UTM
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FACULTY OF COMPUTING
UTM Johor Bahru

SECJ1023-08

SEMESTER 2 2023/2024 PROGRAMMING TECHNIQUE II GROUP

PROJECT DELIVERABLE 2

(Problem Analysis and Design)

Group: CineMatch

Lecturer: Dr Lizawati Binti Mi Yusuf

CHEW ZHUO HENG	A23CS0064
GOH CHANG ZHE	A23CS0225
CHEW CHUAN KAI	A23CS0062

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Section A:

Project Description

The Movie Recommendation System is a C++ software application designed to suggest movies to users based on their preferences. By collecting data on users' movie ratings and genre preferences, the system generates personalized movie recommendations to enhance user satisfaction and engagement.

Users can interact with the system through simple inputs, allowing them to rate movies, add films to their watchlist, and receive personalized suggestions. The goal is to help users discover new and interesting movies that match their tastes, thereby enhancing their movie-watching experience.

Objectives

- Suggest movies to users based on their preferences and behavior
  - Provide tailored movie recommendations by analyzing user preferences and viewing habits.
- Enable users to rate movies
  - Allow users to rate movies, which will help refine and improve future recommendations.
- Organize movie information
  - Efficiently manage and categorize movie details for easy retrieval and recommendation.
- Provide accurate movie information to users
  - Ensure users have access to reliable and comprehensive information about movies.
- Personalized recommendations
  - Offer individualized movie suggestions to enhance the user experience.
- Improve user satisfaction and engagement
  - Boost user satisfaction and keep users engaged by consistently delivering relevant and enjoyable movie recommendations.

Purpose

1. Collect data on users' movie preferences
   - Gather information on users' ratings and genre choices to tailor recommendations.

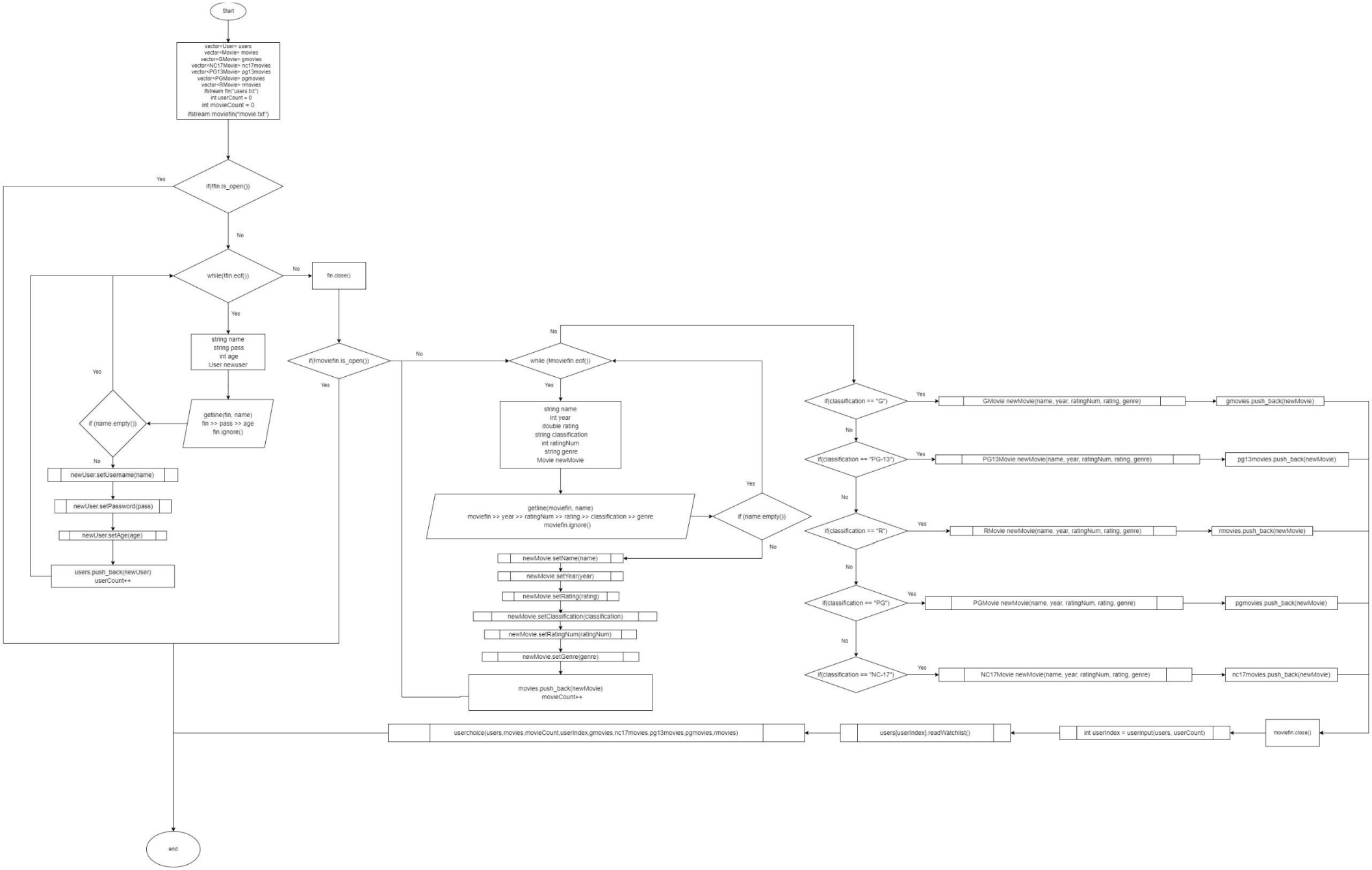
2. Enable user interaction through simple inputs
   - Allow users to easily interact with the system, rate movies, and add movies to their watchlist.

