CHAPTER 3

OPERATORS

Operators are classified into,

- Arithmetic Operators (+, - , * , /)
- Relational Operators (> , < , >= , <= , = , < > or != - not equals to)
- Logical Operators (NOT, AND, OR)
- Special Operators (IN , LIKE , BETWEEN , IS)

SPECIAL OPERATORS

1) IN – it is used for evaluating multiple values.

Ex – 1) List the employees in dept 10 & 20

```
SQL> select * from emp where deptno in (10 , 20 ) ;

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7369 SMITH      CLERK           7902 17-DEC-80        800                    20
      7566 JONES      MANAGER         7839 02-APR-81       2975                    20
      7782 CLARK      MANAGER         7839 09-JUN-81       2450                    10
      7788 SCOTT      ANALYST         7566 19-APR-87       3000                    20
      7839 KING       PRESIDENT            17-NOV-81       5000                    10
      7876 ADAMS      CLERK           7788 23-MAY-87       1100                    20
      7902 FORD       ANALYST         7566 03-DEC-81       3000                    20
      7934 MILLER     CLERK           7782 23-JAN-82       1300                    10

8 rows selected.
```

2) List all the clerks and analysts

```
SQL> select * from emp where job in ('CLERK', 'ANALYST' ) ;

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7369 SMITH      CLERK           7902 17-DEC-80        800                    20
      7788 SCOTT      ANALYST         7566 19-APR-87       3000                    20
      7876 ADAMS      CLERK           7788 23-MAY-87       1100                    20
      7900 JAMES      CLERK           7698 03-DEC-81        950                    30
      7902 FORD       ANALYST         7566 03-DEC-81       3000                    20
      7934 MILLER     CLERK           7782 23-JAN-82       1300                    10

6 rows selected.
```

We can provide upto 1000 values at the max

2) LIKE – used for pattern matching

% (percentage) - matches 0 or „n" characters
_ (underscore) - matches exactly one character

Ex – 1) **List all the employees whose name starts with „S"**

```
SQL> select * from emp where ename like 'S%' ;

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7369 SMITH      CLERK           7902 17-DEC-80        800                    20
      7788 SCOTT      ANALYST         7566 19-APR-87       3000                    20
```

Whenever we use % or _, always ensure that it is preceded by the word **„like"**

2) List the employees whose **name is having letter „L" as 2nd** character

```
SQL> select * from emp where ename like '_L%' ;

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7499 ALLEN      SALESMAN        7698 20-FEB-81       1600        300         30
      7698 BLAKE      MANAGER         7839 01-MAY-81       2850                    30
      7782 CLARK      MANAGER         7839 09-JUN-81       2450                    10
```

ASSIGNMENT

1) **List the employees whose name is having atleast 2 L"s**

```
SQL> select * from emp where ename like '%LL%';

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7499 ALLEN      SALESMAN        7698 20-FEB-81       1600        300         30
      7934 MILLER     CLERK           7782 23-JAN-82       1300                    10
```

2) **List the employees whose name is having letter „E" as the last but one character**

```
SQL> select * from emp where ename like '%E_';

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7499 ALLEN      SALESMAN        7698 20-FEB-81       1600        300         30
      7566 JONES      MANAGER         7839 02-APR-81       2975                    20
      7844 TURNER     SALESMAN        7698 08-SEP-81       1500          0         30
      7900 JAMES      CLERK           7698 03-DEC-81        950                    30
      7934 MILLER     CLERK           7782 23-JAN-82       1300                    10
```

3) List all the employees whose name is having letter „R" in the 3rd position

```
SQL> select * from emp where ename like '__R%';

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7521 WARD       SALESMAN         7698 22-FEB-81       1250        500         30
      7654 MARTIN     SALESMAN         7698 28-SEP-81       1250       1400         30
      7844 TURNER     SALESMAN         7698 08-SEP-81       1500          0         30
      7902 FORD       ANALYST          7566 03-DEC-81       3000                    20
```

In the above query, we give 2 underscores before R%.

4) List all the employees who are having exactly 5 characters in their jobs

```
SQL> select ename, job from emp where job like '_____';

ENAME      JOB
---------- ---------
SMITH      CLERK
ADAMS      CLERK
JAMES      CLERK
MILLER     CLERK
```

Here , in single quotes – we give 5 underscores.

