SOLUTION: {{< var lab.three.title >}}

COMP1048: Databases and Interfaces (2024-2025)

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1 Lab Overview

> **!** Creating ER Diagrams
>
> You are not required to use a specific software for this lab task. However, we recommend Microsoft PowerPoint, as it is freely available to you. If you prefer to use different software, please specify it in your lab submission. If you choose to use pen and paper, ensure that a ruler is used and the diagram is neatly presented. Diagrams that are poorly made, messy, or unprofessional may not receive marks for this lab activity.

In this lab session, we will practice translating problem descriptions into entity-relationship (ER) diagrams, using the techniques covered in the lecture.

Please complete the following exercises and compile your answers into a single PDF document. The requirements for submission are outlined in the Submitting your lab work section.

2 Questions

Q1 Modelling a Film Production Company

Consider the following problem description:

> "A film production company wants to create a database to store the details of its movie collections. Information to be stored about each movie includes: price, title, year and genre. Each movie will have a leading actor, and each leading actor may appear in multiple movies. Actors have names associated with them, and it should be possible to search the database with the actor's name."

Analyse the problem description and model its data requirements completing the following:

1. Identify entities, attributes, relationships, and cardinality ratios from the problem description.

Solution

- **Entities**: Actor, Movie.
- **Attributes**: Name, Title, Price, Year, Genre.
- **Relationship**: Act(1:M)

2. Using the identified components, generate an ER diagram that captures the film production company's needs. Use the ER notation presented during the lectures.

Solution

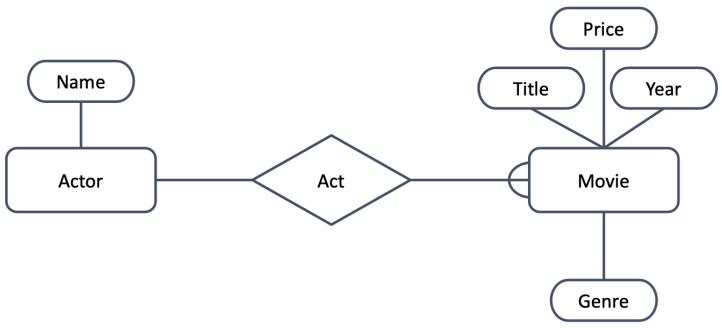

Figure 1: E/R diagram solution for Q1

Q2 Modelling Drug Trials at a Pharmaceutical Company

Consider the following problem description:

> "A research laboratory at a leading Pharmaceutical company is running several drug trials on healthy volunteers to check for side effects. Each drug has a unique name. Each trial involves one drug and multiple volunteers who take the drug and report any side effects. For each volunteer in each trial, it needs to be recorded whether they had side effects and what those side effects were.

There could be multiple side effects for the same person, like headache, dry mouth, and fever. Each side effect has a standard description. For simplicity, assume each volunteer participates in at most one drug trial. Data stored about volunteers includes their National Insurance Number, name, age, gender, address and phone number."

Analyse the problem description and model its data requirements completing the following:

1. Identify entities, attributes, relationships, and cardinality ratios from the problem description.

Solution

- **Entities**: Trial, Drug, Volunteer, Side Effects.
- **Attributes**: Drug name, Description, NI, Name, Age, Gender, Address, Telephone.
- **Relationship**: Involve(1:1), Involve(1:M), Experiences(M:M).

2. Using the identified components, generate an ER diagram that captures the pharmaceutical company's needs. Ensure that all M:M and 1:1 relationships are removed in your solution. Use the ER notation presented during the lectures.

Solution

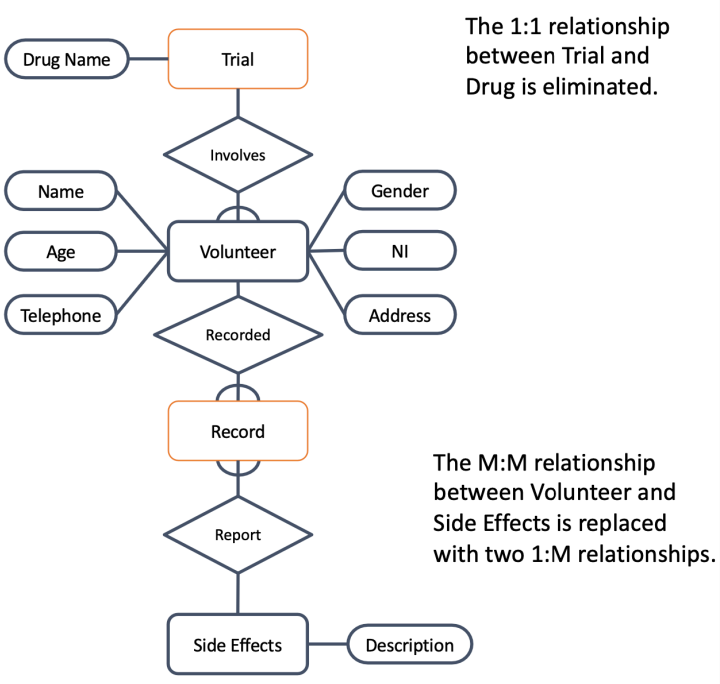

Figure 2: E/R diagram solution for Q2

3 Submitting your lab work

Compile your answers into a single PDF document. Your submission should:

- Be neat and easy to read
- Must include a cover page with:
  - Your name
  - Student ID
  - University email address
  - Module code (COMP1048) and title (Databases and Interfaces)
  - Lab number (003) and title (Entity Relationship Modelling)
  - Date of submission

Name your PDF file using the following format - `DBI_lab003-<student_id>.pdf`, where, `<student_id>` is your student ID. For example, if your student ID is `z123456`, you should name your PDF file `DBI_lab003-z123456.pdf`.

Please ensure you submit your work by the deadline - 28 October 2024 at 15:00. Late submissions will not be accepted, as stated on the coursework issue sheet. Your submission must be less than 10MB in size.

Submissions that are unreadable, corrupted, missing the required cover page, or do not demonstrate a reasonable attempt to answer all questions will receive a mark of zero for the lab.

This lab contributes 1% of your overall module grade.