Part II: Database Application Design

Design your group's database application using the E-R model by providing thoughtful responses to the following questions.

1. List the entity sets and their attributes with primary keys underlined in your design.

- People
- Research Group
- Project
- Experiment
- Tasks
- Department
- Literature

2. List the relationships between different entity sets in your design.

- PeopleProject
- PersonTask
- ProjectExeriment
- TaskExperiment

3. Construct an E-R diagram for your database application. Use the following steps to design your database using the E-R model:

    - Start by identifying essential entity sets to be included in your database.
    - Choose relevant attributes representing the values to be captured in the database for each entity set.
    - Formulate relationship sets among entities, addressing potential redundancy in attributes.
    - Incorporate any necessary constraints (ie, relationship cardinalities, total/partial participation, descriptive attributes, weak entity sets).

    You can use draw.io to create your E-R diagram. To collaborate with your group, click **File** → **Share** and grant edit access to your group members so everyone can work on the diagram in real time.

4. Provide a detailed explanation of the rationale behind your design choice. Highlight how each element contributes to the overall functionality of your database application.

We need the people entity to represent the people who belong to a research group. The research group is there to hold the people and also delegate the projects, experiments and tasks that belong to it. Projects, experiments, and tasks are all related to the research group. Literature will be a foundational part for all research groups and belong to all of them, however some can belong to a specific project but never to a task or experiment. It can be related to a task however through the project it is a part of.

Presentation Split

Task 1: Introduction and Project Overview - Keely

- Clearly state the database application title
- Introduce all group members
- Provide a concise overview of the project
- Explain what inspired the choice and what problem or need it addresses

Task 2: E-R Diagram Deep Dive - Entities and Attributes - Bamba

- Explain each key entity in detail
- Describe the attributes for each entity
- Identify and explain the primary keys
- Discuss any necessary constraints

Task 3: E-R Diagram Deep Dive - Relationships and Design Rationale - Logan

- Explain the relationships between entities and their cardinalities
- Provide the rationale behind the design choices
- Highlight how each element contributes to the overall database functionality

Task 4: Data Sources and User Interactions - Sofia

- Describe the sources from which data will be collected to populate the database
- Explain how different types of users will interact with the database
- Detail the operations users can perform (adding, modifying, removing data)
- Describe the types of questions users can answer and insights they can gain