DBMS LAB Test-2 (20-03-2025)

Name- Bhavya Shrivastava **Roll No-** 23052071 **Section-** CSE-15

1. Draw an ERD & SD of IBM DATABASE from the following description:
IBM has multiple departments like, coding, R&D, testing, marketing etc. Each department recruits employees. There are multiple projects handled by IBM. One project is managed by multiple departments and one department at the same time is associated with multiple projects. An employee can work on multiple projects. Each project has multiple employees and one project manager. IBM database should assign an unique department_id to every department and store information regarding department like, department name, HOD_ID, No_of_employees etc. The database should assign an unique project_no to every project and store information regarding projects like, project_manager's_id, start_date, assigned_budget etc. IBM database should assign an unique employee_id to every employee and store information regarding employees like, name, DoB, DoJ, Phone_no etc.

2. Make a relational database from the above description. Create all necessary relational tables, add primary keys and foreign keys. All constraints should have appropriate names.

```
SQL> create table emp (
  2  emp_id number(10), name varchar(10), DoB number(10), DoJ number(10), phone_no number(10));

Table created.
```

```
SQL> create table dept (
  2  d_id number(10), d_name varchar(10), HOD_ID number(10), no_emp number(10))
  3  ;
```

```
SQL> create table proj (
  2  p_no number(10), P_M_id number(10), start_date number(10), budget number(10));

Table created.
```

```
SQL> alter table emp add constraint pke primary key (emp_id);

Table altered.

SQL> alter table dept add constraint pkd primary key (d_id);

Table altered.

SQL> alter table proj add constraint pkp primary key (p_no);

Table altered.
```

```
SQL> INSERT INTO Department VALUES
  2  (101, 'Coding', 1, 10),
  3  (102, 'R&D', 2, 15),
  4  (103, 'Testing', 3, 8),
  5  (104, 'Marketing', 4, 12);
Enter value for d:
old   3: (102, 'R&D', 2, 15),
new   3: (102, 'R', 2, 15),
(101, 'Coding', 1, 10),
```

```
SQL> INSERT INTO Employee VALUES
  2  (1, 'Alice', '1990-05-15', '2015-06-10', '1234567890', 101),
  3  (2, 'Bob', '1985-09-23', '2010-04-12', '2345678901', 102),
  4  (3, 'Charlie', '1992-11-10', '2018-09-01', '3456789012', 103),
  5  (4, 'David', '1988-07-19', '2012-12-05', '4567890123', 104);
```

```
SQL> INSERT INTO Project VALUES
  2  ('P_13', '2024-01-01', 50000, 1),
  3  ('P_14', '2024-02-15', 75000, 2);
```

```
SQL> INSERT INTO Works_On VALUES
  2  (1, 'P_13'),
  3  (2, 'P_13'),
  4  (3, 'P_13'),
  5  (4, 'P_14');
```

```
SQL> INSERT INTO Manages VALUES
  2  (101, 'P_13'),
  3  (102, 'P_13'),
  4  (103, 'P_13'),
  5  (104, 'P_14');
```

3. Write SQL Statement for the following queries.

I. Find the employee's name and his department's name, who is the project manager of project_no = P_13.

```
SQL> SELECT E.name AS Employee_Name, D.department_name AS Department_Name
  2  FROM Employee E
  3  JOIN Project P ON E.employee_id = P.project_manager_id
  4  JOIN Department D ON E.department_id = D.department_id
  5  WHERE P.project_no = 'P_13';
JOIN Project P ON E.employee_id = P.project_manager_id
```

II. Find all the employees (names, phone_no, HoD_id), who work in P_13.

```
SQL> SELECT E.name, E.phone_no, D.HOD_ID
  2  FROM Employee E
  3  JOIN Works_On W ON E.employee_id = W.employee_id
  4  JOIN Department D ON E.department_id = D.department_id
  5  WHERE W.project_no = 'P_13';
JOIN Works_On W ON E.employee_id = W.employee_id
```

III. **Find all the employees(Names, id, DoB, DoJ), who works as either HoD of a department or manager of a project or both.**

```
SQL> SELECT DISTINCT E.name, E.employee_id, E.DoB, E.DoJ
  2  FROM Employee E
  3  LEFT JOIN Department D ON E.employee_id = D.HOD_ID
  4  LEFT JOIN Project P ON E.employee_id = P.project_manager_id
  5  WHERE D.HOD_ID IS NOT NULL OR P.project_manager_id IS NOT NULL;
LEFT JOIN Department D ON E.employee_id = D.HOD_ID
```