UTM

UNIVERSITI TEKNOLOGI MALAYSIA

SECJ1023 TEKNIK PENGATURCARAAN II

(PROGRAMING TECHNIQUE II)

Semester II 2023/2024

Group Project Deliverable 4

Project Finale

Movie Recommendation System

LECTURER : DR LIZAWATI BINTI MI YUSUF

SECTION : 4

GROUP : 5

STUDENTS :

- **ADRIANA ZULAIKHA BINTI ZULKARMAN (A23CS0035)**
- **MELODY LUI RUO NING (A23CS0244)**
- **LEO MIN XUE (A23CS0237)**

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1.0 Project Description

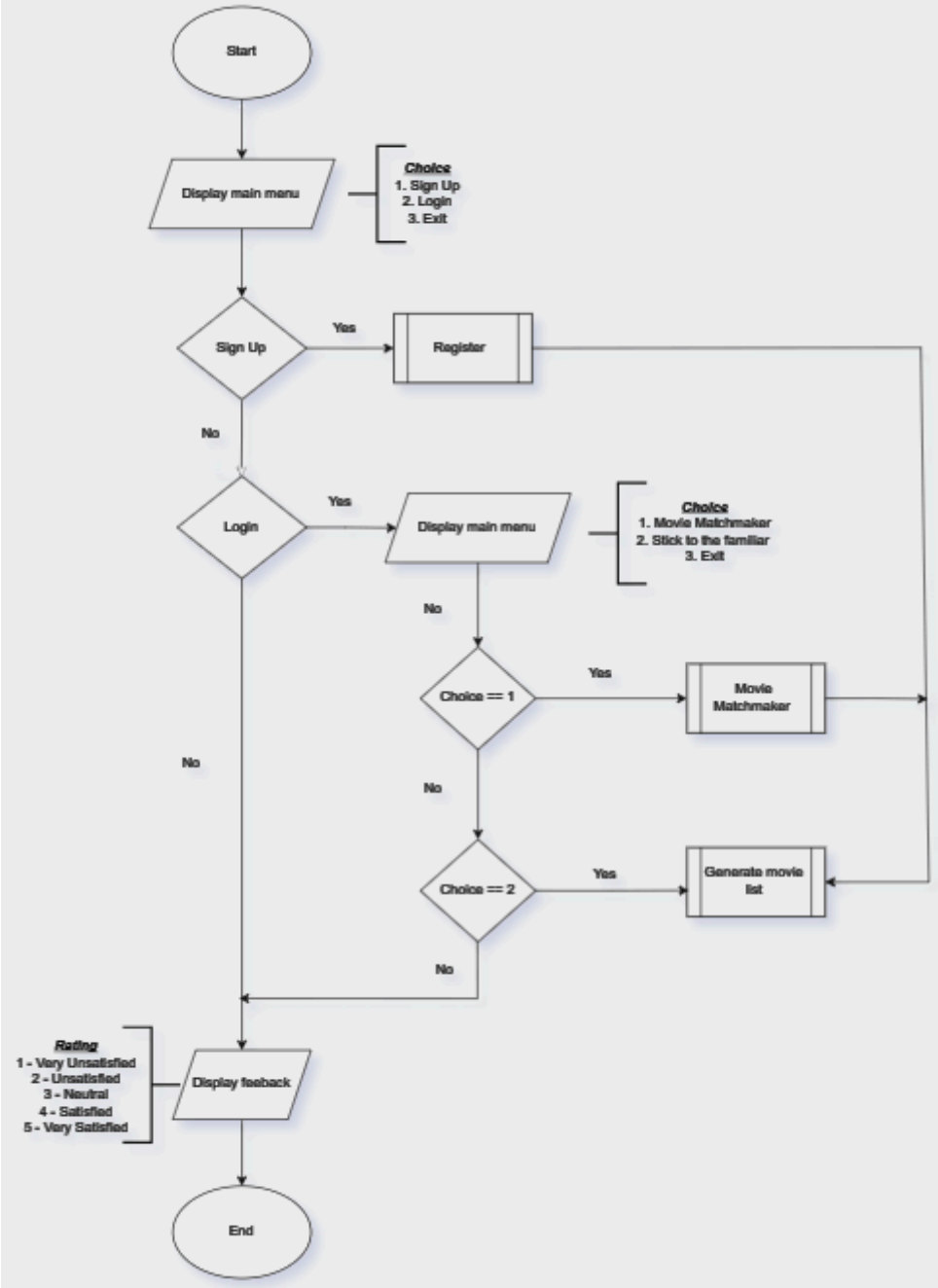
1.1 Objectives and Purpose

The goal of our movie recommendation system is to improve user satisfaction and retention by offering personalized movie suggestions. We are able to make movie recommendations that align with users' likes and preferences by looking at their ratings, viewing history, and interactions on the platform. Additionally, this approach seeks to assist viewers in finding underappreciated and hidden gems of movies, particularly independent or niche films that they might not otherwise come across. At the same time, we encourage users to explore a wider variety of films and broaden their viewing experience. By analyzing user data, we are able to gain valuable insights into their preferences, habits and movie-watching patterns. It aids in platform improvement and efficient planning. It also helps us enhance our platform, plan effective marketing strategies and make better content. To conclude, the movie recommendation system can incorporate certain aspects such as sharing their movie lists, ratings, and suggestions with friends in order to improve user experience. Users may be encouraged to spend more time on the platform and find new material through their networks as a result of this social interaction which can also foster a more lively and community-focused environment. Last but not least, this system can stay ahead of the competition and satisfy customers over the long run by continuously integrating the latest technological advancements and maintaining a strong focus on user feedback.

