

Program 1

Ques)

Consider a scenario on Human Resource Management Database and perform the following

i.

1. Identify the Entities, attributes, relationships, cardinality, and participation
2. Design the ER diagram and map it to schema diagram
3. Create the tables and populated them with appropriate data
4. Design the solution for the following

i. List the f_Name, l_Name, dept_Name of the employer who draws a salary greater than the average salary of employees working for the Finance department.

ii. List the name and department of the employer who is currently working on more than two project controlled by R&D department.

iii. List all the ongoing projects controlled by all the departments.

iv. Give the details of the supervisor who is supervising more than 3 employees who have completed at least one project.

v. List the name of the dependents employee who has completed a total_projects worth 10L.

vi. List the department and employee details whose project is in more than one city.

Scenario

- The company is organized into departments. Each department has a unique name, a unique number, and a particular employee who manages the department. We keep track of the start date when that employee began managing the department. A department may have several locations.
- A department controls a number of projects, each of which has a unique name, a unique number, and a single location.
- We store each employee's name, Social Security number,² address, salary, sex (gender), and birth date. An employee is assigned to one department, but may work on several projects, which are not necessarily controlled by the same department. We keep track of the current number of hours per week that an employee works on each project. We also keep track of the direct supervisor of each employee (who is another employee).
- We want to keep track of the dependents of each employee for insurance purposes. We keep each dependent's first name, sex, birth date, and relationship to the employee.

Figure 7.2 shows how the schema for this database application can be displayed by means of the graphical notation known as **ER diagrams**. This figure will be explained gradually as the ER model concepts are presented. We describe the step-by-step process of deriving this schema from the stated requirements—and explain the ER diagrammatic notation—as we introduce the ER model concepts.

ER Model and Relational Schema Diagram of Company Database

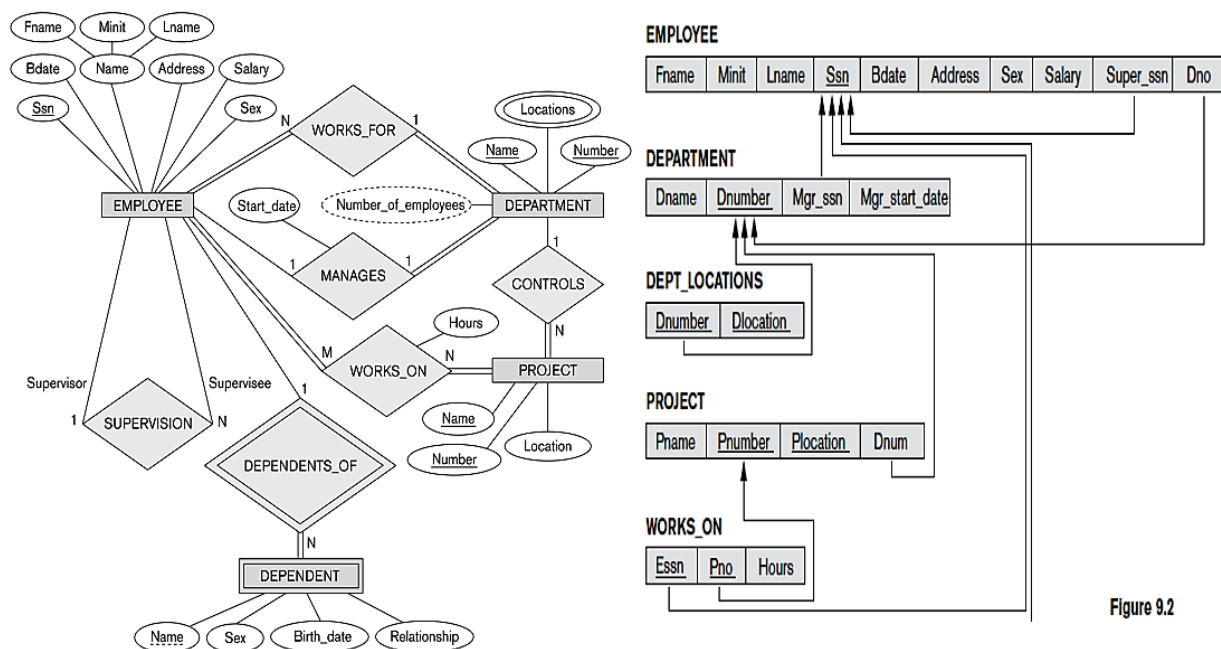


Figure 9.2

```
CREATE DATABASE employee_db;  
USE employee_db;
```

-- creating employee table as strong entity without relationship

```
CREATE TABLE `employee` (  
    `ssn` INT PRIMARY KEY,  
    `f_name` VARCHAR(50) NOT NULL,  
    `m_name` VARCHAR(50),  
    `l_name` VARCHAR(50) NOT NULL,  
    `address` VARCHAR(200),  
    `b_day` DATE NOT NULL,  
    `salary` DECIMAL(10,2)  
);
```

