

Project Title: Petroleum Company Management System

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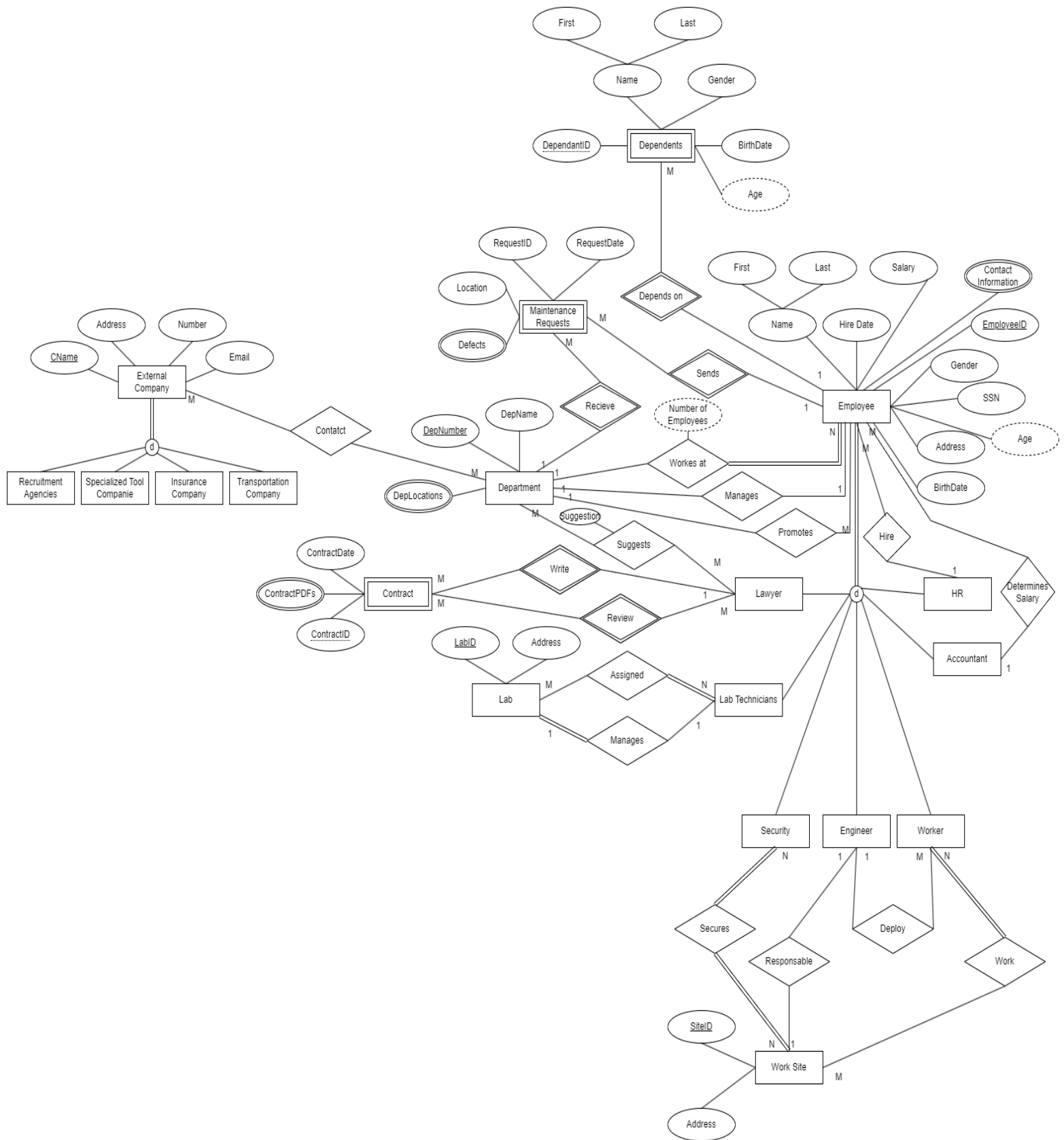
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Project Description:

Aim: increasing the efficiency of operation in the company

This system is made with international standards and according to the company requirements in the petroleum industry to increase the efficiency of operations and monitoring it and to help employees perform tasks in a better way.

The company wants the system to save the Schedule for every employee including the task distribution and times and operation dates and employee's info including name, id, and salary and no of dependents, birthdate, contact info and hire date and the want save maintenance history and reports.

This system will not be fully involved in the production process.

Actors:

Employees:

Eng

Workers

Lab Technicians

HR

Security

Lawyer

Accountant

Departments:

Time Control Management Department

Production Department

Financial Department

Industry Development Department

HR Department

Department of Legal Affairs

Maintenance Department

Laboratory Department

Recycling Department

Insurance Department

Transportation Department

External Actors:

Recruitment Agencies

Specialized Tool Companies

Insurance Companies

Transportation Companies

Locations:

Labs

Work Sites

Weak Entities:

Dependents

Contracts

Requests

Business Rules:

- Dependents have (Name, Related Employee ID)
- Work Sites must have (Location ID, Address, Department name)
- Labs must have (Lab ID, Location)
- Contracts have (Contract ID, Contract Date, Contract PDF)
- Maintenance Requests have (Request ID, Request Date, location, Defect)
- All Employees must have (name, address, birth date, contact information, SSN, hire date, salary, gender, age, Dep number)
- Engs, Workers, Lab Technicians, HR Employees, Security Employees, Lawyers, Accountants are Employees.
- An Eng can Deploy many workers under him.
- Many Workers can be deployed under one Eng.
- An Eng may be responsible for a Work site.
- A Worker Can Work in Many Work Sites.
- A Work Site Can Have Many Workers.
- A Lab Technicians May Works in Many Labs.
- A Lab Has Many Lab Technicians.
- A Lab Technician May Manage only one Lab.
- A Lab can only be managed by one Lab Technician
- A Security Employee must be assigned to a location.
- An HR Employee can Hire many Employees.
- An Employee is Hired by an HR Employee.
- A Department can Request a Lawyers Suggestion.