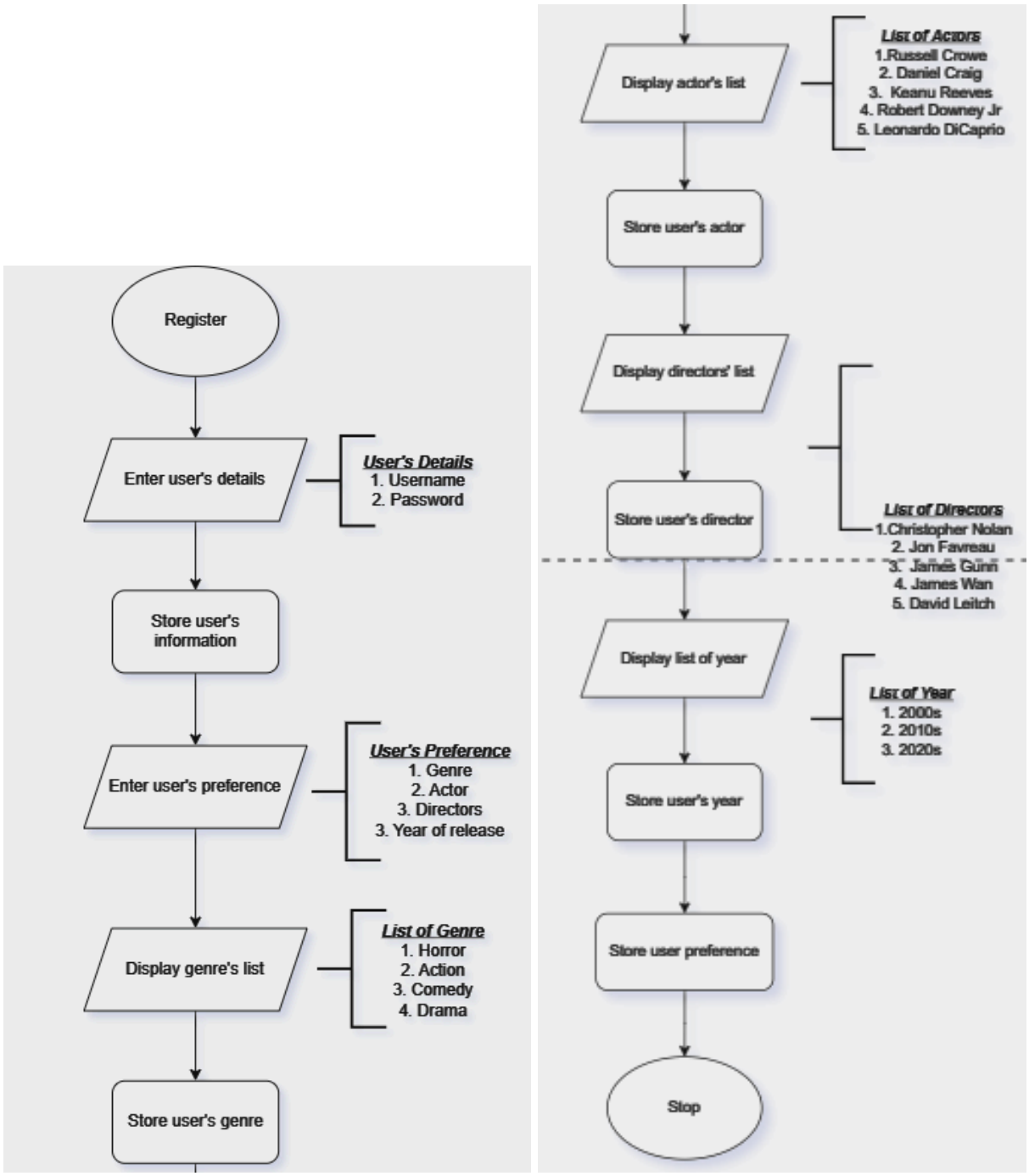
2.0 Analysis and Design

2.1 Flow Chart

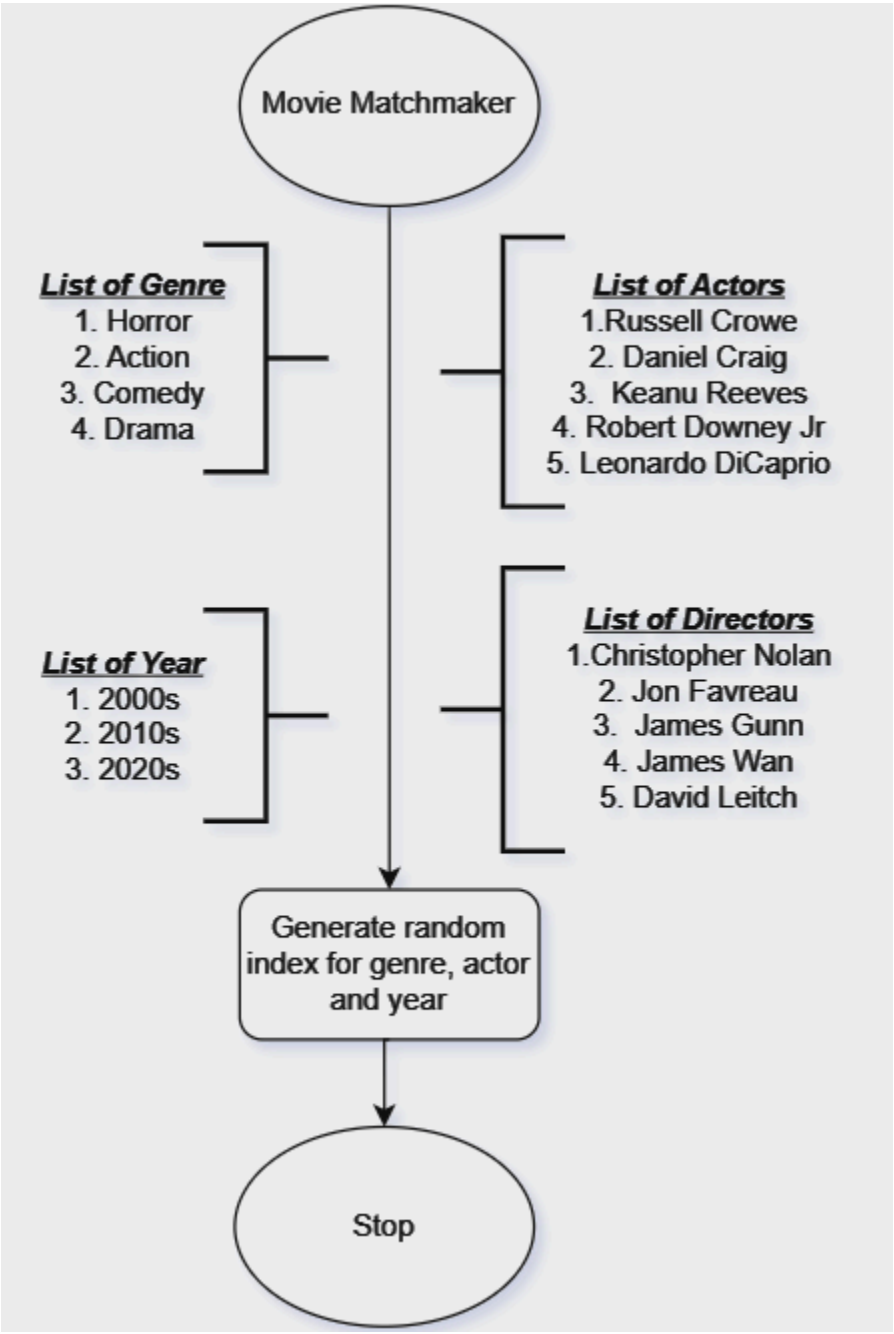
- **Main Process**



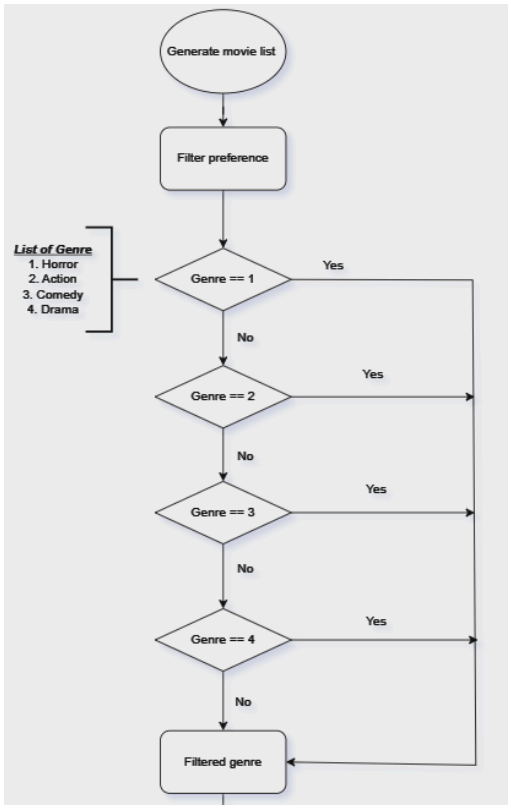
- **Process for Register**

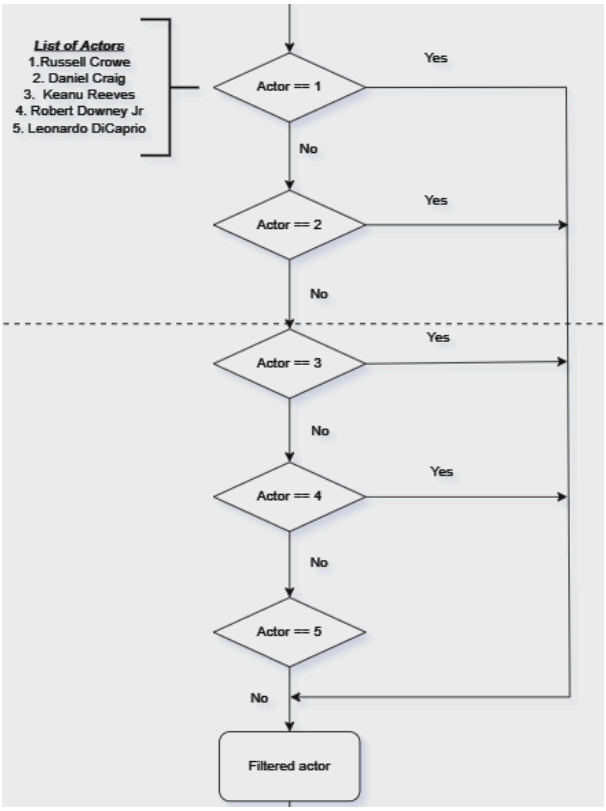


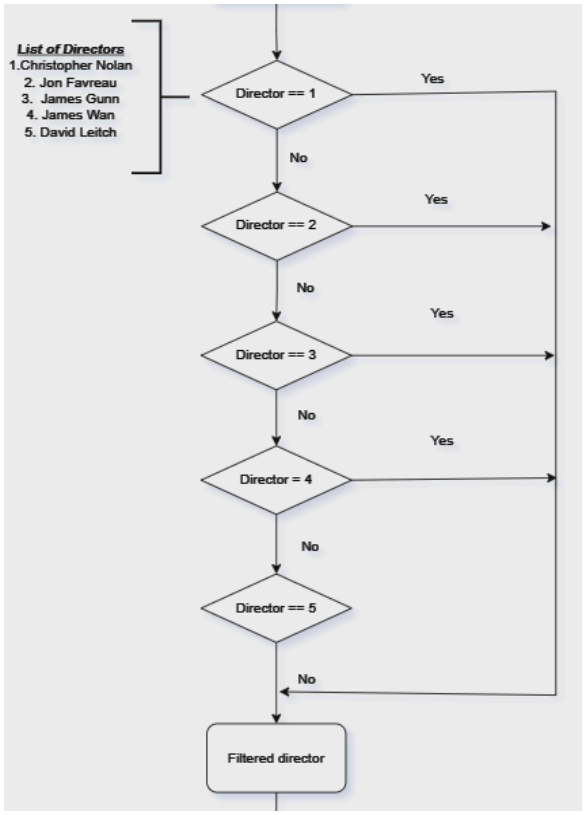
- **Process for Movie Matchmaker**

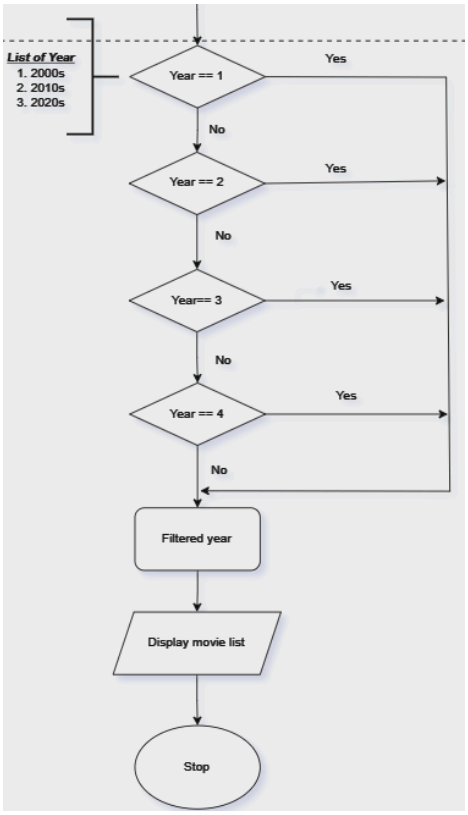


- **Process for Generate Movie List**

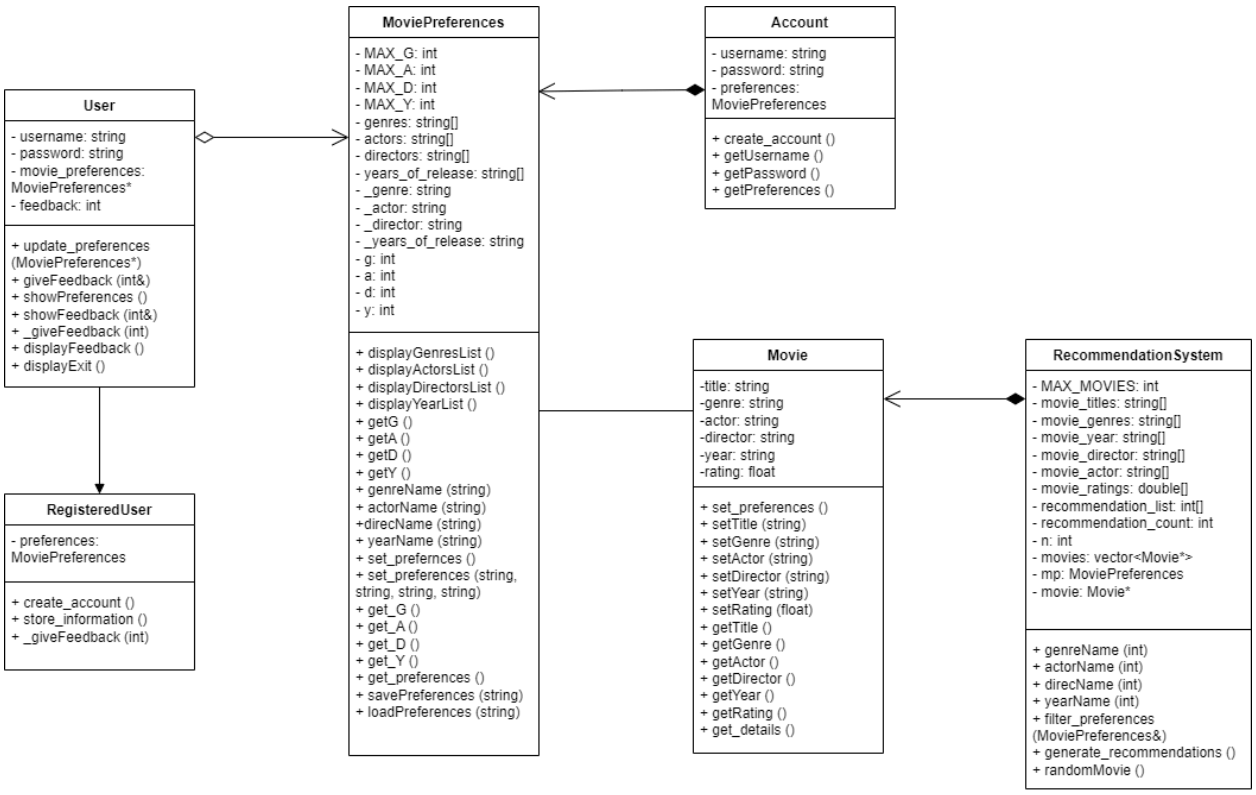








2.2 UML Diagram



3.0 Implementation of the Concepts

3.1 Encapsulation

This movie recommendation system consists of 6 classes which are MoviePreferences, Movie, RecommendationSystem, Account , User and RegisteredUser.

