

###

-32768 (*java.lang.Short.MIN\_VALUE*)

###

32767 (*java.lang.Short.MAX\_VALUE*)

#####

#####

#####INTEGER####BIGINT#####

TIME###

TIME#####

##

TIME

#####Java##

*java.sql.Time*

## JDBC ##### (java.sql.Types)

TIME

#####CAST#####

SQL###/

#####*java.sql.Time*#####Derby#####

hh:mm[:ss]

hh.mm[:ss]

hh[:mm] {AM | PM}

#####*java.sql.Time*#####

#####

Derby#####

#

VALUES TIME('15:09:02')

VALUES '15:09:02'

TIMESTAMP###

TIMESTAMP#####9#####

##

TIMESTAMP

#####Java##

*java.sql.Timestamp*

## JDBC ##### (java.sql.Types)

TIMESTAMP

#####

Derby #####

Derby##TIMESTAMP#####

```
yyyy-mm-dd hh:mm:ss[.nnnnnn]
yyyy-mm-dd-hh.mm.ss[.nnnnnn]
```

#####*java.sql.Timestamp*#####

####4#####1#####2#####2#####

Derby

#####

#

```
VALUES '1960-01-01 23:03:20'
VALUES TIMESTAMP('1962-09-23 03:23:34.234')
VALUES TIMESTAMP('1960-01-01 23:03:20')
```

**VARCHAR###**

VARCHAR#####

##

{ VARCHAR | CHAR VARYING | CHARACTER VARYING }(##)

#####*java.lang.Integer.MAX\_VALUE*#####

VARCHAR#####32,672#####

#####**Java##**

*java.lang.String*

**JDBC##### (java.sql.Types)**

VARCHAR

Derby #####VARCHAR#####

Derby#VARCHAR#####

#####

VARCHAR####~~####~~#####

#####CHAR#VARCHAR#####

#####VARCHAR####CHAR###

**VARCHAR FOR BIT DATA ###**

VARCHAR FOR BIT

DATA#####

##

{ VARCHAR | CHAR VARYING | CHARACTER VARYING }(##) FOR BIT DATA

#####

CHAR FOR BIT DATA#####VARCHAR FOR BIT

DATA#####32,672#####

**JDBC##### (java.sql.Types)**

VARBINARY

VARCHAR FOR BIT DATA#####CHAR FOR BIT

DATA#####VARCHAR FOR BIT DATA#####

#####VARCHAR FOR BIT DATA#CHAR FOR BIT

DATA#####VARCHAR FOR BIT DATA#####

Derby #####

#####VARCHAR FOR BIT DATA###CHAR FOR BIT DATA#####

### XML data type

The XML data type is used for Extensible Markup Language (XML) documents.

XML#####

- SQL/XML#####XML(DOCUMENT(ANY))#####
- #####XML(DOCUMENT(ANY))#####XML(SEQUENCE)#####

### Note:

XML#####JAXP#####Xalan#####

Derby##JDBC###SQL/

XML#####XML#####JDBC#####XML#####

#####XMLPARSE#XMLSERIALIZE#####XML#####SQL#####XML####Java#####

##

XML

#####Java##

##

XML#####Java###java.sql.SQLXML#####java.sql.SQLXML##Derby#####

**JDBC ##### (java.sql.Types)**

##

XML#####SQLXML#####SQLXML#Derby#####

Derby#####XML#####SQL##XMLSERIALIZE#####  
#####

```
SELECT XMLSERIALIZE (xcol as CLOB) FROM myXmlTable
```

#####getXXX#####XML#####CLOB#####

Derby#####JDBC####XML#####SQL###XMLPARSE#####  
#####

```
INSERT INTO myXmlTable(xcol) VALUES XMLPARSE(  
    DOCUMENT CAST (? AS CLOB) PRESERVE WHITESPACE)
```

#####setXXX#####

#####PreparedStatement.setString###PreparedStatement.setCharacterStream#####

## SQL###

#####Derby#####SQL-92#####

#####(")#####Derby#####

###SQL92#####

ADD  
ALL  
ALLOCATE  
ALTER  
AND  
ANY  
ARE  
AS  
ASC  
ASSERTION



Derby #####

AT  
AUTHORIZATION  
AVG  
BEGIN  
BETWEEN  
BIGINT  
BIT  
BOOLEAN  
BOTH  
BY  
CALL  
CASCADE  
CASCADED  
CASE  
CAST  
CHAR  
CHARACTER  
CHECK  
CLOSE  
COALESCE  
COLLATE  
COLLATION  
COLUMN  
COMMIT  
CONNECT  
CONNECTION  
CONSTRAINT  
CONSTRAINTS  
CONTINUE  
CONVERT  
CORRESPONDING  
CREATE  
CURRENT  
CURRENT\_DATE  
CURRENT\_TIME  
CURRENT\_TIMESTAMP  
CURRENT\_USER  
CURSOR  
DEALLOCATE  
DEC  
DECIMAL  
DECLARE  
DEFAULT  
DEFERRABLE  
DEFERRED  
DELETE  
DESC  
DESCRIBE  
DIAGNOSTICS  
DISCONNECT  
DISTINCT  
DOUBLE  
DROP  
ELSE  
END  
END-EXEC

Derby #####

ESCAPE  
EXCEPT  
EXCEPTION  
EXEC  
EXECUTE  
EXISTS  
EXPLAIN  
EXTERNAL  
FALSE  
FETCH  
FIRST  
FLOAT  
FOR  
FOREIGN  
FOUND  
FROM  
FULL  
FUNCTION  
GET  
GETCURRENTCONNECTION  
GLOBAL  
GO  
GOTO  
GRANT  
GROUP  
HAVING  
HOUR  
IDENTITY  
IMMEDIATE  
IN  
INDICATOR  
INITIALLY  
INNER  
INOUT  
INPUT  
INSENSITIVE  
INSERT  
INT  
INTEGER  
INTERSECT  
INTO  
IS  
ISOLATION  
JOIN  
KEY  
LAST  
LEFT  
LIKE  
LOWER  
LTRIM  
MATCH  
MAX  
MIN  
MINUTE  
NATIONAL  
NATURAL

Derby #####

NCHAR  
NVARCHAR  
NEXT  
NO  
NOT  
NULL  
NULLIF  
NUMERIC  
OF  
ON  
ONLY  
OPEN  
OPTION  
OR  
ORDER  
OUTER  
OUTPUT  
OVERLAPS  
PAD  
PARTIAL  
PREPARE  
PRESERVE  
PRIMARY  
PRIOR  
PRIVILEGES  
PROCEDURE  
PUBLIC  
READ  
REAL  
REFERENCES  
RELATIVE  
RESTRICT  
REVOKE  
RIGHT  
ROLLBACK  
ROWS  
RTRIM  
SCHEMA  
SCROLL  
SECOND  
SELECT  
SESSION\_USER  
SET  
SMALLINT  
SOME  
SPACE  
SQL  
SQLCODE  
SQLERROR  
SQLSTATE  
SUBSTR  
SUBSTRING  
SUM  
SYSTEM\_USER  
TABLE  
TEMPORARY

Derby #####

TIMEZONE\_HOUR  
TIMEZONE\_MINUTE  
TO  
TRANSACTION  
TRANSLATE  
TRANSLATION  
TRIM  
TRUE  
UNION  
UNIQUE  
UNKNOWN  
UPDATE  
UPPER  
USER  
USING  
VALUES  
VARCHAR  
VARYING  
VIEW  
WHENEVER  
WHERE  
WITH  
WORK  
WRITE  
XML  
XMLEXISTS  
XMLPARSE  
XMLQUERY  
XMLSERIALIZE  
YEAR

## Derby#####SQL-92###

SQL-92#####4#####

- SQL92E

###

- SQL92T

### FIPS 127-2#####NIST###

- SQL92I

##

- SQL92F

##

#####

#####Derby#####SQL-92#####

**# 13. #####SQL-92###: #####**

##	#####	Derby
SMALLINT	SQL92E	Yes
INTEGER	SQL92E	Yes
DECIMAL(p,s)	SQL92E	Yes

Derby #####

##	#####	Derby
NUMERIC(p,s)	SQL92E	Yes
REAL	SQL92E	Yes
FLOAT(p)	SQL92E	Yes
DOUBLE PRECISION	SQL92E	Yes
CHAR(n)	SQL92E	Yes

#####

# 14. SQL-92#####:#####

##	#####	Derby
+, *, -, /, unary +, unary -	SQL92E	Yes

#####

# 15. SQL-92#####:#####

##	#####	Derby
<, >, <=, >=, <>, =	SQL92E	Yes

#####

# 16. SQL-92#####:#####

##	#####	Derby
BETWEEN, LIKE, NULL	SQL92E	Yes

#####

# 17. SQL-92#####:#####

##	#####	Derby
IN, ALL/SOME, EXISTS	SQL92E	Yes

#####

# 18. SQL-92#####:#####

##	#####	Derby
#	SQL92E	Yes
###	SQL92E	Yes
##	SQL92E	Yes

####

# 19. SQL-92#####:####

##	#####	Derby
###	SQL92E	Yes
#####	SQL92E	Yes

Derby #####

##(#####)

# 20. SQL-92#####: ##(#####)

##	#####	Derby
NOT NULL	SQL92E	Yes (SYSCONSTRAINTS#####)
UNIQUE/PRIMARY KEY	SQL92E	Yes
FOREIGN KEY	SQL92E	Yes
CHECK	SQL92E	Yes
View WITH CHECK OPTION	SQL92E	No #####

####

# 21. SQL-92#####:####

##	#####	Derby
DECLARE, OPEN, FETCH, CLOSE	SQL92E	Yes JDBC#####
UPDATE, DELETE CURRENT	SQL92E	Yes

###SQL1

# 22. SQL-92#####: ###SQL1

##	#####	Derby
ALLOCATE / DEALLOCATE / GET / SET DESCRIPTOR	SQL92T	Yes JDBC#####
PREPARE / EXECUTE / EXECUTE IMMEDIATE	SQL92T	Yes JDBC#####
DECLARE, OPEN, FETCH, CLOSE, UPDATE, DELETE dynamic cursor	SQL92T	Yes JDBC#####
DESCRIBE output	SQL92T	JDBC####

#####

# 23. SQL-92#####

##	#####	Derby
TABLES	SQL92T	SYS.SYSTABLES, SYS.SYSVIEWS, SYS.SYSCOLUMNS
VIEWS	SQL92T	SYS.SYSTABLES, SYS.SYSVIEWS, SYS.SYSCOLUMNS

Derby #####

##	#####	Derby
COLUMNS	SQL92T	SYS.SYSTABLES, SYS.SYSVIEWS, SYS.SYSCOLUMNS

#####

# 24. SQL-92#####: #####

##	#####	Derby
CREATE / DROP TABLE	SQL92T	Yes
CREATE / DROP VIEW	SQL92T	Yes
GRANT / REVOKE	SQL92T	Yes
ALTER TABLE ADD COLUMN	SQL92T	Yes
ALTER TABLE DROP COLUMN	SQL92T	Yes

####

# 25. SQL-92#####: ####

##	#####	Derby
INNER JOIN	SQL92T	Yes
natural join	SQL92T	No
LEFT, RIGHT OUTER JOIN	SQL92T	Yes
join condition	SQL92T	Yes
named columns join	SQL92T	Yes

#####

# 26. SQL-92#####: #####

##	#####	Derby
###DATE, TIME, TIMESTAMP, INTERVAL	SQL92T	Yes ###INTERVAL###
#####	SQL92T	Yes
#####	SQL92T	Yes Java#####
#####	SQL92T	Yes
##: OVERLAPS	SQL92T	Yes Java#####

VARCHAR ####

# 27. SQL-92#####: VARCHAR

##	#####	Derby
LENGTH	SQL92T	Yes

Derby #####

##	#####	Derby
## ( )	SQL92T	Yes

#####

**# 28. SQL-92#####: #####**

##	#####	Derby
READ WRITE / READ ONLY	SQL92T	JDBC#####
RU, RC, RR, SER	SQL92T	Yes

#####

**# 29. SQL-92#####: #####**

##	#####	Derby
SCHEMATA ###	SQL92T	SYS.SYSSCHEMAS

###

**# 30. SQL-92#####: ###**

##	#####	Derby
TABLE_PRIVILEGES	SQL92T	No
COLUMNS_PRIVILEGES	SQL92T	No
USAGE_PRIVILEGES	SQL92T	No

####

**# 31. SQL-92#####: ####**

##	#####	Derby
UNION relaxation	SQL92I	Yes
EXCEPT	SQL92I	Yes
INTERSECT	SQL92I	Yes
CORRESPONDING	SQL92I	No

#####

**# 32. SQL-92#####: #####**

##	#####	Derby
CREATE SCHEMA	SQL92I	#####

####

**# 33. SQL-92#####: ####**

##	#####	Derby
SET SESSION AUTHORIZATION	SQL92I	SET SCHEMA###



Derby #####

##	#####	Derby
CURRENT_USER	SQL92I	Yes
SESSION_USER	SQL92I	Yes
SYSTEM_USER	SQL92I	No

####

**# 34. SQL-92#####:####**

##	#####	Derby
TABLE CONSTRAINTS	SQL92I	SYS.SYSCONSTRAINTS
REFERENTIAL CONSTRAINTS	SQL92I	SYS.SYSFOREIGNKEYS
CHECK CONSTRAINTS	SQL92I	SYS.SYSCHECKS

#####

**# 35. SQL-92#####: #####**

##	#####	Derby
SQL_FEATURES	SQL92I/FIPS 127-2	JDBC#DatabaseMetaData###
SQL_SIZING	SQL92I/FIPS 127-2	JDBC#DatabaseMetaData###

#####

**# 36. SQL-92#####: #####**

##	#####	Derby
TIME#TIMESTAMP###	SQL92F	Yes

#####

**# 37. SQL-92#####: #####**

##	#####	Derby
POSITION#	SQL92F	Java#####LOCATE###
UPPER/LOWER ##	SQL92F	Yes

##

**# 38. SQL-92#####: ##**

##	#####	Derby
#####	SQL92E	Yes
#####	SQL92E	Yes
#####	SQL92E	Yes
##	SQL92E	Yes
Where#####	SQL92E	Yes
Group by	SQL92E	Yes

Derby #####

##	#####	Derby
Having	SQL92E	Yes
####	SQL92E	Yes
Order by	SQL92E	Yes
###	SQL92E	Yes
Select *	SQL92E	Yes
SQLCODE	SQL92E	No SQL-92#####
SQLSTATE	SQL92E	Yes
#####UNION#INTERSECT#	SQL92T	Yes
#####	SQL92T	Yes
#####	SQL92T	Yes
#####	SQL92T	JDBC#SQLExceptions###
#####	SQL92T	Yes
select#####*	SQL92T	Yes
#####	SQL92T	Yes
#####	SQL92T	No
#####	SQL92T	No (JDBC#####)
#####	SQL92T	CASCADE#SET NULL#RESTRICT#NO ACTION
CAST##	SQL92T	Yes
INSERT#	SQL92T	Yes
#####	SQL92T	Yes
#####	SQL92T	Yes
Domain###	SQL92I	No
CASE#	SQL92I	#####
#####	SQL92I	#####
LIKE#####	SQL92I	Yes
UNIQUE###	SQL92I	No
#####	SQL92I	SYS.SYSDEPENDS
#####	SQL92I	JDBC#DatabaseMetaData###Derby#####
#####	SQL92I	#####JDBC#####
####SQL#####	SQL92I	No
#####	SQL92I	Yes
#####	SQL92I	Yes
#####	SQL92I	No
#####	SQL92I	No

Derby #####

##	#####	Derby
#####	SQL92I	### (JDBC2.0#####insensitive#####
#####	SQL92I	#####
#####	SQL92I	Java#####
#####	SQL92I	Java#####
#####	SQL92I	Yes
#####null##	SQL92I	Yes
#####	SQL92I	Yes (ADD/DROP CONSTRAINT)
FOR BIT DATA #	SQL92F	Yes
Assertion ##	SQL92F	No
###	SQL92F	DECLARE GLOBAL TEMPORARY TABLE#####
#####SQL	SQL92F	No
###values#	SQL92F	Yes
#####	SQL92F	Yes
####FROM####	SQL92F	Yes
#####	SQL92F	Yes
Indicator####	SQL92F	JDBC#####
#####	SQL92F	No
###SQL#####	SQL92F	No
#####	SQL92F	Yes
#####	SQL92F	No
###	SQL92F	No
CHECK#####	SQL92F	No ###Java##### ###
Union join	SQL92F	No
Collation#translation	SQL92F	Java#####
#####	SQL92F	RESTRICT###NO ACTION# #####
ALTER domain	SQL92F	No
INSERT ###	SQL92F	No
####MATCH#	SQL92F	No
####CHECK#####	SQL92F	No#####
Session##	SQL92F	JDBC###
####	SQL92F	JDBC###
#####	SQL92F	Yes
insensitive#####	SQL92F	Yes JDBC 2.0#####