- A Lawyer can Review Many Contracts.
- A Contract can be Reviewed by Many Lawyers.
- A Lawyer can Write Many Contracts.
- Only one Lawyer can Write a contract.
- An Accountant Assigns many Employees salary.
- An employees' salaries is set by an Accountant.
- All Departments have (Dep number, Dep name, Dep locations, Dep manager, Dep number of employees)
- An Employee can Send Many Maintenance Requests to the Maintenance Department.
- The Maintenance Department can receive many Maintenance Requests from the Employees.
- All External Companies have (Company Name, Company Number, Company Email)
- Recruitment Agencies, Specialized Tool Companies, Insurance Companies, Transportation Companies are All External Companies.
- A Department Can Send a Request to an External Company Each request has An ID and an Attached PDF of the request.
- Employees can Have Dependents Under their insurance plan.
- All Employees belong to a department.
- One Employee manages only one department, each department can only be managed by a single employee.
- One Eng can Assign many Workers a task.
- Many Engineers can make many tool request to the Industry Development Department.
- Departments can contact each other.
- Departments can promote Employees under them.

Potential Queries:

- Which Employees have a salary above (Set amount)
- Which Employees Work at (Set Location)
- Which employees work in department number (enter department number)
- Which Employees have an age above (enter number)
- Who is the manager of department (enter department number)
- What are the insurance companies we are collaborating with
- What are the transportation companies we are collaborating with
- Which Employees are under (Set Department)
- Were there any Maintenance requests during (Set Date)
- Which Employees were Promoted during (Set Date)
- Which Employees were Demoted during (Set Date)
- Which Employees have Dependents
- Which Employees have more than (set amount) Dependents
- Which Employees have less than (set amount) Dependents
- Who are the Dependents of (set Employee)

Initial Relational Schima:

Employee (Employee ID, FirstName, LastName, Hire Date, Salary, Gender, SSN, Address, Birthdate, Accountant ID, Employer ID, Position, Department Number)

Employee ID → FirstName

Employee ID → Last Name

Employee ID → Gender

Employee ID → SSN

Employee ID → Address

Employee ID → Birth Date

Employee ID → Employer

Employee ID → Position

Employee ID → Accountant ID

Employee ID → Salary

Accountant ID → Salary

Employer ID → Hire Date

Department Number → Position

Employee (Employee ID, FirstName, LastName, Hire Date, Salary, Gender, SSN, Address, Birthdate, Accountant ID, Employer ID, Position, Department Number)

Transformed into 3NF:

Employee Salary (Employee ID, Accountant ID, Salary)

Hired Employee (Employee ID, Employer ID, Hire Date)

Employee Position (Employee ID, Department Number, Position)

Employee (Employee ID, FirstName, LastName, Salary, Gender, SSN, Address, Birthdate)

Contact Information → Employee ID

Contact Information (Employee ID, Contact information)

Is already in 3NF.

Dependent (Dependent ID, Employee ID, Birthdate, Gender, FirstName, LastName)

Dependent ID → Employee ID

Dependent ID → Birthdate

Dependent ID → Gender

Dependent ID → FirstName

Dependent ID → LastName

Dependent ID → Employee ID

Dependent (Dependent ID, Employee ID, Birthdate, Gender, FirstName, LastName)

Is already 3NF.

HR (Employee ID)

Is already 3NF.

Accountant (Employee ID)

Is already 3NF.

Employee ID → Engineer ID

Worker (Employee ID, Engineer ID)

Is already 3NF.

Worker ID → Site ID

Worker Working in Work Site (Worker ID, Site ID)

Is already 3NF.

Engineer (Employee ID)

Is already 3NF.

Security (Employee ID)

Is already 3NF.

Security ID → Site ID

Security Securing Worksite (Security ID, Site ID)

Is already 3NF.

Site ID → Address

Site ID → Responsible Engineer ID

Worksite (Site ID, Address, Responsible Engineer ID)

Is already 3NF.

Lab Technicians (Employee ID)

Is already 3NF.

Lab Technicians Assigned Lab (Lab Technician ID, Lab ID)

Is already 3NF.

Lab ID → Address

Lab ID → Lab Manager

Lab (Lab ID, Address, Lab Manager)

Is already 3NF.

Lawyer (Employee ID)

Is already 3NF.

Lawyer ID → Suggestion

Department ID → Suggestion

Lawyer Suggestion (Lawyer ID, Department ID, Suggestion)

Is already 3NF.

Contract ID → Lawyer ID

Contract Review (Lawyer ID, Contract ID)

Is already 3NF.

Contract ID → Lawyer ID

Contract ID → Contract Date

Contract (Contract ID, Lawyer ID, Contract Date)

Is already 3NF.

Contract ID → Contract PDF

Contract PDF (Contract ID, Contract PDF)

Is already 3NF.

Department Number → Department Name

Department Number → Manager

Department (Department Number, Department Name, Manager)

Is already 3NF.

Department Number → Location

Department Location (Department Number, Location)

Is already 3NF.

Maintenance Request (Request ID, Location, Request Date, Department ID, Employee ID)

Request ID → Location

Request ID → Request Date

Employee ID → Request Date

Employee ID → Location

Request ID → Department ID

Maintenance Request (Request ID, Location, Request Date, Department ID, Employee ID)

Transformed into 3NF:

Employee Request (Employee ID, Request ID, Location, Request Date)

Maintenance Request (Request ID, Employee ID, Department ID)

Defect → Request ID

Defects in Maintenance Request (Request ID, Defect)

Is already 3NF.

Department Number → Company Name

Department Contacting External Company (Company Name, Department Number)

Is already 3NF.

Company Name → Address

Company Name → Number

Company Name → Email

External Company (Company Name, Address, Number, Email)

Is already 3NF.

Recruitment agency (Company Name)

Is already 3NF.

Specialized Tool Company (Company Name)

Is already 3NF.

Insurance company (Company Name)

Is already 3NF.

Transportation Company (Company Name)

Is already 3NF.