3. Enhance user experience with personalized suggestions
   - Improve the movie-watching experience by offering personalized movie recommendations.

4. Simplify and enhance movie discovery
   - Make it easy and enjoyable for users to discover new movies, regardless of their location.

Section A:Flow chart

Main flowchart



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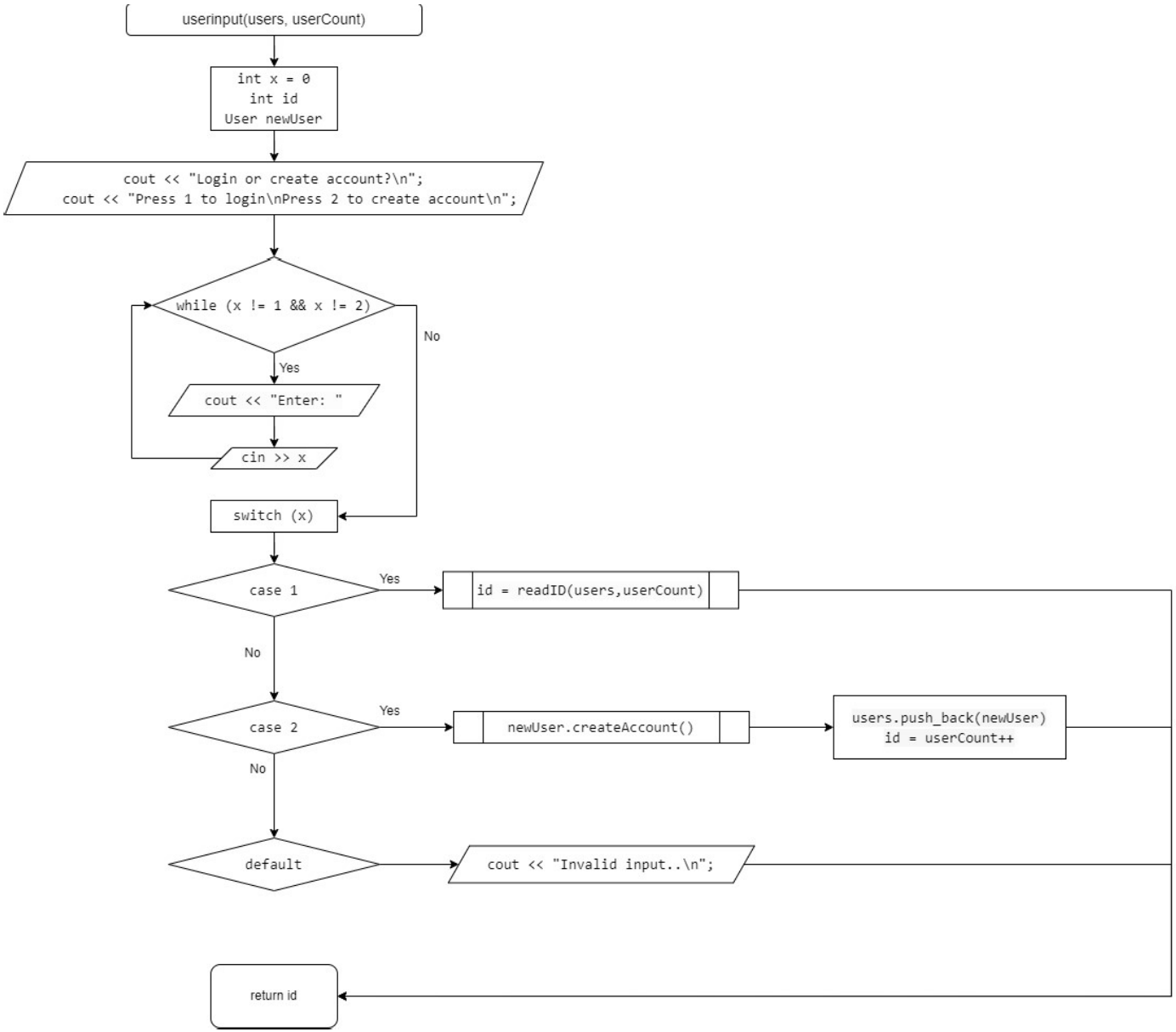

