DBMS Lab 3

Objective: Perform operations on the tables.

DML (Data Manipulation Language)

Data manipulation is ·
The retrieval of information stored in the database. ·
The insertion of new information into the database. ·
The deletion of information from the database. ·
The modification of information stored by the appropriate data model.
There are basically two types.

- Procedural DML:- require a user to specify what data is needed and how to get that data.
- Non Procedural DML : require a user to specify what data is needed without specifying how to get that data.

Computation in expression lists used to select data

+	Addition	-	Subtraction
*	Multiplication	**	Exponentiation
/	Division	()	Enclosed operation

Renaming columns used with Expression Lists

The default output column names can be renamed by the user if required using **as**

Logical Operators

The logical operators that can be used in SQL sentenced are
AND all of must be included
OR any of may be included
NOT none of could be included

Range Searching

between operator is used for range searching

Pattern Searching

SQL includes a string-matching operator for comparisons on character strings.
The operator like uses patterns that are described using two special characters:
percent (%). The % character matches any substring.
underscore (_). The _ character matches any character.

Find the names of all instructors whose name includes the substring “dar”.

```
select name
from instructor
where name like '%dar%'
```

Match the string “100%”

```
like '100 \%'  escape  '\'
```

in that above we use backslash (\) as the escape character.

Patterns are case sensitive.
Pattern matching examples:
'Intro%' matches any string beginning with “Intro”.
'%Comp%' matches any string containing “Comp” as a substring.
'_ _ _' matches any string of exactly three characters.
'_ _ _ %' matches any string of at least three characters.

Aggregate Functions

These functions operate on the multiset of values of a column of a relation, and return a value

- avg: average value
- min: minimum value
- max: maximum value
- sum: sum of values
- count: number of values

Find the average salary of instructors in the Computer Science department

```
select avg (salary)
from instructor
where dept_name= 'Comp. Sci.';
```

Find the total number of instructors who teach a course in the Spring 2018 semester

```
select count (distinct ID)
from teaches
where semester = 'Spring' and year = 2018;
```

Find the number of tuples in the course relation

```
select count (*)
from course;
```

Ordering the Display of Tuples

List in alphabetic order the names of all instructors

```
select distinct name
from   instructor
order by name
```

We may specify desc for descending order or asc for ascending order, for each attribute; ascending order is the default.

Example: order by name desc

Can sort on multiple attributes

Example: order by dept_name, name

Assignment

Using the table client master and product master answer the following questions.

1. Find out the clients who stay in a city whose second letter is a.
   select client_no, name from client_master where city like '_a%';
2. Find out the name of all clients having 'a' as the second letter in their names.
   select name from client_master where name like '_a%';
3. List all client names who stay in a city whose first letter is 'M'.
   select client_no, name from client_master where city like 'M%';
4. List the products in sorted order of their description.
   select * from product_master order by description asc;
5. Count the total number of products
   select count(*) from product_master;
6. Calculate the average sell price of all the products.
   select avg(sell_price) as average_sell_price from product_master;
7. Calculate the minimum cost price of products.
   select min(cost_price) as average_cost_price from product_master;
8. Determine the maximum and minimum sell prices of products. Rename the title as 'max_price' and 'min_price' respectively.
   select min(sell_price) as min_price, max(sell_price) as max_price from product_master;
9. Count the number of products having cost price greater than or equal to 1500.
   select count(*) from product_master where cost_price >= 1500;

Instructions for submission:

- Create a document with a name dbms_lab3_ceXXX (i.e. dbms_lab3_ce009, dbms_lab3_ce078, dbms_lab3_ce103)
- Write a query and include the snapshot/text of the query output in the same order as in assignment.

- Submit the document.

Additional assignment (optional)
Using the book's schemas and data answer the following questions (shared in classroom).

- Find the department names of all instructors.
  select dept_name from instructor;
- Find the department names w/o duplicates of all instructors.
  select distinct dept_name from instructor;
- Find the names of all instructors in the Comp. Sci. department who have salary greater than $70,000
  select name from instructor where dept_name='Comp. Sci.' and salary > 70000;
- Retrieve the names of all instructors, along with their department names and department building names.
  select name, instructor.dept_name, building from instructor, department where instructor.dept_name=department.dept_name;
- List all instructors in the university who have taught some course, find their names and course ID of all courses they have taught.
  select name, course_id from instructor, teaches where instructor.ID = teaches.ID;
- List all instructors in the Comp. Sci. department who have taught some course, find their names and course ID of all courses they have taught.
  select name, course_id from instructor, teaches where instructor.ID = teaches.ID and instructor.dept_name = 'Comp. Sci.';
- Find the names of all instructors whose salary is greater than at least one instructor in the Biology department.
  select distinct T.name from instructor T, instructor S where T.salary > S.salary and S.dept_name = 'Biology';
- Find the names of all departments whose building name includes the substring 'Watsom'
  select dept_name from department where building like '%Watson%';
- List all instructors of the Physics department in descending order.
  select name from instructor where dept_name = 'Physics' order by name desc;
- List the entire instructor relation in descending order of salary. If several instructors have the same salary, order them in ascending order of name.
  select name from instructor where dept_name = 'Physics' order by salary desc, name asc;
- Find the names of instructors with salary amounts between $90000 and $100000.
  select name from instructor where salary between 90000 and 100000;