Final Schema is:

Employee Salary (Employee ID, Accountant ID, Salary)

Accountant ID is a foreign Key for Accountant.

Hired Employee (Employee ID, Employer ID, Hire Date)

Employer ID is a foreign Key for HR Employee.

Employee Position (Employee ID, Department Number, Position)

Department Number is a foreign Key for Department.

Employee (Employee ID, FirstName, LastName, Salary, Gender, SSN, Address, Birthdate)

Contact Information (Employee ID, Contact information)

Dependent (Dependent ID, Employee ID, Birthdate, Gender, FirstName, LastName)

Employee ID is a foreign Key for Employee.

HR (Employee ID)

Accountant (Employee ID)

Worker (Employee ID, Engineer ID)

Engineer ID is a foreign Key for Engineer.

Worker Working in Work Site (Worker ID, Site ID)

Engineer (Employee ID)

Security (Employee ID)

Security Securing Worksite (Security ID, Site ID)

Worksite (Site ID, Address, Responsible Engineer ID)

Responsible Engineer ID is a foreign Key for Engineer.

Lab Technicians (Employee ID)

Lab Technicians Assigned Lab (Lab Technician ID, Lab ID)

Lab (Lab ID, Address, Lab Manager)

Lab Manager is foreign Key for Lab Technician.

Lawyer (Employee ID)

Lawyer Suggestion (Lawyer ID, Department ID, Suggestion)

Contract Review (Lawyer ID, Contract ID)

Contract (Contract ID, Lawyer ID, Contract Date)

Lawyer ID is a foreign Key for Lawyer

Contract PDF (Contract ID, Contract PDF)

Department (Department Number, Department Name, Manager)

Manager is a foreign key for Employee.

Department Location (Department Number, Location)

Employee Request (Employee ID, Request ID, Location, Request Date)

Maintenance Request (Request ID, Employee ID, Department ID)

Defects in Maintenance Request (Request ID, Defect)

Department Contacting External Company (Company Name, Department Number)

External Company (Company Name, Address, Number, Email)

Recruitment agency (Company Name)

Specialized Tool Company (Company Name)

Insurance company (Company Name)

Transportation Company (Company Name)

create database if not exists company ;

use company;

Create table if not exists Employee(

EmployeeID int primary key,

fristname varchar(20) not null,

lastname varchar(20) not null,

Gender varchar(6) not null,

SNN int unique not null,

Address varchar(150) not null,

Birthdate date not null

);

INSERT IGNORE INTO Employee (EmployeeID, fristname, lastname, Gender, SNN, Address, Birthdate)

VALUES

(1,'ahmed','mohamed','male',10001,'alamein university','29-12-04'),

(2,'hussein','ahmed','male',10002,'alamein university','2-12-04'),

(3,'ahmed','abdullah','male',10003,'alamein university','9-1-04'),

(4,'mohamed','ibrahim','male',10004,'alamein university','10-2-04'),

(5,'yousra','mohamed','female',10005,'alamein university','2-10-04'),

(6,'nermin','essam','female',10006,'alamein university','15-9-04'),

(7, 'William', 'Taylor', 'Male', 10007, '456 Oak St', '1993-08-30'),

(8, 'Sophia', 'Anderson', 'Female', 10008, '789 Pine St', '1990-02-14'),

(9, 'Matthew', 'Martinez', 'Male', 10009, '321 Elm St', '1994-07-27'),

(10, 'Ava', 'Hernandez', 'Female', 10010, '654 Main St', '1992-01-10'),
(11, 'Jacob', 'Garcia', 'Male', 10011, '987 Cedar St', '1991-03-23'),
(12, 'Isabella', 'Lopez', 'Female', 10012, '123 Oak St', '1989-06-06'),
(13, 'Ethan', 'Wilson', 'Male', 10013, '456 Pine St', '1993-10-19'),
(14, 'Mia', 'Lee', 'Female', 10014, '789 Elm St', '1990-04-01'),
(15, 'Alexander', 'Clark', 'Male', 10015, '321 Main St', '1995-07-14'),
(16, 'Olivia', 'Hall', 'Female', 10016, '654 Cedar St', '1992-11-27'),
(17, 'James', 'Young', 'Male', 10017, '987 Oak St', '1991-05-10'),
(18, 'Sofia', 'Walker', 'Female', 10018, '123 Pine St', '1994-09-23'),
(19, 'Logan', 'Harris', 'Male', 10019, '456 Elm St', '1993-01-06'),
(20, 'Charlotte', 'Gonzalez', 'Female', 10020, '789 Main St', '1990-03-20'),
(21, 'Benjamin', 'Allen', 'Male', 10021, '321 Oak St', '1995-06-02'),
(22, 'Amelia', 'Perez', 'Female', 10022, '654 Pine St', '1989-09-15'),
(23, 'Mila', 'Parker', 'Female', 10023, '789 Cedar St', '1990-07-29'),
(24, 'Emma', 'Turner', 'Female', 10024, '123 Elm St', '1994-12-28'),
(25, 'Henry', 'Baker', 'Male', 10025, '456 Main St', '1991-04-10'),
(26, 'Grace', 'Hill', 'Female', 10026, '789 Cedar St', '1990-08-23'),
(27, 'Sebastian', 'Ward', 'Male', 10027, '321 Oak St', '1995-01-05'),
(28, 'Scarlett', 'Price', 'Female', 10028, '654 Pine St', '1992-03-18'),
(29, 'Jack', 'Foster', 'Male', 10029, '987 Elm St', '1994-06-30'),
(30, 'Lily', 'Brooks', 'Female', 10030, '123 Main St', '1990-11-12'),
(31, 'Owen', 'Kelly', 'Male', 10031, '456 Elm St', '1993-02-25'),
(32, 'Victoria', 'Coleman', 'Female', 10032, '789 Oak St', '1989-07-08'),
(33, 'Gabriel', 'Gomez', 'Male', 10033, '321 Pine St', '1995-10-21'),
(34, 'Nora', 'Simmons', 'Female', 10034, '654 Cedar St', '1991-02-03'),
(35, 'Carter', 'Hughes', 'Male', 10035, '987 Oak St', '1990-05-16'),
(36, 'Hazel', 'Rivera', 'Female', 10036, '123 Pine St', '1994-08-29'),

```
(37, 'Daniel', 'Ward', 'Male', 10037, '456 Elm St', '1993-12-11'),  
(38, 'Luna', 'Reed', 'Female', 10038, '789 Main St', '1990-03-25'),  
(39, 'Max', 'Cooper', 'Male', 10039, '321 Oak St', '1995-06-07'),  
(40, 'Stella', 'Ross', 'Female', 10040, '654 Pine St', '1989-09-20'),  
(41, 'Elijah', 'Barnes', 'Male', 10041, '123 Elm St', '1994-12-03'),  
(42, 'Avery', 'Wood', 'Female', 10042, '456 Main St', '1991-03-16');
```

```
create table if not exists Accountant (  
EmployeeID int primary key,  
foreign key(EmployeeID) references Employee(EmployeeID) ON DELETE CASCADE  
);
```

```
INSERT IGNORE INTO accountant (EmployeeID)  
VALUES (1),(37),(36),(35),(34),(33);
```

```
create table if not exists Employee_Salary(  
EmployeeID int primary key,  
AccountantID int,  
salary float,  
foreign key(EmployeeID) references Employee(EmployeeID) ON DELETE CASCADE,  
foreign key(AccountantID) references Accountant(EmployeeID) ON DELETE SET NULL  
);
```

```
INSERT IGNORE INTO Employee_Salary (EmployeeID, AccountantID, salary)  
VALUES
```

