

# Project - MUM : Advanced Library Management with Reading Analytics

## Description

Develop a sophisticated library system that manages books, members, borrowing patterns, and provides detailed reading analytics with recommendation engines.

## Core Requirements

- Multi-branch library management
- Digital and physical book tracking
- Member behavior analysis
- Recommendation system based on reading history
- Fine calculation with complex rules
- Reservation and waiting list management
- Reading challenge and gamification features

## Technical Specifications

```
# Expected functions (minimum):
def add_library_branch(branch_id, location, operating_hours)
def add_book(isbn, title, author, genre, copies, book_type)
def register_member(member_id, name, contact, membership_type)
def issue_book(member_id, isbn, branch_id)
def return_book(member_id, isbn, return_date, condition)
def calculate_fine(member_id, return_date, due_date)
def add_to_waitlist(member_id, isbn)
def generate_recommendations(member_id, recommendation_count)
def analyze_reading_patterns(member_id)
def generate_popular_books_report(time_period, genre)
def track_reading_challenge(member_id, challenge_type)
```

## Edge Cases to Handle

- Books lost or damaged during borrowing period
- Member attempting to borrow while having overdue books
- Multiple reservations for single copy books
- Membership expiry during active borrowing period
- System downtime during peak borrowing hours
- Bulk book acquisitions and cataloging
- Member data privacy and GDPR compliance

## Expected Output Examples

```
=== MEMBER READING PROFILE ===
Member: John Smith (ID: LM001)
Membership: Premium
Books Borrowed This Year: 47
Favorite Genres: Mystery (34%), Science Fiction (28%), Biography (21%)
Average Reading Time: 8.5 days per book

Current Status:
```

- Books Issued: 3/5
- Overdue Books: 0
- Pending Fines: £0

Reading Challenge Progress:

"50 Books Challenge 2025": 47/50 (94% complete)

=== RECOMMENDATIONS FOR YOU ===

Based on your reading history:

1. "The Silent Patient" by Alex Michaelides (Mystery)
2. "Project Hail Mary" by Andy Weir (Sci-Fi)
3. "Educated" by Tara Westover (Biography)

Trending in your preferred genres:

1. "The Thursday Murder Club" - 89% match
  2. "Klara and the Sun" - 76% match
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