Cycle 2

SQL SYLLABUS EXERCISES

The requirement: A library wants to maintain the record of books, members, book issue, book return, and fines collected for late returns, in a database. The database can be loaded with book information. Students can register with the library to be a member. Books can be issued to students with a valid library membership. A student can keep an issued book -with him/her for a maximum period of two weeks from the date of issue, beyond which a fine will be charged. Fine is calculated based on the delay in days of return. For 0-7 days: Rs 10, For 7 – 30 days: Rs 100, and for days above 30 days: Rs 10 will be charged per day.

Sample Database Design

BOOK (Book_Id, Title, Language_Id, MRP, Publisher_Id, Published_Date, Volume, Status) // Language_Id, Publisher_Id are FK (Foreign Key)

AUTHOR(Author_Id, Name, Email, Phone_Number, Status)

BOOK_AUTHOR(Book_Id, Author_Id) // many-to-many relationship, both columns are PKFK (Primary Key and Foreign Key)

PUBLISHER(Publisher_id, Name, Address)

MEMBER(Member_Id, Name, Branch_Code, Roll_Number, Phone_Number, Email_Id, Date_of_Join, Status)

BOOK_ISSUE(Issue_Id, Date_Of_Issue, Book_Id, Member_Id, Expected_Date_Of_Return, Status) // Book+Id and Member_Id are FKs

BOOK_RETURN(Issue_Id, Actual_Date_Of_Return, LateDays, LateFee) // Issue_Id is PK and FK

LANGUAGE(Language_id, Name) //Static Table for storing permanent data

LATE_FEE_RULE(FromDays, ToDays, Amount) // Composite Key

EXERCISES

1. Create a normalized database design with proper tables, columns, column types and constraints.
2. Create an ER diagram for the above database design.
3. Create an ER diagram for this specification and then convert the ER diagram into relational model

. create the tables.

3. Write SQL commands to

a. Create DDL statements and create the tables and constraints (from the design)
b. Create and execute DROP TABLE command in tables with and without FOREIGN KEY constraints.
c. Create and execute ALTER TABLE command in tables with data and without data.

4. Based on the above relational database design, Write SQL Query to retrieve the following information

a. Get the number of books written by a given author
b. Get the list of publishers and the number of books published by each publisher
c. Get the list of books that are issued but not returned
d. Get the list of students who reads only 'Malayalam' books
e. Get the total fine collected for the current month and current quarter
f. Get the list of students who have overdue (not returned the books even on due date)
g. Calculate the fine (as of today) to be collected from each overdue book.
h. Members who joined after Jan 1 2021 but has not taken any books