Derby #####

##	#####	Derby
#####	SQL92F	#####
#####	SQL92F	No
#####	SQL92F	No
#####	SQL92F	No

## Derby#####

Derby#####

#####

#####SYS#####SYS#####

#####Java# java.sql.DatabaseMetaData#####

## SYSALIASES #####

#####

##	#	##	###	##
ALIASID	CHAR	36	##	alias#####
ALIAS	VARCHAR	128	##	alias
SCHEMAID	CHAR	36	#	#####
JAVACLASSN	LONGVARCHAR	255	##	Java#####
ALIASTYPE	CHAR	1	##	'F' (##) 'P' (###)
NAMESPACE	CHAR	1	##	'F' (##) 'P' (###)
SYSTEMALIAS	BOOLEAN	'	##	# (#####alias) false (#####alias)
ALIASINFO	org.apache.derby. catalog.AliasInfo:  #####API#####	'	#	alias#####
SPECIFICNAM	VARCHAR	128	##	#####

## SYSCHECKS#####

#####

##	#	##	###	##
CONSTRAINTID	CHAR	36	##	#####
CHECKDEFINITION	LONG VARCHAR	'	##	#####
REFERENCEDCOLUMN	org.apache.derby.ca ReferencedColumns  #####API#####	'	##	#####

**SYSOLPERMS #####**

SYSOLPERMS #####

#####GRANTEE, TABLEID, TYPE,

GRANTOR#####SYSOLPERMS#####SYSOLPERMS#####

- ### (GRANTEE, TABLEID, TYPE, GRANTOR)
- #### (COLPERMSID)
- ##### (TABLEID references SYS.SYSTABLES)

##	#	##	Null#	##
COLPERMSID	CHAR	36	##	#####
GRANTEE	VARCH	30	##	#####
GRANTOR	VARCH	30	##	#####
TABLEID	CHAR	36	##	#####
TYPE	CHAR	1	##	##### SELECT##s##UPDATE##u##REFERENCES##r ##### SELECT##S##UPDATE##U##REFERENCES##
COLUMNS	org.apa	'	##	##### #####API#####

**SYSOLCOLUMNS#####**

#####

##	#	##	###	##
REFERENCEID	CHAR	36	##	#####(SYSTABLES.TABLEID#####)
COLUMNNAME	CHAR	128	##	#####
COLUMNNUMBER	INT	4	##	#####
COLUMNDATATYPE	org.apache.derby.c TypeDescriptor #####API#####	'	##	#####
COLUMNDEFAULT	java.io.Serializable	'	#	##### TABLE#ALTER TABLE#####
COLUMNDEFAULTID	CHAR	36	#	#####
AUTOINCREMENT COLUMNVALUE	BIGINT	'	#	#####
AUTOINCREMENT COLUMNSTART	BIGINT	'	#	#####(#####)
AUTOINCREMENT COLUMNINC	BIGINT	'	#	#####(#####)

Derby #####

## SYSCONGLOMERATES #####

#####

##	#	##	###	##
SCHEMAID	CHAR	36	##	#####
TABLEID	CHAR	36	##	#####(SYSTABLES.TABLEID####
CONGLOMERATENUMBER	BIGINT	8	##	#####(#####)#####
CONGLOMERATENAME	VARCHAR	128	#	#####
ISINDEX	BOOLEAN	1	##	#####
DESCRIPTOR	org.apache.derby. catalog.IndexDesc  #####API#	'	#	#####
ISCONSTRAINT	BOOLEAN	1	#	#####
CONGLOMERATEID	CHAR	36	##	#####

## SYSCONSTRAINTS #####

#####(#####)#####

##	#	##	###	##
CONSTRAINTID	CHAR	36	##	#####
TABLEID	CHAR	36	##	#####(SYSTABLES.TABLEID###)
CONSTRAINTNAME	VARCHAR	128	##	### (#####)
TYPE	CHAR	1	##	P (###)#U (###)#C (###)# #### F (####)
SCHEMAID	CHAR	36	##	#####(SYSSCHEMAS.SCHEMAI
STATE	CHAR	1	##	####E####D
REFERENCECOUNT	INTEGER	1	##	#####

## SYSDEPENDS #####

SYSDEPENDS#####

#####

- #####
- #####

##	#	##	###	##
DEPENDENTID	CHAR	36	##	#####
DEPENDENTFINDER	org.apache.derby.ca DependableFinder: s	1	##	#####
PROVIDERID	CHAR	36	##	#####

Derby #####

##	#	##	###	##
PROVIDERFINDER	org.apache.derby.ca DependableFinder #	1	false	#####

## SYSFILES####

#####jar#####

##	#	##	###	##
FILEID	CHAR	36	##	jar#####
SCHEMAID	CHAR	36	##	jar#####(SYSSCHEMAS. SCHEMAID#####)
FILENAME	VARCHAR	128	##	jar####SQL#
GENERATIONID	BIGINT	'	##	#####jar#####

## SYSFOREIGNKEYS####

#####

Derby

#####SYSFOREIGNKEYS.CONGLOMERATEID#####

##	#	##	###	##
CONSTRAINTID	CHAR	36	false	unique identifier for the foreign key constraint (join with SYSCONSTRAINTS. CONSTRAINTID)
CONGLOMERATEID	CHAR	36	##	#####(SYSCONGLOMERATES CONGLOMERATEID#####)
KEYCONSTRAINTID	CHAR	36	##	#####(SYSKE CONSTRAINTID)
DELETERULE	CHAR	1	##	NO ACTION (##)##R#RESTRICT##S#CASCADE NULL##U
UPDATERULE	CHAR	1	##	NO ACTION(##)##R#restrict##S

## SYSKEYS####

##### Derby#####

#####SYSKEYS.CONGLOMERATEID#####

##	#	##	###	##
CONSTRAINTID	CHAR	36	##	#####
CONGLOMERATEID	CHAR	36	##	#####

Derby #####

## SYSROUTINEPERMS #####

SYSROUTINEPERMS#####

#####SYSROUTINEPERMS####EXECUTE#####SYSROUTINEPERMS#####

- ### (GRANTEE, ALIASID, GRANTOR)
- #### (ROUTINEPERMSID)
- ##### (ALIASID#SYS.SYSALIASES#####)

#####SYSTABLEPERMS#####

##	#	##	###	##
ROUTINEPERMSID	CHAR	36	##	#####
GRANTEE	VARCH	30	##	#####
GRANTOR	VARCH	30	##	#####
ALIASID	CHAR	36	##	#####PERMTYPE#'E'##ALIASID#SYS.S
GRANTOPTION	CHAR	1	##	GRANTEE#####Y####N#

## SYSSCHEMAS #####

#####

##	#	##	###	##
SCHEMAID	CHAR	36	##	#####
SCHEMANAME	VARCHAR	128	##	#####
AUTHORIZATIONID	VARCHAR	128	##	#####

## SYSSTATISTICS#####

#####

##	#	##	###	##
STATID	CHAR	36	##	#####
REFERENCEID	CHAR	36	##	#####(SYSCONGLOMERATES. CONGLOMERATEID###)
TABLEID	CHAR	36	##	#####
CREATIONTIMESTA	TIMESTAM	'	##	#####/#####
TYPE	CHAR	1	##	#####
VALID	BOOLEAN	'	##	#####
COLCOUNT	INTEGER	'	##	#####
STATISTICS	org.apache. derby.catalog Statistics: #####A	'	#	####



**SYSSTATEMENTS####**

#####

##	##	##	###	##
STMTID	CHAR	36	##	#####
STMTNAME	VARCHAR	128	##	####
SCHEMAID	CHAR	36	##	#####
TYPE	CHAR	1	##	##'S'
VALID	BOOLEAN	'	##	####TRUE####FALSE
TEXT	LONG VARCHAR	'	##	#####
LASTCOMPILED	TIMESTAMP	'	#	#####
COMPILATION SCHEMAID	CHAR	36	##	#####
USINGTEXT	LONG VARCHAR	'	#	CREATE STATEMENT#ALTER STATEMENT##USING#####

**SYSTABLEPERMS #####**

SYSTABLEPERMS#####

#####GRANTEE, TABLEID,

GRANTOR#####SYSTABLEPERMS#####SYSTABLEPERMS#####

- ### (GRANTEE, TABLEID, GRANTOR)
- ##### (TABLEPERMSID)
- ##### (TABLEID references SYS.SYSTABLES)

##SYSTABLEPERMS#####

##	#	##	Null#	##
TABLEPERMSID	CHAR	36	##	#####
GRANTEE	VARCH	30	##	#####
GRANTOR	VARCH	30	##	#####
TABLEID	CHAR	36	##	#####
SELECTPRIV	CHAR	1	##	SELECT#####'Y'(#####) 'N'(#####)###
DELETEPRIV	CHAR	1	##	DELETE#####'Y'(#####) 'Y'(#####) 'N'(#####)###
INSERTPRIV	CHAR	1	##	INSERT#####'Y'(#####) 'Y'(#####) 'N'(#####)###

Derby #####

##	#	##	Null#	##
UPDATEPRIV	CHAR	1	##	UPDATE##### #####'y'(#####) 'Y'(#####) 'N'(#####)###
REFERENCEPRIV	CHAR	1	##	REFERENCE##### #####'y'(#####)### 'Y'(#####) 'N'(#####)###
TRIGGERPRIV	CHAR	1	##	TRIGGER##### #####'y'(#####) 'Y'(#####) 'N'(#####)###

## SYSTABLES #####

#####

##	#	##	###	##
TABLEID	CHAR	36	##	#####
TABLENAME	VARCHAR	128	##	#####
TABLETYPE	CHAR	1	##	'S'(#####)'T'(#####)### 'V' (###)
SCHEMAID	CHAR	36	##	#####
LOCK GRANUL	CHAR	1	##	##### 'T' (#####) 'R' (##### #)

## SYSTRIGGERS#####

#####

##	#	##	###	##
TRIGGERID	CHAR	36	##	#####
TRIGGERNAME	VARCHAR	128	##	#####
SCHEMAID	CHAR	36	##	#####(SYSSCHEMAS. SCHEMAID###)
CREATIONTIMESTAMP	TIMESTAMP	'	##	#####
EVENT	CHAR	1	##	'U'#### 'D'####'I'#####
FIRINGTIME	CHAR	1	##	'B'### 'A'#####
TYPE	CHAR	1	##	'R'###'S'#####
STATE	CHAR	1	##	'E'####'D'#####

Derby #####

##	#	##	###	##
TABLEID	CHAR	36	##	#####
WHENSTMTID	CHAR	36	#	WHEN#####(#####)
ACTIONSTMTID	CHAR	36	#	#####SQL##### (SYSSTATEMENTS. STMTID###)
REFERENCEDCOLUMN	org.apache.derby. ReferencedColumn #####API####	'	#	UPDATE#####
TRIGGERDEFINITION	LONG VARCHAR	'	#	####SQL#####
REFERENCINGOLD	BOOLEAN	'	true	whether or not the OLDREFERENCINGNA if non-null, refers to the OLD row or table
REFERENCINGNEW	BOOLEAN	'	#	#####NEWREFERENCINGNAME###
OLDREFERENCINGNA	VARCHAR	128	#	REFERENCING OLD AS#####
NEWREFERENCINGNA	VARCHAR	128	#	REFERENCING NEW AS#####

#####SQL#####SQL#####SYSSTATEMENTS#####ACTIONSTMTID#WHENSTMTID##S

## SYSVIEWS #####

#####

##	#	##	###	##
TABLEID	CHAR	36	##	##### (TABLEID#####SYS
VIEWDEFINITION	LONG VARCHAR	'	##	#####
CHECKOPTION	CHAR	1	##	'N' (#####)
COMPILATION SCHEMAID	CHAR	36	##	#####

## Derby#####SQL state

Derby#####JDBC##SQLException##### SQLException

Derby###SQLException## SQLState#####X##### SQLState#####

JDBC#####0A#### SQLState# SQLException#####

#####JDK

1.6#####java.sql.SQLFeatureNotSupportedException#####

#####Derby#####

Derby#####SQLState#####Derby#nextException#####SQLExceptions#####

#####SQL-92#####Derby#####

SQLExceptions#####Derby #####

Derby #####

## SQL#####

#####SQLStates#####X#####Derby#####

# 39. ## 01:##

SQLSTATE	##
01001	#####
01003	##### NULL #####
01006	##### <#####>#####
0100E	XX #####
01500	#<##>###<###>#####
01501	### <####gt; #####
01502	#<##>##### <####>#####
01503	# <##> ## <##> #####
01504	##### <####> #####
01505	# <##> #####
01522	##### '<####>' ##### '<####>' #####
01J01	##### '<####>' #####
01J02	#####
01J04	# '<##>' ##### '<####>' # java.io.Serializable ### java.sql.SQLData ##### 1 #####
01J05	##### #####
01J06	ResultSet ##### ResultSet #####
01J07	##### ResultSetHoldability # ResultSet.CLOSE_CURSORS_AT_COMMIT #####
01J08	ResultSet # <#####> ##### ResultSet # <#####> #####
01J10	#####
01J12	##### SYSIBM.SQLCAMESSAGE ##### #####
01J13	##### (<#>) #####
01J14	##### SQL #####

# 40. ## 07: ##SQL####

SQLSTATE	##
07000	##### 1 #####
07004	##### <####> # <####> ##### CallableStatement.registerOutParameter #####
07009	#####

Derby #####

**# 41. ## 08: #####**

SQLSTATE	##
08000	#####
08000	##### #####
08001	#####
08001	#### ID #####
08001	#####
08001	### Derby DataSource ##### <###> #####
08001	<###>: ### <#####> ##### <#####> ##### <##> #####
08001	SocketException: '<###>'
08001	#### '<###>' #####
08001	#### ID ### (<#>) # 1 ## <#> #####
08001	##### (<#>) # 1 ## <#> #####
08001	#### ID # NULL #####
08001	##### NULL #####
08001	##### '<#####>' #####
08003	#####
08003	##### PooledConnection #### getConnection() #####
08003	##### LOB #####
08003	#####
08004	#####: <###>
08004	##### ##: <#####>#
08004	##### <#####> #####
08004	#####
08004	User '<##ID>' cannot shut down database '<#####>'. Only the database owner can perform this operation.
08004	User '<##ID>' cannot (re)encrypt database '<#####>'. Only the database owner can perform this operation.
08004	User '<##ID>' cannot hard upgrade database '<#####>'. Only the database owner can perform this operation.
08006	#####
08006	##### '<#####>' #####

**# 42. ## 0A: #####**

Derby #####

SQLSTATE	##
0A000	#####: <###>#
0A000	DRDA #### <#####> #####
0A000	JDBC #####
0A000	JDBC #### <#####> #####
0A000	resultSetHoldability ##### <###> #####
0A000	cancel() #####
0A000	##### '<#####>' #####
0A000	#### '<#####>' #####

# 43. ## 21: #####

SQLSTATE	##
21000	#####

# 44. ## 22: #####

SQLSTATE	##
22001	<#> '<#>' ### <#> #####
22003	##### <#####> #####
22003	# (<#>) #### '<#>' #####
22003	##### 10 ####31 #####
22003	'<#####>' ## <#####> #####
22004	## (<#>) ##### (<#####>) #####
22005	# '<##>' #### '<##>' #####
22005	#####
22005	Unicode ##### EBCDIC #####
22005	##### JDBC #### #: <##>#columnCount: <#>#columnIndex: <#>#
22005	##### <#####> ##### JDBC ####
22005	##### Java SQL # <#####> ###
22005	# '<#####>' ##### '<#####>' #####
22007	#####
22007	#####
22008	'<##>' # <##> #####
2200L	XML ##### DOCUMENT #####
2200M	### XML DOCUMENT: <#####>
2200V	<#####> ##### DOCUMENT #####
2200W	XQuery #####: 1 #####

Derby #####

SQLSTATE	##
22011	SUBSTR ### 2 ##### 3 #####
22012	#####
22013	#### '<#>' #####
22014	LOCATE ##### '#####' ### ##### '<#####>' ### ##### '<#####>' ###
22015	#####<#>#####
22015	'<###>' ##### # 1 ##### '<##>' ### # 2 ##### '<##>' ### # 3 ##### (####) ## '<##>' ###
22018	# <##> #####
22019	#####: <#####># #####1 ##### NULL ## 2 #####
22020	Invalid trim string, '<###>'. The trim string must be exactly one character or NULL. It cannot be more than one character.
22025	##### " _" ### "%" ##### #####
22027	#### TRIM() ##### LTRIM() ### RTRIM() #####
22028	##### <#> #####
22501	NULL # ESCAPE #####

# 45. ## 23: ####

SQLSTATE	##
23502	# '<##>' # NULL #####
23503	# '<##>' ## <#>' ##### <###> ##### '<###>' ##### #####
23505	##### '<#>' ##### '<#>' #####
23513	# '<##>' # INSERT ### UPDATE ##### '<###>' #####

