Structured Query Language

- According to ANSI (American National Standards Institute), it is the standard language for Relational Database Management Systems.

- DBMS that use SQL are :
  Oracle, Sybase, Microsoft SQL Server, Access, Ingres etc.

Ques. What are various SQL commands?

Ans. SQL commands mainly divided into following categories :

(i) DDL (Data Definition Language) Commands -

Commands related to Data Definition, example

→ Creating, altering and dropping
→ granting permissions etc.

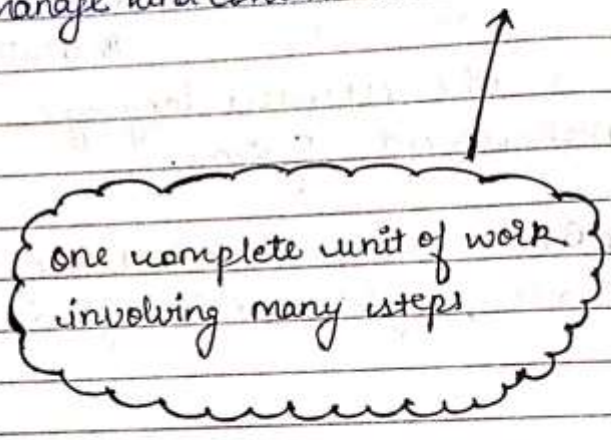
(ii) DML (Data Manipulation Language) Commands -

Commands that perform Data manipulation, example

→ Retrieval, insertion, deletion and modification etc.

(iii) TCL (Transaction Control Language) Commands -

Commands that manage and control the transactions



example -

→ making changes to database
→ undoing changes to database
→ creating Savepoints
→ Setting properties for current transactions

Ques. How to run SQL queries in Base?

Ans. For running SQL queries in Base follow these steps:

1. Go to Tools → SQL command
2. Write SQL command in Command to execute her
3. Click Execute Button.

SQL Commands

(1) For Creating Tables → DDL Command

Syntax - CREATE TABLE <table-name>
(<Column name> <data type>[(<size>)],
<Column name> <data type>[(<size>)])

example - CREATE TABLE employee
(ecode integer,
ename char(20),
grade char(2))

(2) For Inserting Data into Table → DML Command

Syntax - INSERT INTO <tablename> [<column list>]
VALUES (<value>, <value>..

example - INSERT INTO employee
VALUES (1001, 'Amit', 'E4')

OR

```
INSERT INTO employee (ecode, ename, grade)
VALUES (2014, 'Umesh', 'G4')
```

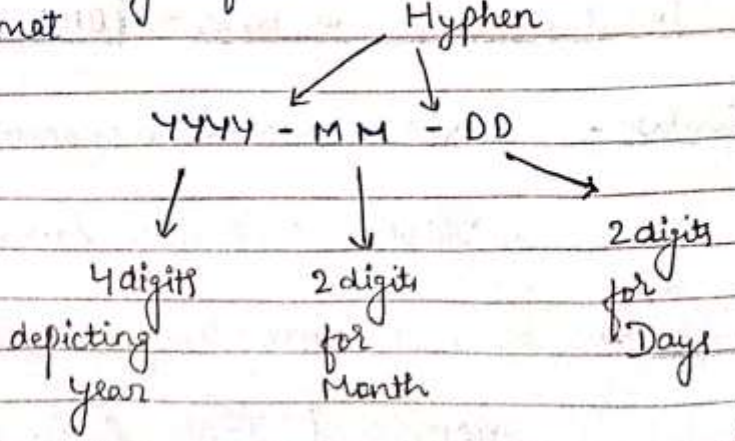
Inserting NULL Values

for inserting NULL values following statement can be used:

```
INSERT INTO employee (ecode, ename, grade)
VALUES (ecode, 'Rajesh', NULL)
```

Inserting Dates

Dates are by default entered in 'YYYY-MM-DD' format



(3) For Selecting Data from the Table → DML command

General form Syntax - SELECT what_to_Select
FROM Which_table
WHERE conditions_to_satisfy

(i) Selecting All Data

```
SELECT * FROM employee
```

(ii) Selecting particular Rows

```
SELECT * FROM employee
WHERE grade = 'G4'
```

(iii) Selecting particular columns

```
SELECT ecode, ename FROM employee
```

(iv) Eliminating Redundant Data (with Keyword DISTINCT)

```
SELECT DISTINCT name FROM employee
```

(v) Selecting From All the Rows - ALL Keyword

```
SELECT ALL ename FROM employee
```

(vi) Viewing Structure of a Table

DESCRIBE employee

or

DESC employee

(vii) Performing Simple calculations

For calculation → SELECT 3.14159 * 6 * 6

For current system date → SELECT curdate()

