

SQL

Structured Query Language

SQL

- Structured Query Language
- International **standard** for database programming
- A 4th generation programming language
 - describing what to do rather than how to do, e.g. order by (sort in SQL) is correspond to a snippet of program in other general-purpose language.

History

- **SQL-92(SQL2)**
 - Complete, stable
- **SQL2003**
 - Have a CORE that must conform
- **SQL2011**

Style

- **End with ;**
- **Free writing style**
 - several clause in multiline
- **Insensitive to uppercase/lowercase**

ISO SQL data types.

- BOOLEAN
- CHAR(n), VARCHAR(n)
- SMALLINT, INTEGER, BIGINT
- REAL, DOUBLE PRECISION, FLOAT(n); NUMERIC(p,d)
- DATE, TIME, TIMESTAMP; INTERVAL
- CHARACTER LARGE OBJECT, BINARY LARGE OBJECT

numeric(p,d) : A fixed-point number with p digits (plus a sign), and d of the p digits are to the right of the decimal point.
float(n): A floating-point number, with precision of at least n digits.

- **CHAR(n), VARCHAR(n)**
- **INT**
- **NUMERIC(7,2)**
- **DATE 'YYYY-MM-DD'**
- **TIME 'HH:MM:SS'**
- **TIMESTAMP '2012-09-11 09:18:31.685039'**

NULL / null

- **NULL/null** is special value that means **none** or **not known**.
- Two NULL values are not think of as equal.
- The result of an arithmetic expression (involving, for example +, −, *, or /) is null if any of the input values is null.

Operators:

+ **-** ***** **/** **^** ******

> **>=** **<** **<=** **=** **<>** **!=**

between...and...

in

not

like

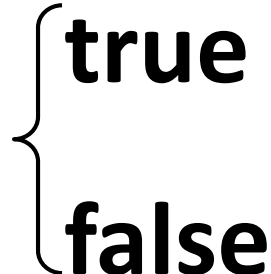
is NULL

exists

and

or

not

- Sage **between 18 and 21**
- Ssex **in** {'男', '女'}
- Sname **like** '李%'
- Sname **like** '李_ _'
- Sdept **is NULL**
- **exists.....** 
 - true**
 - false**

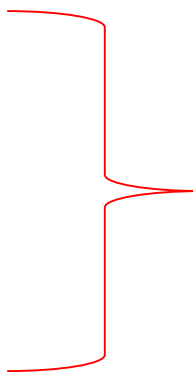
[18,21]

- To illustrate, consider the following patterns, which use a backslash (\) as the escape character:
- like 'ab\%cd%' escape '\ ' matches all strings beginning with "ab%cd".
- like 'ab\\cd%' escape '\ ' matches all strings beginning with "ab\cd".

built-in aggregate functions

- Count: **count()**
- Total: **sum()**
- Average: **avg()**
- Minimum: **min()**
- Maximum: **max()**

Core Statements in SQL

- **select** - *query, read only*
 - **insert**
 - **delete**
 - **Update**
- 
- write or update*
- **create** - *create tables initially.*