UNIVERSITY OF WESTMINSTER

School of Computer Science & Engineering

5COSC020W DATABASE SYSTEMS COURSEWORK (2024/2025)	
Module leader	Ragu Sivaraman
Unit	**Database Systems Coursework – INDIVIDUAL COURSEWORK**
Weighting:	40% of the module assessment
Qualifying mark	30% *(overall module average over 40%, with both components over 30%)*
Description	Produce a conceptual data model & a logical data model following given specs. Produce a supporting report.
Learning Outcomes Covered in this Assignment:	LO1 Design a robust relational database schema using UML notations;
Handed Out:	Friday 04 October 2024
DEADLINES	**> Intermediate: MON 28 OCTOBER 2024 at 13:00:00 – Part A Diagram.** **> FINAL: MON 18 NOVEMBER 2024 at 13:00:00 – Part A + Part B.**
DELIVERABLES	**> MON 28 OCTOBER 2024 at 13:00:00 – Intermediary Report: Part** ***One report in PDF format, font Calibri size 11*** • 1 cover page for part A, student details & tutorial group details. • 1 side featuring conceptual EERD. **> MON 18 NOVEMBER 2024 at 13:00:00 – FINAL REPORT: Part A + Part** ***One report in PDF format, font Calibri size 11*** • 1 cover page for part A+B, student details & tutorial group details. • 1 side featuring Conceptual EERD (part A). • 1 side featuring Critical Evaluation & Reflective Commentary (part A). • 4 Data Dictionary tables supporting conceptual EERD (part A). • 1 side featuring Mapped Logical ERD (part B).
SUBMISSION	On Blackboard, under **"Coursework (CWK)"**.
Feedback and Due Date:	PART A: Global Feedback on conceptual EERD shortly after 28/10/2024. PART A + B: online feedback and marks using Blackboard Rubrics, 25-30 working days (5-6 weeks) after the submission deadline. All marks provisional until formally agreed by Assessment Board.
BCS Accreditation Criteria	2.1.1 Knowledge and understanding of facts, concepts, principles & theories 2.1.2 Use of such knowledge in modelling and design 2.2.1 Specify, design or construct computer-based systems 2.3.2 Development of general transferable skills 3.1.3 Knowledge of systems architecture 3.2.1 Specify, deploy, verify and maintain information systems

Assessment regulations

For detailed information regarding University Assessment Regulations on how you are assessed, penalties and late submissions, what constitutes plagiarism etc. please refer to the following website: https://www.westminster.ac.uk/current-students/guides-and-policies/academic-matters/academic-regulations

Penalty for Late Submission

If you submit your coursework late but within 24 hours or one working day of the specified deadline, 10 marks will be deducted from the final mark, as a penalty for late submission, except for work which obtains a mark in the range 40 – 49%, in which case the mark will be capped at the pass mark (40%). If you submit your coursework more than 24 hours or more than one working day after the specified deadline you will be given a mark of zero for the work in question unless a claim of Mitigating Circumstances has been submitted and accepted as valid.

It is recognised that on occasion, illness or a personal crisis can mean that you fail to submit a piece of work on time. In such cases you must inform the Campus Office in writing on a mitigating circumstances form, giving the reason for your late or non-submission. You must provide relevant documentary evidence with the form. This information will be reported to the relevant Assessment Board that will decide whether the mark of zero shall stand. For more detailed information regarding University Assessment Regulations, please refer to the following website:
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Coursework Part A: Conceptual EERD [50 Marks]

You have been hired as a **Database Architect** to undertake a database design project for a scheme called Racketminster.

Your job in part A is to investigate the Racketminster Project, produce a high-quality **CONCEPTUAL ENHANCED ENTITY RELATIONSHIP DIAGRAM (EERD)** as a conceptual database design to support the data needs of the Racketminster scheme, and document your design with an accurate Data Dictionary.

For this, you have been given a **Racketminster Project Pack** containing two key documents (Documents A.1 and A.2.) and one digital resource (Resource A.3.).

Racketminster Project Pack Document A.1. – The Project Brief

Ovestminster is a small town in the southeast of England, United Kingdom, well-known for its leafy green spaces and great enthusiasm for outdoor life. In particular, the town runs a popular sporting scheme called Racketminster to allow players to participate in racket-based sports, like tennis and pickleball.