(1, 1, 5000.00),
(2, 37, 6000.00),
(3, 36, 5500.00),
(4, 35, 5200.00),
(5, 34, 4800.00),
(6, 33, 5100.00),
(7, 1, 5200.00),
(8, 37, 5500.00),
(9, 36, 5300.00),
(10, 35, 5800.00),
(11, 34, 5200.00),
(12, 33, 5000.00),
(13, 1, 5400.00),
(14, 37, 5200.00),
(15, 36, 5100.00),
(16, 35, 5500.00),
(17, 34, 5600.00),
(18, 33, 5300.00),
(19, 1, 5800.00),
(21, 36, 5200.00),
(22, 35, 5300.00),
(23, 34, 5400.00),
(24, 33, 5500.00),
(25, 1, 5200.00),
(26, 37, 4800.00),
(27, 36, 5100.00),
(28, 35, 5200.00),

(29, 34, 5000.00),
(30, 33, 5300.00),
(31, 1, 5200.00),
(32, 1, 5500.00),
(33, 1, 5300.00),
(34, 1, 5800.00),
(35, 1, 5200.00),
(36, 1, 5000.00),
(37, 1, 5400.00),
(38, 37, 5200.00),
(39, 36, 5100.00),
(40, 35, 5500.00),
(41, 34, 5600.00),
(42, 33, 5300.00);

create table if not exists HR (
EmployeeID INT primary key,
foreign key(EmployeeID) references Employee(EmployeeID) ON DELETE CASCADE
);
INSERT IGNORE INTO HR (EmployeeID)
VALUES (2),(38),(39),(40),(41),(42);

create table if not exists HiredEmployee(
EmployeeID int primary key,
HireDate date not null,
HR_hiredby_ID int ,

```
foreign key(EmployeeID) references Employee(EmployeeID) ON DELETE CASCADE,  
foreign key(HR_hiredby_ID) references HR(EmployeeID) ON DELETE SET NULL  
);
```

```
INSERT IGNORE INTO HiredEmployee (EmployeeID, HireDate, HR_hiredby_ID)
```

```
VALUES
```

```
(1, '2023-01-01', 2),  
(2, '2023-01-02', 2),  
(3, '2023-01-03', 39),  
(4, '2023-01-04', 40),  
(5, '2023-01-05', 41),  
(6, '2023-01-06', 42),  
(7, '2023-01-07', 2),  
(8, '2023-01-08', 38),  
(9, '2023-01-09', 39),  
(10, '2023-01-10', 40),  
(11, '2023-01-11', 41),  
(12, '2023-01-12', 42),  
(13, '2023-01-13', 2),  
(14, '2023-01-14', 38),  
(15, '2023-01-15', 39),  
(16, '2023-01-16', 40),  
(17, '2023-01-17', 41),  
(18, '2023-01-18', 42),  
(19, '2023-01-19', 2),  
(20, '2023-01-20', 38),  
(21, '2023-01-21', 39),  
(22, '2023-01-22', 40),
```

(23, '2023-01-23', 41),
(24, '2023-01-24', 42),
(25, '2023-01-25', 2),
(26, '2023-01-26', 38),
(27, '2023-01-27', 39),
(28, '2023-01-28', 40),
(29, '2023-01-29', 41),
(30, '2023-01-30', 42),
(31, '2023-01-31', 2),
(32, '2023-02-01', 38),
(33, '2023-02-02', 39),
(34, '2023-02-03', 40),
(35, '2023-02-04', 41),
(36, '2023-02-05', 42),
(37, '2023-02-06', 2),
(38, '2023-02-07', 2),
(39, '2023-02-08', 2),
(40, '2023-02-09', 2),
(41, '2023-02-10', 2),
(42, '2023-02-11', 2);

create table if not exists Department (

Departmentno int primary key,

Dapartmentname varchar(30) not null,

Manger_ID int,

foreign key(Manger_ID) references Employee(EmployeeID) ON DELETE SET NULL

```
);  
  
INSERT IGNORE INTO Department (Departmentno, Departmentname, Manger_ID)  
VALUES  
  
(101, 'Financial', 1),  
(201, 'Production', 3),  
(301, 'HR', 2),  
(401, 'Legal Affairs', 7),  
(501, 'Maintenance', 5),  
(601, 'Laboratory', 6),  
(701, 'Security', 4);
```

```
create table if not exists Employee_postion (  
EmployeeID int primary key,  
Position varchar(30) not null,  
Department_no int,  
foreign key(EmployeeID) references Employee(EmployeeID) ON DELETE CASCADE,  
foreign key(Department_no) references Department(Departmentno) ON DELETE SET NULL  
);
```

```
INSERT IGNORE INTO employee_postion (EmployeeID, Position, Department_no)  
VALUES  
  
-- Head of Financial Department  
(1, 'Financial Department Head', 101),  
  
-- Head of HR Department  
(2, 'HR Department Head', 301),  
  
-- Head of Production Department  
(3, 'Production Department Head', 201),  
  
-- Head of Security Department
```

