**STRUCTURED QUERY LANGUAGE**

Structured Query Language (SQL) is a non-procedural database language used for storing and retrieving data from the database.

SQL was invented by IBM in early 1970’s. IBM was able to demonstrate how to control relational databases using SQL.

Oracle’s database language is SQL. (Oracle is a software package containing both front end tools and back end tools. The back end tool is SQL\*PLUS - It submits SQL and PL/SQL statements to the server for execution.) A table is a primary database object of SQL that is used to store data. A table holds data in the form of rows and columns.

SQL supports the following categories of commands to communicate with the database:-

|  |  |  |
| --- | --- | --- |
| **Commands** | **Statements** | **Description** |
| Data Definition Language | Create , Alter Drop, Rename Truncate | Sets up ,changes and removes data  structures called tables |
| \\Data Manipulation Language | Insert , delete ,update  Select | Adds , removes and changes rows in Db. Retrieves data from Db. |
| Data Control Language | Grant ,revoke | Gives or removes access rights to others. |
| Transaction Control Language | Commit, Rollback, save point | Manages the changes made by DML. |

**Oracle Data types**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type Name** | **Syntax** | **Description** | **Range** | **Valid Data** |
| Character | char ( length) ex: char(10) | Fixed length character | 1 to 2000  bytes | ‘1234567890’  ‘dfee’ |
| Character | varchar2(length) ex: varchar2(5) | Variable length Character string | 1 to 4000  bytes | ‘asqeq’ ‘1234’  ‘ssf%.sd’ |
| Number | Number | Integer of any | Integer range | Any number |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | number(3) number (4,1) | maximum range Only 3 digits  Float of max 1 decimal place | 38 digits  after decimal  -84 to 127 | 123, 789  123.4,111.5  12.4 |
| Date | Date | Fixed length date -7 bytes for each date,  month | Jan 1 ,4712 BC  to Dec 31,  4712 AD | ’01-jan-01’  ’31-feb-2005’ |
| Long | Long | To store Variable character length (one table only one long type) | Max 2 GB | ‘ggfg….’ |
| Raw | Raw | Binary data or byte strings (manipulation of data cannot be done) | Max 2000  bytes |  |
| Long Raw | Long raw | Binary data of Variable length | Max 2GB |  |
| Large Object | CLOB  BLOB  BFILE | Stores character Object with single byte Character  Stores large binary objects( Graphics, video clips and sound files)  Stores file pointers to LOBs managed by file systems external to the Db. | Max 4 GB | BFILE(‘dir.  Name’, ‘filename’) |
| Time | Timestamp | Date with time (No separate time type) |  | ’24-sep-  75,06:12:12’ |

# SYNTAX for the SQL statements:-

## DDL

### CREATE

* 1. simple creation

CREATE TABLE < tablename> (

<column name1 > < datatype>,

<column name 2> < datatype>,

<column name 3> < datatype>

);

* 1. without constraint name

CREATE TABLE < tablename> (

<column name 1> < datatype> primary key,

<column name 2> < datatype> unique ,

<column name 3> < datatype> foreignkey(<column name2>)

* 1. with constraint name

CREATE TABLE < tablename1> (

<column name 1> < datatype>,

<column name 2> < datatype>,

constraint < constraint name1 > primary key ( <column name1>), constraint <constraint name2> foreign key (<column name2>) references <tablename2> (<column name1>)

);

* 1. with check constraint

CREATE TABLE < tablename> (

<column name1 > < datatype> ,

<column name 2> < datatype>,

check ( < column name 1 > in ( values) )

check ( < column name 2 > between <val1> and <val2> )

### ALTER

* 1. Add –to add new columns

ALTER TABLE <tablename> add ( <column name > < datatype>)

* 1. Modify the datatype or increase / decrease the column width

ALTER TABLE <tablename> modify ( <column name > < newdatatype>)

* 1. drop –delete column or remove constraint

ALTER TABLE <tablename> drop column < column name>; ALTER TABLE <tablename> drop constraint < constraint name > ;

\*\*\* Constraints addition and column changing (datatype or decreasing the width) can be done only if column values are null.

### TRUNCATE

Removes the rows, not the definition TRUNCATE TABLE <tablename>;

### DROP

Removes the rows and table definition DROP TABLE <tablename>;

### RENAME

Changes table name

RENAME < old tablename> to < new tablename>;

## DML

### INSERT

* 1. Inserting values from user

INSERT INTO <tablename> VALUES( val1,val2 …);

* 1. Inserting interactively

INSERT INTO <tablename> VALUES( &<column name1> , &

<column name2> …);

* 1. Inserting null values

INSERT INTO <tablename> VALUES( val1,’ ‘,’ ‘,val4);

### SELECT

* 1. Simple select

SELECT \* FROM < tablename>; SELECT <col1>, <col2> FROM < tab1>;

* 1. Alias name

SELECT <col1> <alias name 1> , <col2> < alias name 2>FROM < tab1>;

* 1. With distinct clause

SELECT DISTINCT <col2> FROM < tab1>;

* 1. With where clause

SELECT <col1>, <col2> FROM < tab1> WHERE <conditions>;

* 1. Select to create table

CREATE TABLE <tablename> as SELECT <column names > FROM

<existing table>;

### UPDATE

* 1. Simple update

UPDATE < tablename> SET <col> = < new value>;

* 1. Using where clause

UPDATE < tablename> SET <col1> = < new value> , <col2> = < new

value> WHERE <conditions>;

### DELETE

* 1. Delete all rows

DELETE FROM <tablename>;

* 1. Using where clause –delete specific rows