**Stage 2 Overview**

* **Goal:** Refine the ER model from Stage 1 by applying **normalization (up to 3NF)** to improve data integrity and reduce redundancy.
* **Key Deliverables:** Functional dependencies, normalization steps (UNF → 1NF → 2NF → 3NF), updated ER diagram (Mermaid.js), and a well-structured PDF report.
* **Next Steps:** This stage leads to **Stage 3**, where you will implement the database using SQL.

**What You Need to Do**

1. **Problem Identification (5 Marks)**
   * Write **200-300 words** summarizing the **original database design** from Stage 1.
   * Highlight key issues like redundancy, anomalies, and areas needing improvement.
2. **Unnormalized Form (UNF) & Functional Dependencies (20 Marks)**
   * Present the **original tables** from Stage 1 with sample data.
   * Identify **Functional Dependencies (FDs)** (e.g., StudentID → StudentName).
   * Identify **Primary Keys (PKs) and Foreign Keys (FKs)**.
3. **Normalization Process (50 Marks)**
   * **1NF (First Normal Form)**
     + Remove **repeating groups**.
     + Show **restructured tables**.
     + Explain why changes were made.
   * **2NF (Second Normal Form)**
     + Identify **partial dependencies**.
     + Decompose tables to remove them.
     + Show updated tables with **PKs and FKs**.
   * **3NF (Third Normal Form)**
     + Identify **transitive dependencies**.
     + Remove them and adjust the schema.
     + Show final tables in **3NF** with PKs and FKs.
4. **ER Diagram Update (5 Marks)**
   * Update your **ER diagram** to reflect the **final 3NF schema**.
   * Use **Mermaid.js** for the diagram.
   * Include **Markdown code** for rendering.
5. **Conclusion (10 Marks)**
   * Explain how normalization improved the database.
   * Discuss benefits like **reduced redundancy, improved integrity, and better performance**.
6. **Formatting & Presentation (10 Marks)**
   * Ensure the report is **well-structured and clear**.
   * Proper use of headings, subheadings, and formatting.
   * Correct **Mermaid.js rendering**.
7. **References (Harvard Style)**
   * List all **tools and sources** used in your design.

**Submission Details**

* **File format:** PDF
* **Naming:** group\_number\_GCA\_Stage2.pdf
* **Submission:** Upload to **Moodle** (email submissions are not accepted).
* **Strict formatting rules**: Incorrect format = penalty.

**Final Notes**

* **Stage 3 Preview:**
  + Implement **3NF schema in SQL**.
  + Insert sample data and write queries.
  + Prepare for an **interview**, where you'll explain your design.