(4, 'Security Department Head', 701),
-- Head of Maintenance Department
(5, 'Maintenance Department Head', 501),
-- Head of Laboratory Department
(6, 'Laboratory Department Head', 601),
-- Head of Legal Affairs Department
(7, 'Legal Affairs Department Head', 401),
-- HR Employees in HR Department
(38, 'HR', 301),
(39, 'HR', 301),
(40, 'HR', 301),
(41, 'HR', 301),
(42, 'HR', 301),
-- Accountants in Financial Department
(37, 'Accountant', 101),
(36, 'Accountant', 101),
(35, 'Accountant', 101),
(34, 'Accountant', 101),
(33, 'Accountant', 101),
-- Engineers in Production Department
(32, 'Engineer', 201),
(31, 'Engineer', 201),
(30, 'Engineer', 201),
(29, 'Engineer', 201),
(28, 'Engineer', 201),
-- Security Workers in Security Department
(27, 'Security Worker', 701),

(26, 'Security Worker', 701),
(25, 'Security Worker', 701),
(24, 'Security Worker', 701),
(23, 'Security Worker', 701),

-- Workers in Maintenance Department

(22, 'Worker', 501),
(21, 'Worker', 501),
(20, 'Worker', 501),
(19, 'Worker', 501),
(18, 'Worker', 501),

-- Lawyers in Legal Affairs Department

(12, 'Lawyer', 401),
(11, 'Lawyer', 401),
(10, 'Lawyer', 401),
(9, 'Lawyer', 401),
(8, 'Lawyer', 401),

-- Lab Technicians in Laboratory Department

(17, 'Lab Technician', 601),
(16, 'Lab Technician', 601),
(15, 'Lab Technician', 601),
(14, 'Lab Technician', 601),
(13, 'Lab Technician', 601);

create table if not exists Contact_information(
EmployeeID int not null,
Contact_information varchar(200),
primary key(EmployeeID ,Contact_information),

foreign key(EmployeeID) references Employee(EmployeeID) ON DELETE CASCADE
);