# 46. ## 24: #####

SQLSTATE	##
24000	##### - #####
24501	#####

# 47. Class 25: #####

SQLSTATE	##
25000	#####
25001	#####
25501	#####

Derby #####

SQLSTATE	##
25502	#####SQL #####
25503	##### DDL #####
25505	#####

# 48. ## 28: #####

SQLSTATE	##
28502	##### "<####>" #####

# 49. Class 2D: #####

SQLSTATE	##
2D521	setAutoCommit(true) #####
2D521	##### COMMIT ### ROLLBACK #####

# 50. ## 38: #####

SQLSTATE	##
38000	##### '<##>' #####
38001	##### SQL #####
38002	##### MODIFIES SQL DATA #####
38004	##### READS SQL DATA #####

# 51. ## 39: #####

SQLSTATE	##
39004	##### '<#>' ##### NULL #####

# 52. ## 3B: ###SAVEPOINT

SQLSTATE	##
3B001	SAVEPOINT#<SAVEPOINT#> #####
3B002	#####
3B501	##### SAVEPOINT #####
3B502	RELEASE ### ROLLBACK TO SAVEPOINT #####

# 53. ## 40: #####

SQLSTATE	##
40001	#####:\n<#####># ##### XID : <#####>#
40XC0	#####



Derby #####

SQLSTATE	##
40XD0	#####
40XD1	#####
40XD2	##### <#####> #####
40XL1	#####
40XL2	##### lockTable ###: <#####>
40XT0	RawStore #####
40XT1	#####
40XT2	SAVEPOINT #####
40XT4	#####
40XT5	#####
40XT6	#####
40XT7	#####

# 54. ## 42: #####

SQLSTATE	##
42000	#####
42500	#### '<##ID>' ### '<#####>'.<##>' #### <#####> #####
42501	#### '<##ID>' ### '<#####>'.<##>'#### GRANT ##### <#####> #####
42502	#### '<##ID>' ### '<#####>'.<##>' ## '<##>' #### <#####> #####
42503	#### '<##ID>' ### '<#####>'.<##>' ## '<##>' #### GRANT ##### <#####> #####
42504	#### '<##ID>' ##<#####>'<#####>'.<##>' #####
42505	#### '<##ID>' ##<#####>'<#####>'.<##>' #### GRANT #####
42506	#### '<##ID>' # <#####>'<#####>'.<##>' #####
42507	#### '<##ID>' ##### '<#####>' #####
42508	#### '<##ID>' ##### '<#####>' #####
42509	##### '<#####>' #####
4250A	#### '<##ID>' ##### '<#####>'.<#####>' #### <#####> #####
4250B	##### '<#>=<#>#'
4250C	#### '<##ID>' #####
4250D	##### '<#####>' ##### '<##ID>#'
4250E	#####: ##### <##ID> ID #####
42X24	Column <columnName> is referenced in the HAVING clause but is not in the GROUP BY list.

Derby #####

SQLSTATE	##
42X25	'<###>' #####<1>' #####
42X26	# '<##>' ##### '<####>' ##### public #####
42X28	### '<##>' ##### '<####>' #####
42X29	### '<##>' ##### '<####>' #####
42X30	#### '<####>' #####
42X31	# '<##>' ##### '<####>' # FOR UPDATE #####
42X32	##### '<##>' #####
42X33	##### '<##>' #####
42X34	##### ? #####
42X35	'<#>' ##### ? #####
42X36	'<###>' #####? #####
42X37	## '<###>' ##### '<#>' #####
42X38	'SELECT *' ##EXISTS ### NOT EXISTS #####
42X39	#####
42X40	NOT ##### NOT #####TRUE#FALSE#### UNKNOWN #####
42X41	FROM ##### '<####>' #>' ##### (##### '<#>' #####)#
42X42	# '<##>' # FOR UPDATE #####
42X43	###/##### '<####>' ##### ResultSetMetaData # NULL #### #####ResultSetMetaData # NULL #####
42X44	##### '<#>' #####
42X45	<#> # <#> ##### <#> #####
42X46	'<###>' #####
42X47	'<###>' #####
42X48	# '<#>' # <#> #####
42X49	# '<#>' #####
42X50	##### <####>.<#>(<#>) ##### ##### public ### (###) #####
42X51	### '<####>' ##### public #####
42X52	Java ##### '<#>' ##### ('<####>') #####
42X53	LIKE #####"CHAR" ### "VARCHAR" ##### # '<#>' #####
42X54	Java ##### '<####>' ##### ? #####
42X55	## '<##>' # '<#>' #####

SQLSTATE	##
42X56	#####'{}' #####
42X57	##### '<##>' # getColumnCount() ##### '<#>' ##### 1 #####
42X58	<##>#####
42X59	# VALUES #####
42X60	# '<##>' # insertMode ##### '<#>' #####
42X61	# '<#>' # '<#>' # '<#>' #####
42X62	'<#>' # '<#####>' #####
42X63	USING #####
42X64	#####useStatistics ##### '<#>' ##### TRUE ### FALSE #####
42X65	## '<##>' #####
42X66	## '<##>' ##CREATE INDEX #####
42X68	### '<####>' ##### '<#####>' ##### public ##### public #####
42X69	Java ##### '<#>' ##### ('<#####>') #####
42X70	The number of columns in the table column list does not match the number of columns in the underlying query expression in the table definition for '<#gt;'.
42X71	Invalid data type '<#####>' for column '<##>'.
42X72	### '{1}' ##### '<#####>' ##### public ### (###) ##### public #####
42X73	##### <#>.<#>(<#>) ##### (#####)
42X74	### CALL #####
42X75	##### <#>(<#>) ##### #####
42X76	##### 1 ### '<##>' # NULL ##### NULL #####
42X77	### '<####>' #####
42X78	# '<##>' #####
42X79	## '<##>' #####
42X80	VALUES ##### 1 #####
42X82	USING ##### ## ResultSet #####
42X83	# '<##>' #####NULL ##### NULL #####
42X84	## '<####>' ##### '<##>' ##### #####
42X85	## '<####>' ### '<##>' #####
42X86	ALTER TABLE ##### # '<##>' ### '<####>' #####
42X87	'<#>' ##### 1 ##### (THEN ### ELSE) # "?" #####
42X88	

SQLSTATE	##
	##### TRUE#FALSE#### UNKNOWN #####
42X89	# '<#>' # '<#>' #####
42X90	# '<##>' #####
42X91	### '<###>' ##CREATE TABLE #####
42X92	## '<##>' #####
42X93	# '<##>' ##### '<##>' #####
42X94	<#> '<#>' #####
42X96	##### jar #### '<#####>' #####
42X98	#####
42X99	Parameters are not allowed in a TABLE definition.
42Y00	### '<#####>' ##org.apache.derby.iapi.db.AggregateDefinition #####
42Y01	## '<###>' #####
42Y03	'<#>' #####
42Y04	#####EXTERNAL NAME '<##>' ##### <full java path>.<method name> ###
42Y05	'<##>' #####
42Y07	#### '<#####>' #####
42Y08	#####
42Y09	void #####CALL #####
42Y10	INSERT ##### 1 ##### ? ##### ##### 1 #####
42Y11	'<###>' #####
42Y12	JOIN # ON ### '<#####>' #### #####
42Y13	## '<##>' ##CREATE VIEW #####
42Y16	public ##### '<#####>' #### '<#####>' ##### #####public #####
42Y22	### <#####> ### <#> #####
42Y23	# <##> ##### JDBC #####
42Y24	## '<#####>' ##### (#####)
42Y25	'<##>' #####
42Y26	#### GROUP BY #####
42Y27	#####
42Y29	##### SELECT ##### 1 ##### SELECT ##### 1 #####
42Y30	##### SELECT ##### 1 ##### SELECT #### GROUP BY #####

SQLSTATE	##
42Y32	# {2} ##### "{1}" # Aggregator ### "{0}" ##com.ibm.db2j.aggregates.Aggregator #####
42Y33	### <###> ###1 #####
42Y34	## '<##>' ### '<##>' #####
42Y35	### '<##>' ##### SELECT ##### 1 #####
42Y36	### '<##>' ##### GROUP BY ### SELECT #####
42Y37	'<#>' # Java #####
42Y38	insertMode = replace ##### '<##>' # SELECT #####
42Y39	'<#>' ### deterministic #####CHECK CONSTRAINT #####
42Y40	'<#>' ##### '<###>' # UPDATE OF #####
42Y41	'<#>' #####EXECUTE STATEMENT #####
42Y42	### '<#####>' ##<#> #####
42Y43	### '<#####>' ## '<##>' #####
42Y44	FROM ##### '<##>' ##### (#/#####) # '<##>' ###
42Y45	VTI '<#>' ##### VTI ##### WHEN #####
42Y46	FROM ##### # '<##>' ### '<##>' #####
42Y48	"FROM ##### '<###>' ## '<##>' #####
42Y49	##### '<##>' #####
42Y50	# '<##>' #####
42Y55	'<#>' ##### '<#>' #####
42Y56	# '<##>' ##### '<#####>' ##### #####: "hash" ### "nestedloop" #
42Y58	# '<#>' ##### '<#>' ##### NumberFormatException #####
42Y59	hashInitialCapacity ##### '<#>' ##### ## 0 #####
42Y60	hashLoadFactor ##### '<#>' ##### ##0.0 #####1.0 #####
42Y61	hashMaxCapacity ##### '<#>' ##### ## 0 #####
42Y62	##### '<#####>' ### '<#>' #####

SQLSTATE	##
42Y63	##### '<##>'##### ##### "index" ##### '<##>' #####
42Y64	'<#>' # bulkFetch ##### bulkFetch ##### 1 ###
42Y65	bulkFetch ##'<#####>' #####
42Y66	bulkFetch #####
42Y67	#### '<#####>' #####
42Y69	##### 2 ##### 1 ##### (#####)#####2 #####
42Y70	##### #####
42Y71	##### '<###>' #####
42Y82	##### '<#>' ##DROP STATEMENT ##### #####
42Y83	#### NULL ##### <#####> ##### NULL #####
42Y84	'<#>' # DEFAULT #####
42Y85	DEFAULT #####VALUES ### INSERT ##### VALUES #####
42Y90	FOR UPDATE #####
42Y91	USING ##### EXECUTE STATEMENT #####
42Y92	<#####> #####<#> ####/#####
42Y93	### REFERENCING ##: ####/##### 1 #####
42Y94	AND ### OR ##### AND ### OR #####TRUE#FALSE#### UNKNOWN #####
42Y95	##### '<#####>' ##### '<#####>' ### '<#####>'#####
42Y97	# '<###>'## '<##>' #####
42Z02	##### DISTINCT #####
42Z07	#### ON #####
42Z08	'<#>' ##### (<#>) #####
42Z15	# '<##>' #####
42Z16	# VARCHAR #####
42Z17	# '<##>' #####
42Z18	# '<##>' ##### '<###>' ##### #####ALTER TABLE #####
42Z19	# '<##>' ##### 1 ##### '<###>' ##### #####ALTER TABLE #####

SQLSTATE	##
42Z20	# '<##>' # NULL #####NULL #####
42Z21	# '<##>' # ID #####
42Z22	ID # '<##>' ##### ID #####BIGINT#INT ### SMALLINT #####
42Z23	ID # '<##>' #####
42Z24	# '<##>' ## '<##>' #### ID # #####
42Z25	##### ID ##### ## \= NULL #####
42Z26	ID ##### '<##>' # NULL ## #####
42Z27	NULL ### '<##>' ##ID #####
42Z50	#####: <#> #####
42Z53	#####: ##### <#> ##### Activation #####
42Z60	<#> ##### <#####> ### '<#>' #####
42Z70	XML #####XMLPARSE #####
42Z71	##### XML #####XMLSERIALIZE #####
42Z72	SQL/XML ##### '<#####>' ## <###>## <###> #####
42Z73	XMLSERIALIZE #####: '<#####>'#
42Z74	XML #####: '<#####>'#
42Z75	XML #####
42Z76	### XML #####
42Z77	##### "XML" ##### '<#>' #####
42Z79	XMLPARSE #####CAST #####
42Z90	### '<#####>' ##### ResultSet #####
42Z91	###
42Z92	#####
42Z93	## '<###>' # '<###>' #####
42Z97	# '<##>' ##### '<###>' #####
42Z99	##### 16 #####64K #####
42Z9A	#####
42Z9B	#####BLOB ### CLOB ##### '<#>' ## '<#>'#
42Z9D	BEFORE #####SQL #####
42Z9D	'<#>' ##### '<#####>' #####
42Z9E	## '<###>' ##<#> #####
42Z9F	# <##> ##### (<##>) ##### ## <#> ##
42ZA0	##### #####
42ZA1	##### SQL #####: '<#####>'#

Derby #####

SQLSTATE	##
42ZA2	Operand of LIKE predicate with type <#> and collation <#> is not compatible with LIKE pattern operand with type <#> and collation <#>.
42ZA3	The table will have collation type <#> which is different than the collation of the schema <#> hence this operation is not supported .

# 55. ## 57: DRDA #####: ###

SQLSTATE	##
57017	##### <#####> ##### <#####> ##### #####

# 56. ## 58: DRDA #####: #####

SQLSTATE	##
58009	#####: VCM#VCS ##### 0 ##### 1 ##### #####
58009	#####
58009	#####: ##### <#> ##### <#> ##### #####
58009	#####: DDM ##### 4 #####
58009	#####: ### ID #####
58009	#####: ### ID #####DSS ### 0 #####
58009	#####: DSS ##### ID ## #####
58009	#####: InputStream (##### #<#>) #####
58009	#####: ### FDOCA LID ###
58009	#####: SECTKN #####
58009	#####: NVCM#NVCS ##### 1 #####
58009	#####: SCLDTA ### <##> # RDBNAM #####
58009	SocketException: '<###>'
58009	#####: <###>#
58009	#####
58009	##### <#> ##### <#> #####
58009	JVM ##### LOB #####
58009	#####: SCLDTA ### <##> # RDBNAM #####
58009	#####: SCLDTA ### <##> # PKGID #####
58009	#####: PKGNAMCSN ### <##> # SQLAM <##> ##### #####



Derby #####

SQLSTATE	##
58009	#####: <###>
58010	##### <#> ##### <#> #####
58014	DDM #### 0x<#> #####
58015	DDM ##### 0x<#> #####
58016	DDM ##### 0x<#> #####
58017	DDM ##### 0x<#> ##### #####

# 57. ## X0: ####

SQLSTATE	##
X0A00	##### '<##>' # 2 ##### GROUP BY ##### HAVING ##### 1 #####
X0X02	# '<##>' # '<###>' #####
X0X03	#####
X0X05	##### '<##>' #####
X0X07	JAR #### '<#####>' # derby.database.classpath '<#####>' #####
X0X0E	##### '<###>' #####
X0X0F	Column name '<columnName>' listed in auto-generated column selection array not found in the insert table.
X0X10	USING ##### ResultSets #####
X0X11	USING #####
X0X13	#### '<#####>' # JAR #### '<#####>' #####
X0X57	# '<#>' # Java ## SQL ##### SQL ##### ## Java #####
X0X60	'<#####>' #####
X0X61	## '<##>' ## '<###>.<#####>' ## '<##>' ##### '<##>' ##### ##### '<#>' ##### '<#>' ### ##### '<#####>' ### #####
X0X62	# '<##>' ### '<###>' ##### '<#####>' ##### '<#####>' ### #####
X0X63	IOException '<#>' #####
X0X67	# '<#>' #####CREATE INDEX#ORDER BY#GROUP BY#UNION#INTERSECT#EXCEPT ### DISTINCT #####
X0X81	<#> '<#>' #####
X0X85	'<#####>' ##### '<#####>' #####
X0X86	0 ##ResultSet.absolute(int row) #####
X0X87	#####ResultSet.relative(int row) #####

SQLSTATE	##
X0X95	##### '<#####>' ##### '<#####>'##### ResultSet #####
X0X99	## '<###>' #####
X0Y16	'<#>' ##### DROP TABLE #####
X0Y23	##### '<#####>' ##### '<#####>' #####VIEW '<#####>'#####
X0Y24	##### '<#####>' ##### '<#####>' #####STATEMENT '<#>' #####
X0Y25	##### '<#####>' ##### '<###>' #####<#>' '<#>'#####
X0Y26	## '<###>' ### '<##>' #####
X0Y28	## '<###>' ##### '<##>' #####
X0Y32	<#>'<#>' #### <#>'<#>' #####
X0Y38	# '<##>' ##### '<###>' #####
X0Y41	### <##> ##### '<###>' ##### #### <##>#####
X0Y42	## '<###>' #####: #####
X0Y43	## '<###>' #####: <###> (<#>) ##### (<#>) #####
X0Y44	## '<###>' #####: # '<##>'#####
X0Y45	1 ##### '<###>' ## <##>#####
X0Y46	## '<###>' #####: ### <##> #####
X0Y54	#### '<#####>' #####
X0Y55	##### 1 ##### # '<#####>.<##>' #### '<##>' #<#> ##### <#> #### #####
X0Y56	'<#>' ##### '<##>' #####
X0Y57	NULL ##### '<##>' ##### 1 ##### NULL#####
X0Y58	##### '<##>' ##### ##1#####
X0Y59	# '<##>' ##### <###>#####: <##>#
X0Y63	# '<##>' #####/#### NULL ##### ##### NULL #####
X0Y66	#####
X0Y67	#####
X0Y68	<#>'<#>' #####
X0Y69	<#####> ##### <#> #####

