CS201 – Fall 2022-2023
Homework 4
– CS201 Course – Movie Recommender –
Due December 14th, Wednesday, 23:55 (Sharp Deadline)

Introduction

The aim of this homework is to practice on vector of struct's data structure, sorting and searching algorithms. You will build a movie search engine that will display movies in the "database" according to user input.

Description

The program takes 10 movies from the user as a single string input with the movie name, movie release year and movie genre, respectively, separated by semicolons, and each movie separated by a "|" operator:

Movie1Name;Movie1Year;Movie1Genre|Movie2Name;Movie2Year;Movie2Genre

You should use a struct data structure to encapsulate the data of one movie, such as movie name, movie release year and movie genre. Then you should use a vector to store all movies and their data.

After creating your vector, you should sort the vector according to the release year of movies *from newest to oldest*. If there are more than one movie released in the same year, you should sort these movies from A to Z ascending order according to the movie name.

The program that you are going to implement will operate based on the selection number input by the user. According to selection your program will either continue to recommend movies or exit the execution. There are 4 options:

```
1. Select the genre of the movie that you want to watch
2. Select the year of the movie that you want to watch
3. Choose the random movie
4. Exit program
```

If the user selects the 1st option, the user is prompted to enter a genre. After the user enters the genre, the movies belonging to that genre are displayed from newest to oldest. If there are movies released in the same year, they are displayed based on their names A to Z. Here genre input should be case-insensitive.

If the user selects the 2nd option, the user is prompted to enter a year or a range of years. When the user enters just a year, the program displays movies that are released that year, according to their names in ascending order. If the user enters a range of years, then the program displays the movies released in these years, from newest to oldest ones. Also if there are multiple movies released in the same year, they should be displayed based on the alphabetical order of their names, from A - Z.

For the 1st and 2nd options, if there is no matching movie, an appropriate message is printed.

If the user selects the 3rd option, your program displays a random movie. You can use the `RandGen` class you learned in the course. You should seed RandGen as **rand.SetSeed(1907)**. This random selection part will not affect the grade.

Eventually, if the user selects the 4th option, the program ends.

IMPORTANT!

The name of your main source (cpp) file should be in the expected format: "SUCourseUsername_HWnumber.cpp" (all lowercase letters). Please check the submission procedures of the homework, which are listed at the end of this document.

You should submit all of your files to SUCourse **without zipping** them.

VERY IMPORTANT!

Your homework will be automatically graded using **GradeChecker**, so it is very important to satisfy the exact same output given in the sample runs. You use (http://learnt.sabanciuniv.edu/GradeChecker/) GradeChecker to check whether your implementation is working in the expected way. To be able to use GradeChecker, you should upload all the files in your homework project. **Just a reminder, you will see a character ¶ which refers to a newline in your expected output.**

If your code does not compile, then you will get **zero**. Please be careful about this and double check your code before submission.

Your programs will be compiled, executed and evaluated **automatically**; therefore you should definitely follow the rules for prompts, inputs and outputs. See **Sample Runs** section for some examples.

- **Order of inputs and outputs** must be in the mentioned format.

Following these rules is crucial for grading, otherwise our software will not be able to process your outputs and you will lose some points in the best scenario.

See the General Guidelines below, about homework submissions and how to get help etc.

Sample Runs

Below, we provide some sample runs of the program you will develop. The *italic* and **bold** phrases are inputs taken from the user. You have to display the required information in the same order and with the same words and characters as below.

Sample Run 1

```
Welcome to the movie recommender program!

Please enter the movie, year and genre list:
TheGodfather;1974;Drama|ForrestGump;1994;Drama|LaLaLand;2016;Comedy|TheMatrix;1999;Sci-Fi|Zootopia;2016;Comedy|PulpFiction;1994;Drama|Interstellar;2014;Sci-Fi|Gladiator;2000;Action|Inception;2010;Sci-Fi|FightClub;1999;Drama

Please select your action:
1. Select the genre of the movie that you want to watch
2. Select the year of the movie that you want to watch
3. Choose a random movie
4. Exit program

Enter your choice: 1
Please enter the genre of the movie you want to watch: drama

drama movies from newest to oldest:
Movie name: FightClub Release Year: 1999
Movie name: ForrestGump Release Year: 1994
Movie name: PulpFiction Release Year: 1994
Movie name: TheGodfather Release Year: 1974

Enter your choice: 1
Please enter the genre of the movie you want to watch: Comedy

Comedy movies from newest to oldest:
Movie name: LaLaLand Release Year: 2016
Movie name: Zootopia Release Year: 2016

Enter your choice: 1
Please enter the genre of the movie you want to watch: horror

There are no horror movies!

Enter your choice: 4
Thank you...
```