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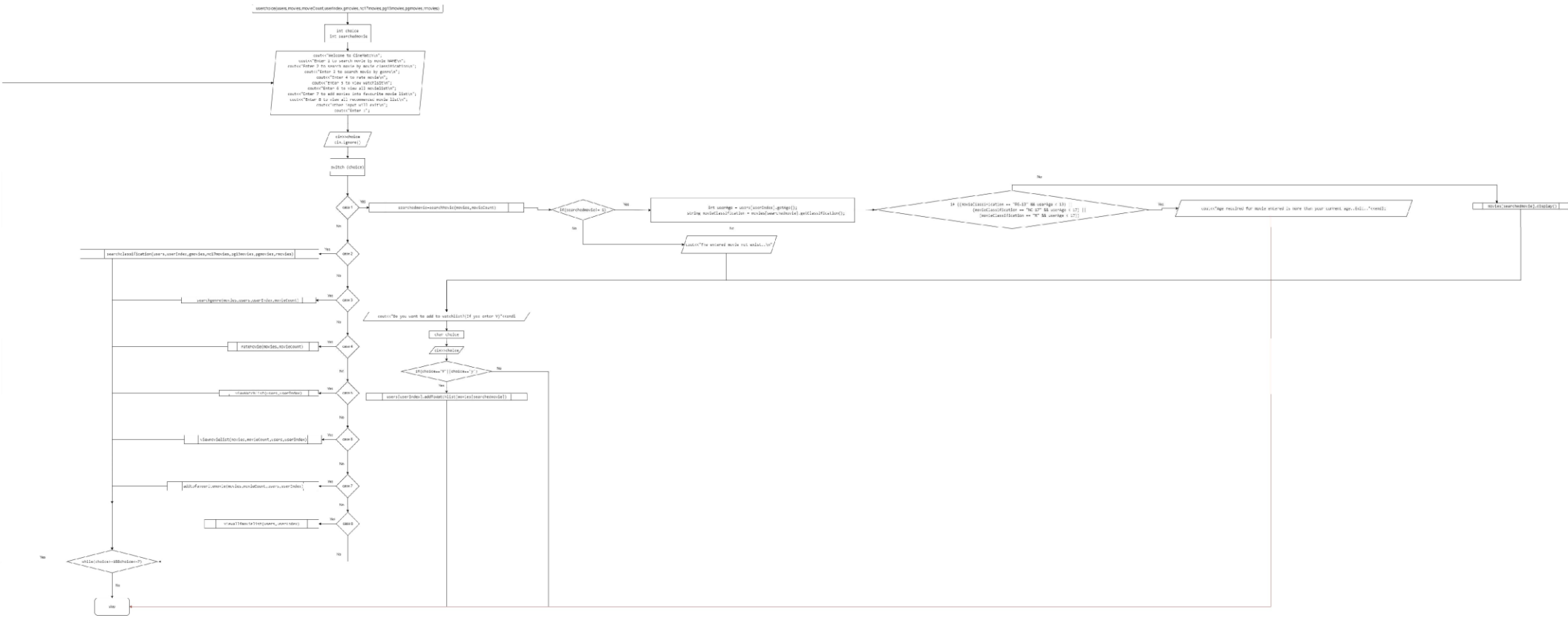

