In-Class DDL Challenge: Digital Library System

Scenario: University Library Digitization Project

The university library is modernizing and needs database support for both **physical books** and **digital resources**. You must quickly design the database structure for this hybrid system.

Current System Context

Your university already has these core tables: - `students` (with student_id, email, phone, etc.) - `professors` (with professor_id, email, department info, etc.)

Your Tasks:

Part A: Database Setup
1. **Create database** `library_system` with connection limit of 75
2. **Create tablespace** `digital_content` at location '/storage/ebooks'

Part B: Core Library Tables

Create these tables in the `library_system` database:

Table: book_catalog - `catalog_id` (auto-incrementing integer) - `isbn` (fixed string, exactly 13 characters) - `book_title` (variable string, max 150 characters) - `author_name` (variable string, max 100 characters) - `publisher` (variable string, max 80 characters) - `publication_year` (small integer) - `total_pages` (integer) - `book_format` (fixed string, exactly 10 characters) - `purchase_price` (decimal with 2 decimal places) - `is_available` (boolean)

Table: digital_downloads - `download_id` (auto-incrementing integer) - `user_id` (integer) - `catalog_id` (integer) - `download_timestamp` (timestamp without timezone) - `file_format` (variable string, max 10 characters) - `file_size_mb` (real number) - `download_completed` (boolean) - `expiry_date` (date only) - `access_count` (small integer)

Part C: Table Modifications

Apply these changes to your tables:

Modify book_catalog: 1. Add column `genre` (variable string, max 50 characters) 2. Add column `library_section` (fixed string, exactly 3 characters) 3. Set default value 'UNKNOWN' for `genre`

Modify digital_downloads: 1. Add column `device_type` (variable string, max 30 characters) 2. Change `file_size_mb` data type to `integer` 3. Add column `last_accessed` (timestamp with timezone)

Part D: Additional Table Creation

Quickly create this table:

Table: reading_sessions - Session ID (auto-incrementing) - User reference (integer) - Book reference (integer) - Session start (timestamp with timezone) - Reading duration (interval type) - Pages read (small integer) - Session active (boolean)

Data Type Quick Guide:

Need	Use
ID numbers	`serial`, `integer`
Year values	`smallint`
Fixed codes	`char(n)`
Variable text	`varchar(n)`, `text`
Money amounts	`numeric(p,2)`
File sizes	`real`, `integer`, `bigint`
Time tracking	`timestamp`, `interval`
Yes/No values	`boolean`