1. Write down a sample requirement for a database.

2. Identify nouns from the requirement statement. There will be a table for each noun.

3. Identify possible attributes for each table.

4. Identify relationships for all the tables.

5. Assesses the tables and fields and adjusts them if needed and implement the design.

Step 1: Problem Statement

The data science company requires a centralized database system. It should streamline project tracking, employee information, customer relations, and financial records, while also enabling easy access to sales and expense data. Additionally, it should support the documentation and organization of future plans and initiatives, ensuring seamless coordination and decision-making across the organization's operational aspects.

Step 2: Identifying Tables

The data science company requires a centralized database system. It should streamline **project** tracking, **employee** information, **customer** relations, and **financial records**, while also enabling easy access to **sales** and **expense** data. Additionally, it should support the documentation and organization of **future plans and initiatives**, ensuring seamless coordination and decision-making across the organization's operational aspects.

Extension: It is very common that a company has different departments to operate smoothly. So there will a few **departments** in the company from the problem statement. Also, I can further sub-divided projects under **tasks** for employees.

Table Names

1. Departments
2. Employees
3. Projects
4. Tasks
5. Customers
6. Sales
7. Expenses
8. Future Plans

Step 3: Identifying Attributes

Departments:

- Department Number
- Department Name

Employees:

- Employee ID
- First Name
- Last Name
- Email
- Phone Number
- Department Number
- Position
- Start Date

Projects:

- Project ID
- Project Name
- Start Date
- End Date
- Status
- Department Number

Tasks:

- Task ID
- Project ID
- Employee ID
- Due Date
- Status

Customers:

- Customer ID
- Customer Name
- Email
- Phone Number
- Address
- Sale ID
- Project ID

Sales:

- Sale ID
- Customer ID
- Date
- Sale’s Price

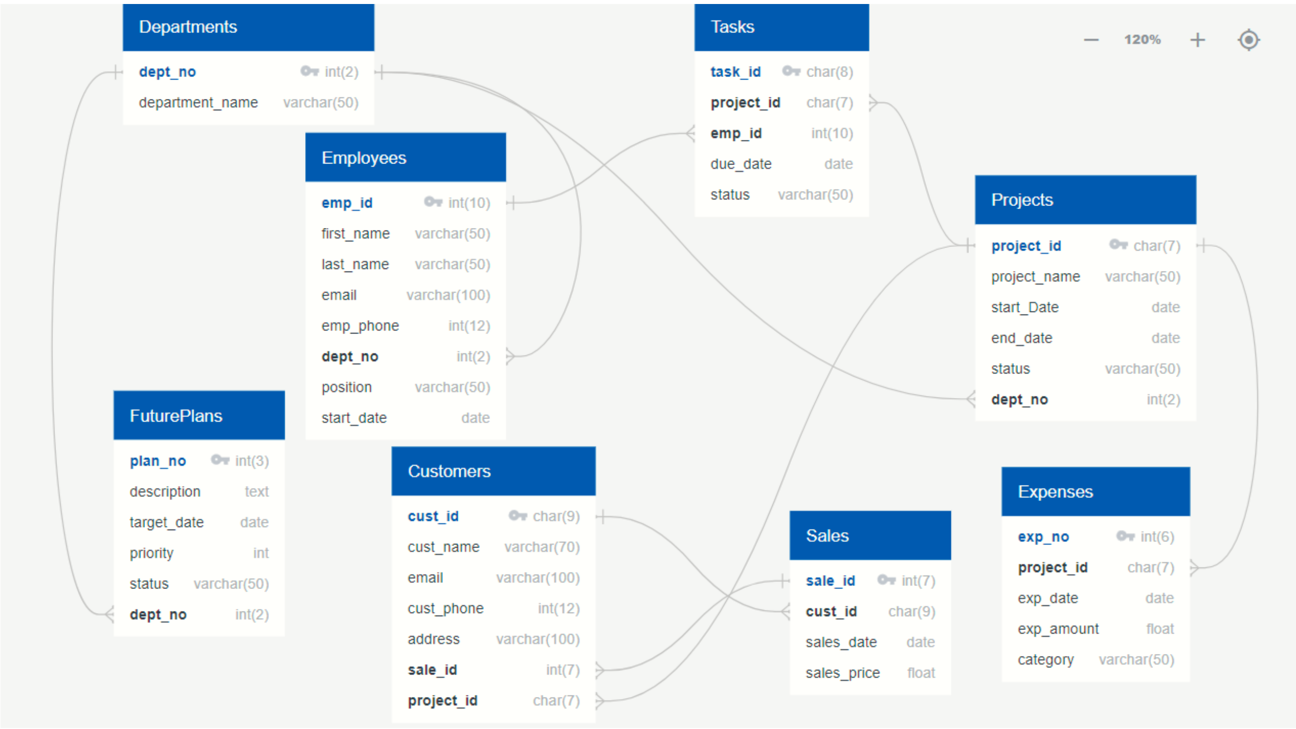
Expenses:

Expense Number
Project ID
Date
Amount
Category

Future Plans:

Plan Number
Description
Target Date
Priority
Status
Department Number

Step 4: Relationships build up



Departments	
dept_no	int(2)
department_name	varchar(50)

Tasks	
task_id	char(8)
project_id	char(7)
emp_id	int(10)
due_date	date
status	varchar(50)

Employees	
emp_id	int(10)
first_name	varchar(50)
last_name	varchar(50)
email	varchar(100)
emp_phone	int(12)
dept_no	int(2)
position	varchar(50)
start_date	date

Projects	
project_id	char(7)
project_name	varchar(50)
start_Date	date
end_date	date
status	varchar(50)
dept_no	int(2)

FuturePlans	
plan_no	int(3)
description	text
target_date	date
priority	int
status	varchar(50)
dept_no	int(2)