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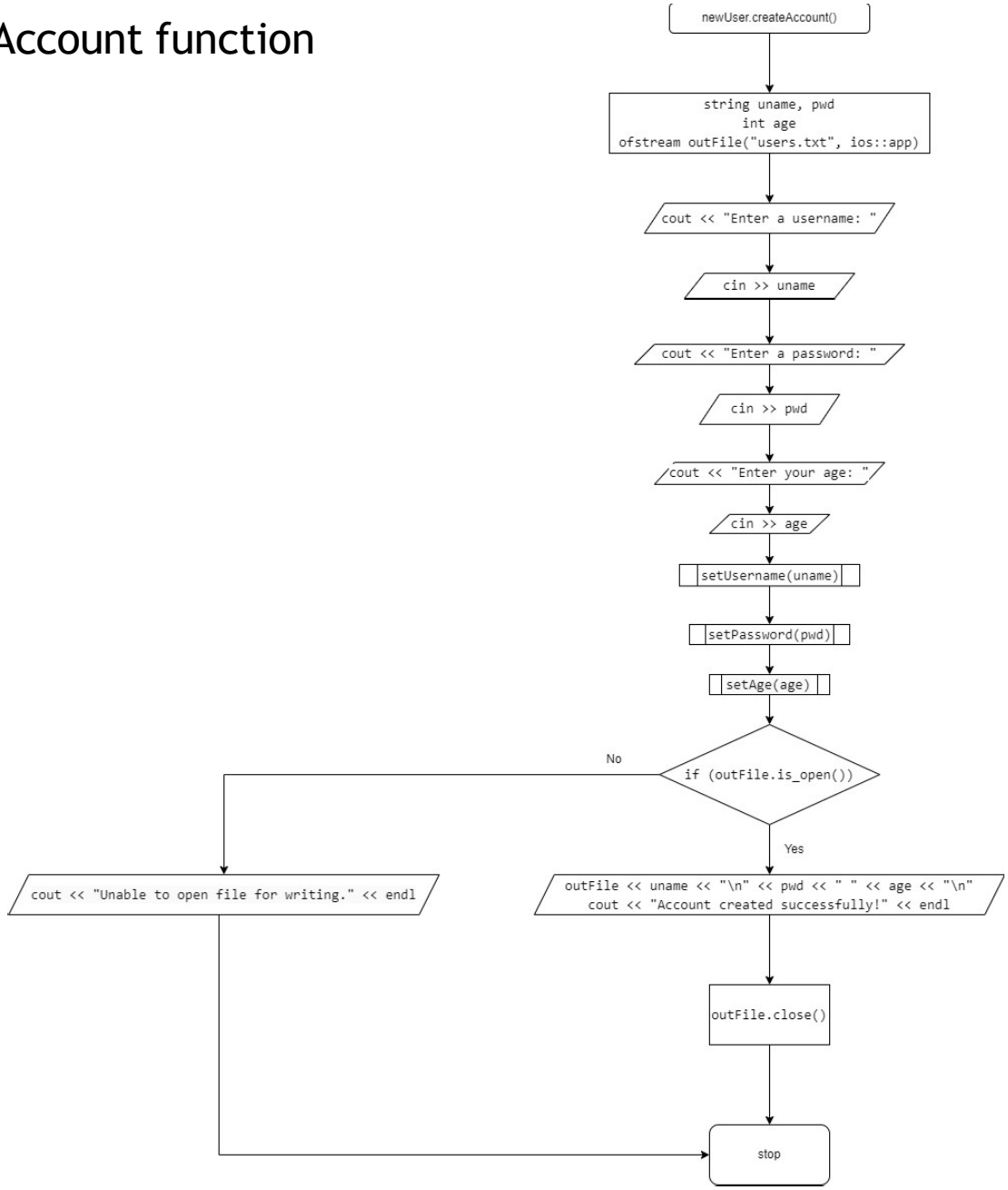

