Task 2 (Design ERDs)

🎌 1) Airline Information System

An airline system is needed to manage flight operations, schedules, reservations, and related data:

✈️ AIRPORT

- Each airport has a unique **airport_code**.
- It stores **city**, **state**, and **name**.
- An airport can serve as a **departure** or **arrival** point for many flight legs.
- An airport may **allow landing** of different airplane types.

🛫 FLIGHT LEG

- Each flight leg is uniquely identified by a **leg_no**.
- A leg has a **scheduled_dep_time** and **scheduled_arr_time**.
- A leg **departs from** and **arrives at** an airport.

🖼️ LEG INSTANCE

- A **leg instance** is a specific occurrence of a flight leg on a **given date**.
- It includes:
  - **Arrival time**
  - **Departure time**
  - **Number of available seats**
- It is **assigned** an airplane and connected to **seat reservations**.

✈️ AIRPLANE TYPE

- Defined by a **type_name**, **company**, and **max_seats**.
- Multiple airplanes can share a type.

✈️ AIRPLANE

- Identified by **airplane_id**.
- Has a **total number of seats**.
- Each airplane belongs to a **specific type**.
- Assigned to **leg instances**.

💺 SEAT / RESERVATION

- A **reservation** is made by a **customer** with name and phone.
- It is linked to a specific **seat number** in a **leg instance**.

📑 FLIGHT & FARE

- A **flight** includes multiple legs.

- Flights have attributes like:

    o **Airline**

    o **Weekdays**

    o **Restrictions**

- Each flight can have multiple **fares**, with:

    o **Code**

    o **Amount**

🎓 2) College Management System – Requirement

A college database system is needed to manage students, faculty, courses, hostels, and examinations:

👨‍🏫 FACULTY

- Identified by **F_id**.

- Attributes: **Name**, **Mobile_no**, **Department**, **Salary**.

- Teaches multiple students and handles subjects.

🧑‍🎓 STUDENT

- Identified by **S_id**.

- Attributes: **F_name**, **L_name**, **Name**, **Phone_no**, **DOB**, and **Age** (derived).

- Can:

    o Enroll in **multiple courses**

    o Belong to a **department**

    o Take **multiple exams**

    o Live in a **hostel**

🏫 HOSTEL

- Identified by **Hostel_id**.

- Attributes: **Hostel_name**, **City**, **State**, **Address**, **Pin_code**, **No_of_seats**.

📚 COURSE

- Identified by **Course_id**.

- Attributes: **Course-name**, **Duration**.

- Courses are handled by **departments** and have multiple enrolled students.

📖 SUBJECT

- Each subject has a **Subject_id** and **Subject_name**.

- Students take subjects which are taught by faculty.

🖊️ EXAMS

- Identified by **Exam_code**.

- Attributes: **Date**, **Time**, **Room**.

- Conducted by a **department**.

📊 DEPARTMENT

- Identified by **Department_id**.

- Has a **D_name**.

- Handles courses and conducts exams.

📊 3) Company Database – Requirement

This system manages a company's departments, employees, projects, and their dependents:

👩 EMPLOYEE

- Identified by **SSN**.

- Attributes: **Fname**, **Minit**, **Lname**, **Address**, **Sex**, **Bdate**, **Salary**.

- Can:

    o **Work for** a department with **StartDate**

    o **Supervise** other employees

    o Be **supervised**

    o **Work on** projects with **hours logged**

    o **Manage** departments

    o Have **dependents**

👨‍👩‍👧 DEPENDENT

- Each dependent is related to one employee.

- Attributes: **Name**, **Sex**, **Birthdate**, **Relationship**.

📊 DEPARTMENT

- Identified by **Name**.

- Attributes: **Number**, **Locations**, **NumberOfEmployees**.

- A department:

    o **Controls** multiple projects

    o Is **managed by** an employee

🏢 PROJECT

- Identified by **Name** and **Number**.

- Attributes: **Location**

- Employees **work on** projects, each with **logged hours**.