To run Racketminster, the town has several lush parks which contain dedicated courts for racket sports. To ensure that they are always kept in pristine condition, the town parks are continuously looked after by specifically allocated Racketminster caretakers who are responsible for their preservation. There are different kinds of courts in these parks, for people to play tennis or pickleball. Some courts are specific for tennis; others are specific for pickleball, and some can be used for both. Each court comes with its own equipment allocated to it (typically fixed or movable items, like nets, rackets, balls, etc.). A careful record of all the pieces of equipment assigned to each court needs to be kept.

As for parks, courts are also regularly maintained by specifically dedicated and highly trained Racketminster caretakers to ensure they are constantly kept in full running order and that the equipment they offer is always top quality. While not required for parks (as they are continually looked after), the maintenance of courts needs to be recorded separately (date, time, maintenance status and maintenance log) so that a clear up-to-date maintenance record is kept for each court, for greater transparency and accountability. Likewise, it is essential to hold accurate maintenance records for pieces of equipment to make sure timely information is captured about their regular upkeep.

Racketminster playing sessions are pre-scheduled to run on specific courts. Some sessions are specifically allocated as unsupervised sessions to allow players to play completely on their own initiative, typically as two players (singles) or four players (doubles). Other playing sessions are scheduled as supervised, as they run under the guidance of qualified instructors. Supervised sessions can be personal training sessions (one-to-one sessions with an instructor) or supervised group sessions (multiple players, up to two instructors). Supervised group sessions can come under three categories: fitness-play sessions (players get to both exercise and learn how to play), group coaching sessions (more structured learning lessons at different levels) or social-fun sessions (players gets to socialise and play racket sports in a more relaxed environment, still with an instructor overseeing the session).

For players to play as part of the Racketminster scheme, they need to place a booking for a specific session, depending on what type of sessions they are interested in. A booking tends to be usually for a single session. However, players can block-book unsupervised sessions if they want to book more sessions ahead of time. In this case it is essential to keep track of how each unsupervised session follows on from a previous unsupervised session for traceability.

Also, a player has the possibility to recommend the Racketminster scheme to other players. If they do, it is important to capture which players recommends Racketminster to which other players, so that in the future a discount-based incentive system can be introduced.

Racketminster Project Pack Document A.2.: AI-Generated Draft Conceptual EERD

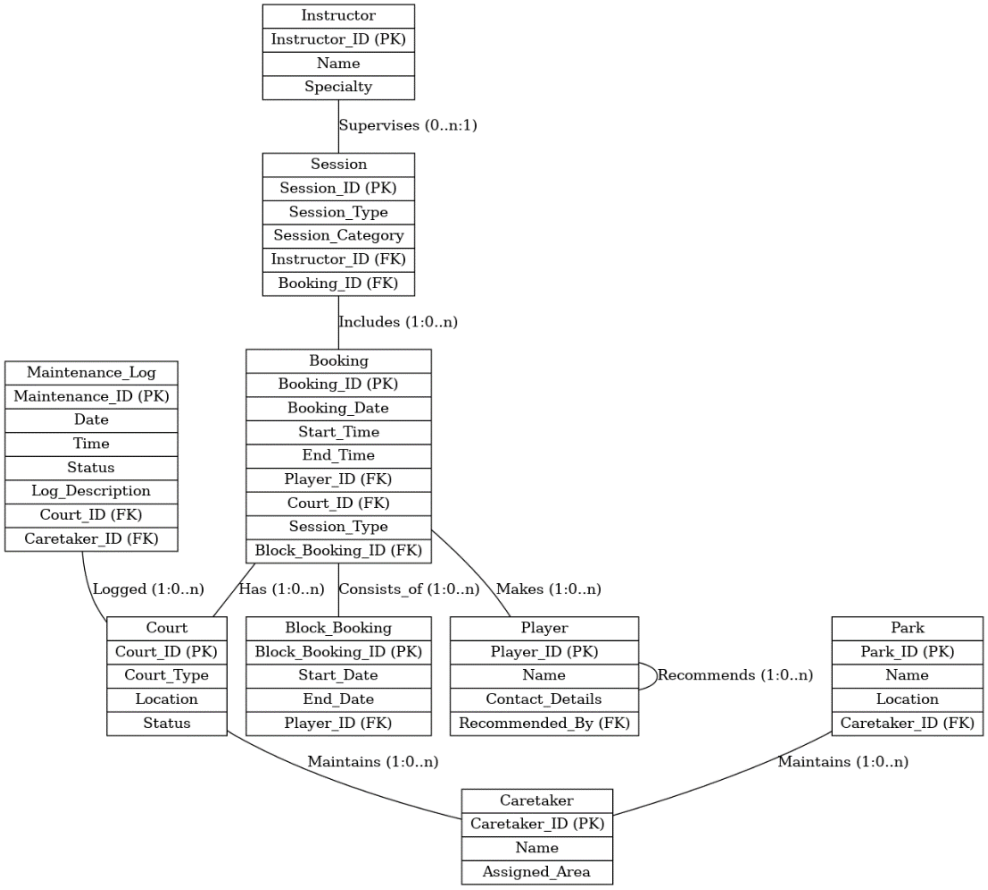
Source: The Racketminster Project Brief presented in Document A.1.