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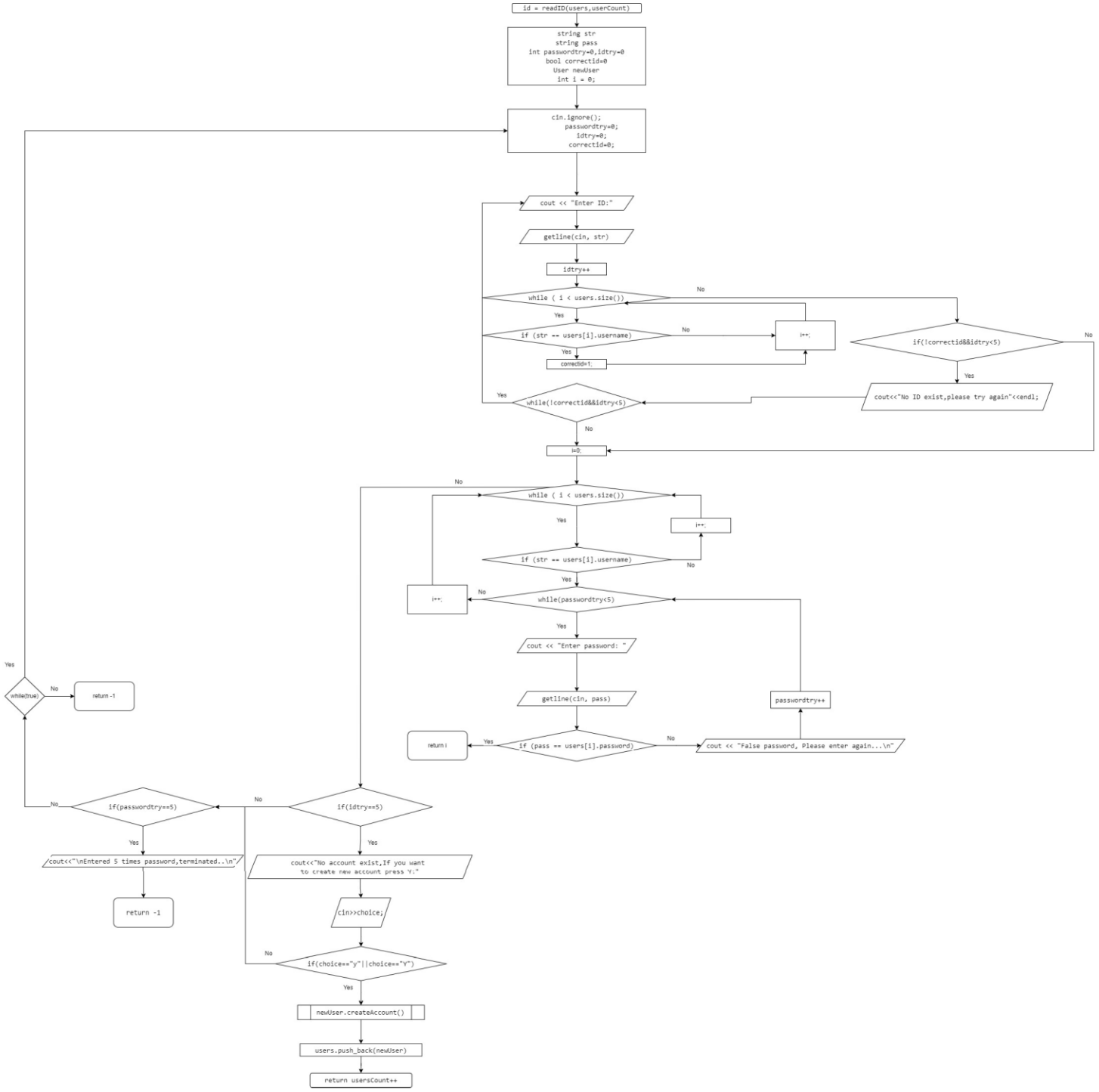