In this movie recommendation system, encapsulation is demonstrated in the class of MoviePreferences and Movie. The class MoviePreferences has private data members like genres, actors, directors, years_of_release, _genre, _actor, _director and _years_of_release. These are encapsulated within the class and cannot be directly accessed from outside the class. Next, to interact with the private data members, public methods like displayGenresList(), getG(), displayActorsList(), getA(), displayDirectorsList(), getD(), displayYearList(), getY(), set_preferences(), and get_preferences() are provided. These methods allow controlled access and modification of the private data.

Furthermore, the Movie class has private data members such as title, genre, actor, director, year and rating. These are encapsulated within the class. Public methods like setTitle(), getTitle(), setGenre(), getGenre(), setActor(), getActor(), setDirector(), getDirector(), setYear(), getYear(), setRating(), getRating(), and get_details() are provided to interact with the private data members.

To conclude, those private data members in those classes are able to ensure data integrity as data cannot be directly modified .This encapsulation ensures that the preferences are set and accessed in a controlled manner, maintaining data integrity and hiding implementation details from the user.

3.2 Composition

The RecommendationSystem class is composed of MoviePreferences and a vector of Movie objects which demonstrates a "has", “contain” or “consist of" relationship.This concept is able to provide tailored movie recommendations based on user preferences. Besides, the RecommendationSystem’s constructor initializes the vector of Movie pointers by reading data from an input file that is named “INPUT2.txt ". Furthermore, the filter_preferences and generate_recommendations methods demonstrate the use of the MoviePreferences object to filter and recommend movies based on user preferences. Lastly, the MoviePreferences and Movie classes can be reused in other parts of the system without modification as composition indicates reusability.

Furthermore, the Account class is utilized to manage the relationship between the Account class and its MoviePreferences member. At the same time, composition indicates that the preferences object is owned by and managed by the Account class.