Prompt 1: Please produce a high-quality CONCEPTUAL ENHANCED ENTITY RELATIONSHIP DIAGRAM (EERD) to support the data needs of the Racketminster scheme.

Result 1: Generated text describing different components of the EERD.

Prompt 2: Can you please create the actual diagram?

Result 2:



Racketminster Project Pack Resource A.3.: Questions & Answers Forum (Q&A Forum) on Blackboard

Available in Blackboard -> Coursework -> Coursework - Business Questions

Deadline to post Business Questions: 27 October 2024 at 17:00:00

You can use this online Q&A forum to ask **key Business Questions (BQs)** for the Racketminster's Board of Directors to clarify your understanding of the scheme, its data needs and the components of the conceptual EERD you are building.

Your BQs must be asked on the forum only. BQs asked by email will be ignored.

Your BQs must be formulated in a way that is understandable to Racketminster Managing Directors who do not have technical knowledge in the field of database systems. Questions directed at lecturers will not be accepted.

Your BQs must be totally unique and formulated by you, and only you, and not be AI generated.

Your BQs must be asked by the deadline specified above (27/10/24). Any questions asked after the deadline will not be considered.

A selection of the most relevant and useful BQs will be answered shortly after the deadline (17/10/24), by the Managing Directors. You are strongly encouraged to use the answers to improve and refine your conceptual EERD.

Coursework Part A Questions

You are required to attempt the following questions for part A.

Prefix the names of all entities and attributes with your student id number starting with w (see end of doc).

QUESTION 1: CRITICAL EVALUATION & REFLECTIVE COMMENTARY (10 Marks)

Write a Critical Evaluation of the very basic, and mainly erroneous, EERD given in Document A.2. Make sure you emphasise mainly on the key issues with the semantics (i.e. the meaning) of the produced conceptual model.
Write also a **Reflective Commentary** to explain how you can radically improve on the given design to produce the high quality conceptual EERD required in this project. You should explain the exact approach that YOU followed and the choices YOU make to create the Conceptual EERD for Racketminster, in terms of entities, specialisations, relationships, multiplicities, attributes, and primary keys. It should be written "in your own voice" and provide all the required justifications to support your design.

QUESTION 2: ENTITIES (04 Marks)

Create an **Entity Data Dictionary Table** to document the identified entities for Racketminster.
To produce this supporting documentation, fill in the table below to briefly explain each entity.

Entity name	*Brief Explanation*

For more information, please refer to page 510 of the 6th edition of the Connolly's textbook.

QUESTION 3: SPECIALISATIONS (12 Marks)

Create a **Specialisation Data Dictionary Table** to document the identified specialisations for Racketminster.
To produce this supporting documentation, fill in the table below to briefly explain each specialisation.

General entity	*Specialised entity*	*Brief explanation*

For more information, please refer to page 510 of the 6th edition of the Connolly's textbook.

QUESTION 4: RELATIONSHIPS & MULTIPLICITIES (14 Marks)

Create a **Relationships & Multiplicities Data Dictionary Table** to document the identified relationships and associated multiplicities (participations + cardinalities) for Racketminster.
To produce this supporting documentation, fill in the table below to briefly explain the relationships and associated multiplicities.

Entity name	*Multiplicity*	*Relationship*	*Multiplicity*	*Entity name*	*Brief justifications for the multiplicity (4 statements for each relationship)*

For more information, please refer to page 513 of the 6th edition of the Connolly's textbook.

QUESTION 5: ATTRIBUTES & PRIMARY KEYS (5 Marks)

Create an **Attributes and Primary Key Data Dictionary Table** to document the identified attributes and primary keys for Racketminster.
To produce this supporting documentation, fill in the table below to briefly explain the attributes and primary keys identified for each entity.