Derby #####

SQLSTATE	##
X0Y70	#### <##> ##### <#####> ## INSERT#UPDATE ### DELETE #####
X0Y71	SET ISOLATION ##### <#####> #####
X0Y72	'<#>' ##### (<#>) #####
X0Y77	##### set transaction isolation #####
X0Y78	Statement.executeQuery() #####
X0Y78	#####<#>.executeQuery() ##### <#>.execute() #####
X0Y78	<#>.executeQuery() ##### #####<#>.executeUpdate() #####
X0Y79	Statement.executeUpdate() ##ResultSet #####
X0Y80	ALTER # '<##>' ##### # '<##>' # NULL #####
X0Y83	##: ##### ID <id> ##### <##> #####

# 58. ## XBCA: #####

SQLSTATE	##
XBCA0	## <##> #### <#####> ##### #####

# 59. ## XBCM: #####

SQLSTATE	##
XBCM1	##### <#####> ##### Java #####
XBCM2	##### <#####> #####
XBCM3	#### <#####>() ##### <#####> #####
XBCM4	Java #####: ##### <#####> # <#>#

# 60. ## XBCX: ##

SQLSTATE	##
XBCX0	#####
XBCX1	#####ENCRYPT # DECRYPT #####
XBCX2	##### <#> #####
XBCX5	##### NULL #####
XBCX6	#####
XBCX7	#####: old_boot_password, new_boot_password#
XBCX8	#####

Derby #####

SQLSTATE	##
XBCX9	#####
XBCXA	#####
XBCXB	##### '<#>' ##### "NoPadding" #####
XBCXC	##### '<#####>' ##### '<#####>' #####
XBCXD	#####
XBCXE	#####
XBCXF	##### '<####>' #####
XBCXG	##### '<#####>' #####
XBCXH	encryptionAlgorithm '<#####>' ##### #####algorithm/feedbackMode/NoPadding ###
XBCXI	##### '<####>' ##### CBC#CFB#OFB#### ECB ###
XBCXJ	#####1.2.1 #### Java Cryptography Extension (JCE) ##### JCE 1.2.1 #####
XBCXK	#####
XBCXL	#####
XBCXM	#####
XBCXN	##### 1 ##### 16 ##### 0 ## 9#a ## f#### A ## F ###
XBCXO	#####
XBCXP	#####
XBCXQ	#####
XBCXR	#####
XBCXS	#####
XBCXT	#####
XBCXU	#####: <#####>
XBCXV	#####: <#####>

**# 61. ## XBM: ####**

SQLSTATE	##
XBM01	#####
XBM02	<#> ##### Derby #####
XBM05	<value> #####
XBM06	#####

Derby #####

SQLSTATE	##
XBM07	##### 8 #####
XBM08	<#> StorageFactory ### <#> #####
XBM0G	##### Java 2 #####JCE #####
XBM0H	##### <#####> #####
XBM0I	##### <#####> #####
XBM0J	##### <#####> #####
XBM0K	##### <#####> #####
XBM0L	##### <####> ##### <#####> #####
XBM0M	##### <####> #####
XBM0N	java.sql.DriverManager ## JDBC ##### #####
XBM0P	#####
XBM0Q	#### <#####> ##### #####
XBM0R	#### <#####> #####
XBM0S	#### '<#####>' # '<#####>' #####
XBM0T	##### <#####> #####
XBM0U	ID <#####> #####
XBM0V	ID <#####> ##### <####> #####
XBM0W	ID <#####> ##### <####> #####
XBM0X	##### '<#>' #####: In[_CO[_variant]]\nIn=### 2 ##### ISO-639 #####CO= ### 2 ##### ISO-3166 #####java.util.Locale ####
XBM03	Supplied value '<#>' for collation attribute is invalid, expecting UCS_BASIC or TERRITORY_BASED.
XBM0Y	##### <#####> ##### #####
XBM0Z	#### '<#####>' # '<#####>' ##### #####

**# 62. ## XCL: #####**

SQLSTATE	##
XCL01	##### <####> #####
XCL05	Activation ##### <####> #####
XCL07	#### '<#####>' #####
XCL08	#### '<#####>' #####
XCL09	PreparedStatement ##### '<#####>' ##### Activation #####
XCL10	

SQLSTATE	##
	PreparedStatement ##### JDBC #####
XCL12	# '<####>' ##### '<####>' #####
XCL13	##### '<####>' ##### '<#>' ###
XCL14	### '<####>' ##### ## ResultSet ##### '<#>' ###
XCL15	##### '<####>' ##### compareTo() ##### ClassCastException ##### compareTo() ##### '<####>' ###
XCL16	ResultSet ##### '<####>' ##### #####
XCL16	ResultSet #####
XCL17	#####
XCL18	##### 2 #####
XCL19	# '<####>' ### '<####>' #####
XCL20	##### '<####>' ##### '<####>' #####
XCL21	##### (CREATE#DROP#### ALTER) ##### #####SQL ##### Java #####
XCL22	##### <####> # IN #####OUT #####
XCL23	SQL ### '<#>' ##registerOutParameter() #####
XCL24	##### <####> #####registerOutParameter() ##### <#> #####
XCL25	##### <####> ## <#> ##### <#> ##### 2 #####
XCL26	##### <####> #####
XCL27	#####
XCL30	InputStream ## '<#>' #####IOException #####
XCL31	#####
XCL33	##### <####> ##### (##### SET NULL #####)
XCL34	##### <####> ##### (##### (#####CASCADE #####))
XCL35	##### <####> ##### (##### SET NULL ###)
XCL36	##### <#> ##### (##### (NO ACTION#RESTRICT ### CASCADE)#)
XCL37	##### <#> ##### (##### CASCADE #####)

Derby #####

SQLSTATE	##
XCL38	##### <###> ##### (##### (NO ACTION#RESTRICT ### CASCADE)#)
XCL39	##### CASCADE ##### (#####SET NULL#NO ACTION ### RESTRICT #####)
XCL40	##### CASCADE ##### (##### ##### 1 ## CASCADE ##### CASCADE #####)
XCL41	##### CASCADE ##### (#####SET NULL #####)
XCL42	CASCADE
XCL43	SET NULL
XCL44	RESTRICT
XCL45	NO ACTION
XCL46	SET DEFAULT
XCL47	'<#>' ##### <#####> ##### <#####> #####
XCL48	TRUNCATE TABLE # '<#>' #####/#####
XCL49	'<#>' ##### DELETE #### (<#>) ##### TRUNCATE TABLE #####
XCL50	##### '<#####>' ##### '<#####>' ###
XCL51	#####SESSION #####
XCL52	#####
XCL53	Stream is closed

# 63. ## XCW: #####

SQLSTATE	##
XCW00	'<#>' ## '<#>' #####

# 64. ## XCX: #####

SQLSTATE	##
XCXA0	### ID#
XCXB0	#####: '<#####>'
XCXC0	### ID ####
XCXE0	#####

# 65. ## XCY: Derby #####

Derby #####

SQLSTAT	##
XCY00	##### '<#>'='<#>'#
XCY02	##### '<#>'='<#>'#
XCY03	##### '<#####>' #####
XCY04	##### -- DERBY-PROPERTIES propertyName = value [, propertyName = value]*

**# 66. ## XCZ: org.apache.derby.database.UserUtility**

SQLSTAT	##
XCZ00	##### '<###>'#
XCZ01	##### '##ID'#
XCZ02	##### '<#>'='<#>'#

**# 67. ## XD00: #####**

SQLSTAT	##
XD003	##### DependableFinder = '<#>'# ####: "<#>"#
XD004	#####

**# 68. ## XIE: #####/#####**

SQLSTAT	##
XIE01	### NULL ###
XIE03	# <###> ## <##> #####
XIE04	#####: <#####>
XIE05	##### NULL #####
XIE06	##### NULL ###
XIE07	#####
XIE08	#####: <##>#
XIE09	#####: <#>#
XIE0B	### '<##>' ### <#> #####/#####
XIE0D	# <###> #####
XIE0E	# <###> ##### endOfFile #####
XIE0I	##### IOException #####
XIE0J	#####1 #####
XIE0K	#####
XIE0M	# '<##>' #####
XIE0N	An invalid hexadecimal string '<16####>' detected in the import file.
XIE0P	Lob data file <#####> referenced in the import file not found.



Derby #####

SQLSTATE	##
XIE0Q	Lob data file name cannot be null.
XIE0R	Import error on line <###> of file <#####>: <##>

# 69. ## XJ: #####

SQLSTATE	##
XJ004	##### '<#####>' #####
XJ008	#####
XJ009	CallableStatement #####<value>
XJ010	autoCommit #####savepoint #####
XJ011	##### NULL #####
XJ012	'<#>' #####
XJ013	##### ID #####
XJ014	#####
XJ015	Derby #####
XJ016	#### '<#####>' #####
XJ017	savepoint #####
XJ018	### NULL #####
XJ020	##### TYPE '<##>' #####java.sql.Types ##### NULL ####
XJ021	#####
XJ022	#####: '<##>#'
XJ023	#####
XJ025	#####
XJ028	URL '<url#>' #####
XJ030	#####
XJ040	##### '<#####>' #####
XJ041	##### '<#####gt;' #####
XJ042	'<#>' ##### '<#####>' #####
XJ044	'<#>' #####
XJ045	##### (##) ##### '<#####>' # Connection.setTransactionIsolationLevel() ##### #####java.sql.Connection.TRANSACTION_SERIALIZABLE#java.sql.Connection.T java.sql.Connection.TRANSACTION_READ_UNCOMMITTED ###
XJ049	#####
XJ04B	#####
XJ04C	CallableStatement #####

SQLSTATE	##
XJ056	#####AUTOCOMMIT ON #####
XJ057	Cannot commit a global transaction using the Connection, commit processing must go thru XAResource interface.
XJ058	Cannot rollback a global transaction using the Connection, commit processing must go thru XAResource interface.
XJ059	#####
XJ05B	JDBC ## '<###>' ## '<#>' ##### '<#>' ###
XJ05C	##### ResultSet.HOLD_CURSORS_OVER_COMMIT #####
XJ061	'<#####>' #####
XJ062	ResultSet.setFetchSize(int rows) ##### '<#>'#
XJ063	Statement.setMaxRows(int maxRows) ##### '<#>'# ##### >= 0 #####
XJ064	setFetchDirection(int direction) ##### '<#>'#
XJ065	Statement.setFetchSize(int rows) ##### '<#>'#
XJ066	Statement.setMaxFieldSize(int max) ##### '<#>'#
XJ067	SQL ##### NULL ###
XJ068	#####executeBatch # clearBatch #####
XJ069	SetXXX #####USING #####
XJ070	##### '<##>' # BLOB ### CLOB #####
XJ071	##### '<##>' # BLOB ### CLOB #####
XJ072	NULL ##### searchStr # BLOB ### CLOB #####
XJ073	## BLOB ### CLOB ##### BLOB/CLOB #####
XJ074	Statement.setQueryTimeout(int seconds) ##### '<#>'#
XJ076	#### '<#####>' # BLOB/CLOB #####
XJ077	getBytes/getSubString ##### BLOB/CLOB #####/#####
XJ078	##### '<#>' ##### BLOB/CLOB #####
XJ079	##### '<#>' # BLOB/CLOB #####
XJ080	USING ##### <#> #### <#> #####
XJ081	##### create/restore/recovery #####
XJ081	##### '<#####>' ##### '<#>' ##### '<#####>' #####
XJ085	#####
XJ086	##### ResultSet ##### CONCUR_READ_ONLY #####
XJ087	Sum of position('<##>') and length('<##>') is greater than the size of the LOB.
XJ088	#####: ##### wasNull() #####

SQLSTATE	##
XJ090	#####: ##### NULL ###
XJ091	#####: ##### <####> # OUT ##### INOUT #####
XJ093	BLOB/CLOB ### <#> ##### ### <#> #####
XJ094	#####
XJ095	#####
XJ096	##### <#> # <#####> #####
XJ097	#####
XJ098	##### <#> #####
XJ099	Reader/Stream #####
XJ100	registerOutParameter ##### setter ##### #####
XJ102	#####
XJ103	### NULL #####
XJ104	#####: <#>#
XJ105	DES ##### <#>##### <#> ###
XJ106	#####
XJ107	#####
XJ108	#####
XJ110	### NULL #####
XJ111	##### NULL #####
XJ112	#####
XJ113	#### <#####> #####: <###>
XJ114	##### '<#####>' ##
XJ115	##### <#> #####
XJ116	##### <#> #####
XJ117	##### J2EE #####
XJ118	#####
XJ121	#####
XJ122	##### updateXXX #####
XJ123	#####
XJ124	#####
XJ125	##### ResultSet ##### (TYPE_SCROLL_SENSITIVE #### TYPE_SCROLL_INSENSITIVE #) #####
XJ126	#####
XJ128	'<#>' #####
XJ200	##### <#> #####
XJ202	##### '<#####>' ###

Derby #####

SQLSTATE	##
XJ203	##### '<#####>' #####
XJ204	##### <#####> #####
XJ206	SQL #### '<#>' #####
XJ207	executeQuery #####
XJ208	##### 1 ##### getNextException() #####
XJ209	#####
XJ210	#####
XJ211	#####
XJ212	#####: <#####>
XJ213	traceLevel #####
XJ214	CLOB ### BLOB #### free() ##### IO #####
XJ215	free() ##### java.sql.Clob/java.sql.Blob #####
XJ216	The length of this BLOB/CLOB is not available yet. When a BLOB or CLOB is accessed as a stream, the length is not available until the entire stream has been processed.
XJ217	The locator that was supplied for this LOB/BLOB is invalid

# 70. ## XK: #####

SQLSTATE	##
XK000	The security policy could not be reloaded: <##>

# 71. ## XN: #####

SQLSTATE	##
XN001	#####
XN008	#####
XN009	BLOB/CLOB #####
XN010	##### NULL #####
XN011	##### <#> ##### 1 ## <#> #####
XN012	<#####> #####XA ##### <#####> ##### <#####> ###
XN013	#####
XN014	#####: IOException ##### #<#> ### ##### 0x0 ##### #: <##>#
XN015	#####: ##### InputStream #### (##### #<#>) #### InputStream #####
XN016	#####: ##### #<#> ### #####: <##>#

Derby #####

SQLSTATE	##
XN017	#####: ##### #<#> ### ##### 0x0 #####
XN018	#####: ##### Reader #### (##### #<#>) #### Reader #####
XN019	<#> ##### <#> #####

**# 72. ## XSAI: ### - access.protocol.interface**

SQLSTATE	##
XSAI2	##### (<#>) #####
XSAI3	#####

**# 73. ## XSAM: ### - AccessManager**

SQLSTATE	##
XSAM0	'<#>' #####
XSAM2	#####conglom id '<conglomID>' #####
XSAM3	conglom id '<conglomID>' #####
XSAM4	'<####>' #####
XSAM5	#####next() #####
XSAM6	##### <#####> ##### <#####> ##### <#####> #####

**# 74. ## XSAS: Store - ####**

SQLSTATE	##
XSAS0	#####
XSAS1	#####
XSAS3	#####
XSAS6	#####

**# 75. ## XSAX: ### - access.protocol.XA statement**

SQLSTATE	##
XSAX0	XA #####
XSAX1	##### Xid #####

**# 76. ## XSCB: ### - BTree**

SQLSTATE	##
XSCB0	#####
XSCB1	##### <#####> #####
XSCB2	

Derby #####

SQLSTATE	##
	##### <#####> ##btree # 2 #### createConglomerate() #####
XSCB3	#####
XSCB4	##### (####next() #####) ##btree ##### (<#>) ###
XSCB5	btree ##### UNDO #####
XSCB6	##: #####btree # 2 ##### derby.storage.pageSize ###/### derby.storage.pageReservedSpace #####
XSCB7	btree #####current_rh # NULL = <#>##### NULL = <#>#
XSCB8	btree ##### <#> #####
XSCB9	#####

**# 77. ## XSCG0: #####**

SQLSTATE	##
XSCG0	#####

**# 78. ## XSCH: ###**

SQLSTATE	##
XSCH0	#####
XSCH1	##### <#####> #####
XSCH4	#####
XSCH5	##### <#> ##### <#> #####
XSCH6	##### (##### ID <#####ID>) #####
XSCH7	#####
XSCH8	#####

**# 79. ## XSDA: RawStore - Data.Generic statement**

SQLSTATE	##
XSDA1	#####
XSDA2	#####
XSDA3	##: ##### derby.storage.pageSize ###/### derby.storage.pageReservedSpace #####
XSDA4	#####
XSDA5	#####
XSDA6	### <##> # NULL #####

