**Library Management System - Project Proposal**

**1. Project Overview**

The **Library Management System (LMS)** is a web-based application designed to help libraries efficiently manage books, users, borrowing records, and overdue book report for librarians. The system will enable librarians to oversee book inventory, monitor borrowing trends, and enforce penalties for late returns. Users (readers) will be able to search, borrow, return, and review books.

**2. Key Functionalities**

**User Authentication & Role Management**

* Two primary roles: **Librarians** (manage inventory, users) & **Readers** (borrow, review books).
* Secure login with authentication & authorization.

**Book Management**

* CRUD operations: **Add, Edit, Delete, and Search Books**.
* Categorization based on **subject, author, availability, and rating**.

**Borrow & Return Books**

* Book checkout with **loan duration tracking**.
* Automated due date calculation.

**Overdue Notifications & Fine Calculation**

* Fine calculation based on late return duration.

**Book Reviews & Ratings**

* Users can **rate and review** books.
* Display **most popular books** based on ratings.

**Statistics & Reports**

* Generate reports for **most borrowed books, overdue books, and user activity**.

**3. Planned Database Schema**

**Author**  
AuthorId int IDENTITY(1,1) NOT NULL, PK  
FirstName nvarchar(30) NOT NULL  
LastName nvarchar(30) NOT NULL  
BirthDate date NOT NULL  
DateOfDeath date NULL  
Biography nvarchar(500) NULL  
CONSTRAINT CHECK (BirthDate < DateOfDeath)

**Subject**  
SubjectId int IDENTITY(1,1) NOT NULL, PK  
Name nvarchar(30) NOT NULL  
CONSTRAINT UNIQUE (Name)  
  
**Book**  
BookId int IDENTITY(1,1) NOT NULL, PK  
ISBN nvarchar(13) NOT NULL  
Name nvarchar(50) NOT NULL  
SubjectId int NOT NULL, FK (Subject.SubjectId)  
Synopsis nvarchar(500) NULL  
Photo nvarchar(300) NULL  
CONSTRAINT UNIQUE (ISBN)

**BookAuthor**  
BookAuthorId int IDENTITY(1,1) , NOT NULL, PK  
BookId int NOT NULL, FK (Book.BookId)  
AuthorId int NOT NULL, FK (Author.AuthorId)

**User**  
UserId int IDENTITY(1,1) NOT NULL, PK  
CoreId NVARCHAR(450) NOT NULL  
FirstName nvarchar(30) NOT NULL  
LastName nvarchar(30) NOT NULL  
BirthDay date NOT NULL,  
CONSTRAINT CHECK (BirthDay < CURRENT\_DATE)  
CONSTRAINT UNIQUE (CoreId)

**Editorial**  
EditorialId int IDENTITY(1,1) NOT NULL, PK  
Name nvarchar(30) NOT NULL,   
CONSTRAINT UNIQUE (Name)

**Edition**  
EditionId int IDENTITY(1,1) NOT NULL, PK  
BookId int NOT NULL, FK (Book.BookId)  
EditionDate date NOT NULL  
EditorialId int NOT NULL, FK (Editorial .EditorialId)

**Loan**  
LoanId int IDENTITY(1,1) NOT NULL, PK  
UserId int NOT NULL, FK (User.UserId)  
InitialDate date NOT NULL  
FinalDate date NOT NULL  
CONSTRAINT CHECK (InitialDate < FinalDate)

**LoanDetail**  
LoanId int NOT NULL, FK (Loan.LoanId)  
BookId int NOT NULL, FK (Book. BookId)  
CONSTRAINT UNIQUE (LoanId, BookId)  
  
**Rating**  
RatingId int IDENTITY(1,1) NOT NULL, PK  
BookId int NOT NULL, FK (Book. BookId)  
UserId int NOT NULL, FK (User. UserId)  
Rate smallint NULL  
Comment nvarchar(500) NULL

**4. Technology Stack**

* **Frontend**: ASP.NET MVC, Razor Pages, Bootstrap
* **Backend**: ASP.NET Core, C#
* **Database**: SQL Server
* **Authentication**: Identity Framework (Cookies-based authentication)