-- inserting values in the employee Table

```
INSERT INTO employee  
(ssn,f_name,m_name,l_name,address,b_day,salary)  
VALUES  
    (10,'ABCD','EFG','XYZ','Bangalore','1990-08-01',100000.00),  
    (1,'Nabendu',NULL,'Das','West Bengal','2001-09-23',60000.00),  
    (2,'Ashish',NULL,'Garg','Delhi','2000-06-20',50000.00);
```

-- creating department table as strong entity without relationship

```
CREATE TABLE `department` (  
    `d_no` INT PRIMARY KEY,
```

```
`d_name` VARCHAR(50)
```

```
);
```

```
-- ALTER TABLE `department` MODIFY COLUMN `m_start_date` DATE;
```

```
-- inserting values to department table
```

```
INSERT INTO department(d_no,d_name)
```

```
VALUES
```

```
(123,'Software Developer'),
```

```
(345,'Networking');
```

```
-- creating project table
```

```
CREATE TABLE `project` (
```

```
`p_no` INT PRIMARY KEY,
```

```
`p_name` VARCHAR(50) NOT NULL,
```

```
`location` VARCHAR(100));
```

```
-- inserting values to project table
```

```
INSERT INTO `project` (p_no,p_name,location)
```

```
VALUES
```

```
(100,'Bangalore Guide App','bangalore');
```

```
-- creating dependent weak entity with partial key refering from employee table
```

```
CREATE TABLE `dependent` (
```

```
`emp_ssn` INT,  
`emp_name` VARCHAR(50),  
`sex` VARCHAR(10),  
`b_day` DATE,  
`relationship` VARCHAR(50),  
PRIMARY KEY (`emp_ssn`,`emp_name`),  
FOREIGN KEY (`emp_ssn`) REFERENCES `employee` (`ssn`)  
);
```

-- adding values to the dependent table

```
INSERT INTO `dependent` (emp_ssn,emp_name,sex,b_day,relationship)  
VALUES  
(1,'Nabendu Das','Male','2001-09-23','Single'),  
(10,'ABCD EFG XYZ','FEMALE','1990-08-01','Married'),  
(2,'Ashish Garg','Male','2000-06-20','Single');
```

-- adding department foreign key to the employee table from department table

```
ALTER TABLE `employee`  
ADD COLUMN `d_no` INT,  
ADD CONSTRAINT `fk_dept_no`  
FOREIGN KEY (`d_no`) REFERENCES `department` (`d_no`);
```

-- adding supervisor ssn as foreign key to the employee table

```
ALTER TABLE `employee`  
ADD COLUMN `sup_ssn` INT,
```

```
ADD CONSTRAINT `fk_supervisor_ssn`  
FOREIGN KEY (`sup_ssn`) REFERENCES `employee`(`ssn`);
```

-- updating employee values with foreign keys

```
UPDATE `employee`  
SET d_no = '123' , sup_ssn = 10  
WHERE ssn = 1;
```

```
UPDATE `employee`  
SET d_no = '123' , sup_ssn = 10  
WHERE ssn = 2;
```

```
UPDATE `employee`  
SET d_no = '123' , sup_ssn = 10  
WHERE ssn = 10;
```

-- adding manager ssn as foreign key in department table with start date

```
ALTER TABLE `department`  
ADD COLUMN `m_ssn` INT,  
ADD COLUMN `m_start_date` DATE,  
ADD CONSTRAINT `fk_manager_ssn`  
FOREIGN KEY (`m_ssn`) REFERENCES `employee`(`SSN`);
```

-- updating the values of department with foreign key

```
UPDATE `department`
```

```
SET m_ssn = 2, m_start_date = '2022-09-30'  
WHERE d_no = 123;
```

-- adding department no to the project table as foreign key

```
ALTER TABLE `project`  
ADD COLUMN `d_no` INT,  
ADD CONSTRAINT `fk_proj_dept_no`  
FOREIGN KEY (`d_no`) REFERENCES `department` (`d_no`);
```

-- updating the project table values with foreign keys

```
UPDATE `project`  
SET d_no = 123  
WHERE p_no = 100;
```

-- adding works_on table for m:n relationship between employee and project

```
CREATE TABLE `works_no` (  
    `emp_ssn` INT,  
    `p_no` INT,  
    `hour` INT,  
    PRIMARY KEY (`emp_ssn`, `p_no`),  
    FOREIGN KEY (`emp_ssn`) REFERENCES `employee` (`ssn`),  
    FOREIGN KEY (`p_no`) REFERENCES `project` (`p_no`));
```

-- adding values to works on table

```
INSERT INTO `works_no` (emp_ssn,p_no,hour)
```

VALUES

(1,100,10),

(2,100,6);

-- adding dept location table for multivalued attribute location

CREATE TABLE `dept_location` (

`d_no` INT,

`d_locations` VARCHAR(100),

PRIMARY KEY (`d_no`,`d_locations`),

FOREIGN KEY (`d_no`) REFERENCES `department` (`d_no`)

);

-- adding values into dept_location table

INSERT INTO `dept_location` (d_no,d_locations)

VALUES

(123,'bangalore'),

(123,'delhi'),

(123,'kolkata')