The initialization of the preferences object in the constructor ensures that each Account object possesses its own instance of MoviePreferences, which is set up with either default values or values specified during object creation. Consequently, the Account class directly oversees the preferences object. It makes sure that the lifespan of the Account object is accompanied during the construction, destruction, and management of the preferences object.

3.3 Aggregation

In the RecommendationSystem class, mp is an instance of the MoviePreferences class. Aggregation implies that RecommendationSystem has a MoviePreferences object as a member, which it can use to filter and customize recommendations. It is also used to manage and generate movie recommendations based on user preferences.

For the User class, it aggregates a pointer to a MoviePreferences object. Aggregation here implies that User has a reference to MoviePreferences. This means the User class can have different MoviePreferences objects assigned to it dynamically, allowing users to change preferences without altering the User class itself.

3.4 Inheritance

The base class is known as ‘User’ that contains attributes of username, password, movie_preferences and feedback. At the same time, _giveFeedback is a pure virtual function that used to make User an abstract base class. This function is meant to be overridden by derived classes to provide specific implementations. Next the derived class is known as ‘RegisteredUser’ which needs to inherit from the class of User and extend its functionality. For example, the constructor of derived class initializes the username and password through the base class constructor User(uname, pwd). Then, the methods of create_account() and store_information() are used to manage user accounts and store user-related details. Hence, RegisteredUser extends the User class by inheriting its core attributes and behaviors. It enhances its functionality with specific features by establishing an “is a” relationship between classes.

3.5 Polymorphism

In the User class, _giveFeedback is declared as a pure virtual function using virtual void _giveFeedback(int& feedback) = 0 while RegisteredUser provides a concrete implementation of _giveFeedback using the override keyword. The use of virtual functions and method overriding allows different derived classes to provide their own implementations of the same function declared in the base class. It is important as it enables the correct function to be called for objects of different derived classes through a base class pointer or reference.

Furthermore, inside the main function, the instances of RegisteredUser are created and used. The User pointer regUser can point to objects of type RegisteredUser that demonstrate polymorphic behavior. So, regUser is declared as a pointer to User which allows it to point to an object of type RegisteredUser. This pointer can invoke _giveFeedback and the actual implementation invoked which is based on the object it currently points to.

3.6 Array of objects

Arrays of objects are used to store multiple instances of a class. They are utilized to manage movie data within the class of recommendationSystem. For example,

- string movie_titles[MAX_MOVIES];
- string movie_genres[MAX_MOVIES];
- string movie_year[MAX_MOVIES];
- string movie_director[MAX_MOVIES];
- string movie_actor[MAX_MOVIES];
- double movie_ratings[MAX_MOVIES];
- int recommendation_list[MAX_MOVIES];

Those arrays are used to store attributes of movies such as title, genre, year, director, actor and rating. This allows the class to efficiently store, retrieve and manipulate information about movies. By using an array of objects in our system, it can make our coding easier to manage and access into a structured format. Since we need to deal with a large amount of input data, it can access those elements fastly and efficiently. Further, the action of adding and removing becomes available when user preferences change.