Customers	
cust_id	char(9)
cust_name	varchar(70)
email	varchar(100)
cust_phone	int(12)
address	varchar(100)
sale_id	int(7)
project_id	char(7)

Sales	
sale_id	int(7)
cust_id	char(9)
sales_date	date
sales_price	float

Expenses	
exp_no	int(6)
project_id	char(7)
exp_date	date
exp_amount	float
category	varchar(50)

Step 5: Implimentation (using MySQL)

```
-- MySQL Workbench 8.0 CE
-- Data Science Company Database (dsc_database)
-- My GitHub Link: https://github.com/kawserabdullah
```

-- Creat Database

```
DROP DATABASE IF EXISTS dsc_database;
CREATE DATABASE dsc_database;
USE dsc_database;
```

-- Departments Table

```
CREATE TABLE `Departments` (
    `dept_no` int(2)  NOT NULL ,
    `department_name` varchar(50)  NOT NULL ,
    PRIMARY KEY (
        `dept_no`
    )
);
```

-- Employees Table

```
CREATE TABLE `Employees` (
    `emp_id` int(10)  NOT NULL ,
    `first_name` varchar(50)  NOT NULL ,
    `last_name` varchar(50)  NOT NULL ,
    `email` varchar(100)  NOT NULL ,
    `emp_phone` int(12)  NOT NULL ,
    `dept_no` int(2)  NOT NULL ,
    `position` varchar(50)  NOT NULL ,
    `start_date` date  NOT NULL ,
    PRIMARY KEY (
        `emp_id`
    )
);
```

-- Projects Table

```
CREATE TABLE `Projects` (
    `project_id` char(7)  NOT NULL ,
    `project_name` varchar(50)  NOT NULL ,
    `start_Date` date  NOT NULL ,
    `end_date` date  NOT NULL ,
    `status` varchar(50) NULL ,
    `dept_no` int(2)  NOT NULL ,
    PRIMARY KEY (
        `project_id`
    )
);
```

```
-- Tasks Table
CREATE TABLE `Tasks` (
    `task_id` char(8)  NOT NULL ,
    `project_id` char(7)  NOT NULL ,
    `emp_id` int(10)  NOT NULL ,
    `due_date` date  NOT NULL ,
    `status` varchar(50) NULL ,
    PRIMARY KEY (
        `task_id`
    )
);

-- Customers Table
CREATE TABLE `Customers` (
    `cust_id` char(9)  NOT NULL ,
    `cust_name` varchar(70)  NOT NULL ,
    `email` varchar(100)  NOT NULL ,
    `cust_phone` int(12)  NOT NULL ,
    `address` varchar(100) NULL ,
    `sale_id` int(7)  NOT NULL ,
    `project_id` char(7)  NOT NULL ,
    PRIMARY KEY (
        `cust_id`
    )
);

-- Sales Table
CREATE TABLE `Sales` (
    `sale_id` int(7)  NOT NULL ,
    `cust_id` char(9)  NOT NULL ,
    `sales_date` date  NOT NULL ,
    `sales_price` float  NOT NULL ,
    PRIMARY KEY (
        `sale_id`
    )
);

-- Expenses Table
CREATE TABLE `Expenses` (
    `exp_no` int(6)  NOT NULL ,
    `project_id` char(7)  NOT NULL ,
    `exp_date` date  NOT NULL ,
    `exp_amount` float  NOT NULL ,
    `category` varchar(50)  NULL ,
    PRIMARY KEY (
        `exp_no`
    )
);
```

-- FuturePlans Table

```
CREATE TABLE `FuturePlans` (
    `plan_no` int(3)  NOT NULL ,
    `description` text NULL ,
    `target_date` date NULL ,
    `priority` int  NOT NULL ,
    `status` varchar(50) NULL ,
    `dept_no` int(2)  NOT NULL ,
    PRIMARY KEY (
        `plan_no`
    )
);
```

-- Relationships Build up using PK and FK

```
ALTER TABLE `Employees` ADD CONSTRAINT `fk_Employees_dept_no` FOREIGN KEY(`dept_no`)
REFERENCES `Departments` (`dept_no`);

ALTER TABLE `Projects` ADD CONSTRAINT `fk_Projects_dept_no` FOREIGN KEY(`dept_no`)
REFERENCES `Departments` (`dept_no`);

ALTER TABLE `Tasks` ADD CONSTRAINT `fk_Tasks_project_id` FOREIGN KEY(`project_id`)
REFERENCES `Projects` (`project_id`);

ALTER TABLE `Tasks` ADD CONSTRAINT `fk_Tasks_emp_id` FOREIGN KEY(`emp_id`)
REFERENCES `Employees` (`emp_id`);

ALTER TABLE `Customers` ADD CONSTRAINT `fk_Customers_sale_id` FOREIGN KEY(`sale_id`)
REFERENCES `Sales` (`sale_id`);

ALTER TABLE `Customers` ADD CONSTRAINT `fk_Customers_project_id` FOREIGN KEY(`project_id`)
REFERENCES `Projects` (`project_id`);

ALTER TABLE `Sales` ADD CONSTRAINT `fk_Sales_cust_id` FOREIGN KEY(`cust_id`)
REFERENCES `Customers` (`cust_id`);

ALTER TABLE `Expenses` ADD CONSTRAINT `fk_Expenses_project_id` FOREIGN KEY(`project_id`)
REFERENCES `Projects` (`project_id`);

ALTER TABLE `FuturePlans` ADD CONSTRAINT `fk_FuturePlans_dept_no` FOREIGN KEY(`dept_no`)
REFERENCES `Departments` (`dept_no`);
```

My GitHub Link: https://github.com/kawserabdullah