INSERT IGNORE INTO Contact_information (EmployeeID, Contact_information)
VALUES

-- Employees with 3 contact information entries

(1, 'employee1@example.com'),

(1, '123-456-7890'),

(1, '123 Main St'),

(2, 'employee2@example.com'),

(2, '456-789-0123'),

(2, '456 Elm St'),

(3, 'employee3@example.com'),

(3, '789-012-3456'),

(3, '789 Oak Ave'),

-- Employees with 2 contact information entries

(4, 'employee4@example.com'),

(4, '234-567-8901'),

(5, 'employee5@example.com'),

(5, '567-890-1234'),

(6, 'employee6@example.com'),

(6, '890-123-4567'),

-- Employees with 1 contact information entry

(7, 'employee7@example.com'),

(8, 'employee8@example.com'),

(9, 'employee9@example.com'),

(10, 'employee10@example.com'),

(11, 'employee11@example.com'),

(12, 'employee12@example.com'),
(13, 'employee13@example.com'),
(14, 'employee14@example.com'),
(15, 'employee15@example.com'),
(16, 'employee16@example.com'),
(17, 'employee17@example.com'),
(18, 'employee18@example.com'),
(19, 'employee19@example.com'),
(20, 'employee20@example.com'),
(21, 'employee21@example.com'),
(22, 'employee22@example.com'),
(23, 'employee23@example.com'),
(24, 'employee24@example.com'),
(25, 'employee25@example.com'),
(26, 'employee26@example.com'),
(27, 'employee27@example.com'),
(28, 'employee28@example.com'),
(29, 'employee29@example.com'),
(30, 'employee30@example.com'),
(31, 'employee31@example.com'),
(32, 'employee32@example.com'),
(33, 'employee33@example.com'),
(34, 'employee34@example.com'),
(35, 'employee35@example.com'),
(36, 'employee36@example.com'),
(37, 'employee37@example.com'),
(38, 'employee38@example.com'),

```
(39, 'employee39@example.com'),  
(40, 'employee40@example.com'),  
(41, 'employee41@example.com'),  
(42, 'employee42@example.com');
```

```
create table if not exists Dependent (  
    Dependent int primary key,  
    Birthdate date not null,  
    fristname varchar(20) not null,  
    lastname varchar(20) not null,  
    Gender varchar(6) not null,  
    EmployeeID int not null,  
    foreign key(EmployeeID) references Employee(EmployeeID) ON DELETE CASCADE  
);  
  
INSERT IGNORE INTO Dependent (Dependent, Birthdate, fristname, lastname, Gender,  
EmployeeID)  
VALUES  
  
-- Employees with 3 dependents  
(1, '2000-01-01', 'John', 'Doe', 'Male', 1),  
(2, '2005-02-03', 'Emily', 'Smith', 'Female', 1),  
(3, '2010-06-10', 'Daniel', 'Johnson', 'Male', 1),  
(4, '2001-03-15', 'Sophia', 'Anderson', 'Female', 2),  
(5, '2007-07-20', 'Oliver', 'Wilson', 'Male', 2),  
(6, '2014-09-25', 'Isabella', 'Taylor', 'Female', 2),  
  
-- Employees with 2 dependents  
(7, '2002-05-12', 'Mason', 'Brown', 'Male', 3),
```

```
(8, '2008-09-18', 'Emma', 'Jones', 'Female', 3),  
(9, '2004-11-07', 'Michael', 'Clark', 'Male', 4),  
(10, '2011-12-30', 'Ava', 'Martinez', 'Female', 4),  
-- Employees with 1 dependent  
(11, '2003-08-14', 'William', 'Harris', 'Male', 5),  
(12, '2009-10-22', 'Sophie', 'Lee', 'Female', 6);
```

```
create table if not exists Engineer (  
EmployeeID int primary key,  
foreign key(EmployeeID) references Employee(EmployeeID) ON DELETE CASCADE  
);  
INSERT IGNORE into engineer values(3),(32),(31),(30),(29),(28);
```

```
create table if not exists Security_worker (  
EmployeeID int primary key,  
foreign key(EmployeeID) references Employee(EmployeeID) ON DELETE CASCADE  
);  
INSERT IGNORE into security_worker values(4),(27),(26),(25),(24),(23);
```

```
create table if not exists worker (  
EmployeeID int primary key,  
EngineerID int,  
foreign key(EngineerID) references Engineer(EmployeeID) ON DELETE SET NULL,  
foreign key(EmployeeID) references Employee(EmployeeID) ON DELETE CASCADE  
);  
INSERT IGNORE into worker(EmployeeID,EngineerID)  
values(5,3),(22,32),(21,31),(20,30),(19,29),(18,28);
```

```
create table if not exists Worksite (  
SiteID int primary key ,  
Address varchar(150) not null,  
Responsible_Engineer_ID int,  
foreign key(Responsible_Engineer_ID) references Engineer(EmployeeID) ON DELETE SET NULL  
);  
  
INSERT IGNORE INTO Worksite (SiteID, Address, Responsible_Engineer_ID)  
VALUES  
(1, '123 Main St, City A', 3),  
(2, '456 Elm St, City B', 32),  
(3, '789 Oak St, City C', 31),  
(4, '321 Pine St, City D', 30),  
(5, '654 Maple St, City E', 29),  
(6, '987 Cedar St, City F', 28);
```

```
create table if not exists Worker_Working_inWork_Site (  
WorkerID int not null,  
siteID int not null,  
primary key(WorkerID, siteID),  
foreign key(WorkerID) references worker(EmployeeID) ON DELETE CASCADE,  
foreign key(siteID) references Worksite(SiteID) ON DELETE CASCADE  
);  
  
INSERT IGNORE INTO Worker_Working_inWork_Site (WorkerID, siteID)  
VALUES  
(5, 1),
```

(22, 1),
(21, 1),
(20, 1),
(19, 1),
(18, 1);

```
create table if not exists Security_Securing_Worksite (  
    SecurityID int not null,  
    siteID int not null,  
    primary key(SecurityID, siteID),  
    foreign key(SecurityID) references Security_worker(EmployeeID) ON DELETE CASCADE,  
    foreign key(siteID) references Worksite(SiteID) ON DELETE CASCADE  
);  
  
INSERT IGNORE INTO Security_Securing_Worksite (SecurityID, siteID)  
VALUES  
(4, 1),  
(27, 1),  
(26, 1),  
(25, 1),  
(24, 1),  
(23, 1);
```

```
create table if not exists Lawyer (  
    EmployeeID int primary key,  
    foreign key(EmployeeID) references Employee(EmployeeID) ON DELETE CASCADE
```

);

INSERT IGNORE INTO lawyer values(7),(12),(11),(10),(9),(8);

CREATE TABLE if not exists lab (

lab_id INT PRIMARY KEY,

Address VARCHAR(150) NOT NULL,

LabManger_ID INT

);

CREATE TABLE if not exists Lab_Technicians (

EmployeeID INT PRIMARY KEY,

Lab_id INT,

FOREIGN KEY (EmployeeID) REFERENCES Employee (EmployeeID) ON DELETE CASCADE,

FOREIGN KEY (Lab_id) REFERENCES lab (lab_id) ON DELETE SET NULL

);

ALTER TABLE lab

ADD FOREIGN KEY (LabManger_ID) REFERENCES Lab_Technicians (EmployeeID) ON DELETE SET NULL;

INSERT IGNORE INTO lab values (1,'alamein university 10',null);

INSERT IGNORE INTO lab_technicians values(6,1),(17,1),(16,1),(15,1),(14,1),(13,1);