Derby #####

SQLSTATE	##
XSDA7	### <###> ##### SQLData #####
XSDA8	### <###> ##### SQLData #####
XSDA9	### <###> ##### SQLData #####
XSDAA	##### <#>#####
XSDAB	NULL #####
XSDAC	#####
XSDAD	1 #####
XSDAE	##### ID #####
XSDAF	#####
XSDAG	#####
XSDAI	##### <###> #####
XSDAJ	##### SQLData #####
XSDAK	##### <#> #####
XSDAL	##### <#> #####
XSDAM	### <###> # SQLData ##### #####
XSDAN	### <###> # SQLData ##### #####

#### # 80. ## XSDB: RawStore - Data.Generic transaction

SQLSTATE	##
XSDB0	##### <###> #####
XSDB1	### <###> #####
XSDB2	##### <#####> #####: <#>
XSDB3	##### <#> ##### <#> ###
XSDB4	### <###> ##### <#####> ##### <#####> #####
XSDB5	##### <###> #####
XSDB6	Derby ##### <#####> #####
XSDB7	##: Derby (##### <#>) #####Derby ( ##### <#>) ##### <#####> ##### ##### Derby #####1 ## 1 ##### #####
XSDB8	##: Derby (##### <#>) #####Derby ( ##### <#>) ##### <#####> ##### ##### Derby #####1 ## 1 ##### Derby # 2 ##### db2j.database.forceDatabaseLock=true #####db.lock ##### Derby

Derby #####

SQLSTATE	##
	##### ##### db.lock ##### VM #####
XSDB9	##### <#####> #####
XSDBA	##### <#####> #####

#### # 81. ## XSDF: RawStore - Data.Filesystem statement

SQLSTATE	##
XSDF0	#### <#####> #####
XSDF1	##### <#####> #####
XSDF2	##### <#####> ##### #: <#>#
XSDF3	##### <#####> #####
XSDF4	##### <#####> #####: <#>#
XSDF6	##### <###> #####
XSDF7	#####: <#>
XSDF8	##### <###> #####
XSDFB	#####
XSDFD	### <###> # 2 #####1 #####2 ##### #####: <#><#>
XSDFE	#####
XSDFH	##### <#####> #####
XSDFI	##### ##### ##### ##### ##### <###> #####

#### # 82. ## XSDG: RawStore - Data.Filesystem database

SQLSTATE	##
XSDG0	### <###> #####
XSDG1	### <###> #####
XSDG2	### <###> #####=<#>#####=<#>#####: <#>
XSDG3	##### <#####> #####
XSDG5	createFinished #####
XSDG6	##### <#> ##### #####
XSDG7	##### <#####> #####



Derby #####

SQLSTATE	##
XSDG8	##### '<#####>' # '<#####>' ##### #####

### # 83. ## XSLA: RawStore - Log.Generic database exceptions

SQLSTATE	##
XSLA0	##### <#> #####
XSLA1	##### (##### <#####>) ##### #####
XSLA2	#####
XSLA3	#####
XSLA4	##### #####
XSLA5	##### <#####> #####
XSLA6	#####
XSLA7	##### <#####> #####
XSLA8	##### <#> ##### <#> # <#> #####
XSLAA	#####
XSLAB	##### <#####> #####logDevice #####
XSLAC	<#> #####
XSLAD	##### <#####> ##### <#> ##### ##### <#> ##### <#> ####
XSLAE	<#> #####
XSLAF	#####
XSLAH	#####
XSLAI	#####
XSLAJ	#####
XSLAK	##### <#> #####
XSLAL	##### <#> ##### <#> ##### <#####> (## <#>) #####
XSLAM	IOException #####{1} #####
XSLAN	<#> ##### <#####versionNumber> #####
XSLAO	##### <#> #####
XSLAP	##### (<#>) ##### <#####> ### #####
XSLAQ	##### <#####> #####

Derby #####

SQLSTATE	##
XSLAR	##### '<#####>' # '<#>' ##### #####
XSLAS	##### <#####> ##### #####
XSLAT	##### '<#####>' ##### ##### logDevice #####

#### # 84. ## XSLB: RawStore - Log.Generic statement exceptions

SQLSTATE	##
XSLB1	##### <#####> #####
XSLB2	##### <#####> #####
XSLB4	truncationLWM <#> #####
XSLB5	##### <#> ##### truncationLWM ##### <#># ##### <#> ## <#> ###
XSLB6	0 ### -ve #####
XSLB8	<#> ##### <#> #####
XSLB9	#####

#### # 85. ## XSRs: RawStore - protocol.Interface statement

SQLSTATE	##
XSRs0	#####
XSRs1	##### <#> #####
XSRs4	##### (#####) <#> ## <#> #####
XSRs5	##### (#####) <##> ## <##> #####
XSRs6	##### <#####> #####
XSRs7	#####
XSRs8	#####
XSRs9	#### <#####recordName> #####
XSRSA	##### #####
XRSRB	#####
XSRSC	##### <#####directoryLocation> #####

#### # 86. ## XSTA2: XACT\_TRANSACTION\_ACTIVE

SQLSTATE	##
XSTA2	#####

Derby #####

### # 87. ## XSTB: RawStore - Transactions.Basic system

SQLSTAT	##
XSTB0	#####
XSTB2	#####
XSTB3	(#####) ##### NULL #####
XSTB5	#####
XSTB6	1 #####

### # 88. ## XXXXX: No SQLSTATE

SQLSTAT	##
XXXXX	#####

## JDBC #####

Derby#####JDBC#####

#####JDBC API#####Derby#####API###

#####Java#####(Sun#####4###)

#####Derby####JDBC API#####JDBC

2.0#3.0#4.0#API#####

#####Derby #####

##JDBC#####Sun#####JDBC##### Derby###JVM#####JDBC

#####

#####/

#####JDBC#####JDBC#####Derby###JVM#####JDBC

Derby#####JDBC#####Derby#####JDBC#####

JDBC#####"Feature not

implemented"#####XJZZ###SQLState#SQLException#####

#####Derby#####

## java.sql####JDBC#####

#####java.sql#####Derby#####

- [java.sql.Driver#####](#)
- [java.sql.DriverManager.getConnection ####](#)
- [java.sql.Driver.getPropertyInfo ####](#)
- [java.sql.Connection #####](#)
- [java.sql.DatabaseMetaData #####](#)
- [java.sql.Statement#####](#)
- [java.sql.PreparedStatement#####](#)
- [java.sql.CallableStatement #####](#)
- [java.sql.ResultSet #####](#)
- [java.sql.ResultSetMetaData #####](#)
- [java.sql.SQLException ###](#)
- [java.sql.SQLWarning ###](#)
- [SQL##java.sql.Types###](#)

Derby #####

## java.sql.Driver#####

```
Derby#####org.apache.derby.jdbc.EmbeddedDriver#####
#####
java.sql.Driver#####DriverManager#####
    • #####JDK1.6#####
    • Class.forName("org.apache.derby.jdbc.EmbeddedDriver")
      #####JVM#####
    • new org.apache.derby.jdbc.EmbeddedDriver()
      Class.forName("org.apache.derby.jdbc.EmbeddedDriver")#####
    • Class c = org.apache.derby.jdbc.EmbeddedDriver.class
      ### Class.forName("org.apache.derby.jdbc.EmbeddedDriver")#####
    • #####jdbc.drivers
      #####

java -Djdbc.drivers=org.apache.derby.jdbc.EmbeddedDriver
applicationClass

jdbc:derby:#####DriverManager#####org.apache.derby.jdbc.EmbeddedDriver###
jdbc:derby:#####Derby#####DriverManager#####(java.sql.Driver)#####
####getDriver#getConnection#####(java.sql.Connection)#####

java.sql.Driver.getPropertyInfo ###
#####JDBC#####DriverPropertyInfo#####

java.sql.DriverManager.getDriver("jdbc:derby:").
getPropertyInfo(URL, Prop)

org.apache.derby.jdbc.EmbeddedDriver#####DriverPropertyInfo#####
#####DriverPropertyInfo#####
Derby#####URL#####
#####databaseName=nameofDatabase,#####
###Derby#####toursDB#flightsDB#####A:
dbs/tours94#####
getPropertyInfo#####databaseName#####
##DriverPropertyInfo#####choices#####toursDB#flightsDB#A: /dbs /
tours94#####
#####(#####)#####shutdown###true#####

java.sql.Driver.getPropertyInfo#####Derby #####
####8#####
```

## java.sql.DriverManager.getConnection ###

```
JDBC
API#####Connection#####Connection#####
JDBC#####URL(uniform resource locator)#####

DriverManager.getConnection#####URL####Properties#####Properties#####
#####Derby#####
####Derby#####
#####Derby#####APP#####Derby#####
#####
```

Derby #####

**Derby#####URL##**

Derby#####URL#####URL#####

#####Derby #####

#####1#####

**#####URL##**

#####URL#####

jdbc:derby: [#####:][#####][;##]\*

- jdbc:derby:

JDBC##derby##Derby#####

#####derby#####

- #####:

#####Derby#####jar#####

#####

- directory

- classpath:

#####

- jar #####

jar: #####

(#####)

#####jar#zip#####

#####URL####Derby #####

- #####

#####

#####/#####Derby #####

#####1#####

"#####-#####"#####

- ##

0#####URL#####Derby#####URL#####

**####SQL##**

Derby#####JDBC#####SQL#####

jdbc:default:connection

**Derby#####URL###**

#####URL#####

Derby#####DriverManager.getConnection#Properties#####

#####Derby#########URL#####

#####URL

import java.util.Properties;

Connection conn = DriverManager.getConnection(  
"jdbc:derby:sampleDB;create=true");

/\* ###Properties#####\*/

Properties myProps = new Properties();

myProps.put("create", "true");

Connection conn = DriverManager.getConnection(  
"jdbc:derby:sampleDB", myProps);

/\* #####\*/

Derby #####

```
Connection conn = DriverManager.getConnection(
    "jdbc:derby:sampleDB", "dba", "password");
```

**Note:**

#####(Derby#####)  
#####)

## java.sql.Connection #####

Derby###Connection#####JDBC#####Connection##

#####Connection#####JDBC#####

**java.sql.Connection.setTransactionIsolation ###**

Derby#####java.sql.Connection.TRANSACTION\_SERIALIZABLE#

java.sql.Connection.TRANSACTION\_REPEATABLE\_READ#

java.sql.Connection.TRANSACTION\_READ\_COMMITTED

###java.sql.Connection.TRANSACTION\_READ\_UNCOMMITTED ###

#####TRANSACTION\_READ\_COMMITTED ###

#####setTransactionIsolation#####

#####Derby #####

**java.sql.Connection.setReadOnly ###**

java.sql.Connection.setReadOnly#####

#####Derby #####Connection.setReadOnly

#####

**java.sql.Connection.isReadOnly ###**

#####isReadOnly#####Connections#setReadOnly####

#####)Connections#####readOnlyAccess#####

#####

#####

Derby #####"#####"

- createArrayOf( java.lang.String, java.lang.Object[] )
- createNClob( )
- createSQLXML( )
- createStruct( java.lang.String, java.lang.Object[] )
- getTypeMap( )
- prepareStatement( java.lang.String, int[] )
- prepareStatement( java.lang.String, java.lang.String[] )
- setTypeMap( java.util.Map )

## java.sql.DatabaseMetaData #####

#####Derby###java.sql.DatabaseMetaData#####

**DatabaseMetaData #####**

#####DatabaseMetaData#####

####JDBC#####DatabaseMetaData#####

#####

**java.sql.DatabaseMetaData.getProcedureColumns###**

Derby#Java#####Derby###SQL####Java#####

getProcedureColumns#####Derby#####

Derby #####

#####Java##### Derby##CREATE  
PROCEDURE#####Java#####

*getProcedureColumns#ResultSet#####*

**getProcedureColumns###**

JDBC API#####

- *catalog*

Derby#####null#####

- *schemaPattern*

Java#####

- *procedureNamePattern*

#####

- *column-Name-Pattern*

#####CREATE

PROCEDURE###Java#####%#####

**getProcedureColumns#####**

*getProcedureColumns####ResultSet####API#####API#####*

- PROCEDURE\_CAT

Derby#####null####

- PROCEDURE\_SCHEM

Java#####

- PROCEDURE\_NAME

#####

- COLUMN\_NAME

#####([column-Name-Pattern](#)#####)

- COLUMN\_TYPE

short#####*DatabaseMetaData.procedureColumnIn#####*

- TYPE\_NAME

Derby#####

- NULLABLE

#####*DatabaseMetaData.procedureNoNulls#####DatabaseMetaData.procedure*

- REMARKS

a String describing the java type of the method parameter

- COLUMN\_DEF

#####(null#####)

- SQL\_DATA\_TYPE

#####JDBC#####

- SQL\_DATETIME\_SUB

#####JDBC#####

- CHAR\_OCTET\_LENGTH

#####(#####NULL###)

- ORDINAL\_POSITION

#####/#####1#####

- IS\_NULLABLE

#####(YES#####NULL#####NO#####)

Derby #####

- SPECIFIC\_NAME

#####

- METHOD\_ID

Derby#####

- PARAMETER\_ID

Derby#####

**java.sql.DatabaseMetaData.getBestRowIdentifier###**

*java.sql.DatabaseMetaData.getBestRowIdentifier#####*

*java.sql.DatabaseMetaData.getBestRowIdentifier#####*

- #####
- #####
- #####

**Note:**

*java.sql.DatabaseMetaData.getBestRowIdentifier#####*

## **java.sql.Statement#####**

JDBC 1.2#####*java.sql.Statement#setEscapeProcessing#####Derby#####*  
#####

- *cancel( )*
- *execute( java.lang.String, int[] )*
- *execute( java.lang.String, String[] )*
- *executeUpdate( java.lang.String, int[] )*
- *executeUpdate( java.lang.String, String[] )*

**ResultSet #####**

####SELECT#####*ResultSet#####ResultSet#####Resul*

####*java.sql.Statement#java.sql.PreparedStatement#executeQuery#####*

#####*ResultSet#####*

#####GROUP BY#ORDER

BY#DISTINCT#INTERSECT#EXCEPT#UNION#####

*Statement#####ResultSet#####*

*ResultSet#####*

## **java.sql.CallableStatement #####**

Derby###JDBC 1.2####*CallableStatement#####*

- *getBoolean()*
- *getByte()*
- *getBytes()*
- *getDate()*
- *getDouble()*
- *getFloat()*
- *getInt()*
- *getLong()*
- *getObject()*
- *getShort()*
- *getString()*
- *getTime()*
- *getTimestamp()*



Derby #####

- `registerOutParameter()`
- `wasNull()`

#### CallableStatements#OUT##

Derby###OUT#####CALL#####

```
CallableStatement cs = conn.prepareCall(
    "? = CALL getDriverType(cast (? as INT))"
cs.registerOutParameter(1, Types.INTEGER);
cs.setInt(2, 35);
cs.executeUpdate();
```

**Note:** #####CALL#####? =#####

#####

#### CallableStatements#INOUT##

Java#####INOUT#####(#####)  
#####SQL#####

#####:

```
CallableStatement call = conn.prepareCall(
    "{CALL doubleMyInt(?)}" );
// #####
// inout#####
call.registerOutParameter(1, Types.INTEGER);
call.setInt(1,10);
call.execute();
int retval = call.getInt(1);
```

#####doubleInt#####int#####

```
public static void doubleMyInt(int[] i) {
    i[0] *=2;
    /* Derby#####*/
}
```

**Note:** #####

#### # 89. INOUT#####

JDBC##	#####	#####
BIGINT	long[]	long
BINARY	byte[][]	byte[]
BIT	boolean[]	boolean
DATE	<i>java.sql.Date[]</i>	<i>java.sql.Date</i>
DOUBLE	double[]	double
FLOAT	double[]	double
INTEGER	int[]	int
LONGVARBINARY	byte[][]	byte[]
REAL	float[]	float
SMALLINT	short[]	short
TIME	<i>java.sql.Time[]</i>	<i>java.sql.Time</i>
TIMESTAMP	<i>java.sql.Timestamp[]</i>	<i>java.sql.Timestamp</i>
VARBINARY	byte[][]	byte[]

Derby #####

JDBC##	#####	#####
OTHER	<i>yourType[]</i>	<i>yourType</i>
JAVA_OBJECT (Java2/JDBC 2.0#####)	<i>yourType[]</i>	<i>yourType</i>

#####INOUT#####

### java.sql.SQLException ###

Derby###SQLExceptions#getMessage()#getSQLState()#getErrorCode()#####  
####Derby##nextException#####SQLExceptions#####  
Derby#####SQL-92#####  
SQLExceptions#####Derby #####  
####5###"#####Derby#SQLExceptions###"#####

### java.sql.PreparedStatement#####

Derby###JDBC  
1.2#####setXXX#####setObject(Value,JDBCTypeCode)#####  
#####setString#####  
#####PreparedStatement#setCursorName#####  
#####  
setXXXStream#####  
JDBC##IN#####Java#####JDBC#####  
Derby##JDBC 1.2#####  
• setBinaryStream  
#####  
• setAsciiStream  
ASCII#####  
• setUnicodeStream  
Unicode#####  
JDBC 2.0#JDBC 3.0#####Derby#####JDK 1.5#####  
#####Java#####java.io.InputStream#####  
JDBC#####  
**# 90. #####JDBC####**