(viii) Using Column Aliases

Syntax - Select <columnname> AS [Columnalias]
From <tablename>

example - SELECT ename AS "employeename"
FROM employee

(ix) Condition Based on Range

```
SELECT ecode, employeename, grade, salary.
FROM employee
WHERE salary BETWEEN 20 AND 30
```

(x) Condition Based on a List

IN operator is used → Selects values that match any value in the given list

```
SELECT * FROM employee
WHERE address IN ('DELHI', 'MUMBAI',
                  'CHENNAI', 'BANGLORE')
```

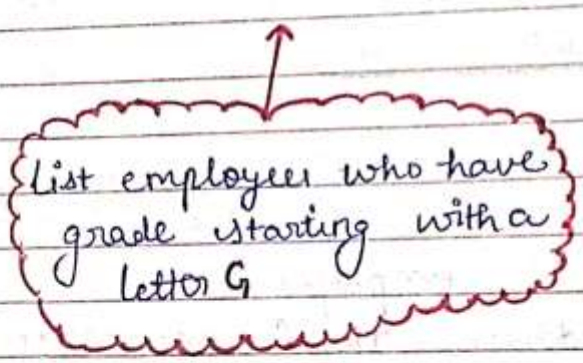
NOT IN operator is used → to find rows that do not match in the list

(xi) Condition Based on Pattern Matches

- LIKE is the string-matching operator
- Two special wildcard characters are used:
  - (i) Percent (%) → Substring match
  - (ii) Underscore (_) → Character match

example :

```
SELECT ecode, ename
FROM employee
WHERE grade LIKE 'G%'
```



(xii) Searching for NULL

example : For selecting employees whose grade contains NULL value following statement is used :

```
SELECT ecode, ename
FROM employee
WHERE grade IS NULL
```

CREATING TABLES WITH SQL constraints

- To apply conditions on columns, SQL constraints are used.

example : If we do not want particular column of a table to be blank, NOT NULL constraints can be used.

- Various SQL constraints Are as under :

NOT NULL → column cannot have NULL Value
DEFAULT → when nothing is filled in the column, a default value can be used.
UNIQUE → all values in column are different or unique
CHECK → values in column satisfy particular criteria.

Primary Key → uniquely identifies a Record or Row in Table.

Foreign Key → ensures Referential Integrity of data.

- Defining Primary Key through Create Table Command

```
CREATE TABLE customer
(
Cu_Id integer not null PRIMARY KEY,
Last_Name varchar (30),
First_Name varchar (30) )
```

OR

```
CREATE TABLE customer
( Branch integer not null,
Cu_Id integer not null,
Last_Name varchar (30),
First_Name varchar (30),
PRIMARY KEY (Branch, Cu_Id) )
```

- Defining Primary Key through Alter Table command:

```
ALTER TABLE Customer
ADD PRIMARY KEY (Cu_Id)
```

- Defining Foreign Key through Create Table command

```
CREATE TABLE ORDERS
(
    Order_Id integer,
Cu.order_name varchar (30), order_ref integer ,
    Primary Key (order_Id),
    Foreign Key (Cu_Id) references Customer (Cu_Id))
                (order_ref)
```

- Defining Foreign Key through Alter Table command

```
ALTER TABLE ORDERS
ADD FOREIGN KEY (order_ref)
references CUSTOMER (Cu_Id)
```

Que. How to view a Table Structure?

Ans. For viewing a Table Structure one of the following commands are used:

```
DESC orders
```

OR

```
DESCRIBE orders
```

Que. How to Insert Data into another Table?

Ans. For Inserting data into Table following commands are used:

```
INSERT INTO orders
VALUES (1002, 'Raj', '502')
```

OR

```
INSERT INTO orders (order_Id, order_name)
VALUES (1003, 'Reetu')
```

For Inserting particular data

Ques. How to Modify data in Tables?

Ans. For modifying data in Tables following commands are used:

It is a DML command

```
UPDATE orders
SET order_name = 'Neha', order_no = 305
WHERE order_Id = 1002
```

Ques. How to Delete Data from a Table?

Ans. For deleting data from Tables following commands are used:

Tablename

```
DELETE FROM employee
WHERE salary < 2200
```

It is a DML command

Ques. How to change definitions of existing tables?

Ans. The ALTER TABLE command is used to change definitions of existing tables:

```
ALTER TABLE Customers
CHANGE First_name Firstname VARCHAR (20)
```

It is a DDL command
i.e. Data Definition Command

Ques. What is Dropping Tables command?

Ans. For dropping tables following command is used:

It is a DDL command.

```
DROP TABLE employee
```

And

```
DROP TABLE IF EXISTS employee
```