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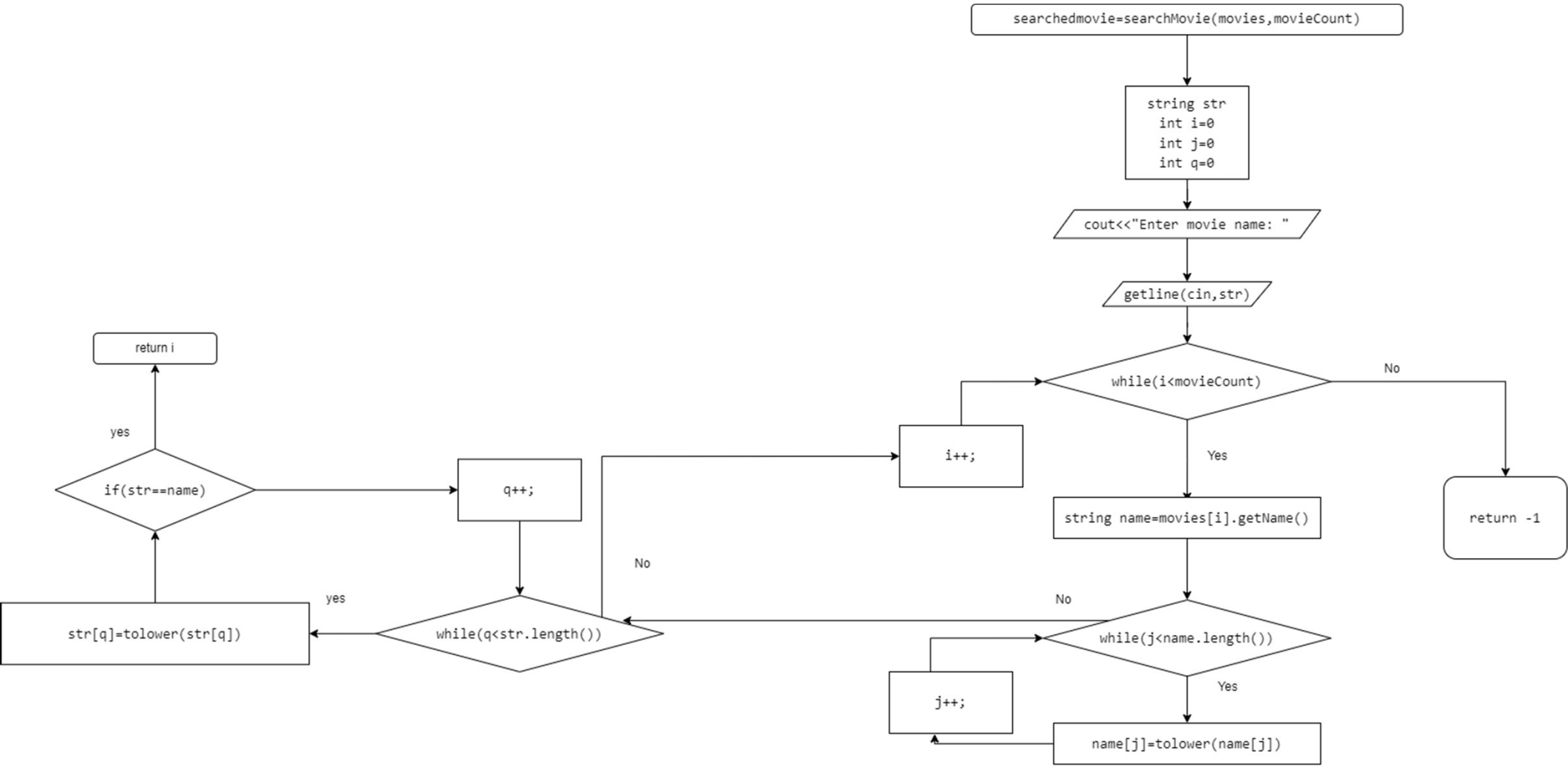

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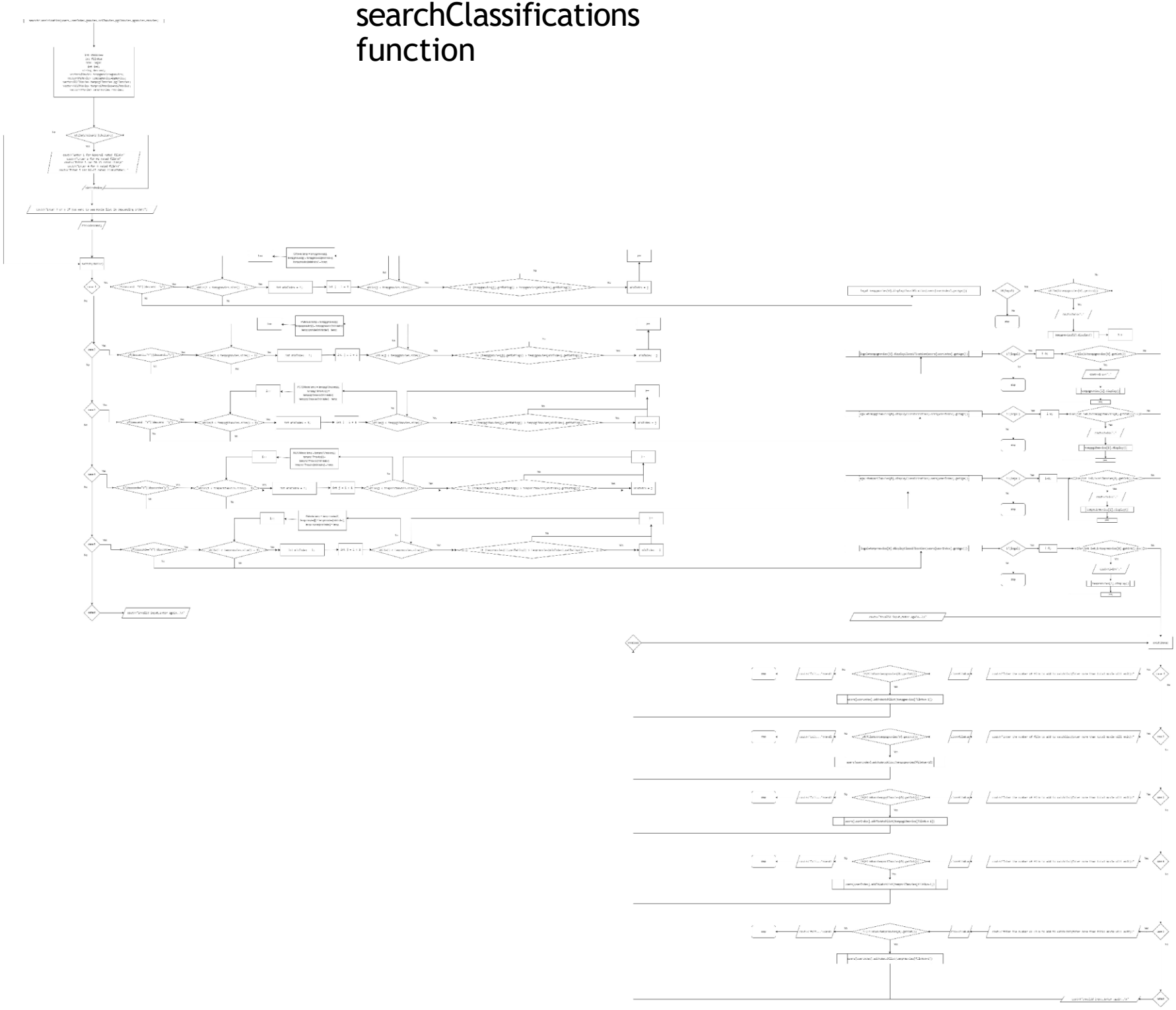