Sample Run 2

```
Welcome to the movie recommender program!

Please enter the movie, year and genre list:
TheGodfather;1974;Drama|ForrestGump;1994;Drama|LaLaLand;2016;Comedy|TheMatrix;1999;Sci-Fi|Zootopia;2016;Comedy|PulpFiction;1994;Drama|Interstellar;2014;Sci-Fi|Gladiator;2000;Action|Inception;2010;Sci-Fi|FightClub;1999;Drama

Please select your action:
1. Select the genre of the movie that you want to watch
2. Select the year of the movie that you want to watch
3. Choose a random movie
4. Exit program

Enter your choice: 2
Please enter the year of the movie you want to watch: 1999
Movies released in 1999 from A to Z:
Movie name: FightClub Genre: Drama
Movie name: TheMatrix Genre: Sci-Fi

Enter your choice: 2
Please enter the year of the movie you want to watch: 1994-2010
Movies released between the years 1994-2010 from A to Z with decreasing year ordering:
Movie name: Inception Release Year: 2010 Genre: Sci-Fi
Movie name: Gladiator Release Year: 2000 Genre: Action
Movie name: FightClub Release Year: 1999 Genre: Drama
Movie name: TheMatrix Release Year: 1999 Genre: Sci-Fi
Movie name: ForrestGump Release Year: 1994 Genre: Drama
Movie name: PulpFiction Release Year: 1994 Genre: Drama

Enter your choice: 2
Please enter the year of the movie you want to watch: 1989-1993
There are no movies released between 1989-1993!

Enter your choice: 2
Please enter the year of the movie you want to watch: 1899
There are no movies released in 1899!


Enter your choice: 4
Thank you...
```

Sample Run 3

```
Welcome to the movie recommender program!

Please enter the movie, year and genre list:
TheGodfather;1974;Drama|ForrestGump;1994;Drama|LaLaLand;2016;Comedy|TheMatrix;1999;Sci-Fi|Zootopia;2016;Comedy|PulpFiction;1994;Drama|Interstellar;2014;Sci-Fi|Gladiator;2000;Action|Inception;2010;Sci-Fi|FightClub;1999;Drama

Please select your action:
1. Select the genre of the movie that you want to watch
2. Select the year of the movie that you want to watch
3. Choose a random movie
4. Exit program

Enter your choice: 3
Movie name: Zootopia Release Year: 2016 Genre: Comedy

Enter your choice: 3
Movie name: ForrestGump Release Year: 1994 Genre: Drama

Enter your choice: 3
Movie name: LaLaLand Release Year: 2016 Genre: Comedy

Enter your choice: 4
Thank you...
```

Sample Run 4

```
Welcome to the movie recommender program!

Please enter the movie, year and genre list:
TheGodfather;1974;Drama|ForrestGump;1994;Drama|LaLaLand;2016;Comedy|TheMatrix;1999;Sci-Fi|Zootopia;2016;Comedy|PulpFiction;1994;Drama|Interstellar;2014;Sci-Fi|Gladiator;2000;Action|Inception;2010;Sci-Fi|FightClub;1999;Drama
```

```
Please select your action:
1. Select the genre of the movie that you want to watch
2. Select the year of the movie that you want to watch
3. Choose a random movie
4. Exit program

Enter your choice: 1
Please enter the genre of the movie you want to watch: sci-fi

sci-fi movies from newest to oldest:
Movie name: Interstellar Release Year: 2014
Movie name: Inception Release Year: 2010
Movie name: TheMatrix Release Year: 1999

Enter your choice: 2
Please enter the year of the movie you want to watch: 1999-2000
Movies released between the years 1999-2000 from A to Z with
decreasing year ordering:
Movie name: Gladiator Release Year: 2000 Genre: Action
Movie name: FightClub Release Year: 1999 Genre: Drama
Movie name: TheMatrix Release Year: 1999 Genre: Sci-Fi

Enter your choice: 3
Movie name: Inception Release Year: 2010 Genre: Sci-Fi

Enter your choice: 4
Thank you...
```

General Rules and Guidelines about Homeworks

The following rules and guidelines will be applicable to all homework unless otherwise noted.