5) List the employees whose name is having atleast 5 characters

```
SQL> select ename from emp where ename like '_____%';

ENAME
----------
SMITH
ALLEN
JONES
BLAKE
CLARK
SCOTT
ADAMS
JAMES

8 rows selected.
```

Here, also in single quotes – we give 5 underscores (_____)%

3) BETWEEN operator – used for searching based on range of values.
Ex – 1) List the employees whose salary is between 200 and 300

```
SQL> select * from emp where
  2  sal between 2000 and 3000 ;

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7566 JONES      MANAGER          7839 02-APR-81       2975                    20
      7698 BLAKE      MANAGER          7839 01-MAY-81       2850                    30
      7782 CLARK      MANAGER          7839 09-JUN-81       2450                    10
      7788 SCOTT      ANALYST          7566 19-APR-87       3000                    20
      7902 FORD       ANALYST          7566 03-DEC-81       3000                    20
```

4) IS operator – it is used to compare nulls
Ex – 1) List all the employees whose commission is null

```
SQL> select * from emp where comm is null ;

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7369 SMITH      CLERK            7902 17-DEC-80        800                    20
      7566 JONES      MANAGER          7839 02-APR-81       2975                    20
      7698 BLAKE      MANAGER          7839 01-MAY-81       2850                    30
      7782 CLARK      MANAGER          7839 09-JUN-81       2450                    10
      7788 SCOTT      ANALYST          7566 19-APR-87       3000                    20
      7839 KING       PRESIDENT             17-NOV-81       5000                    10
      7876 ADAMS      CLERK            7788 23-MAY-87       1100                    20
      7900 JAMES      CLERK            7698 03-DEC-81        950                    30
      7902 FORD       ANALYST          7566 03-DEC-81       3000                    20
      7934 MILLER     CLERK            7782 23-JAN-82       1300                    10

10 rows selected.
```

ASSIGNMENT
1) **List all the employees who don"t have a reporting manager**

```
SQL> select * from emp where mgr is null ;

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7839 KING       PRESIDENT             17-NOV-81       5000                    10
```

LOGICAL OPERATORS

1) List all the salesmen in dept 30

```
SQL> select * from emp where job = 'SALESMAN' and deptno = 30 ;

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7499 ALLEN      SALESMAN         7698 20-FEB-81       1600        300         30
      7521 WARD       SALESMAN         7698 22-FEB-81       1250        500         30
      7654 MARTIN     SALESMAN         7698 28-SEP-81       1250       1400         30
      7844 TURNER     SALESMAN         7698 08-SEP-81       1500          0         30
```

2) List all the salesmen in dept number 30 and having salary greater than 1500

```
SQL> select * from emp
  2  where job = 'SALESMAN'
  3  and deptno = 30
  4  and sal > 1500 ;

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7499 ALLEN      SALESMAN         7698 20-FEB-81       1600        300         30
```

3) **List all the employees whose name starts with „s" or „a"**

```
SQL> select * from emp
  2  where ename like 'S%' or ename like 'A%' ;

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7369 SMITH      CLERK            7902 17-DEC-80        800                    20
      7499 ALLEN      SALESMAN         7698 20-FEB-81       1600        300         30
      7788 SCOTT      ANALYST          7566 19-APR-87       3000                    20
      7876 ADAMS      CLERK            7788 23-MAY-87       1100                    20
```

4) List all the employees except those who are working in dept 10 & 20.

```
SQL> select * from emp
  2  where deptno not in (10,20) ;

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7499 ALLEN      SALESMAN         7698 20-FEB-81       1600        300         30
      7521 WARD       SALESMAN         7698 22-FEB-81       1250        500         30
      7654 MARTIN     SALESMAN         7698 28-SEP-81       1250       1400         30
      7698 BLAKE      MANAGER          7839 01-MAY-81       2850                    30
      7844 TURNER     SALESMAN         7698 08-SEP-81       1500          0         30
      7900 JAMES      CLERK            7698 03-DEC-81        950                    30

6 rows selected.
```

5) List the employees whose name does not start with „S"

```
SQL> select * from emp
  2  where ename not like 'S%' ;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30
7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30
7566	JONES	MANAGER	7839	02-APR-81	2975		20
7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30
7698	BLAKE	MANAGER	7839	01-MAY-81	2850		30
7782	CLARK	MANAGER	7839	09-JUN-81	2450		10
7839	KING	PRESIDENT		17-NOV-81	5000		10
7844	TURNER	SALESMAN	7698	08-SEP-81	1500	0	30
7876	ADAMS	CLERK	7788	23-MAY-87	1100		20
7900	JAMES	CLERK	7698	03-DEC-81	950		30
7902	FORD	ANALYST	7566	03-DEC-81	3000		20
7934	MILLER	CLERK	7782	23-JAN-82	1300		10

```
12 rows selected.
```

6) List all the employees who are having reporting managers in dept 10

```
SQL> select * from emp
  2  where mgr is not null
  3  and deptno = 10 ;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7782	CLARK	MANAGER	7839	09-JUN-81	2450		10
7934	MILLER	CLERK	7782	23-JAN-82	1300		10

ASSIGNMENT

1) List the employees who are not working as managers and clerks in dept 10 and 20 with a salary in the range of 1000 to 3000

```
SQL> select * from emp
  2  where job not in ('MANAGER','CLERK')
  3  and deptno in (10,20)
  4  and sal between 1000 and 3000;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7788	SCOTT	ANALYST	7566	19-APR-87	3000		20
7902	FORD	ANALYST	7566	03-DEC-81	3000		20

2) List the employees whose salary not in the range of 1000 to 2000 in dept 10,20,30 except all salesmen

