Uttara University

Excellence in Higher Education and Research

Lab Report 2

DATABASE MANAGEMENT SYSTEM

(CSEC-321)

SUBMITTED BY	SUBMITTED TO
Abrar Agmain Shazid ID: 2222081036 Batch: 57A Day Department of CSE, Uttara University	**Md. Harun-Ar-Rashid** Lecturer, Department of CSE, Uttara University

Submission Date – 06/11/2024

GITHUB Link: https://github.com/AbrarShazid/DBMS/tree/main/Lab%20report%202

Task 1:

Using WHERE Clause

• Write a query to select all records from a table where a specific condition is met.

• Example: Retrieve all employees with a salary greater than 50,000.

Code:

```sql
CREATE DATABASE db;
USE db;

CREATE TABLE employee(
id INT PRIMARY KEY,
NAME VARCHAR(50),
designation VARCHAR (50),
salary INT
);

INSERT INTO employee VALUES
(1,'Alice','Junior Engineer',40000),
(2,'Bob','Junior Engineer',44000),
(3,'Eve','Engineer',48000),
(4,'John','Senior Engineer',60000),
(5,'Paul','Manager',55000),
(6,'Mofizzz','HR',10);

SELECT * FROM employee
WHERE salary>50000;
```

Output:

employee (2r × 4c)

#	id	NAME	designation	salary
1	4	John	Senior Engineer	60,000
2	5	Paul	Manager	55,000

Task 2:

Using LIKE Operator

• Write a query to find records where a column's value matches a specified pattern.

• Example: Retrieve all customers whose names start with 'A'.

Code:

```sql
CREATE DATABASE db;
USE db;

CREATE TABLE customer(
id INT PRIMARY KEY,
customer_name VARCHAR(50)
);

INSERT INTO customer VALUES
(1,'Eric'),
(2,'John'),
(3,'Adam'),
(4,'Eve'),
(5,'Mike'),
(6,'Anis'),
(7,'James Aron');

SELECT * FROM customer
WHERE customer_name LIKE 'A%';

```

Output:

customer (2r × 2c)

#	id	customer_name
1	3	Adam
2	6	Anis

Task 3:

Using GROUP BY Clause

• Write a query to group records by a specific column and perform aggregate functions.

• Example: Group employees by department and calculate the average salary.

Code:

```sql
CREATE DATABASE db;
USE db;

CREATE TABLE emp(
id INT PRIMARY KEY,
designation VARCHAR(50),
department VARCHAR(50),
salary int
);

INSERT INTO emp VALUES
(1,'Junior Engineer','Development',40000),
(2,'Engineer','Development',50000),
(3,'Senior Engineer','Development',55000),
(4,'Manager','Management',52000),
(5,'Accountant','Finance',35000),
(6,'CEO','Management',900000),
(7,'Senior Accountant','Finance',65000);

SELECT department, AVG(salary) FROM emp
GROUP BY department;
```

Output:

emp (3r × 2c)

#	department	AVG(salary)
1	Development	48,333.3333
2	Finance	50,000.0
3	Management	476,000.0

Task 4:

Using HAVING Clause

• Write a query to filter groups based on a condition.

• Example: Retrieve departments with an average salary greater than 60,000.

Code:

```sql
CREATE DATABASE db;
USE db;

CREATE TABLE emp(
id INT PRIMARY KEY,
designation VARCHAR(50),
department VARCHAR(50),
salary int
);

INSERT INTO emp VALUES
(1,'Junior Engineer','Development',40000),
(2,'Engineer','Development',50000),
(3,'Senior Engineer','Development',55000),
(4,'Manager','Management',52000),
(5,'Accountant','Finance',55000),
(6,'CEO','Management',100000),
(7,'Senior Accountant','Finance',67000);

SELECT department,AVG(salary) FROM emp
GROUP BY department
HAVING avg(salary)>60000;
```

Output:

emp (2r × 2c)

#	department	AVG(salary)
1	Finance	61,000.0
2	Management	76,000.0

Task 5:

Using IN Operator

• Write a query to select records where a column's value is within a specified set of values.

• Example: Retrieve all orders placed by customers with IDs 1, 2, and 3.

Code:

```sql
create database db;
USE db;

CREATE TABLE customer(
id INT,
order_item VARCHAR (100),
price INT);

INSERT INTO customer VALUES
(1,'Shirt',1200),
(2,'Watch',2200),
(3,'Pant',1700),
(4,'SSD',10000),
(1,'Earphone',1900),
(1,'Medicine',765),
(5,'Phone',120000),
(3,'Laptop',100000);

SELECT * FROM customer
WHERE id IN (1,2,3);
```

Output:

customer (6r × 3c)

#	id	order_item	price
1	1	Shirt	1,200
2	2	Watch	2,200
3	3	Pant	1,700
4	1	Earphone	1,900
5	1	Medicine	765
6	3	Laptop	100,000

Task 6:

Using NOT IN Operator

• Write a query to select records where a column's value is not within a specified set of values.

• Example: Retrieve all products that are not in categories 1, 2, and 3.

Code:

```sql
create database db;
USE db;

CREATE TABLE product (
    product_id INT PRIMARY KEY,
    product_name VARCHAR(100),
    category_id INT);

INSERT INTO product VALUES
(1,'Shirt',1),
(2,'Pant',1),
(3,'Earphone',2),
(4,'Cable',2),
(5,'Chips',3),
(6,'Mobile',4),
(7,'Laptop',4),
(8,'Paper',5),
(9,'pen',5);

SELECT product_name FROM product
WHERE category_id NOT IN (1,2,3);
```

Output:

product (4r × 1c)

#	product_name
1	Mobile
2	Laptop
3	Paper
4	pen

Task 7:

Using Sub queries

• Write a query that includes a sub query to perform a more complex selection.

• Example: Retrieve all employees who work in a department with more than 10 employees.

Code:

```sql
create database db;
USE db;
CREATE TABLE emp (
    emp_id INT PRIMARY key,
    designation VARCHAR(100),
    department VARCHAR(100));
INSERT INTO emp VALUES
(1,'Junior Engineer','Development'),
(2,'Junior Engineer','Development'),
(3,'Junior Engineer','Development'),
(4,'Junior Engineer','Development'),
(5,'Junior Engineer','Development'),
(6,'Engineer','Development'),
(7,'Engineer','Development'),
(8,'Engineer','Development'),
(9,'Senior Engineer','Development'),
(10,'Lead Engineer','Development'),
(11,'Senior Engineer','Development'),
(12,'Accountant','Finance'),
(13,'Senior Accountand','Finance'),
(14,'Manager','Management'),
(15,'Product Manager','Management'),
(16,'Digital Marketing','Marketing'),
(17,'CEO','Management'),
(18,'MD','Management'),
(19,'Marketing Head','Management'),
(20,'Finance Director','Management');

SELECT emp_id, designation, department
FROM emp
WHERE department IN (
    SELECT department
    FROM emp
    GROUP BY department
    HAVING COUNT(emp_id) > 10
);
```

Output:

emp (11r × 3c)

#	emp_id	designation	department
1	1	Junior Engineer	Development
2	2	Junior Engineer	Development
3	3	Junior Engineer	Development
4	4	Junior Engineer	Development
5	5	Junior Engineer	Development
6	6	Engineer	Development
7	7	Engineer	Development
8	8	Engineer	Development
9	9	Senior Engineer	Development
10	10	Lead Engineer	Development
11	11	Senior Engineer	Development