Project 1: Research Project Database

Project Title:
 ER Schema Design for Research Projects Database
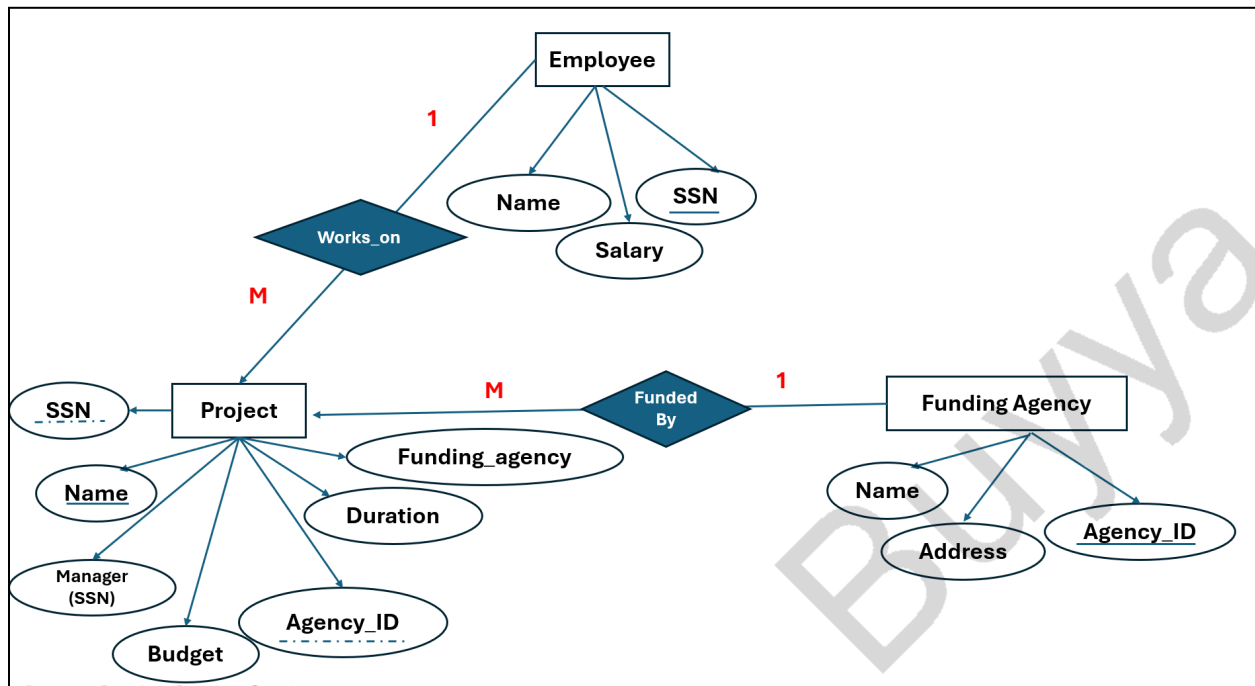
Objective:
 To design an Entity-Relationship (ER) schema that models the relationships between research projects, employees, and funding agencies.

Key Requirements:

- **Projects:**

    - Attributes: Name, Manager, Budget, Duration (in years), Funding Agency

    - Each project is funded by one agency

    - Project names are unique within an agency

- **Employees:**

    - Attributes: SSN, Name, Salary

    - Can work on multiple projects

    - Managers are also employees

- **Funding Agencies:**

    - Attributes: Name, Address

    - Can fund multiple projects

Assumptions:

- Each project must be linked to a funding agency

- An employee may be involved in multiple projects

- A project must have one manager

🧾 SQL Table Creation Statements:

1. Employee Table

```sql
CREATE TABLE Employee (
    SSN INT PRIMARY KEY,
    Emp_Name VARCHAR(50),
    Salary DECIMAL
);
```

2. FundingAgency Table

```sql
CREATE TABLE FundingAgency (
```

```
    Agency_ID INT PRIMARY KEY,
    Name VARCHAR(100),
    Address VARCHAR(255)
);
```

3. Project Table

```
CREATE TABLE Project (
    Project_ID INT PRIMARY KEY,
    Name VARCHAR(100),
    Duration INT,  -- Assuming duration in days/months
    Budget DECIMAL(12, 2)
);
```

4. Employee_Project Junction Table

```
CREATE TABLE Employee_Project (
    SSN INT,
    Project_ID INT,
    Manager_SSN INT,
    PRIMARY KEY (SSN, Project_ID),
    FOREIGN KEY (SSN) REFERENCES Employee(SSN),
    FOREIGN KEY (Project_ID) REFERENCES Project(Project_ID),
    FOREIGN KEY (Manager_SSN) REFERENCES Employee(SSN)
);
```

5. Project_Manager Table

```
CREATE TABLE Project_Manager (
    Project_ID INT PRIMARY KEY,
    Manager_SSN INT,
    FOREIGN KEY (Project_ID) REFERENCES Project(Project_ID),
    FOREIGN KEY (Manager_SSN) REFERENCES Employee(SSN)
);
```

1) **Employee**

```
INSERT INTO Employee (SSN, Emp_Name, Salary) VALUES
(101, 'John Doe', 55000.00),
(102, 'Jane Smith', 65000.00),
(103, 'Alice Brown', 72000.00);
```

2) **FundingAgency**

```
INSERT INTO FundingAgency (Agency_ID, Name, Address) VALUES
(201, 'Tech Research Fund',   '123 Tech Ave, Silicon Valley, CA'),
(202, 'Innovation Grants Inc.', '456 Innovation Dr, New York, NY'),
(203, 'Global Funding Group',  '789 Global St, London, UK');
```

3) **Project**

```
INSERT INTO Project (Project_ID, Name, Duration, Budget) VALUES
(301, 'AI Research',        12, 200000.00),
(302, 'Cloud Migration',    18, 300000.00),
(303, 'Blockchain Platform',  24, 400000.00);
```

4) **Project_Manager** (one manager per project)

```
INSERT INTO Project_Manager (Project_ID, Manager_SSN) VALUES
(301, 101),
(302, 102),
(303, 103);
```

5) **Employee_Project** (who works on which project, with that project's manager)

```
INSERT INTO Employee_Project (SSN, Project_ID, Manager_SSN) VALUES
(101, 301, 101),  -- John manages & works on AI Research
(102, 302, 102),  -- Jane manages & works on Cloud Migration
(103, 303, 103);  -- Alice manages & works on Blockchain Platform
```