

## **Assessment item 2 - ERD and Normalisation**

**Value:** 24%

**Due Date:** 31-Aug-2025

**Return Date:** 19-Sep-2025

**Group Assessment:** No

**Submission method options:** Brightspace Assignment

**7-Day Automatic Extension availability:** Yes

**Hurdle Assessment:** No

## TASK

### Task 1: Overview of Business Case (12 marks)

Liam is a dedicated member of the Computer Science Club at CSU Albury-Wodonga. Each week, he coordinates study group meetups with club members to review course content or collaborate on projects. Currently, Liam uses WhatsApp to manage these meetups, but the constant back-and-forth messaging is inefficient and time-consuming. He would like a simple app integrated with a relational database to streamline the meetup process and accurately record all related information.

**NOTE:** The overview is for context only. To identify entities, attributes, and relationships, refer to the business rules and instructions below.

**NOTE:** For guidance on creating an ERD from business rules, watch this YouTube video:  
<https://youtu.be/zGG40ujNd5c>

### Business Rules and Instructions for Creating Your ERD

1. Every club member is invited to all study group meetups.
2. A meetup only takes place if at least three members confirm attendance.
3. Each meetup has a unique ID, and its date, time, and duration must be stored.
4. Each club member also has a unique ID, along with their first name, last name, student ID, email, phone number, and campus address recorded.
5. Some members may have multiple addresses (e.g., home and campus addresses).
6. The database must record which members attended which meetups, and the venue name (e.g., café or campus room) where each meetup was held.

### Requirements:

- Create an Entity-Relationship Diagram (ERD) that clearly represents the entities, attributes, relationships, and the cardinality and optionality of each relationship based on the business rules
- Use <https://www.draw.io> to create your ERD.
- Apply Crow's Foot notation.
- Include primary keys (PKs) where appropriate.
- Resolve all many-to-many (M:N) relationships into one-to-many (1:M) relationships.
- Manually drawn ERDs will not be accepted.

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## Task 2: A Database for CSU Albury-Wodonga Campus Library System (6 marks)

Consider the following table, which stores information about IT equipment used in the library at CSU's Albury-Wodonga campus:

| Asset_ID | Asset_Name      | Purchase_Date | Units_In_Stock | Unit_Price | Transaction_ID | Transac   |
|----------|-----------------|---------------|----------------|------------|----------------|-----------|
| IT-001-X | Desktop PC      | 15/06/2022    | 40             | \$1200     | 500101         | 20/06/202 |
| IT-002-Y | Wireless Mouse  | 10/08/2022    | 150            | \$25       | 500102         | 15/08/202 |
| IT-003-Z | Monitor         | 12/09/2022    | 30             | \$300      | 500103         | 18/09/202 |
| IT-004-W | Docking Station | 20/10/2022    | 25             | \$150      | 500104         | 25/10/202 |

### Questions

1. Identify the redundant data in the table. [2 marks]
2. Why is this data redundant? [2 marks]
3. What entities can be observed in the above table? [2 marks]

## Task 3: Database Normalization for CSU Albury-Wodonga Campus Library System (6 marks)

This task builds on the dataset provided in **Task 2**, which stores information about IT equipment transactions at the CSU Albury-Wodonga campus library.

Decompose the unnormalized table into a set of relations that satisfy **Third Normal Form (3NF)** and draw the corresponding **Entity-Relationship Diagram (ERD)**. [6 marks]

### GENERATIVE AI

Use of Generative AI NOT permitted.

### RATIONALE

This assessment task will assess the following learning outcome/s:

- be able to model complex business rules using Entity Relationship Diagrams (ERDs).
- be able to apply normalisation techniques to optimise a database design.

## MARKING CRITERIA AND STANDARDS

The marking criteria for this assignment are:

### ERD

| Criteria                                                                                              | HD                                                                                                                                                                                                                                       | DI                                                                                                                                                                                                                                                                   | CR                                                                                                                                                                                                                                    | PS                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| be able to analyse and model business database requirements using Entity Relationship Diagrams (ERD). | Model identifies all PKs, attributes and relationships. Model accurately represents all business rules and includes all entities, PKs, attributes, relationships, associative entities (if applicable), cardinalities and optionalities. | Model identifies PKs, attributes and relationships with minor omissions. Model accurately represents the business rules and includes the identified entities, PKs, attributes, relationships, associative entities (if applicable), cardinalities and optionalities. | Model identifies key PKs, attributes and relationships. Model represents key business rules and includes the related entities, PKs, attributes, relationships, associative entities (if applicable), cardinalities and optionalities. | Model represents key business rules and draws out the key relationships and includes the related entities, PKs, attributes, relationships, cardinalities and optionalities. |

| Criteria                                                                            | HD                                                                                                                                                | DI                                                                                                                                                                                                              | CR                                                                                                                                                                   | PS                                                                                            |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| be able to analyse a database design and apply normalisation theory and techniques. | Analysis identifies all PKs and functional, partial and transitive dependencies. Accurately identifies all 3NF relations, including PKs, relevant | Analysis identifies PKs and functional, partial and transitive dependencies with minor omissions. Accurately identifies 3NF relations, including PKs, relevant attributes and referential integrity constraints | Analysis identifies key PKs and functional, partial and transitive dependencies. Identifies key 3NF relations, including PKs and relevant attributes and referential | Analysis identifies key PKs and functional dependencies and draws out relevant 3NF relations. |

#### Normalization

|  |                                                   |                       |                        |  |
|--|---------------------------------------------------|-----------------------|------------------------|--|
|  | attributes and referential integrity constraints. | with minor omissions. | integrity constraints. |  |
|--|---------------------------------------------------|-----------------------|------------------------|--|

## REQUIREMENTS

- Please save your diagrams as a **PDF file only**.
- Do **not** use any other file formats.
- Make sure to include your **student ID, name, and subject code** in your submission.