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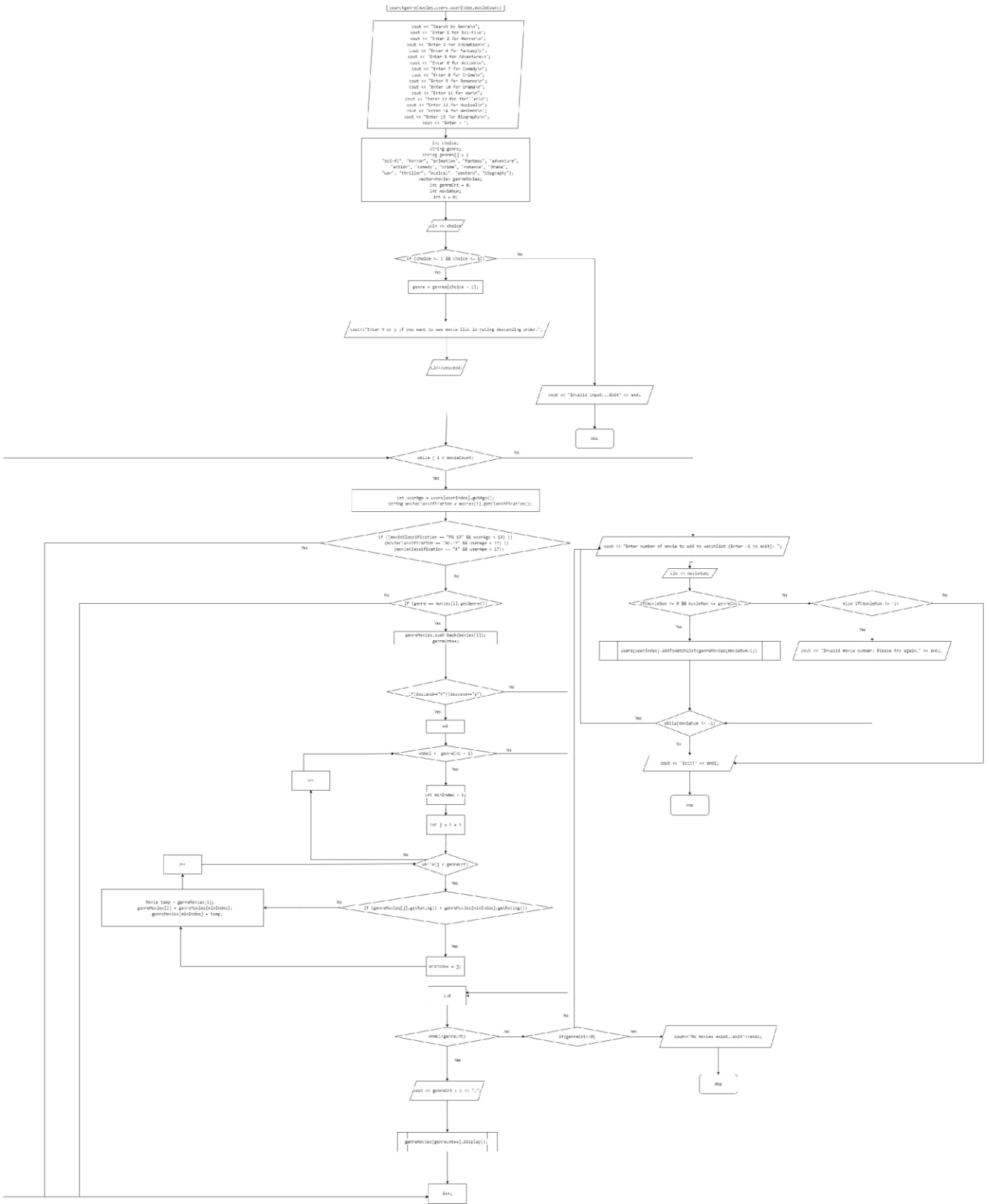

