CSE 108: Java Term Project (Part 1)
Movie Database System

You are required to write a program that implements a simple movie database. This movie database system aims to keep a database of the movies and perform operations such as searching for movies, searching for production companies, adding movies, etc.

The Movie Database System should provide the following features:

- Maintains a list (using a Java Collection class) of Movie objects
- Each Movie object represents a movie
- Each movie should contain the following information:
  - Title
  - Year of Release
  - Genre (A movie can have up to three different genres)
  - Running Time (in minutes)
  - Production Company
  - Budget
  - Revenue
- Movies can be added to the list
- Lists the details of an existing movie (or movies)
- Produces a report of movies based on some criteria
- Produces different statistics of the movies and production companies
- Loads a list of movies from a text file and saves the list of current movies to a text file

When the movie database system starts, it should automatically load a text file called "movies.txt", which contains details of all movies currently kept by the database. The actual format of this text file is described later in this document. The data loaded should be stored in some appropriate data structures. No other reading from or writing to file is required while the program is in operation until the user chooses to exit, at which point the program saves all the data in memory back to the same text file (movies.txt). In other words, the file I/O operations are performed automatically by the program and require no direct interactions with the user.

Main Menu
When the program is running, it should repeatedly display the command line based main menu with these options:

Main Menu:
1) *Search Movies*
2) *Search Production Companies*
3) *Add Movie*
4) *Exit System*

Option (1) of the Main Menu

Option (1) of the main menu allows the user to search for movies in the database. The user should be asked what criteria(s) he/she wants to use to search for movies. The following sub-menu and options should be displayed:

Movie Searching Options:
1) *By Movie Title*
2) *By Release Year*
3) *By Genre*
4) *By Production Company*
5) *By Running Time*
6) *Top 10 Movies*
7) *Back to Main Menu*

Inputs other than 1-7 should be rejected, and an error message should be printed. The menu should be displayed repeatedly until the user chooses Option (7).

If the user chooses option (1), you should ask the user to input a movie name and then search the database for any movie with the specific name. If found, display all information of this movie or display "No such movie with this name" if not found. The search needs to be case insensitive.

If the user chooses option (2), you should ask the user to input a year and then search the database for any movie with the specific year of release. If found, display all the movies or display "No such movie with this release year" if not found.

If the user chooses option (3), you should ask the user to input a genre and then search the database for any movie with the specific genre. If found, display all the movies or display "No such movie with this genre" if not found.

If the user chooses option (4), you should ask the user to input a production company and then search the database for any movie with the specific production company. If found, display all the movies or display "No such movie with this production company" if not found. The search needs to be case insensitive.

If the user chooses option (5), you should ask the user to input two numbers as range and then search the database for any movie with a running time in this range. If found, display all the movie or display "No such movie with this running time range" if not found.

If the user chooses option (6), display the top ten movies based on profit (positive difference between revenue and budget). You do not need to take any input from the users.

If the user chooses option (7), the program should go back to the main menu.

Option (2) of the Main Menu
Option (2) of the main menu allows the user to search for movies of specific production company in the database. The user should be asked what criteria(s) he/she wants to use to search. The following sub-menu and options should be displayed:

Production Company Searching Options:
1) *Most Recent Movies*
2) *Movies with the Maximum Revenue*
3) *Total Profit*
4) *List of Production Companies and the Count of their Produced Movies*
5) *Back to Main Menu*

Inputs other than 1-5 should be rejected, and an error message should be printed. The menu should be displayed repeatedly until the user chooses Option (5)

If the user chooses option (1), you should ask the user to input a production company and then display the movies of this production company with the latest release year. Display "No such production company with this name" if the production company is not found. The search needs to be case insensitive.

If the user chooses option (2), you should ask the user to input a production company and then display the movies of this production company with the maximum revenue. Display "No such production company with this name" if the production company is not found. The search needs to be case insensitive.

If the user chooses option (3), you should ask the user to input a production company and then display the total profit (loss needs to considered) of the movies of this production company. Display "No such production company with this name" if the production company is not found. The search needs to be case insensitive.

If the user chooses option (4), display all the production companies and the total number of movies they produced. You do not need to take any input from the users.

If the user chooses option (5), the program should go back to the main menu.

Option (3) of the Main Menu
Option (3) of the main menu allows the user to add a new movie to the database. You must take input for all the information of a movie. Please note that a movie must have a minimum of one and a maximum of three genres.

Option (4) of the Main Menu
Option (4) of the main menu exits the program. All the movies currently in memory are automatically saved back to "movies.txt" if any new movie is added.

Inputs other than 1-4 to this main menu should be rejected, and an error message should be printed. The menu should be displayed repeatedly until the user chooses Option (4).

Input File Format
The input data file (movies.txt) has the following format for each line: (Note that there is no space between a word and a comma).

Name,ReleaseYear,Genre1,Genre2,Genre3,RunningTime,ProductionCompany,Budget,Revenue

Name, Genre1, Genre2, Genre3, and ProductionCompany are Strings. Genre2 and Genre3 can be empty.
ReleaseYear, RunningTime, Budget and Revenue are positive integers.

Important Assumptions
You should assume the following when implementing your program:
- You are not allowed to hardcode anything
- You have to reuse your code later, so design and code accordingly
- All movie names are unique - if a movie with the inputted name is already in the database, you cannot add this movie, and you should generate an error
- There is no limit to how many movies can be stored
- When performing searches, all search strings are case insensitive
- The data file is always in the correct format - i.e., no need to validate the data when reading it in
- All on-screen input/output should be formatted in a user-friendly manner. Sensible error messages should be displayed whenever appropriate (e.g., when searching for a movie who is not in the database, a "Not Found" error message should be displayed)
- You are not allowed to use JavaFX or Java Swing for this part; everything should be command line based