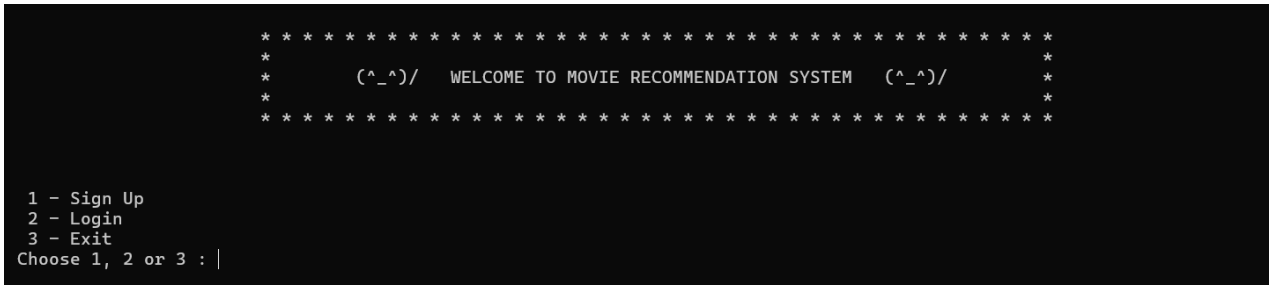
4.0 Codes

1.0 Account

1.1 New user - Sign Up

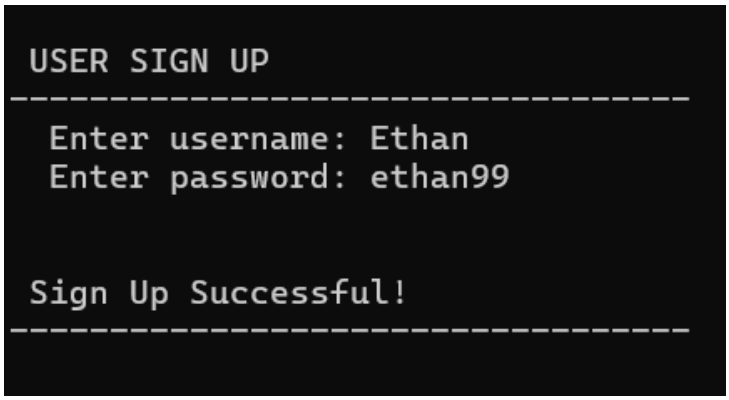
1.2 Old user - Login

1.3 Exit



1.1 New user - Sign Up

1.1.1 Enter username and password to create new account



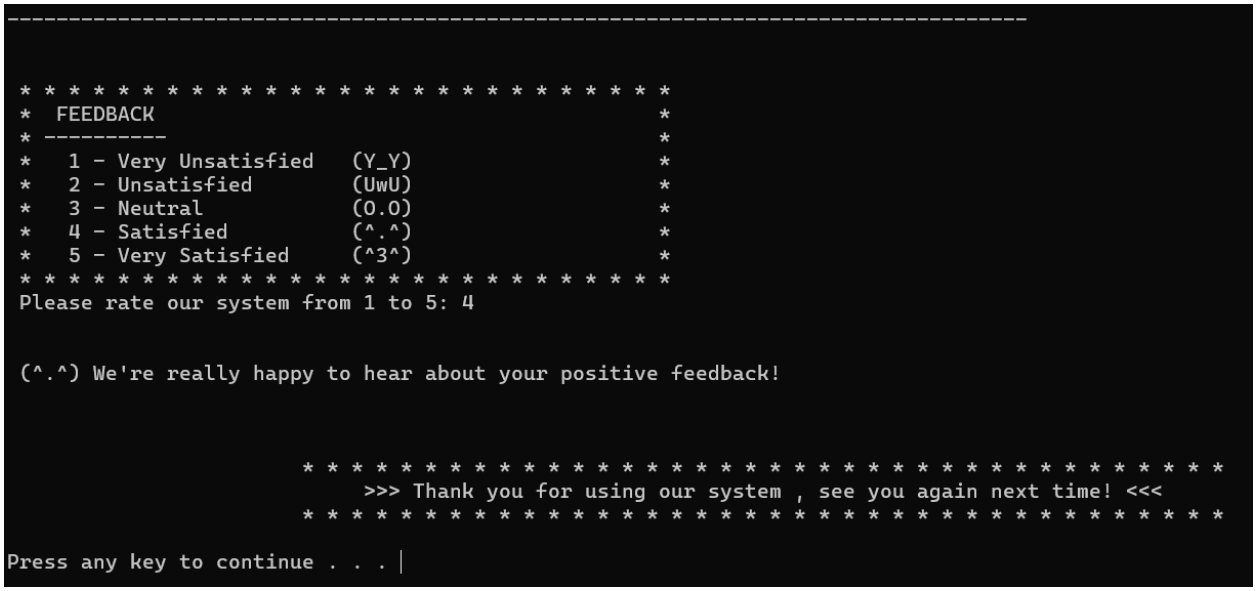
1.1.2 Set preferences and store it

```
Genres's List :
 1 - Horror
 2 - Action
 3 - Comedy
 4 - Drama
Choose one of the Genres => 3

Actor's List :
 1 - Russell Crowe
 2 - Daniel Craig
 3 - Keanu Reeves
 4 - Robert Downey Jr
 5 - Leonardo DiCaprio
Choose one of the Actors => 5

Director's List :
 1 - Christopher Nolan
 2 - Jon Favreau
 3 - James Gunn
 4 - James Wan
 5 - David Leitch
Choose one of the Directors => 2

YEAR of RELEASE LIST :
 1 - 2000s
 2 - 2010s
 3 - 2020s
Choose one of the Years => 3



Preferences saved successfully!
YOUR PREFERENCES:
--------------------
 Genre           => Comedy
 Actor           => Leonardo DiCaprio
 Director        => Jon Favreau
 Year of Release => 2020s
```