#####	####Java##	AsciiStream	UnicodeStream	BinaryStream
CLOB	java.sql.Clob	x	x	'
CHAR	'	x	x	'
VARCHAR	'	x	x	'
LONGVARCHAR	'	X	X	'
BINARY	'	x	x	x
BLOB	java.sql.Blob	x	x	x
VARBINARY	'	x	x	x

Derby #####

#####	####Java##	AsciiStream	UnicodeStream	BinaryStream
LONGVARBINARY	'	x	x	X

**Note:**

- #####X#####SQL##java.sql.Types#####
- #####LONG VARCHAR###LONG VARCHAR FOR BIT DATA##### LONG VARCHAR###LONG VARCHAR FOR BIT DATA#####
- #####

#####java.io.File#####LONG VARCHAR#####

```
Statement s = conn.createStatement();
s.executeUpdate("CREATE TABLE atable (a INT, b LONG VARCHAR)");
conn.commit();
java.io.File file = new java.io.File("derby.txt");
int fileLength = (int) file.length();
// #####
java.io.InputStream fin = new java.io.FileInputStream(file);
PreparedStatement ps = conn.prepareStatement(
    "INSERT INTO atable VALUES (?, ?)");
ps.setInt(1, 1);
// #####
ps.setAsciiStream(2, fin, fileLength);
ps.execute();
conn.commit();
```

**java.sql.ResultSet #####**

ResultSet#####ResultSet#####

#####ResultSet#####

Derby###getXXX#####JDBC 1.2#####

JDBC##ResultSet.getBigDecimal#####Derby###java.math.BigDecimal.ROUND\_HALF\_UP

#####

#####OutputStream#####getBinaryStream#####

#####getXXXStream#####ResultSet#####

#####

#####LONG VARCHAR#####

```
// #####
ResultSet rs = s.executeQuery("SELECT b FROM atable");
while (rs.next()) {
    // java.io.InputStream#####
    java.io.InputStream ip = rs.getAsciiStream(1);
    // #####--#####// #####
    int c;
    int columnSize = 0;
    byte[] buff = new byte[128];
    for (;;) {
        int size = ip.read(buff);
        if (size == -1)
            break;
        columnSize += size;
        String chunk = new String(buff, 0, size);
        System.out.print(chunk);
    }
}
rs.close();
```

Derby #####

```
s.close();  
conn.commit();
```

## java.sql.ResultSetMetaData #####

Derby##ResultSet#####

####	#
<i>isDefinitelyWritable</i>	false
<i>isReadOnly</i>	false
<i>isWritable</i>	false

## java.sql.SQLWarning ###

Derby#####create#####sum()#

#####Derby#####*derby.log*##### All other informational messages are written to the Derby system's *derby.log* file.

## java.sql.SQLXML#####

JDBC

4.0###SQL#XML#####java.sql.SQLXML#####Derby###XML##SQL#####JDB

Derby###java.sql.SQLXML#####XML#####XML#####

###Derby###XML#####JDBC#####

## SQL##java.sql.Types###

Derby##java.sql.Types#SQL#####

#####java.sql.Types#SQL#####

**# 91. SQL##java.sql.Types###**

<i>java.sql.Types</i>	SQL#
BIGINT	BIGINT
BINARY	CHAR FOR BIT DATA
BIT <sup>1</sup>	CHAR FOR BIT DATA
BLOB	BLOB (JDBC 2.0##)
CHAR	CHAR
CLOB	CLOB (JDBC 2.0##)
DATE	DATE
DECIMAL	DECIMAL
DOUBLE	DOUBLE PRECISION
FLOAT	DOUBLE PRECISION <sup>2</sup>
INTEGER	INTEGER

Derby #####

<i>java.sql.Types</i>	<b>SQL#</b>
LONGVARBINARY	LONG VARCHAR FOR BIT DATA
LONGVARCHAR	LONG VARCHAR
NULL	#####
NUMERIC	DECIMAL
REAL	REAL
SMALLINT	SMALLINT
SQLXML <sup>3</sup>	XML
TIME	TIME
TIMESTAMP	TIMESTAMP
VARBINARY	VARCHAR FOR BIT DATA
VARCHAR	VARCHAR

**Notes:**

1. BIT#JDBC 2.0#####
2. FLOAT#####DOUBLE  
PRECISION#####DOUBLE#####
3. SQLXML#JDBC 4.0#####Derby###SQLXML#SQL#XML##### ##Derby#java.sql.Type###XML#####

**java.sql.Blob#####java.sql.Clob#####**

JDBC 2.0##java.sql.Blob#SQL#BLOB(binary large object)#####java.sql.Clob#SQL#CLOB(character large object)#####

java.sql.Blob#java.sql.Clob###(large object)#####Derby#####BLOB#####

###Derby#####BLOB#CLOB#####

##Derby#####

- **BLOB###Derby##java.sql.Blob#####java.sql.PreparedStatement#####: JDBC2.0#####java.sql.ResultSet#BLOB##### CallableStatement#getBlob#####**
- **CLOB###Derby##java.sql.Clob#####java.sql.PreparedStatement#####: JDBC2.0#####java.sql.ResultSet#CLOB##### CallableStatement#getClob#####**

java.sql.Blob#java.sql.Clob#####

- ###SQL#BLOB#####LONG VARCHAR FOR BIT DATA#BINARY###VARCHAR FOR BIT DATA#####
- ###SQL#CLOB#####LONG VARCHAR#CHAR###VARCHAR#####
- java.sql.ResultSet#####getBlob#####getClob#####BLOB#CLOB#####
- LOB#####

#####BLOB#####

Derby#####(1##2###)#####ASCII##(1####1###)#####  
#####CLOB#####

**BLOB#CLOB#(LOB#)###**

- LOB####(=)####(!=# <>. #####
- LOB#####<# <=# ># >=#####
- LOB#####LOB#####

Derby #####

- LOB#####DISTINCT#GROUP BY#ORDER BY#####
- #####LOB#####

Derby###CallableStatement#set###get#####JDBC  
2.0#####

####:java.sql.Blob#java.sql.Clob#####java.sql.Blob###java.sql.Clob###

#### # 92. #####JDBC 2.0 java.sql.Blob####

###	#####	#####
InputStream	getBinaryStream()	'
byte[]	getBytes(long pos, int length)	pos < 1#####pos#length#####length <= 0#####
long	length()	'
long	position(byte[] pattern, long start)	pattern == null#####start < 1#####pattern####0#####
long	position(Blob pattern, long start)	pattern == null#####start < 1#####pattern####0#####pattern#####

#### # 93. #####JDBC 2.0 java.sql.Clob #####

###	#####	#####
InputStream	getAsciiStream()	'
Reader	getCharacterStream()	'
String	getSubString(long pos, int length)	pos < 1#####pos# Clob#####length <= 0#####
long	length()	'
long	position(Clob searchstr, long start)	searchStr == null#####start < 1#####searchStr ####0#####searchStr#####
long	position(String searchstr, long start)	searchStr == null#####start < 1#####pattern#####

#### java.sql.Blob#java.sql.Clob#####:

Derby#####(#####)###java.sql.Blob#java.sql.Clob#####  
#####Derby#####java.sql.Blob#java.sql.Clob#####  
####getBlob/getClob###java.sql.Blob/java.sql.Clob#####

###java.sql.Blob/

java.sql.Clob#####(#####)#####(#####getXXXStream#####

java.sql.Blob/

java.sql.Clob#####

ResultSet getXXX#####

- getBlob
- getClob
- getAsciiStream
- getBinaryStream

Derby #####

- `getUnicodeStream`

#####  
#####

```
ResultSet rs = s.executeQuery("SELECT text FROM CLOBS WHERE i = 1");
while (rs.next()) {
    aclob=rs.getClob(1);
    ip = rs.getAsciiStream(1);
}
```

#####  
Clob#####

## JDBC 2.0 ###

#####Derby#####JDBC2.0#####

### java.sql.Connection #####: JDBC 2.0#####

**# 94. Connecction#####JDBC 2.0#####**

###	#####
<i>Statement</i>	<i>createStatement( int resultSetType, int resultSetConcurrency)</i>
<i>PreparedStatement</i>	<i>prepareStatement(String sql, int resultSetType, int resultSetConcurrency)</i>
<i>CallableStatement</i>	<i>prepareCall(String sql, int resultSetType, int resultSetConcurrency)</i>

#####

#####ResultSet.TYPE\_FORWARD\_ONLY#ResultSet.TYPE\_SCROLL\_INSENSITIVE#####  
TYPE\_SCROLL\_SENSITIVE#####Derby#SQLWarning#####TYPE\_SCROLL\_INSENSITIVE#Resul

#####ResultSet.CONCUR\_READ\_ONLY#ResultSet.CONCUR\_UPDATABLE#####

### java.sql.DatabaseMetaData #####: #####JDBC 2.0#####

Derby#####JDBC 2.0#####

### java.sql.PreparedStatement#####: JDBC2.0#####

**# 95. java.sql.PreparedStatement#####JDBC 2.0#####**

###	#####	#####
<i>void</i>	<i>addBatch()</i>	<i>'</i>
<i>ResultSetMetaData</i>	<i>getMetaData()</i>	<i>'</i>
<i>void</i>	<i>setBlob(int i, Blob x)</i>	<i>'</i>
<i>void</i>	<i>setClob(int i, Clob x)</i>	<i>'</i>

### java.sql.ResultSet

**# 96. ResultSet#####JDBC 2.0#####**

Derby #####

###	#####	#####
boolean	<i>absolute(int row)</i>	'
void	<i>afterLast()</i>	'
void	<i>beforeFirst()</i>	'
void	<i>beforeFirst()</i>	'
void	<i>deleteRow()</i>	#####ResultSet#####ResultSet#close#####
boolean	<i>first()</i>	'
Blob	<i>getBlob(int columnIndex)</i>	java.sql.Blob#####java.sql.Clob#####
Blob	<i>getBlob(String column-Name)</i>	
Clob	<i>getClob(int columnIndex)</i>	
Clob	<i>getClob(String column-Name)</i>	
int	<i>getConcurrency()</i>	Statement#####CONCUR_READ_ONLY#####R #####Statement#####CONCUR_UPDATABLE#####
int	<i>getFetchDirection()</i>	'
int	<i>getFetchSize()</i>	Always returns 1.
int	<i>getRow()</i>	'
void	<i>insertRow()</i>	'
boolean	<i>isAfterLast()</i>	'
boolean	<i>isBeforeFirst</i>	'
boolean	<i>isFirst()</i>	'
boolean	<i>isLast()</i>	'
boolean	<i>last()</i>	'
void	<i>moveToCurrentRow()</i>	'
void	<i>moveToInsertRow()</i>	'
boolean	<i>previous()</i>	'
boolean	<i>rowDeleted()</i>	#####false#####
boolean	<i>rowInserted()</i>	##false#####
boolean	<i>rowUpdated()</i>	#####false#####
boolean	<i>relative(int rows)</i>	'
void	<i>setFetchDirection(int direction)</i>	'
void	<i>setFetchSize(int rows)</i>	A fetch size of 1 is the only size supported.
void	<i>updateRow()</i>	#####ResultSet##### ResultSet#close##

java.sql.ResultSetMetaData #####: JDBC 2.0#####

Derby#####JDBC 2.0#####



Derby #####

**java.sql.Statement #####: #####JDBC 2.0####**

**# 97. java.sql.Statement#####JDBC2.0####**

###	####	#####
void	<i>addBatch(String sql)</i>	'
void	<i>clearBatch()</i>	'
int[]	<i>executeBatch()</i>	'
int	<i>getFetchDirection()</i>	#####
int	<i>getFetchSize()</i>	#####
int	<i>getMaxFieldSize()</i>	'
void	<i>getMaxRows()</i>	'
void	<i>setEscapeProcessing(boolean enable)</i>	'
void	<i>setFetchDirection(int direction)</i>	#####
void	<i>setFetchSize(int rows)</i>	#####
void	<i>setMaxFieldSize(int max)</i>	Blobs#Clobs#####
void	<i>setMaxRows()</i>	'

**java.sql.BatchUpdateException ###**

#####

**Connected Device Configuration###Foundation  
Profile###JDBC####(JSR169)**

Derby##JSR169#####Connected Device Configuration###Foundation

Profile#####JDBC API#####JDBC 3.0#####JSR169#####D

JSR169#####org.apache.derby.jdbc.EmbeddedSimpleDataSource#####

org.apache.derby.jdbc.EmbeddedDataSource#####Derby

#####

#####Derby##JSR169#####:

- #####DECIMAL#####getString()#setString()#####getXXX##setXXX  
2.0#JDBC 3.0##DECIMAL#####JSR169#####
- CONTAINS SQL#READS SQL DATA#MODIFIES SQL  
DATA#####JDBC#####Java#####JSR169#####
- #####API(jdbc:default:connection)#JSR169#####  
#####jdbc:default:connection#####
- #####
- #####
- #####
- DriverManager#####DriverManager.getConnection()#####

**JDBC 3.0###**

JDBC 3.0####API#####Derby#####

**Note: #####Java2#1.4#####**

Derby #####

#####

- DatabaseMetaData#####java.sql.DatabaseMetaData #####: JDBC 3.0#####
- #####java.sql.ParameterMetaData#####JDBC3.0#####java.sql.PreparedStatement
- #####java.sql.Statement#####java.sql.DatabaseMetaData #####: JDBC 3.0#####
- #####java.sql.Connection#####JDBC3.0#####
- HOLD#####java.sql.DatabaseMetaData #####: JDBC 3.0#####

**java.sql.Connection#####: JDBC3.0#####**

**# 98. Connection#####JDBC 3.0#####**

###	#####	#####
Savepoint	setSavepoint (String name)	#####
Savepoint	setSavepoint ()	#####
void	releaseSavepoint (Savepoint savepoint)	#####
void	rollback(Savepoint savepoint)	#####
PreparedStatement	prepareStatement(String sql, int autoGeneratedKeys)	sql#INSERT#####autoGeneratedKeys#####
PreparedStatement	prepareStatement(String sql, int [] columnIndexes)	sql#INSERT#####columnIndexes#####
PreparedStatement	prepareStatement(String sql, String [] columnNames)	sql#INSERT#####columnNames#####

- Autogenerated keys

**java.sql.DatabaseMetaData #####: JDBC 3.0#####**

**# 99. DatabaseMetaData#####JDBC 3.0#####**

###	#####	#####
boolean	supportsSavepoints()	'
int	getDatabaseMajorVersion()	'
int	getDatabaseMinorVersion()	'
int	getJDBCMajorVersion()	'
int	getJDBCMinorVersion()	'
int	getSQLStateType()	'
boolean	supportsNamedParameters()	'
boolean	supportsMultipleOpenResults()	'
boolean	supportsGetGeneratedKeys()	'
boolean	supportsResultSetHoldability(int holdability)	'
int	getResultSetHoldability()	ResultSet.HOLD_CURSORS_OVER_COMMIT####

Derby #####

## java.sql.ParameterMetaData#####JDBC3.0#####

ParameterMetaData#JDBC

3.0#####PreparedStatement.getParameterMetaData

#####PreparedStatement#####ParameterMetaData#####[java.sql.Prepa](#)

[JDBC3.0#####](#)

ParameterMetaData#####

**# 100. ParameterMetaData#JDBC 3.0#####**

###	####	#####
int	getParameterCount()	'
int	isNullable(int param)	'
boolean	isSigned(int param)	'
int	getPrecision(int param)	'
int	getScale(int param)	'
int	getParameterType(int param)	'
String	getParamterTypeName (int param)	'
String	getParamterClassName (int param)	'
int	getParameterMode (int param)	'

## java.sql.PreparedStatement#####JDBC3.0#####

PreparedStatement.getParameterMetaData#####PreparedStatement#####ParameterMetaDa

**# 101. PreparedStatement#####JDBC 3.0#####**

###	####	#####
ParameterMetaData	getParameterMetaData()	'

## java.sql.Savepoint #####

Savepoint#####JDBC

3.0#####

#####

#####

JDBC

3.0#API###Connection.setSavepoint#####

Connection.rollback#####[java.sql.Connection#####](#)

[JDBC3.0#####](#)

#####svpt1#####svpt1#####

```
conn.setAutoCommit(false); // #####
Statement stmt = conn.createStatement();
int rows = stmt.executeUpdate("INSERT INTO TABLE1 (COL1) VALUES(1)");
// #####
set savepoint
```

Derby #####

```
Savepoint svpt1 = conn.setSavepoint("S1");
rows = stmt.executeUpdate("INSERT INTO TABLE1 (COL1) VALUES (2)");
...
conn.rollback(svpt1);
...
conn.commit();
```

