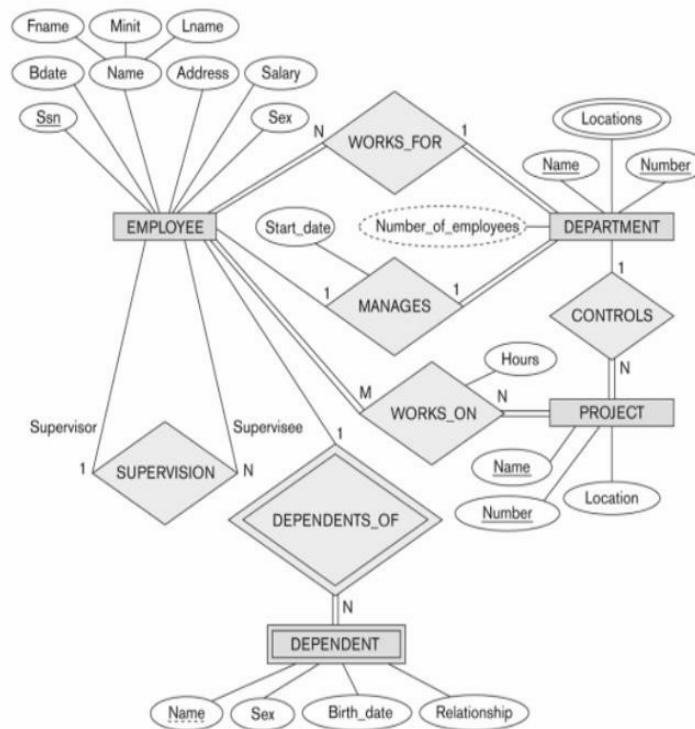


Lab1. Data Modeling using ER Diagrams

Objectives

In this lab, you will create Entity-Relationship diagrams for the given business scenarios and understand the terminologies.

Question1: For the ER diagram shown below, answer the following questions



1. How many entities are here in the Employee database?

Ans: 4 entities

2. How many relationships are there?

Ans: 6 relationship.

3. What is the primary key for the entity EMPLOYEE?

Ans: Ssn

4. Is there any unary relationship in this ERD?. What is it?

Ans: Yes, it is supervision

5. Which one is the weak entity here?

Ans: Dependent is the weak entity

6. Which one is the multivalued attribute?

Ans: Locations is the multivalued attribute

7. Is there any derived attribute?

Ans: Yes.

8. Which one is the weak entity?. Why?

Ans: Dependent is the weak entity, because it cannot be uniquely identified by its own attributes.

9. How many departments can an employee work for?

Ans: One to one

10. How many employees can work for a Department?

Ans: Many to one

11. What are the total participations here?

Ans: many to many

Question2: Create schema for all entities and relationships from ER diagram of Employee Database

EMPLOYEE:

ssn	Bdate	Fname	Minit	Lname	address	salary	sex
-----	-------	-------	-------	-------	---------	--------	-----

DEPARTMENT:

name	number	location	Number_of_employees
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PROJECT:

Number	Name	Location
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DEPENDENT:

name	sex	Birth_date	Relationship
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WORKS_ON:

Hours

MANAGES:

Start_date

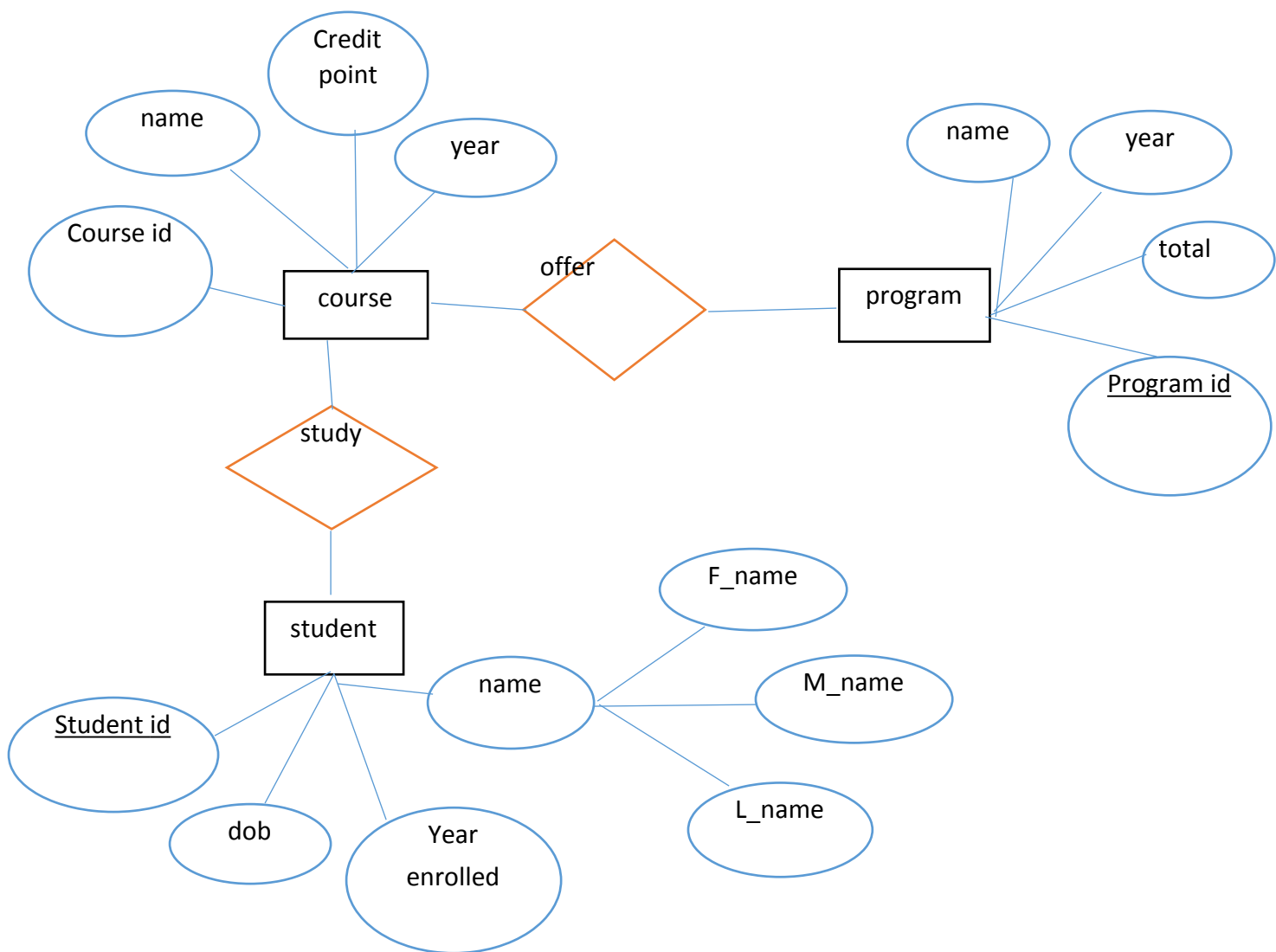
Question3: Create ER diagram for the following University application

The **university** database stores details about university students, courses, the semester a student took a particular course (and his mark and grade if he completed it), and what degree program each student is enrolled in. The database is a long way from one that'd be suitable for a large tertiary institution, but it does illustrate relationships that are interesting to query, and it's easy to relate to when you're learning SQL. We explain the requirements next and discuss their shortcomings at the end of this section.

Consider the following requirements list:

- The university offers one or more programs.
- A program is made up of one or more courses.
- A student must enroll in a program.
- A student takes the courses that are part of her program.
- A program has a name, a program identifier, the total credit points required to graduate, and the year it commenced.
- A course has a name, a course identifier, a credit point value, and the year it commenced.
- Students have one or more given names, a surname, a student identifier, a date of birth, and the year they first enrolled. We can treat all given names as a single object—for example, "John Paul."

- When a student takes a course, the year and semester he attempted it are recorded. When he finishes the course, a grade (such as A or B) and a mark (such as 60 percent) are recorded.
- Each course in a program is sequenced into a year (for example, year 1) and a semester (for example, semester 1).



Question 3B: Create schema for all entities and relationships from the university ER diagram

Course:

Course id	Name	Credit_point	Year
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Program:

P_id	Name	Year	Total
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Student:

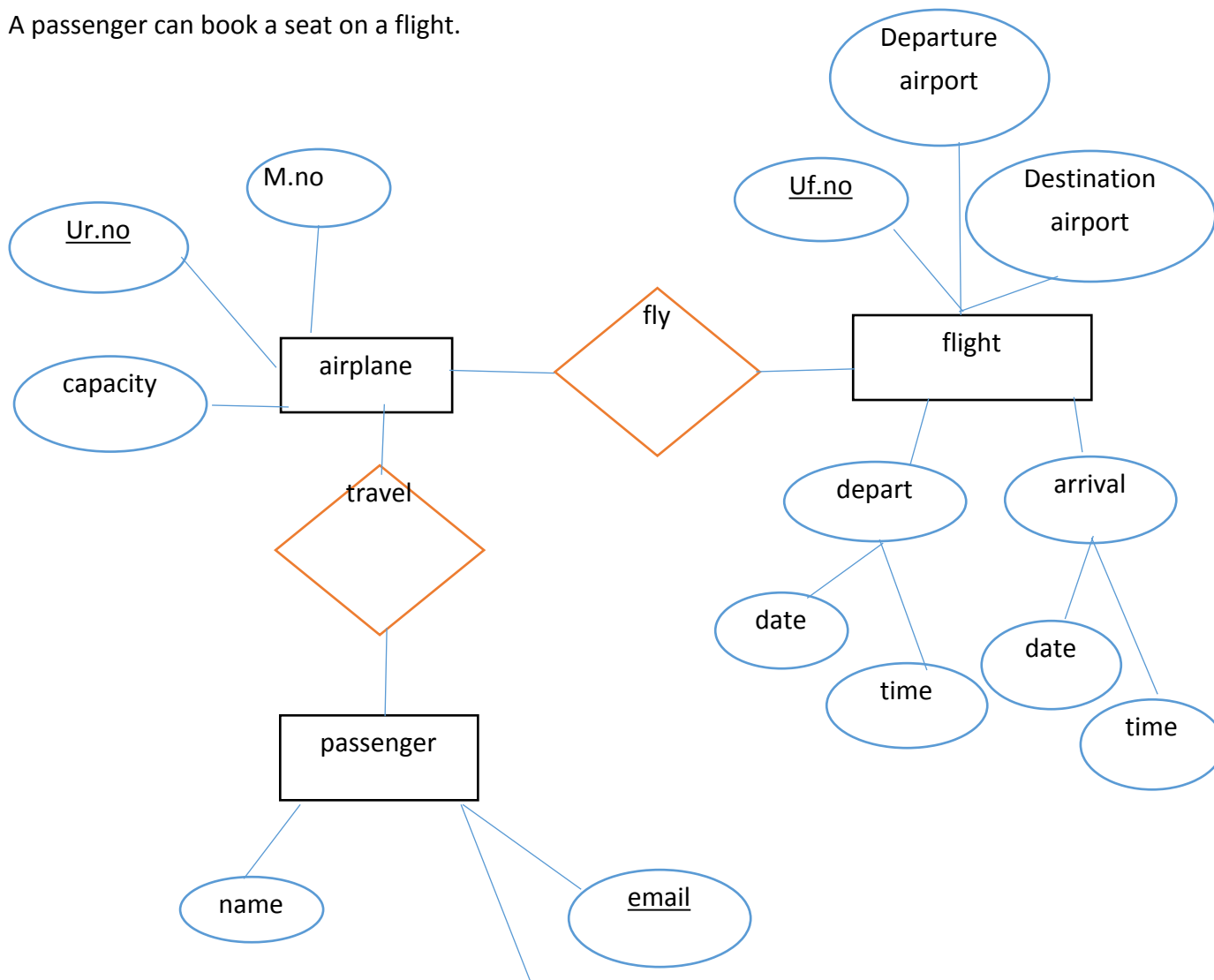
Student id	Dob	Year enrolled	F_name	M_name	L_name

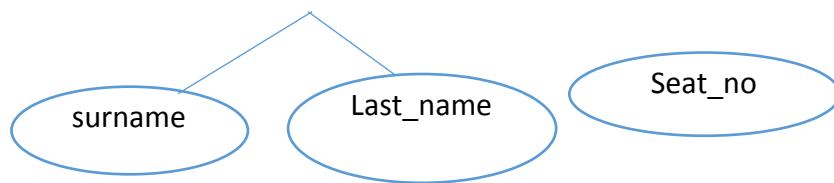
Question4: Create ER diagram for the Flight database application

The ~~flight~~ database stores details about an airline's fleet, flights, and seat bookings. Again, it's a hugely simplified version of what a real airline would use, but the principles are the same.

Consider the following requirements list:

- The airline has one or more airplanes.
- An airplane has a model number, a unique registration number, and the capacity to take one or more passengers.
- An airplane flight has a unique flight number, a departure airport, a destination airport, a departure date and time, and an arrival date and time.
- Each flight is carried out by a single airplane.
- A passenger has given names, a surname, and a unique email address.
- A passenger can book a seat on a flight.





Question 4B: Create schema for all entities and relationships from the flight ER diagram

Airplane:

Ur_no	M_no	Capacity
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Flight:

Surname	Lastname	Email	Seat_no
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Passenger:

Uf_no	Departure airport	Destination airport	Depart date	Depart time	Arrival date	Arrival time
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