UPDATE lab

SET LabManger_ID = 6

WHERE lab_id = 1;


```
create table if not exists Lawyer_Suggestion(  
Lawyer_ID int not null,  
DepartmentID int not null,  
Suggestion varchar(5000),  
primary key(Lawyer_ID, DepartmentID),  
foreign key(Lawyer_ID) references Lawyer(EmployeeID) ON DELETE CASCADE,  
foreign key(DepartmentID) references Department(Departmentno) ON DELETE CASCADE  
);  
  
INSERT IGNORE INTO Lawyer_Suggestion (Lawyer_ID, DepartmentID, Suggestion)  
VALUES  
(8, 101, 'Implement stricter financial regulations.'),  
(9, 201, 'Improve production efficiency through automation.'),  
(10, 301, 'Enhance employee training and development programs.'),  
(11, 401, 'Review and update legal contracts and agreements.'),  
(12, 501, 'Increase preventive maintenance for equipment.'),  
(7, 601, 'Upgrade laboratory equipment for better research capabilities.');
```

```
create table if not exists Contract (  
Contract_ID int primary key ,  
Contract_Date date not null,  
Contract_Details varchar(2000),  
Lawyer_ID int ,  
foreign key(Lawyer_ID) references Lawyer(EmployeeID) ON DELETE SET NULL  
);
```

```
INSERT IGNORE INTO Contract (Contract_ID, Contract_Date, Contract_Details, Lawyer_ID)
VALUES
(101, '2023-01-15', 'Supply agreement with ABC Company', 8),
(102, '2023-02-10', 'Service contract with XYZ Corporation', 9),
(103, '2023-03-22', 'Lease agreement for property rental', 10),
(104, '2023-04-05', 'Consulting services contract with DEF Inc.', 11),
(105, '2023-05-18', 'Construction agreement for project A', 12),
(106, '2023-06-30', 'Software licensing contract with GHI Corporation', 7);
```

```
create table if not exists contract_reveiw(
Lawyer_ID int ,
Contract_ID int ,
primary key (Lawyer_ID ,Contract_ID),
foreign key(Lawyer_ID) references Lawyer(EmployeeID) ON DELETE CASCADE,
foreign key(Contract_ID) references Contract(Contract_ID) ON DELETE CASCADE
);
```

```
INSERT IGNORE INTO contract_reveiw (Lawyer_ID, Contract_ID)
VALUES
(8, 101),
(9, 102),
(10, 103),
(11, 104),
(12, 105),
(7, 106);
```

```
create table if not exists Department_location(  
    Departmentno int,  
    DepartmentLocation varchar(500),  
    primary key(Departmentno ,DepartmentLocation),  
    foreign key(Departmentno) references Department(Departmentno) ON DELETE CASCADE  
);  
  
INSERT IGNORE INTO Department_location (Departmentno, DepartmentLocation)  
VALUES  
  
(101, 'Location 1A'),  
(101, 'Location 1B'),  
(101, 'Location 1C'),  
(201, 'Location 2A'),  
(301, 'Location A1'),  
(301, 'Location B1'),  
(401, 'Location C1'),  
(501, 'Location X'),  
(601, 'Location Y'),  
(701, 'Location Z');
```

```
create table if not exists Employee_Request(  
    EmployeeID int not null,  
    RequestID int not null,  
    requestDetails varchar(2000) not null,  
    RequestDate date not null,  
    primary key(EmployeeID,RequestID),  
    foreign key(EmployeeID) references Employee(EmployeeID) ON DELETE CASCADE
```

```

);

INSERT IGNORE INTO Employee_Request (EmployeeID, RequestID, requestDetails,
RequestDate) VALUES

-- Employee 12 - 3 requests
(12, 1, 'Request details 1', '2023-05-01'),
(12, 2, 'Request details 2', '2023-05-02'),
(12, 3, 'Request details 3', '2023-05-03'),
-- Employee 17 - 2 requests
(17, 4, 'Request details 4', '2023-05-04'),
(17, 5, 'Request details 5', '2023-05-05'),
-- Employees 22-42 - 1 request each
(22, 6, 'Request details 6', '2023-05-06'),
(27, 7, 'Request details 7', '2023-05-07'),
(32, 8, 'Request details 8', '2023-05-08'),
(37, 9, 'Request details 9', '2023-05-09'),
(42, 10, 'Request details 10', '2023-05-10');

```

```

create table if not exists Maintenance_Request(
RequestID int not null,
EmployeeID int not null,
requestDetails varchar(2000),
Departmentno int,
primary key(RequestID, EmployeeID, Departmentno),
foreign key(EmployeeID) references Employee(EmployeeID) ON DELETE CASCADE,
foreign key(Departmentno) references Department(Departmentno) ON DELETE CASCADE
);

```

```
INSERT IGNORE INTO Maintenance_Request (RequestID, EmployeeID, requestDetails,
Departmentno) VALUES

(1, 12, 'Request details 1', 501),
(2, 12, 'Request details 2', 501),
(3, 12, 'Request details 3', 501),
(4, 17, 'Request details 4', 501),
(5, 17, 'Request details 5', 501),
(6, 22, 'Request details 6', 501),
(7, 27, 'Request details 7', 501),
(8, 32, 'Request details 8', 501),
(9, 37, 'Request details 9', 501),
(10, 42, 'Request details 10', 501);

create table if not exists Defects_in_Maintenance_Request(
RequestID int not null,
Defect varchar(500) not null,
primary key(RequestID, Defect),
foreign key(RequestID) references Maintenance_Request(RequestID) ON DELETE CASCADE
);

INSERT IGNORE INTO Defects_in_Maintenance_Request (RequestID, Defect) VALUES

(1, 'Defect 1'),
(2, 'Defect 2'),
(3, 'Defect 3'),
(4, 'Defect 4'),
(5, 'Defect 5'),
(6, 'Defect 6'),
(7, 'Defect 7'),
```

```
(8, 'Defect 8'),  
(9, 'Defect 9'),  
(10, 'Defect 10');
```

```
create table if not exists External_Company(  
    Company_ID int primary key,  
    Company_name varchar(100) not null,  
    Address varchar(50) not null,  
    Num int not null,  
    Email varchar(100) not null  
);
```

```
INSERT IGNORE INTO External_Company (Company_ID, Company_name, Address, Num, Email)  
VALUES
```

```
(1, 'Company 1', 'Address 1', 123456789, 'company1@example.com'),  
(2, 'Company 2', 'Address 2', 987654321, 'company2@example.com'),  
(3, 'Company 3', 'Address 3', 567891234, 'company3@example.com'),  
(4, 'Company 4', 'Address 4', 321456789, 'company4@example.com'),  
(5, 'Company 5', 'Address 5', 678912345, 'company5@example.com'),  
(6, 'Company 6', 'Address 6', 234567891, 'company6@example.com'),  
(7, 'Company 7', 'Address 7', 789123456, 'company7@example.com'),  
(8, 'Company 8', 'Address 8', 456789123, 'company8@example.com'),  
(9, 'Company 9', 'Address 9', 912345678, 'company9@example.com'),  
(10, 'Company 10', 'Address 10', 345678912, 'company10@example.com'),  
(11, 'Company 11', 'Address 11', 891234567, 'company11@example.com'),  
(12, 'Company 12', 'Address 12', 678912345, 'company12@example.com'),  
(13, 'Company 13', 'Address 13', 123456789, 'company13@example.com'),
```

```
(14, 'Company 14', 'Address 14', 987654321, 'company14@example.com'),
(15, 'Company 15', 'Address 15', 567891234, 'company15@example.com'),
(16, 'Company 16', 'Address 16', 321456789, 'company16@example.com'),
(17, 'Company 17', 'Address 17', 678912345, 'company17@example.com'),
(18, 'Company 18', 'Address 18', 234567891, 'company18@example.com'),
(19, 'Company 19', 'Address 19', 789123456, 'company19@example.com'),
(20, 'Company 20', 'Address 20', 456789123, 'company20@example.com'),
(21, 'Company 21', 'Address 21', 912345678, 'company21@example.com'),
(22, 'Company 22', 'Address 22', 345678912, 'company22@example.com'),
(23, 'Company 23', 'Address 23', 891234567, 'company23@example.com'),
(24, 'Company 24', 'Address 24', 678912345, 'company24@example.com');
```

```
create table if not exists Recruitment_agency(
Company_ID int primary key,
foreign key(Company_ID) references External_Company(Company_ID) ON DELETE CASCADE
);
INSERT IGNORE INTO Recruitment_agency (Company_ID) VALUES
(1),
(2),
(3),
(4),
(5),
(6);
```

```
create table if not exists Specialized_Tool_Company(  
Company_ID int primary key,  
foreign key(Company_ID) references External_Company(Company_ID) ON DELETE CASCADE  
);  
  
INSERT IGNORE INTO Specialized_Tool_Company (Company_ID) VALUES  
(7),  
(8),  
(9),  
(10),  
(11),  
(12);
```

```
create table if not exists Insurance_company(  
Company_ID int primary key,  
foreign key(Company_ID) references External_Company(Company_ID) ON DELETE CASCADE  
);  
  
INSERT IGNORE INTO Insurance_company (Company_ID) VALUES  
(13),  
(14),  
(15),  
(16),  
(17),  
(18);
```



```
create table if not exists Transportation_Company(  
Company_ID int primary key,  
foreign key(Company_ID) references External_Company(Company_ID) ON DELETE CASCADE  
);  
  
INSERT IGNORE INTO Transportation_Company (Company_ID) VALUES  
(19),  
(20),  
(21),  
(22),  
(23),  
(24);
```

```
create table if not exists Department_Contacting_External_Company(  
Company_ID int not null,  
Departmentno int not null,  
primary key(Company_ID, Departmentno),  
foreign key(Company_ID) references External_Company(Company_ID) ON DELETE CASCADE,  
foreign key(Departmentno) references Department(Departmentno) ON DELETE CASCADE  
);  
  
INSERT IGNORE INTO Department_Contacting_External_Company (Company_ID,  
Departmentno) VALUES  
(1, 301),  
(2, 301),  
(7, 201),  
(8, 201),  
(13, 101),  
(19, 501);
```