#####

Connection.releaseSavepoint#####

#####

#####

#####

#####executeBatch#####

#####(#####)#####(#####)#####

#####

Derby#####

Derby#####

**# 102. JDBC 3.0#####**

###	####	#####
int	getSavepointId()	##### #####SQLException#####
String	getSavepointName()	##### #####SQLException#####

**java.sql.Statement#####: JDBC 3.0#####**

**# 103. JDBC 3.0#####Statement#####**

###	####	#####
ResultSet	getGeneratedKeys()	#####IDENTITY_VAL_LO
boolean	execute(String sql, int autoGeneratedKeys)	sql#INSERT#####autoGeneratedKeys#####
boolean	execute(String sql, int [] columnIndexes)	sql#INSERT#####columnIndexes#####
boolean	execute(String sql, String [] columnNames)	sql#INSERT#####columnNames#####
int	executeUpdate(String sql, int autoGeneratedKeys)	sql#INSERT#####autoGeneratedKeys#####
int	executeUpdate(String sql, int [] columnIndexes)	sql#INSERT#####columnIndexes##### #####INSERT#####
int	executeUpdate(String sql, String [] columnNames)	sql#INSERT#####columnNames#####

Autogenerated keys

Derby #####

```
JDBC 3.0#####
Derby#####
JDBC
3.0##Statement.getGeneratedKeys#####Result
##getGeneratedKeys#####ResultSet#####ResultSet.getMetaData#####IDENTITY_VAL_LOCA
####Connection.prepareStatement#####Statement.execute#####Statement.executeUpdate#####
    • #####Statement.RETURN_GENERATED_KEYS##
    • #####Derby
      #####(#####Derby#####)
    • #####Derby#####(#####Derby#####)
```

#

#####TABLE1#####

```
CREATE TABLE TABLE1 (C11 int, C12 int GENERATED ALWAYS AS IDENTITY)
```

#####TABLE1#####C12 #####ResultSet#####

### 1:

```
Statement stmt = conn.createStatement();
stmt.execute(
    "INSERT INTO TABLE1 (C11) VALUES (1)",
    Statement.RETURN_GENERATED_KEYS);
ResultSet rs = stmt.getGeneratedKeys();
```

### 2:

```
Statement stmt = conn.createStatement();
String [] colNames = new String [] { "C12" };
stmt.execute(
    "INSERT INTO TABLE1 (C11) VALUES (1)",
    colNames);
ResultSet rs = stmt.getGeneratedKeys();
```

### 3:

```
Statement stmt = conn.createStatement();
int [] colIndexes = new int [] { 2 };
stmt.execute(
    "INSERT INTO TABLE1 (C11) VALUES (1)",
    colIndexes);
ResultSet rs = stmt.getGeneratedKeys();
```

```
#####
Statement.getGeneratedKeys#####null#ResultSet#####
```

## JDBC 4.0###

JDBC 4.0 #####API#####Derby#####

**Note:** #####JDK 1.6#####

#####

- **DataSources** JDBC  
4.0#####Derby#####[javax.sql.DataSource](#)#####[javax.sql.DataSource](#)  
#####: [JDBC 4.0###](#)#####

Derby #####

- **JDBC#####**  
#####JDBC#####  
JDBC  
4.0#####Class.forName()#####Driv
- **SQLExceptions. JDBC 4.0**  
#####SQLException#####[SQLException#####](#)
- **#### JDBC**  
4.0#####JDBC#####Connection#  
Derby#####Derby#####
- **##### JDBC**  
4.0#####[javax.sql.PooledConnection#####](#)
- **Streaming API JDBC**  
4.0##CallableStatement#PreparedStatement#ResultSet#####
- **#####** ##### [javax.sql.Connection#](#)  
[javax.sql.DatabaseMetaData](#)  
###[javax.sql.Statement](#)[java.sql.Connection#####JDBC4.0#####](#)[java.sql.DatabaseM](#)  
[JDBC4.0####](#)[java.sql.Statement#####JDBC 4.0#####](#)

### #####SQLException#####

#####JDK 1.6##### Derby  
#####JDBC4.0#####SQLException#####  
#####javadoc#####

- [java.sql.SQLClientInfoException](#)
- [java.sql.SQLDataException](#)
- [java.sql.SQLFeatureNotSupportedException](#)
- [java.sql.SQLIntegrityConstraintViolationException](#)
- [java.sql.SQLInvalidAuthorizationSpecException](#)
- [java.sql.SQLSyntaxErrorException](#)
- [java.sql.SQLTransactionRollbackException](#)
- [java.sql.SQLTransientConnectionException](#)

### [java.sql.Connection#####JDBC4.0#####](#)

JDBC 4.0 #####

- **LOB### -**  
#####[createBlob\(\)](#)#####[createClob\(\)](#)#####Blob#Clob#####
- **##### - isValid#####Connection#####**

### [java.sql.DatabaseMetaData#####JDBC4.0###](#)

Derby###JDBC 4.0#####

- **##### -**  
JDBC4.0#####  
[autoCommitFailureClosesAllResultSets#](#) [providesQueryObjectGenerator#](#)  
[getClientInfoProperties###](#) [supportsStoredFunctionsUsingCallSyntax###](#)
- **##### -**  
#####[getColumns#####IS\\_AUTOINCREMENT#YES###](#)
- **##### - JDBC**  
4.0#####  
#####[getFunctions###](#)[getFunctionColumns###](#)  
#####[getProcedures###](#)[getProcedureColumns#####](#)
- **##### -**  
[getProcedureColumns#####](#)[javadoc](#)  
[COLUMN\\_DEF#](#) [SQL\\_DATA\\_TYPE#](#) [SQL\\_DATETIME\\_SUB#](#)

Derby #####

CHAR\_OCTET\_LENGTH# ORDINAL\_POSITION#  
IS\_NULLABLE###SPECIFIC\_NAME###  
• ##### - JDBC  
4.0##getSchemas#####

## java.sql.Statement#####: JDBC 4.0#####

Derby#Statement###JDBC 4.0#####  
• ##### - JDBC 4.0#####  
###isPoolable#setPoolable###  
• ##### - JDBC 4.0##isClosed#####

## javax.sql.DataSource #####: JDBC 4.0###

Derby###JDBC 4.0###DataSource#####JDK  
1.6#####DataSource#####  
• org.apache.derby.jdbc.EmbeddedConnectionPoolDataSource40  
• org.apache.derby.jdbc.EmbeddedDataSource40  
• org.apache.derby.jdbc.EmbeddedXADataSource40  
• org.apache.derby.jdbc.ClientConnectionPoolDataSource40  
• org.apache.derby.jdbc.ClientDataSource40  
• org.apache.derby.jdbc.ClientXADataSource40

## JDBC#####

JDBC##DBMS#####SQL#####JDB

JDBC#####

{##### }

Derby#####JDBC#####

- #####JDBC#####  
#####CallableStatements#####
- JDBC#####  
#####
- LIKE##JDBC#####  
#####LIKE#####
- fn#####JDBC#####  
#####
- #####JDBC#####  
#####
- #####JDBC#####  
#####
- #####JDBC#####  
#####

#####JDBC#####

Note:

Derby##Connection.nativeSQL#####SQL#####SQL#####

## #####JDBC#####

Derby #####

#####CallableStatement####java.sql.Statement#java.sql.PreparedStatement #####

##

```
{call statement }
```

-- Java#####

```
{ call TOURS.BOOK_TOUR(?, ?) }
```

## JDBC#####

Derby####JDBC#####SQL#####

##

```
{d 'yyyy-mm-dd' }
```

#####

```
DATE('yyyy-mm-dd')
```

```
VALUES {d '1999-01-09' }
```

## LIKE##JDBC#####

SQL#LIKE###%((#####)#\_((#####)#####JDBC#####LIKE

##

```
WHERE ### [ NOT ]
```

```
LIKE
```

```
#####
```

```
{ ESCAPE '#####' }
```

-- "%"#####

```
SELECT a FROM tabA WHERE a LIKE '$%%' {escape '$' }
```

-- "\_"#####

```
SELECT a FROM tabA WHERE a LIKE '%=_ ' {escape '=' }
```

**Note:** LIKE#####?#####?#####

#####(#####16#####)#####

JDBC#####LIKE#####

## fn#####JDBC#####

JDBC#####fn#####

##

```
{fn #####}
```

#####

**abs**

```
#####
```

```
abs(##)
```

JDBC#####{fn abs(##)}#####ABSOLUTE(##)#####

#####ABS#ABSVAL##

**acos**



Derby #####

#####

**acos( # )**

JDBC#####{fn acos( # )}#####ACOS( # )#####ACOS#####

**asin**

#####

**asin( # )**

JDBC#####{fn asin( # )}#####ASIN( # )#####ASIN#####

**atan**

#####

**atan( # )**

The JDBC#####{fn  
atan( # )}#####ATAN( # )#####ATAN#####

**ceiling**

#####

**ceiling( # )**

JDBC#####{fn  
ceiling( # )}#####CEILING( # )#####CEIL###CEILING#####

**concat**

#####

**concat( ###, ### )**

#####NULL#####JDBC#####{fn  
concat( ###, ### )}#####{ ### || ### }#####Concatenation#####

**cos**

#####

**cos( # )**

JDBC#####{fn cos( # )}#####COS( # )#####COS #####

**degrees**

#####

**degrees( # )**

JDBC#####{fn degrees( # )}#####DEGREES( # )#####DEGREES  
#####

**exp**

e#####

**exp( # )**

JDBC#####{fn exp( # )}#####EXP( # )#####EXP#####

**floor**

#####

**floor( # )**

JDBC#####{fn floor( # )}#####FLOOR( # )#####FLOOR#####

Derby #####

## locate

#####  
#####

locate(###,### [, ###] )

JDBC#####{fn locate(###,### [, ###]  
)}#####LOCATE(CharacterExpression, CharacterExpression [, StartPosition]  
)#####LOCATE#####

## log

#####(##e#####)#####

log( # )

JDBC#####{fn log(##)}#####LOG(##)#####LN####LOG#####

## log10

#####10#####

log10( # )

JDBC#####{fn log10(##)}#####LOG10(##)#####LOG10 #####

## mod

#####(##)#####

mod( ##, ## )

###MOD#####

## pi

pi#####

pi( )

JDBC#####{fn pi()}#####PI()#####PI #####

## radians

#####

radians( # )

JDBC#####{fn radians(##)}#####RADIANS(##)#####RADIAN  
#####

## sin

#####

sin( # )

JDBC#####{fn sin(##)}#####SIN(##)#####SIN#####

## sqrt

#####

sqrt( ##### )

JDBC#####{fn sqrt  
(#####)}#####SQRT(#####)#####SQRT#####

## substring

#####1#####

substring(###, ###, ##)

Derby #####

**tan**

#####

tan( # )

JDBC#####{fn tan( # )}#####TAN( # )#####TAN#####

**TIMESTAMPADD**

TIMESTAMPADD#####

TIMESTAMPADD#JDBC#####JDBC#####

TIMESTAMPADD( #####, ###, ##### )

#####TIMESTAMPADD#####00:00:00.0#####

WHERE#####

**TIMESTAMPDIFF**

TIMESTAMPDIFF#####

TIMESTAMPDIFF#JDBC#####JDBC#####

TIMESTAMPDIFF( #####, #####1, #####2 )

#####TIMESTAMPDIFF#####00:00:00.0#####

WHERE#####

**TIMESTAMPADD ### TIMESTAMPDIFF#####**

TIMESTAMPADD###TIMESTAMPDIFF#####

- SQL\_TSI\_DAY
- SQL\_TSI\_FRAC\_SECOND
- SQL\_TSI\_HOUR
- SQL\_TSI\_MINUTE
- SQL\_TSI\_MONTH
- SQL\_TSI\_QUARTER
- SQL\_TSI\_SECOND
- SQL\_TSI\_WEEK
- SQL\_TSI\_YEAR

**#####TIMESTAMPADD#TIMESTAMPDIFF#####**

#####

{fn TIMESTAMPADD( SQL\_TSI\_MONTH, 1, CURRENT\_TIMESTAMP)}

#####2008#1#1#####

{fn TIMESTAMPDIFF( SQL\_TSI\_WEEK, CURRENT\_TIMESTAMP, timestamp( '2008-01-01-12.00.00.000000' ) )}

**#####JDBC#####**

Derby#####(#####)#JDBC#####SQL#####

#####JOIN #######

##

{oj ##### [#### ]\* }

####

Derby #####

```
#### [#### ]*
```

```
-- ####
SELECT *
FROM
{oj Countries LEFT OUTER JOIN Cities ON
  (Countries.country_ISO_code=Cities.country_ISO_code)}
-- #####
SELECT *
FROM
{oj Countries JOIN Cities ON
  (Countries.country_ISO_code=Cities.country_ISO_code)}
-- #####
-- FROM#####
SELECT E.EMPNO, E.LASTNAME, M.EMPNO, M.LASTNAME
FROM {oj EMPLOYEE E INNER JOIN DEPARTMENT
INNER JOIN EMPLOYEE M ON MGRNO = M.EMPNO ON E.WORKDEPT = DEPTNO};
```

#####JDBC#####

Derby#####JDBC#####SQL#####Derby##8##(6#####2#)#ISO#####

##

```
{t 'hh:mm:ss'}
```

#####

TIME 'hh:mm:ss'

#

```
VALUES {t '20:00:03'}
```

#####JDBC#####

Derby#####JDBC#####SQL#####

##

```
{d 'yyyy-mm-dd'}
```

#####

DATE 'yyyy-mm-dd'

#

```
VALUES {d '1995-12-19'}
```

#####JDBC#####

Derby#####JDBC#####SQL#####

###Derby##23##(17#####3#####3#)#ISO#####

##

```
{ts 'yyyy-mm-dd hh:mm:ss.f...'}  
#####
```

TIMESTAMP 'yyyy-mm-dd hh:mm:ss.f...'

#####(f...)#####

Derby #####

```
VALUES {ts '1999-01-09 20:11:11.123455'}
```

Derby #####

## #####URL#####

Derby#####URL##### JDBC#####

###Derby#####

#####Derby#####URL#####

Note: #####

## bootPassword=key##

##

#####

- #####
- #####
- #####

8#####

#####

#####bootPassword=key###create=true

####dataEncryption=true#####

#####bootPassword=key###dataEncryption=true#####

#####SQL#####Derby #####

#####SQL#####

#####

#

-- #####

jdbc:derby:newDB;create=true;dataEncryption=true;  
bootPassword=cseveryPlace

-- #####

jdbc:derby:salesdb;dataEncryption=true;bootPassword=cseveryPlace

-- #####

jdbc:derby:encryptedDB;bootPassword=cseveryPlace

## collation=collation ##

##

collation#####

collation#####TERRITORY\_BASED#UCS\_BASIC###

####:

collation#####

Derby#####collation###TERRITORY\_BASED#####territory#####

#####territory#####Derby#java.util.Locale.getDefault#####Java#

Note:

collation#####

#

#####MexicanDB#####URL#####territory#####collat

jdbc:derby:MexicanDB;create=true;territory=es\_MX;collation=TERRITORY\_BASED

Derby #####

Derby#####Derby #####Derby#####

## create=true ##

##

Derby#####URL#####

#####SQLWarning#####

JDBC#####

#####URL#create=true#####

#####

#####

#####(user=userName #####

###SQL#####(Derby #####

#####SQL#####)#####

#####APP#####(SET  
SCHEMA #####)

#####

(#####URL#####)databaseName#####databaseName=nameofDatabase#####

#####territory=ll\_CC#####

**Note:** create=true#####SQLWarning#####

jdbc:derby:sampleDB;create=true

jdbc:derby:;databaseName=newDB;create=true;

## createFrom=Path##

##

#####URL#createFrom=path#####

##derby.system.home##### ##derby.system.home##

#####logDevice###createFrom=path#####cr

#####Derby #####

#####

#####rollforwardrecoveryFrom#restoreFrom#create#####

URL: jdbc:derby:wombat;createFrom=d:/backup/wombat

## databaseName=nameofDatabase##

##

#####

#####URL(###Properties#####)

- jdbc:derby:toursDB
- jdbc:derby:;databaseName=toursDB
- jdbc:derby:(#####Properties#####databaseName#####toursDB#####)

##URL#####URL#tour

jdbc:derby:toursDB;databaseName=flightsDB

Derby #####

```
#####Derby#####getPropertyInfo##  
#####java.sql.Driver.getPropertyInfo #####  
  
#####  
#####  
  
jdbc:derby:;databaseName=newDB;create=true
```

## dataEncryption=true##

```
##  
#####Derby  
#####  
  
#####  
  
dataEncryption####bootPassword=key####newEncryptionKey=key#####  
#####encryptionProvider=providerName#encryptionAlgorithm=algorithm#####  
  
#####SQL#####Derby  
#####SQL#####  
  
#  
  
-- #####  
jdbc:derby:encryptedDB;create=true;dataEncryption=true;  
    bootPassword=cLo4u922sc23aPe  
-- #####  
jdbc:derby:salesdb;dataEncryption=true;bootPassword=cLo4u922sc23aPe
```