1.1.3 Generate recommended movie list

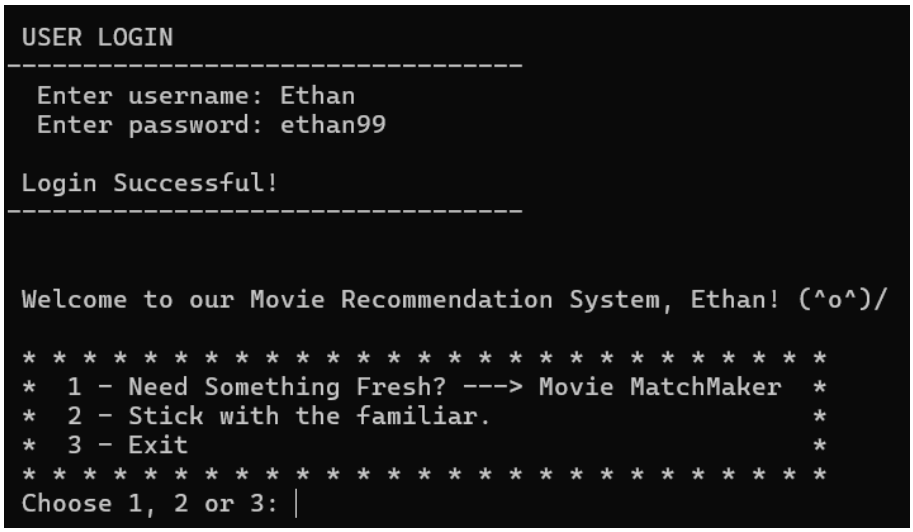
```
-----------------------
 Recommendations List:
-----------------------
 Title           : Palm Springs
 Genre           : Comedy
 Actor           : Andy Samberg
 Director        : Max Barbakow
 Year of Release : 2020s
 Rating          : 7.4

 Title           : Borat Subsequent Moviefilm
 Genre           : Comedy
 Actor           : Sacha Baron Cohen
 Director        : Jason Woliner
 Year of Release : 2020s
 Rating          : 6.7

 Title           : The King of Staten Island
 Genre           : Comedy
 Actor           : Pete Davidson
 Director        : Judd Apatow
 Year of Release : 2020s
 Rating          : 7.1

 Title           : Eurovision Song Contest: The Story of Fire Saga
 Genre           : Comedy
 Actor           : Will Ferrell
 Director        : David Dobkin
 Year of Release : 2020s
 Rating          : 6.5

 Title           : Bad Trip
 Genre           : Comedy
 Actor           : Eric Andre
 Director        : Kitao Sakurai
 Year of Release : 2020s
 Rating          : 6.5

 Title           : Barb and Star Go to Vista Del Mar
 Genre           : Comedy
 Actor           : Kristen Wiig
```

1.1.4 Feedback



1.2 Old user - Login

1.2.0 Enter username and password to verify



1.2.1 Generate Movie Matchmaker List

```
-----------------------
 Movie Matchmaker List:
-----------------------
  Title           : The Social Network
  Genre           : Drama
  Actor           : Jesse Eisenberg
  Director        : David Fincher
  Year of Release : 2010s
  Rating          : 7.7

  Title           : Us
  Genre           : Horror
  Actor           : Lupita Nyong'o
  Director        : Jordan Peele
  Year of Release : 2010s
  Rating          : 6.9

  Title           : The Descent
  Genre           : Horror
  Actor           : Shauna Macdonald
  Director        : Neil Marshall
  Year of Release : 2000s
  Rating          : 7.2

  Title           : Get Out
  Genre           : Horror
  Actor           : Daniel Kaluuya
  Director        : Jordan Peele
  Year of Release : 2010s
  Rating          : 7.7
```

1.2.2 Stick to the familiar (Generate movie list based on the previous stored preferences)

```
 YOUR PREFERENCES:
--------------------
  Genre           => Comedy
  Actor           => Leonardo DiCaprio
  Director        => Jon Favreau
  Year of Release => 2020s


--------------------------------------------------------------------------


-----------------------
 Recommendations List:
-----------------------
  Title           : Palm Springs
  Genre           : Comedy
  Actor           : Andy Samberg
  Director        : Max Barbakow
  Year of Release : 2020s
  Rating          : 7.4

  Title           : Borat Subsequent Moviefilm
  Genre           : Comedy
  Actor           : Sacha Baron Cohen
  Director        : Jason Woliner
  Year of Release : 2020s
  Rating          : 6.7

  Title           : The King of Staten Island
  Genre           : Comedy
  Actor           : Pete Davidson
  Director        : Judd Apatow
  Year of Release : 2020s
  Rating          : 7.1

  Title           : Eurovision Song Contest: The Story of Fire Saga
  Genre           : Comedy
  Actor           : Will Ferrell
  Director        : David Dobkin
  Year of Release : 2020s
```

1.2.3 Exit and Feedback

```
* * * * * * * * * * * * * * * * * * * * * * * * * * *
*  1 - Need Something Fresh? ---> Movie MatchMaker  *
*  2 - Stick with the familiar.                     *
*  3 - Exit                                         *
* * * * * * * * * * * * * * * * * * * * * * * * * * *
Choose 1, 2 or 3: 3



* * * * * * * * * * * * * * * * * * * * * * * * * * *
*  FEEDBACK                                         *
* ----------                                        *
*   1 - Very Unsatisfied   (Y_Y)                    *
*   2 - Unsatisfied        (UwU)                    *
*   3 - Neutral            (O.O)                    *
*   4 - Satisfied          (^.^)                    *
*   5 - Very Satisfied     (^3^)                    *
* * * * * * * * * * * * * * * * * * * * * * * * * * *
Please rate our system from 1 to 5: 5


(^3^) We're glad that you enjoyed our service!



                       * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
                            >>> Thank you for using our system , see you again next time! <<<
                       * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

Press any key to continue . . .
```