Project 2:

- **Library Management System Database:**

  - **Project Description:** You are tasked with developing an advanced Library Management System Database that leverages advanced SQL Server concepts to improve functionality and efficiency. The system should allow library administrators to manage books, authors, and patron interactions seamlessly while implementing various advanced SQL techniques to enhance data retrieval and processing.

  - **Tasks**:
    - Design and create a "Books" table to store book details (e.g., title, author, ISBN, availability).
    - Create an "Authors" table to store author information (e.g., author name, birthdate, nationality).
    - Design a "Patrons" table to store patron information (e.g., patron name, contact information).
    - Implement SQL queries to add new books to the library, update book details, and mark books as borrowed or returned.
    - Create SQL queries to search for books by title, author, or ISBN.
    - Write SQL queries to track book borrowing and return history.

- **Project Objectives:**
  - Enhanced Data Management: Design a comprehensive database that includes tables for books, authors, and patrons. Implement advanced SQL Server concepts such as window functions, common table expressions (CTEs), subqueries, the SELECT INTO statement, and the MERGE statement for efficient data management.
  - Data Retrieval and Reporting: Create complex SQL queries and reports using window functions and CTEs to provide insightful information to library administrators. Examples include identifying top-rated books by each author and analysing patron borrowing patterns.
  - Efficient Upsert Operations: Utilize the MERGE statement to handle book borrowing operations efficiently. This should involve checking book availability and either updating the book's status or inserting a new borrowing record as needed.

- **Deliverables:**
  - Database Schema: A well-designed database schema that includes tables for books, authors, and patrons, with appropriate relationships and constraints.
  - Advanced SQL Queries: Implement advanced SQL queries and reports that leverage window functions, CTEs, and subqueries to retrieve meaningful information from the database.
  - Efficient Upsert Operations: Implement the MERGE statement for efficient book borrowing and returning operations, ensuring data consistency.

- **Success Criteria:**
  - The system should effectively manage book data, author information, and patron interactions.
  - Advanced SQL concepts like window functions, CTEs, subqueries, the SELECT INTO statement, and the MERGE statement should be correctly applied.
  - Complex queries and reports should provide valuable insights for library administrators.
  - Upsert operations (borrowing and returning books) should work efficiently and maintain data integrity.