## encryptionKey=key##

```
##  
#####  
    • #####  
    • #####  
    • #####  
#####  
  
#####  
  
#####encryptionKey#create=true#dataEncryption=true#####  
  
#####encryptionKey###dataEncryption=true#####  
###SQL#####Derby  
#####SQL#####  
  
#####encryptionAlgorithm#####  
  
Derby#####DES/CBC/NoPadding###  
  
#  
  
#####JDBC URL##:  
  
jdbc:derby:newDB;create=true;dataEncryption=true;  
    encryptionAlgorithm=DES/CBC/NoPadding;encryptionKey=6162636465666768  
  
#####JDBC URL##:  
  
jdbc:derby:salesdb;dataEncryption=true;encryptionKey=6162636465666768  
  
#####JDBC URL##:
```



Derby #####

```
jdbc:derby:encryptedDB;encryptionKey=6162636465666768
```

## encryptionProvider=providerName##

##

#####Derby #####

#####

#####JVM#####

#####

encryptionProvider###bootPassword=key#dataEncryption=true#####

##encryptionAlgorithm=algorithm #####

###SQL#####

#####Derby #####

#####SQL#####

#

-- #####

```
jdbc:derby:encryptedDB;create=true;dataEncryption=true;
```

```
encryptionProvider=com.sun.crypto.provider.SunJCE;
```

```
encryptionAlgorithm=DESede/CBC/NoPadding;
```

```
bootPassword=cLo4u922sc23aPe
```

-- #####

```
jdbc:derby:salesdb;dataEncryption=true;
```

```
encryptionProvider=com.sun.crypto.provider.SunJCE;
```

```
encryptionAlgorithm=DESede/CBC/NoPadding;
```

```
bootPassword=cLo4u922sc23aPe
```

## encryptionAlgorithm=algorithm ##

##

#####

Java#####

algorithmName/feedbackMode/padding

Derby##padding####NoPadding#####

#####DES/CBC/NoPadding#####

#####Derby #####

#####

encryptionAlgorithm####bootPassword=key###dataEncryption=true

#####

####encryptionProvider=providerName#####

#####SQL#####Derby

#####SQL#####

#

-- #####

```
jdbc:derby:encryptedDB;create=true;dataEncryption=true;
```

```
encryptionProvider=com.sun.crypto.provider.SunJCE;
```

```
encryptionAlgorithm=DESede/CBC/NoPadding;
```

```
bootPassword=cLo4u922sc23aPe
```

-- #####

Derby #####

```
jdbc:derby:salesdb;dataEncryption=true;
encryptionProvider=com.sun.crypto.provider.SunJCE;
encryptionAlgorithm=DESede/CBC/NoPadding;
bootPassword=cLo4u922sc23aPe
```

Note: #####Derby#####

## logDevice=logDirectoryPath ##

##

logDirectoryPath#####logDirectoryPath#####

#####Derby

#####logDevice=logDirectoryPath#####

#####

*create# createFrom#restoreFrom####rollForwardRecoveryFrom#####*

```
jdbc:derby:newDB;create=true;logDevice=d:/newDBlog
```

## newEncryptionKey=key ##

##

#####

#####

#####

newEncryptionKey###*encryptionKey=key*#####

newEncryptionKey#####

#####SQL#####*#####*#####

#####Derby #####SQL#####

#

-- #####

```
jdbc:derby:salesdb;encryptionKey=6162636465666768;newEncryptionKey=6862636465666768
```

## newBootPassword=newPassword ##

##

#####

#####Derby #####

#####

#####

newBootPassword###*bootPassword=key*#####

newBootPassword#####

#####SQL#####*#####*#####

#####Derby #####SQL#####

#

-- #####

```
jdbc:derby:salesdb;bootPassword=abc1234xyz;newBootPassword=new1234xyz
```

Derby #####

## password=userPassword

##

#####

#####

*user=userName#####*

jdbc:derby:toursDB;user=jack;password=upTheHill

## restoreFrom=path##

##

#####URL#####restoreFrom=path#####derby.system.home#####

#####logDevice###restoreFrom=path#####

#####Derby #####

#####

#####createFrom#rollforwardrecoveryFrom#####create#####

URL: jdbc:derby:wombat;restoreFrom=d:/backup/wombat

## rollForwardRecoveryFrom=path ##

##

####URL#

rollForwardRecoveryFrom=path#####

#####

#####

#####Derby #####

#####

#####createFrom#restoreFrom###create#####

URL: jdbc:derby:wombat;rollForwardRecoveryFrom=d:/backup/wombat

## shutdown=true##

##

databaseName#####(#####)

###SQL#####*#####*Derby

#####SQL#####

databaseName#####Derby#####

#####Derby#####

#####Derby#####JDBC#####JVM#####JVM#####

Derby#####Derby#####Derby

#####1#####

#####

Derby #####

```
#####  
Note: ###shutdown=true####DriverManager#####  
  
-- #####  
jdbc:derby:;shutdown=true  
-- salesDB#####(#####)  
jdbc:derby:salesDB;shutdown=true
```

**territory=ll\_CC ##**

```
##  
##### territory#####  
#####ll_CC#####l#2#####CC #2#####  
#####ISO-639#####  
# 104. #####
```

####	##
de	German
en	English
es	Spanish
ja	Japanese

ISO-639#####<http://www.ics.uci.edu/pub/ietf/http/related/iso639.txt>#####  
#####2#####ISO-3166#####  
**# 105. #####**

####	##
DE	Germany
US	United States
ES	Spain
MX	Mexico
JP	Japan

ISO-3166####[http://www.chemie.fu-berlin.de/diverse/doc/ISO\\_3166.html](http://www.chemie.fu-berlin.de/diverse/doc/ISO_3166.html)#####  
#####  
territory#####  
#####  
  
jdbc:derby:MexicanDB;create=true;territory=es\_MX  
  
collation  
##territory#####Unicode#####

**traceDirectory=path ##**

##

Derby #####

```
Derby#####JDBC#####
traceFile=path#####
#####Derby#####
##### Derby #####
#####
#####
#

-- #####
jdbc:derby://localhost:1527/mydb;traceDirectory=/home/mydir/mydbtracedir
-- #####
jdbc:derby://localhost:1527/mydb;traceDirectory=/home/mydir/
mydbtracedir;traceFile=trace.out
-- #####
jdbc:derby://localhost:1527/mydb;traceDirectory=/home/mydir/
mydbtracedir;traceFileAppend=true
```

## traceFile=path ##

```
##

Derby#####JDBC#####derby.system.home#
#####)

traceFile=path#traceFileAppend=true#####traceFile=
##### Derby #####
##### traceDirectory=path# traceLevel=value#####
#####
#####
#

-- #####
jdbc:derby://localhost:1527/mydb;create=true;traceFile=trace.out
```

## traceFileAppend=true ##

```
##

Derby#####JDBC#####traceFile=path#####
##### Derby
##### traceDirectory=path#traceLevel=
#####
#####traceFile=path####traceDirectory=path#####
#

-- #####
-- #####
jdbc:derby://localhost:1527/mydb;traceFile=trace.out;traceFileAppend=true
-- #####
-- Derby#####
-- #####
jdbc:derby://localhost:1527/
mydb;traceDirectory=mytracedir;traceFileAppend=true
```

Derby #####

## traceLevel=value ##

##

#####Derby#####value#####

#####Derby #####

##### traceFile=path# traceFileAppend=true###

traceDirectory=path#####

#####

#####

### # 106. Available tracing levels and values

#####	16##	10##
org.apache.derby.jdbc.ClientDataSource.TRACE_NONE	0x0	0
org.apache.derby.jdbc.ClientDataSource.TRACE_CONNECTION_CALL	0x1	1
org.apache.derby.jdbc.ClientDataSource.TRACE_STATEMENT_CALLS	0x2	2
org.apache.derby.jdbc.ClientDataSource.TRACE_RESULT_SET_CALL	0x4	4
org.apache.derby.jdbc.ClientDataSource.TRACE_DRIVER_CONFIGUR	0x10	16
org.apache.derby.jdbc.ClientDataSource.TRACE_CONNECTS	0x20	32
org.apache.derby.jdbc.ClientDataSource.TRACE_PROTOCOL_FLOWS	0x40	64
org.apache.derby.jdbc.ClientDataSource.TRACE_RESULT_SET_META	0x80	128
org.apache.derby.jdbc.ClientDataSource.TRACE_PARAMETER_META	0x100	256
org.apache.derby.jdbc.ClientDataSource.TRACE_DIAGNOSTICS	0x200	512
org.apache.derby.jdbc.ClientDataSource.TRACE_XA_CALLS	0x800	2048
org.apache.derby.jdbc.ClientDataSource.TRACE_ALL	0xFFFF	-1

#####

- ij#####10#####TRACE\_PROTOC  
(64)#TRACE\_CONNECTION\_CALLS (1)#####65#####

- JDBC#####

- #####OR##( |  
 )#####

TRACE\_PROTOCOL\_FLOWS | TRACE\_CONNECTION\_CALLS

- #####( ~  
 )#####

~TRACE\_PROTOCOL\_FLOWS

#####

#####traceFile=path#####traceDirectory=path#####

#

-- #####

jdbc:derby://localhost:1527/

mydb;create=true;traceFile=trace.out;traceLevel=65

Derby #####

## upgrade=true attribute

##

#####Derby#####Derby#####

#####Derby #####

#####

#####Derby #####

#####SQL#####

#####Derby #####SQL#####

#####

(#####URL#####)#####*databaseName=nameofDatabase*#####

*collation*#### *territory=IL\_CC*#####

jdbc:derby:sampleDB;upgrade=true

jdbc:derby:;databaseName=sampleDB;upgrade=true;

## user=userName ##

#####

#####

*password=userPassword*#####

#####URL###jill#####toursDB#####

jdbc:derby:toursDB;user=jill;password=toFetchAPail

## ssl=sslMode ##

##

#####SSL#####

*sslMode*#basic#*peerAuthentication*####off(##)##### ##Derby

#####SSL/TLS#####

#####

#####

#

mydb#basic SSL#####

jdbc:derby://localhost/mydb;ssl=basic

## #####

#####*databaseName*#####

Derby#####

#####SQLException#####

jdbc:derby:mydb

Derby #####

## J2EE####:Java Transaction API#javax.sql #####

J2EE#Java 2 Platform, Enterprise

Edition#####

J2EE##Java 2 Platform, Standard Edition (J2SE)####Enterprise Java

Beans (EJB)#Java Server Pages (JSP)#####XML#####

J2EE#####

Derby#####J2EE#####J2EE#####JNDI#####

J2EE#####<http://java.sun.com/javase/reference/>

#####J2EE#####

J2EE#####J2EE#####

- JNDI####

#####URL#####JDBC##

- #####

#####((Derby)#####

#####

#####/

#####

#####JDBC#####[javax.sql.ConnectionPoolDataSource](#)#[javax.sql.PooledConnection](#)#####

- XA #####

XA#####

###2#####[javax.sql.XAxxx](#)#####[java.transaction.xa](#)#####XA#####

XA#####X/Open CAE Specification-Distributed Transaction Processing:

The XA Specification, X/Open Document No. XO/CAE/91/300##ISBN

1 872630 24 3#####

JTA#API##[java.transaction.xa](#)#####([javax.sql.XAConnection](#),[javax.sql.XADataSource](#),[ja](#)

and [javax.transaction.xa.XAException](#))#####

#####JDBC#####

**Note:** #####Derby#####Derby

#####6#####Derby#J2EE#####

## JTA API

JTA API#

[java.transaction.xa](#)#####API#Derby#####

- [javax.transaction.xa.XAResource](#)
- [javax.transaction.xa.Xid](#)
- [javax.transaction.xa.XAException](#)

#####

#####

[XAResource.prepare](#)#####

**XAConnection#####**

#####XAConnection#####XAConnection#####

#####XAConnection#####XAConnection#####

#####XAConnection#####



Derby #####

**Note:** ####(#####/###)####XA#####XA  
DataSource#####

## javax.sql:JDBC#####

#####Derby#####JDBC#####J2EE#####

#####JDK#API#####[http://java.sun.com/  
javase/reference/api.jsp](http://java.sun.com/javase/reference/api.jsp)#####

- *javax.sql.DataSource*

#####DataSource#####Java  
Naming and Directory (JNDI) API#####

- *javax.sql.ConnectionPoolDataSource# javax.sql.PooledConnection*

#####/

#####

Derby#ConnectionPoolDataSource###PooledConnection#####

#####

- *javax.sql.XAConnection*

###XAConnection#####XAResource#####Connection#####

- *javax.sql.XADataSource*

XADataSource#####XAConnections#####ConnectionPoolDataSource###

###Derby##XADataSource#DataSource#ConnectionPoolDataSource#####

Derby#####

- *setCreateDatabase(String create)*

#####"create"#####

- *setShutdownDatabase(String shutdown)*

#####"shutdown"#####

**Note:** #####

Derby #####

## Derby API

```
Derby#javadoc#####API#####Javadoc#HTML#####
#####API#####Derby###Derby####API####java.sql#Javadoc##JDBC
API##### Derby####JDBC#####JDBC #####
#####API#####java
class###JDBC#####JDBC
API#####
```

#####

```
#####org.apache.derby.tools#####
• org.apache.derby.tools.ij
SQL#####/
##### Derby #####
• org.apache.derby.tools.sysinfo
#####JVM#Derby##### Derby
#####
• org.apache.derby.tools.dblook
#####DDL#####Derby #####
```

## JDBC#####

### JDBC driver

```
#####Derby#JDBC#####:
• org.apache.derby.jdbc.EmbeddedDriver
#####Derby#####JDBC#####
• org.apache.derby.jdbc.ClientDriver
#####Derby#####/#####
Derby #####
```

#####

```
#####javax.sql.DataSource#####API#####Derby##### #####Derby #####
#####
```

```
#####JDK1.5#####
```

#####:

- org.apache.derby.jdbc.EmbeddedDataSource and org.apache.derby.jdbc.EmbeddedDataSource40
- org.apache.derby.jdbc.EmbeddedConnectionPoolDataSource and org.apache.derby.jdbc.EmbeddedConnectionPoolDataSource40
- org.apache.derby.jdbc.EmbeddedXADataSource and org.apache.derby.jdbc.EmbeddedXADataSource40

Client-server environment

- org.apache.derby.jdbc.ClientDataSource and org.apache.derby.jdbc.ClientDataSource40

Derby #####

- *org.apache.derby.jdbc.ClientConnectionPoolDataSource* and  
*org.apache.derby.jdbc.ClientConnectionPoolDataSource40*
- *org.apache.derby.jdbc.ClientXADataSource* and  
*org.apache.derby.jdbc.ClientXADataSource40*

#####

- *org.apache.derby.authentication.UserAuthenticator*
- #####Derby#####  
#####Derby  
#####7#####

Derby #####

#####

#####

##	Derby####(derby.territory)
###(###)	zh_CN
###(###)	zh_TW
####	cs
#####	fr
####	de_DE
#####	hu
#####	it
###	ja_JP
###	ko_KR
#####	pl
#####(#####)	pt_BR
####	ru
#####	es

Derby #####

## Derby####

#####Derby#####

#####

**# 107. #####**

#####Derby#####

#	##
#####	1,012
#####	5,000
#####	90
#####	32,767 #####
SQL#####	#####
#####	1,012
WHERE##HAVING#####	#####
GROUP BY#####	32,677
ORDER BY#####	1,012
#####	#####
#####	#####
#####	#####
#####	#####
#####	#####
#####	#####
#####	#####
#####	#####
#####	16

## DATE#TIME#TIMESTAMP###

#####Derby#####

**Table 108. DATE#TIME#TIMESTAMP###**

#	##
DATE####	0001-01-01
DATE####	9999-12-31
TIME####	00:00:00
TIME####	24:00:00
TIMESTAMP####	0001-01-01-00.00.00.000000

Derby #####

#	##
TIMESTAMP####	9999-12-31-23.59.59.999999

#####

# 109. #####

#####Derby#####

###	#####
###	128
###	128
#####	128
#####	128
#####	128
#####	128
#####	128
#####	128
#####	128
#####	128
#####	128
#####	128
#####	128
#####	128
#####	128
#####	128

#####

Derby#####

# 110. #####

#	##
INTEGER####	-2,147,483,648
INTEGER####	2,147,483,647
BIGINT####	-9,223,372,036,854,775,808
BIGINT####	9,223,372,036,854,775,807
SMALLINT####	-32,768
SMALLINT####	32,767
decimal#####	31
DOUBLE####	-1.79769E+308

Derby #####

#	##
DOUBLE####	1.79769E+308
##DOUBLE####	2.225E-307
##DOUBLE####	-2.225E-307
REAL####	-3.402E+38
REAL####	3.402E+38
##REAL####	1.175E-37
##REAL####	-1.175E-37

#####

# 111. #####

#####Derby#####

#	##
CHAR###	254##
VARCHAR###	32,672##
LONG VARCHAR###	32,700##
CLOB###	2,147,483,647##
BLOB###	2,147,483,647##
#####	32,672
#####	2,147,483,647
#####	2,147,483,647
16#####	16,336
DOUBLE#####	30 characters

XML###

#####Derby##XML#####

Table 112. XML###

##	##
XML###	2,147,483,647##
XML#####	Apache Xerces####JAXP#####Apache Xalan#####

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