Project 4: Design, Implementation, Usage

Objectives
Exercise your understanding of the ER Model, the Relational Model, ER-to-Relational Mapping Process, normalization, database design, SQL DDL, SQL Queries, and SQL DML (Data Manipulation Language).

Instructions
Given the problem statement and requirements below, create and deliver:

An ERD for the domain
An implementation of a relational database
A dump of your .schema
A list of SQL queries (SELECT statements) and SQL DML (UPDATE/INSERT/DELETE statements) that satisfy the requirements.

Problem
Your roommate has started to acquire a pretty large collection of movie information, and to stay organized has attempted to use an Excel spreadsheet to keep track of her data.

"Maaaaaan," she says, "I don't think this excel spreadsheet thing is worth the trouble. Every time I want to add new data to the spreadsheet I have to find the right row position, insert a new blank row, and then enter in the data. Also, it's a pain to find things quickly and to make changes to certain things if I make a mistake. Maybe I should just have another glass of wine and forget about this whole movie spreadsheet thing."

"Dude, you should totally use a database rather than Excel," you reply. And you explain the merits of of managing data with a proper RDBMS, which you learned about in your CSCI403 course.

You ask your roommate to show you the Excel file she had been using.

	A	B	C	D	E	F	G
1	**Movie Title**	**Movie Genre**	**Date Watched**	**Rating**	**Actor Name**	**Actor Gender**	**Actor Age**
2	Babel	Twisted Romance	1/1/14	****	Cate Blanchett	F	40
3	Drunken Master	Excessive Action	1/1/14	****	Jackie Chan	M	55
4	Juice	Excessive Action	1/2/14	***	Queen Latifah	F	40
5	Dodgeball	Plotless Drivel	1/3/14	*	David Hasselhoff	M	59
6	Star Wars	Sci-Fi / Fantasy	1/5/14	****	Mark Hamill	M	60
7	Bullitt	Excessive Action	1/6/14	***	Steve McQueen	M	??
8	Hackers	Computer Geek	1/7/14	**			
9	Wargames	Computer Geek	1/8/14	**			
10		Children					
11		Drama Cliché					
12							
13							

“Oh. Oh my,” you say, biting your tongue, “I think there’s definitely a better way to work with this data.”

"Maaaaan," she smiles, "if you can help me out I'll definitely look for your car keys... which I lost yesterday."

“Well, then we have two problems,” you sigh, “But first, tell me more about what you want to be able to do with this data,”

Your roommate divulges the following:

I want a database for storing the movies I’ve seen, and a little information about the actors in the movie. I want to record the movie title, its genre, when I watched the movie, and my rating. I also want to record all the main actors in the movie. Sometimes I only care about one actor, but other times I’ll want to record more than one actor for the movie.

I’d like to record the actors’ names, their gender, and their age.

I would also like to be able to record movie information, genres and actor information independently, since sometimes I might just get an idea for one of these things and, you know, I’m a little scatter-brained.

I want to be able to change the genre for a movie.

I want to be able to change the age of any actor.

I also want to be able to delete an actor, move or genre by its name.

Lastly, I want to be able to see:

- Movie information for a single movie, given its name. This information should include the date I watched it, the genre, and the actors’ names for that movie.
- A list of all actors, ordered by their age, from oldest to youngest.
- A list of the number of movies rated 1, 2, 3 and 4 stars, ordered by the groups of ratings in ascending order.
- A list of all actors whose first name includes “Bacon” because I like bacon.
- A list of the number of male and female actors.
- A list of the average age, maximum age and minimum age of all actors.

“I would also like to see -- ooooh, what’s that? Is that a drone flying by in the sky?” she says, distracted.

Having lost her attention, you decide to get to work.

Instructions

- Draw an ER diagram that correctly represents the domain.
- Write the SQL DDL statements (CREATE TABLE statements) for an appropriate relational schema for this domain and its requirements described above.
- Implement the schema as a SQLite database.
- Write the INSERT statements necessary for seeding the database with the information you see in the spreadsheet (shown above). Be sure to record these insert statements in a file/document, which you will submit.
- Write all the necessary SELECT, UPDATE and DELETE statements that would be used in order to satisfy the requirements above. Use a ? character in place of a particular value when necessary. (For example, your roommate wants to delete a genre by its name, so your WHERE clause would be WHERE genre.name = ?.)

Presentation

There are four components to be submitted for this assignment:

- An ER diagram representing the problem statement
- The SQLite database file
- A printed copy of your .schema
- A document listing all of the SQL queries and DML statements.

Good writing is important, but you may be brief with your answers for this assignment. Nevertheless, w*riting with poor grammar, misspellings, etc will be handed back for re-writing (no grade penalty).*

Submit your database file via blackboard, *but bring a hard copy of your ERD, your schema and queries to class on the due date(s)*.

Grading Criteria (120 points)

ER Diagram (30 points)
Completion & correctness of printed schema (30 points)
Completion & correctness of all SQL queries & DML statements (30 points)
Completion & correctness of database file (30 points)

Bring a hard copy of your ERD, your schema and queries to class on the due date(s).