```
SQL> select * from emp where
  2  sal not between 1000 and 2000
  3  and deptno in (10,20,30)
  4  and job <>'SALESMAN';
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	17-DEC-80	800		20
7566	JONES	MANAGER	7839	02-APR-81	2975		20
7698	BLAKE	MANAGER	7839	01-MAY-81	2850		30
7782	CLARK	MANAGER	7839	09-JUN-81	2450		10
7788	SCOTT	ANALYST	7566	19-APR-87	3000		20
7839	KING	PRESIDENT		17-NOV-81	5000		10
7900	JAMES	CLERK	7698	03-DEC-81	950		30
7902	FORD	ANALYST	7566	03-DEC-81	3000		20

```
8 rows selected.
```

3) **List the department names which are having letter „O" in their locations as well as their department** names

```
SQL> select * from dept
  2  where loc like '%O%' and
  3  dname like '%O%';
```

DEPTNO	DNAME	LOC
10	ACCOUNTING	NEW YORK
40	OPERATIONS	BOSTON

SORTING

It arranges the data either in ascending / descending order

Ascending – ASC / Descending – DESC

We can sort the data using ORDER BY

By default, the data is always arranged in ASC order

For ex – 1) Arrange all the employees by their salary

```
SQL> select * from emp
  2  order by sal;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	17-DEC-80	800		20
7900	JAMES	CLERK	7698	03-DEC-81	950		30
7876	ADAMS	CLERK	7788	23-MAY-87	1100		20
7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30
7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30
7934	MILLER	CLERK	7782	23-JAN-82	1300		10
7844	TURNER	SALESMAN	7698	08-SEP-81	1500	0	30

```
      7499 ALLEN      SALESMAN        7698 20-FEB-81       1600        300         30
      7782 CLARK      MANAGER         7839 09-JUN-81       2450                    10
      7698 BLAKE      MANAGER         7839 01-MAY-81       2850                    30
      7566 JONES      MANAGER         7839 02-APR-81       2975                    20
      7788 SCOTT      ANALYST         7566 19-APR-87       3000                    20
      7902 FORD       ANALYST         7566 03-DEC-81       3000                    20
      7839 KING       PRESIDENT            17-NOV-81       5000                    10

14 rows selected.
```

2) Arrange all the employees by their salary in the descending order

```
SQL> select * from emp
  2  order by sal desc;

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM     DEPTNO
---------- ---------- --------- ---------- --------- ---------- ---------- ----------
      7839 KING       PRESIDENT            17-NOV-81       5000                    10
      7902 FORD       ANALYST         7566 03-DEC-81       3000                    20
      7788 SCOTT      ANALYST         7566 19-APR-87       3000                    20
      7566 JONES      MANAGER         7839 02-APR-81       2975                    20
      7698 BLAKE      MANAGER         7839 01-MAY-81       2850                    30
      7782 CLARK      MANAGER         7839 09-JUN-81       2450                    10
      7499 ALLEN      SALESMAN        7698 20-FEB-81       1600        300         30
      7844 TURNER     SALESMAN        7698 08-SEP-81       1500          0         30
      7934 MILLER     CLERK           7782 23-JAN-82       1300                    10
      7521 WARD       SALESMAN        7698 22-FEB-81       1250        500         30
      7654 MARTIN     SALESMAN        7698 28-SEP-81       1250       1400         30
      7876 ADAMS      CLERK           7788 23-MAY-87       1100                    20
      7900 JAMES      CLERK           7698 03-DEC-81        950                    30
      7369 SMITH      CLERK           7902 17-DEC-80        800                    20

14 rows selected.
```

3) Arrange ename, sal, job, empno and sort by descending order of salary

```
SQL> select ename, sal, job, empno
  2  from emp
  3  order by 2 desc ;

ENAME             SAL JOB              EMPNO
---------- ---------- --------- ----------
KING             5000 PRESIDENT       7839
FORD             3000 ANALYST         7902
SCOTT            3000 ANALYST         7788
JONES            2975 MANAGER         7566
BLAKE            2850 MANAGER         7698
CLARK            2450 MANAGER         7782
ALLEN            1600 SALESMAN        7499
TURNER           1500 SALESMAN        7844
MILLER           1300 CLERK           7934
WARD             1250 SALESMAN        7521
MARTIN           1250 SALESMAN        7654
ADAMS            1100 CLERK           7876
JAMES             950 CLERK           7900
SMITH             800 CLERK           7369

14 rows selected.
```

order by salary desc;

In the above query we have – order by 2 – thus it arranges only the 2nd column „salary" in the descending order.
Thus to arrange the specific columns in order – we must have to specify the column number.

NOTE :- ORDER BY should be used always as the last statement in the SQL query.

Selecting DISTINCT VALUES

```
SQL> select distinct deptno
  2  from emp ;

    DEPTNO
----------
        30
        20
        10
```

The above query arranges all the distinct values of department number.