Project Phase 1: Data Requirements

Due: October 15, 2025 11:59 PM

1 Mini World Development [50 Marks]

1.1 Idea Formulation [20]

Select a fantasy world of your choice — it could be *Harry Potter*, *Death Note*, or any other universe that inspires you. Imagine that you and your team are active participants within this mini world.

Now, propose a **Database System** that would naturally exist in this world and integrate seamlessly with its narrative. Your system could, for example, help the hero track allies or villains, store master plans, manage magical resources, or perform any other function that fits the context of the fantasy universe.

We would be looking for the novelty of the idea as the main grading rubric here. Make sure to describe the mini world and how your database integrates to the fantasy world.

Note: Do not use any mini-worlds that were given in the previous year assignments.

Important: Proposals such as "Library Management" or "Food Delivery" are too generic and would not get any novelty points. **The novelty points would be up to the discretion of the TA evaluating you.**

1.2 User Identification & Interaction [15 Marks]

Identify the users of the database and how they are expected to interact with the database.

1.3 Purpose of the Database [15 Marks]

State clearly why the database is important in the mini-world setting. What does it offer that non-DB solutions don't?

2 Database Requirements [50 Marks]

Your mini-world should have **at least**:

- six entity types
- two entities with at least two-key attributes
- two weak entity types
- seven relationship types (this should include cardinality ratios and participation constraints)
- two n > 3 relationship types
- at least one sub class hierarchy
- few composite, multi-valued and derived attributes

Sidenote: Specify constraints that your data may have. Specify the acceptable values, ranges, and formats for the attributes of the data. Clearly define the cardinality and participation constraints of the relationships. Make sure that there are integrity constraints and enforcement mechanisms for them.

3 Functional Requirements [50 Marks]

In your mini-world, you will be required to have applications that operate on the database.

3.1 Retrieval Operations [20 Marks]

At least one query function for each should be described. It need not be in the SQL syntax but can be explained in English on what the function/query intends to accomplish.

3.1.1 Selection

Example: "Retrieve all premium customers who joined in 2025"

3.1.2 Projection

Example: "Display names and contact details of all active customers"

3.1.3 Aggregate (SUM, MAX, MIN, AVG, etc.)

Example: "Calculate total revenue generated this quarter"

3.1.4 Search

Example: Partial text matching for entries in an entity, "TECH" will match with "TECHNOLOGY" or "FINTECH"

3.2 Analysis Report (Minimum 3) [15 Marks]

Generate comprehensive intelligence reports that demonstrate relationships between entities and provide actionable insights. These reports should use Join operations across multiple entities, not simple selections from single entities.
Example: "Monthly revenue breakdown by customer segment and service type"

3.3 Modification Operations [15 Marks]

(a) At least one **insertion** of data with automatic checking for violations of integrity constraints
(b) At least one **update** operation with enforcement of cascading business rules
(c) At least one **deletion** operation maintaining referential integrity

Important
The TA allotment sheet will be released after team formation. You are **strongly encouraged** to consult your assigned TAs in case you have any queries. You will be building the ER Models and final project based on this document. So, try to think ahead and **not drastically change** the specifications later.

May the force be with you !!!