Entity name	*Attributes for each entity (include PK)*	*Brief explanation*

For more information, please refer to page 516 of the 6th edition of the Connolly's textbook.

QUESTION 6: CONCEPTUAL EERD QUALITY & NOTATIONS (5 Marks)

Produce a complete high-quality **CONCEPTUAL EERD** for Racketminster. This **CONCEPTUAL EERD** needs to include all the identified **entities**, **specialisations, relationships**, **multiplicities**, **attributes,** and **primary keys**.

- It should fit on one page of the report and be easy to read.
- It should use **UML notations** only, as learnt in this module, and no other notations.
- The use of non-UML notations will be penalised, and marks will be deducted.
- The names of all entities & attributes should be **prefixed with the student id number** starting with w.
- The diagram is ultimately what is being assessed. The absence of a diagram will lead to zero marks.

Coursework Part A Marks Allocation

Part A will be assessed based on the following marking criteria:

Marking Criteria	Marks
Relevance of the critical evaluation and usefulness of the reflective commentary	10
Correct identification of entities	04
Correct identification of specialisations	12
Correct identification of relationships & multiplicities	14
Correct identification of attributes & primary keys	05
High quality of representation of the conceptual EERD and correct use of UML notations	05
PART A TOTAL	**50**

Coursework Part B: Logical ERD [50 Marks]

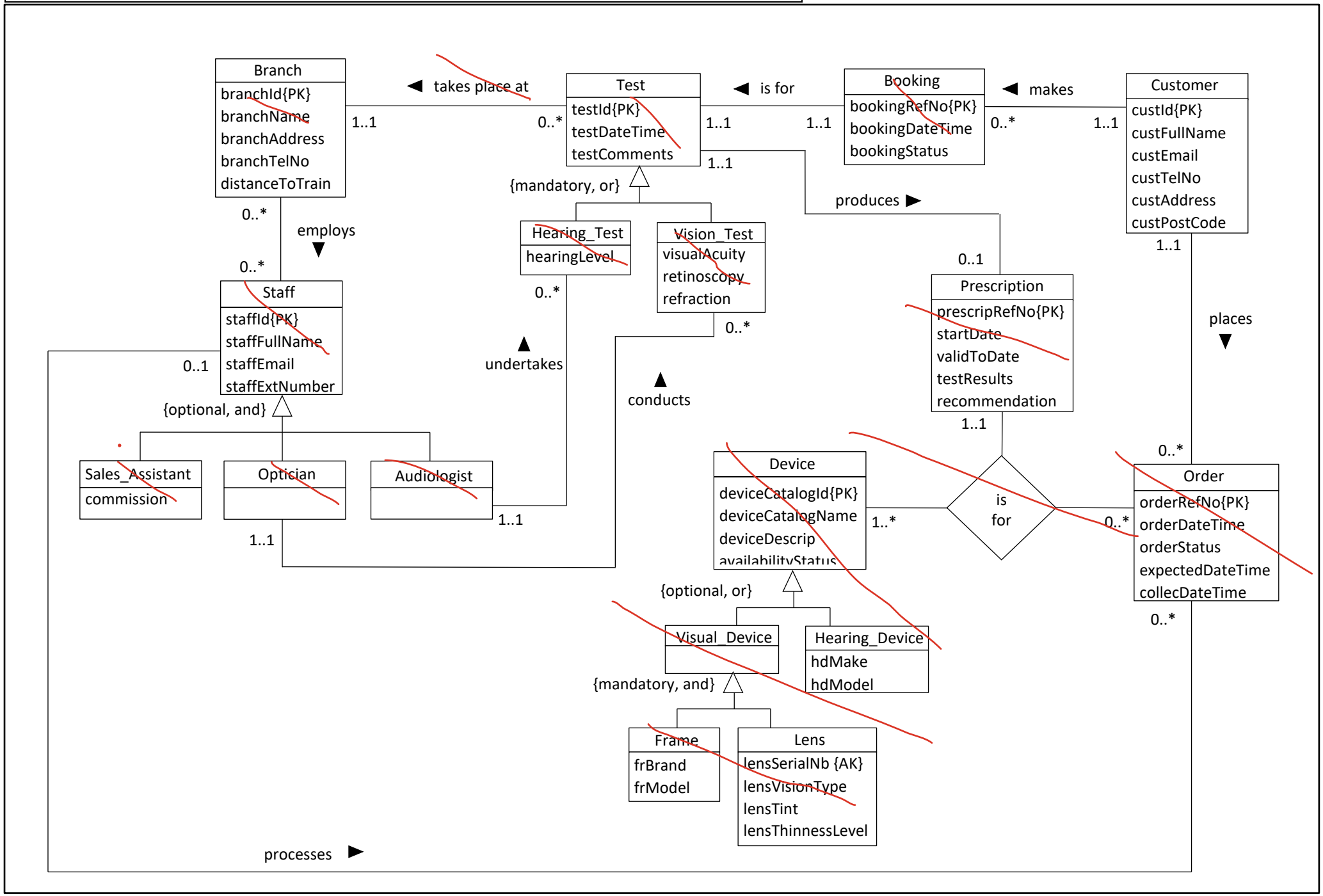
You have been hired as a **Database Architect** to undertake a database design project for a firm called AudioVizzion.