-- Which Employees have a salary above (Set amount)

```
SELECT *  
FROM Employee  
WHERE EmployeeID IN (  
    SELECT EmployeeID  
    FROM Employee_Salary  
    WHERE salary > 5200  
);
```

-- Which Employees Work at (Set Location)

```
SELECT E.*  
FROM Employee AS E  
JOIN Employee_postion AS EP ON E.EmployeeID = EP.EmployeeID  
JOIN Department AS D ON EP.Department_no = D.Departmentno  
JOIN Department_location AS DL ON D.Departmentno = DL.Departmentno  
WHERE DL.DepartmentLocation = 'Location 1A';
```

-- Which employees work in department number (enter department number)

```
SELECT E.*  
FROM Employee AS E  
JOIN Employee_postion AS EP ON E.EmployeeID = EP.EmployeeID  
WHERE EP.Department_no = 101;
```

-- Which Employees have an age above (enter number)

```
SELECT *  
  
FROM Employee  
  
WHERE TIMESTAMPDIFF(YEAR, Birthdate, CURDATE()) > 40;
```

-- Who is the manager of department (enter department number)

```
SELECT E.EmployeeID, E.fristname, E.lastname  
  
FROM Employee AS E  
  
JOIN Department AS D ON E.EmployeeID = D.Manger_ID  
  
WHERE D.Departmentno = 101;
```

-- What are the insurance companies we are collaborating with

```
SELECT EC.*  
  
FROM External_Company AS EC  
  
JOIN Department_Contacting_External_Company AS DCEC ON EC.Company_ID =  
DCEC.Company_ID  
  
JOIN Insurance_company AS IC ON EC.Company_ID = IC.Company_ID;
```

-- Which Employees are under (Set Department)

```
SELECT E.*  
  
FROM Employee AS E  
  
JOIN Employee_postion AS EP ON E.EmployeeID = EP.EmployeeID  
  
JOIN Department AS D ON EP.Department_no = D.Departmentno  
  
WHERE D.Dapartmentname = 'financial';
```

-- Were there any Maintenance requests during (Set Date) that date only

```
SELECT *  
FROM Employee_Request  
WHERE RequestDate = '2023-05-01';
```

-- Were there any Maintenance requests during (Start Date, End Date)

```
SELECT *  
FROM Employee_Request  
WHERE RequestDate BETWEEN '2023-05-01' AND '2023-05-04';
```

-- Which Employees have Dependents

```
SELECT DISTINCT E.*  
FROM Employee AS E  
JOIN Dependent AS D ON E.EmployeeID = D.EmployeeID;
```

-- Which Employees have less than (set amount) Dependents

```
SELECT E.*  
FROM Employee AS E  
LEFT JOIN (  
    SELECT EmployeeID, COUNT(*) AS DependentCount  
    FROM Dependent  
    GROUP BY EmployeeID  
) AS D ON E.EmployeeID = D.EmployeeID  
WHERE D.DependentCount < 2 OR D.DependentCount IS NULL;
```

-- Which Employees have more than (set amount) Dependents

```
SELECT E.*  
FROM Employee AS E  
JOIN (  
    SELECT EmployeeID, COUNT(*) AS DependentCount  
    FROM Dependent  
    GROUP BY EmployeeID  
    HAVING COUNT(*) > 2  
) AS D ON E.EmployeeID = D.EmployeeID;
```

-- Who are the Dependents of (set Employee)

```
SELECT *  
FROM Dependent  
WHERE EmployeeID = 1;
```