Guidelines for the Initial Steps in the Database Management Principles Project

The project should be completed step by step, following the outline below:

Step 1: Topic Selection and Requirement Review

- Select a project topic after meeting with the entire group to reach an agreement.
- Carefully review the project requirements and suggested ideas provided in the course description.

Step 2: Design the Entity–Relationship Diagram (ERD)

- Create an ERD to visually represent entities, attributes, and relationships within the project.

Step 3: Convert ERD to Relational Model

- Transform the ERD into a relational schema.
- Clearly define all relations, primary keys, and foreign keys to ensure proper structure.

Step 4: Data Preparation

- Search for or generate the necessary dataset.
- Verify that the data is complete, consistent, and properly formatted to support database population.

Step 5: Data Retrieval with Relational Algebra and Trees

- Formulate multiple queries using relational algebra expressions.
- Represent queries with relational algebra trees to illustrate the execution process.

Step 6: SQL Implementation

- **Database creation**: Build the database on SQL Server and input the collected data.
- **SQL queries**: Write and execute queries from basic (SELECT, FROM, WHERE, GROUP BY, HAVING, ORDER BY) to advanced (nested queries, aggregate functions).
- **Normalization**: Apply normalization techniques to enhance the Third Normal Form (3NF) to improve efficiency, consistency, and data integrity.

Step 7: Java-Based User Interface Development

- Create a Java-based interface that connects to the database.
- At a minimum, the interface should display information from the database.
- Additional recommended features include:
    - User account creation and login
    - Data filtering and searching
    - Data retrieval and management options