Library Management System (Microservices Prototype)

1. **User Service 2 API**

   ○ Register/login users.

   ○ JWT-based authentication & role management (admin, user).

   ○ Tech: ASP.NET Core Web API, PostgreSQL.

2. **Book Catalog Service: 5 API, 1 listen gRPC**

   ○ CRUD for books (title, author, availability). Validate, index

   ○ Search books (basic filtering). index

3. **Borrowing Service: 1 send gRPC 2 send MQ 1 listen MQ**

   ○ Allows students to borrow/return books.

   ○ Talks to Book Service (to update availability) → gRPC (Book ↔ Borrowing).

   ○ Uses async messaging (RabbitMQ) for updating borrow history.

   ○ Uses async messaging (RabbitMQ) for sending email.

4. **Notification Service: 1 listen MQ**

   ○ Listens to events (book borrowed, due date, returned).

   ○ Sends email/push notification.

5. **API Gateway Ocelot**

   ○ Single entry point for frontend.

   ○ Handles routing, authentication, rate-limiting. (optional)