Your job in part B is to map a given Conceptual Enhanced Entity Relationship Diagram (EERD) onto a high-quality **LOGICAL ENTITY RELATIONSHIP DIAGRAM (ERD)** as a logical database design to represent how the business data for AudioVizzion can be organised as a set of interrelated tables that could then be implemented with a Relational Database Management System (RDBMS).

For this, you have been given a **AudioVizzion Project Pack** containing two key documents (Documents B.1 and B.2.).

AudioVizzion Project Pack Document B.1. – Simple Project Brief
AudioVizzion is a large retail chain that offers optical and audiology services, and essentially sells spectacles and hearing aids to the public. AudioVizzion operates globally from several branches located all around the United Kingdom. Every branch offers AudioVizzion customers the opportunity to get tested on their vision and/or on their hearing before being able to purchase what the company refers to as Visual Devices (i.e. frames and lenses for glasses) and/or Hearing Devices (i.e. hearing aids).

AudioVizzion Project Pack Document B.2. – Conceptual Enhanced Entity Relationship Diagram



Coursework Part B Questions

You are asked to attempt the following question for part B.

Prefix the names of all tables and attributes with your student id number starting with w (see end of doc).

QUESTION 7: MAPPING CONCEPTUAL EERD TO LOGICAL ERD (50 Marks)

Map the Conceptual EERD given in document B.2. to produce a complete **LOGICAL ERD** for AudioVizzion. This **LOGICAL ERD** needs to include all the **correct tables, relationships, multiplicity constraints, attributes, primary keys** and **foreign keys**. It should be easy to read and needs to fit on one page of the report.

- It should fit on one page of the report and be easy to read.
- It should use **UML notations** as learnt in this module and no other notations.
- The use of non-UML notations will be penalised, and marks will be deducted.
- The names of all tables & columns should be **prefixed with the student id number** starting with w.
- The diagram is ultimately what is being assessed. The absence of a diagram will lead to zero marks.

Part B Marks Allocation

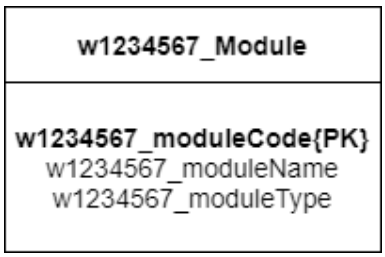
Part B will be assessed based on the following marking criteria:

Marking Criteria	Marks
Clarity, formatting, and structure of the logical ERD with correct UML notations	05
Correct mapping of specialisations	24
Correct mapping of many-to-many relationships & ternary relationships	10
Correct mapping of one-to-many relationships and one-to-one relationships (optional)	07
Correct mapping of one-to-one relationships (mandatory)	04
PART B TOTAL	**50**

KEY REQUIREMENTS FOR THE ENTIRE COURSEWORK

- Only **UML notations** are accepted for this coursework, as introduced in this module.
- You need to **prefix** all your entities, tables, and attributes with "w + the 7 digits of your ID number" as provided by the University, both for **Part A (Racketminster Conceptual EERD)** and **Part B (AudioVizzion Logical ERD)**.
- Failure to use UML notations and to prefix entities, tables and attributes with an ID number will be penalised and marks will be deducted.

  For example, if my name is Francois Roubert and my ID number is w1234567, when I identify the entity or table "Module" and its attributes "moduleCode", "moduleName" and "moduleType", I will have to represent it this way:



End of Document