How to get help?

You can use GradeChecker (http://learnt.sabanciuniv.edu/GradeChecker/) to check your expected grade. Just a reminder, you will see a character ¶ which refers to a newline in your expected output.

You may ask questions to TAs (Teaching Assistants) or LAs (Learning Assistants) of CS201. Office hours of TAs/LAs can be found at SUCourse.

What and Where to Submit

You should prepare (or at least test) your program using MS Visual Studio 2012 C++ (Windows users) or using XCode (macOS users).

You should also write your name and last name inside the program (as a comment line of course). Do not use any Turkish characters anywhere in your code (not even in comment parts). If your name and last name is "Gülşen Demiröz", and if you want to write it as comment; then you must type it as follows:

// Gulsen Demiroz

Submission guidelines are below. Since the grading process will be automatic, students are expected to strictly follow these guidelines. If you do not follow these guidelines, your grade will be 0.

- Name your submission file as follows:
    - Use only English alphabet letters, digits, dot ('.') or underscore in the file names. Do not use blank, Turkish characters or any other special symbols or characters.
    - Name your cpp file that contains your program as follows:
      "SUCourseUsername_hwnumber.cpp"
    - Your SUCourse user name is actually your SUNet username, which is used for checking sabanciuniv emails. Do NOT use any spaces, non-ASCII and Turkish characters in the file name (**use only lowercase letters**) except dot ('.'). For example, if your SUCourse username is "**gulsend**", then the file name should be: **gulsend_hw4*.cpp*** (please only use lowercase letters).
    - Do not add any other character or phrase to the file name.
- Please make sure that this file is the latest version of your homework program.
- Submit your work **through SUCourse only**! You can use GradeChecker only to see if your program can produce the correct outputs both in the correct order and in the correct format. It will not be considered as the official submission. You must submit your work to SUCourse. You will receive no credits if you submit by any other means (email, paper, etc.).
- If you want to resubmit your work, you should first remove the existing file(s). This step is very important as if you don't delete the old files, we receive both files and the old one may be graded.

Grading, Review and Objections

Be careful about the automatic grading: Your programs will be graded using an automated system. Therefore, you should follow the guidelines on the input and output order. Moreover, you should also use the same text as given in the "Sample Runs" section. Otherwise, the automated grading process will fail for your homework, and you may get a zero, or in the best scenario, you will lose points.

Grading:

- There is NO late submission. You need to submit your homework before the deadline. Please be careful that SUCourse time and your computer time may have 1-2 minute differences. You need to take this time difference into consideration.
- Successful submission is one of the requirements of the homework. If, for some reason, you cannot successfully submit your homework and we cannot grade it, your grade will be 0.

- If your code does not work because of a syntax error, then we cannot grade it; and thus, your grade will be 0.
- Please submit your **own** work only. It is really easy to find "similar" programs!
- Plagiarism will not be tolerated. Please check our plagiarism policy given in the Syllabus.

Plagiarism will not be tolerated!

Grade announcements: Grades will be posted in SUCourse, and you will get an Announcement at the same time. You will find the grading policy and test cases in that announcement.

Grade objections: It is your right to object to your grade if you think there is a problem, but before making an objection please try the steps below and if you still think there is a problem, contact the TA that graded your homework from the email address provided in the comment section of your announced homework grade or attend the specified objection hour in your grade announcement.

- Check the comment section in the homework tab to see the problem with your homework.
- Download the file you submitted to SUCourse and try to compile it.
- Check the test cases in the announcement and try them with your code.
- Compare your results with the given results in the announcement.

Good Luck!
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