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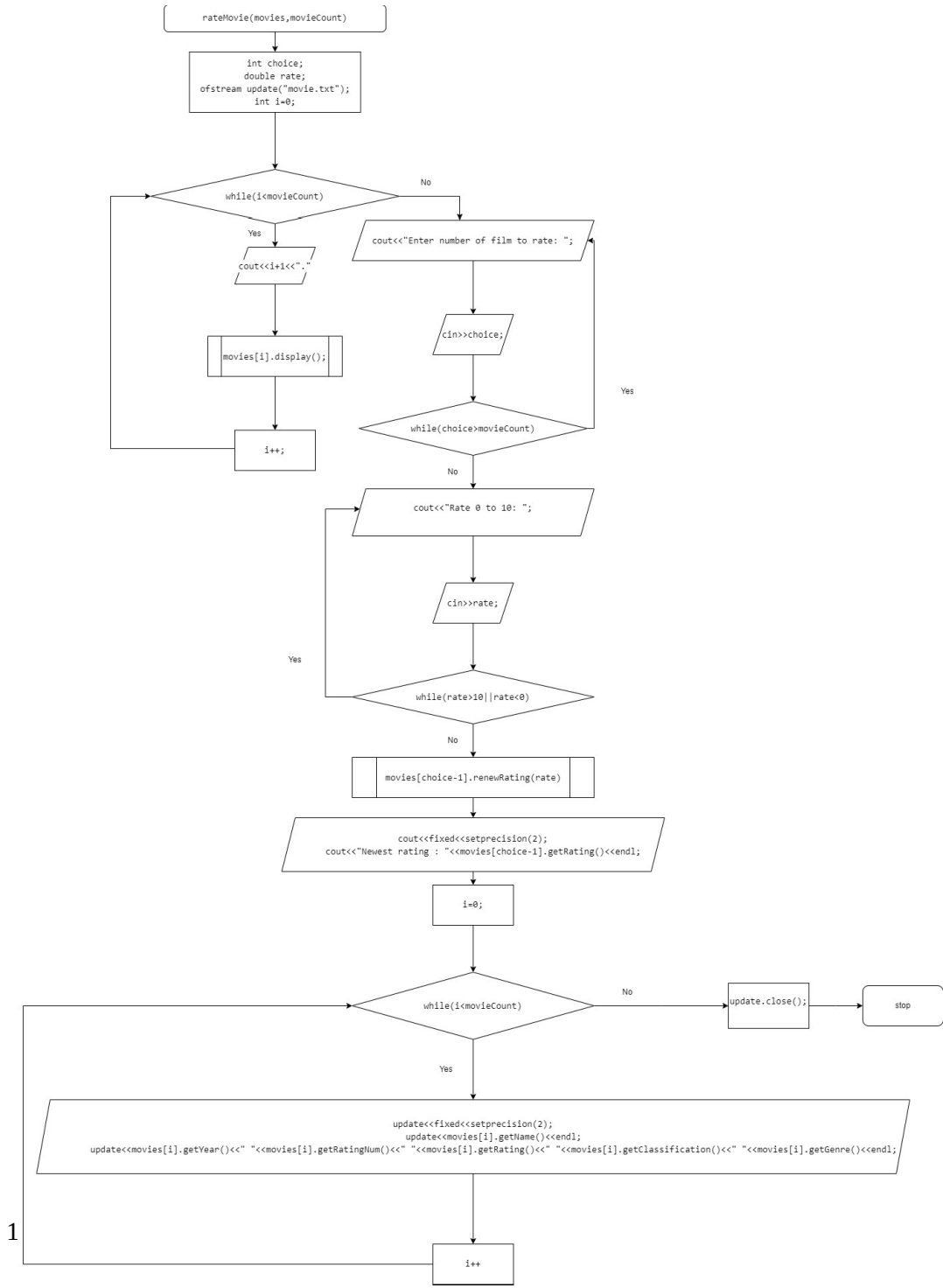

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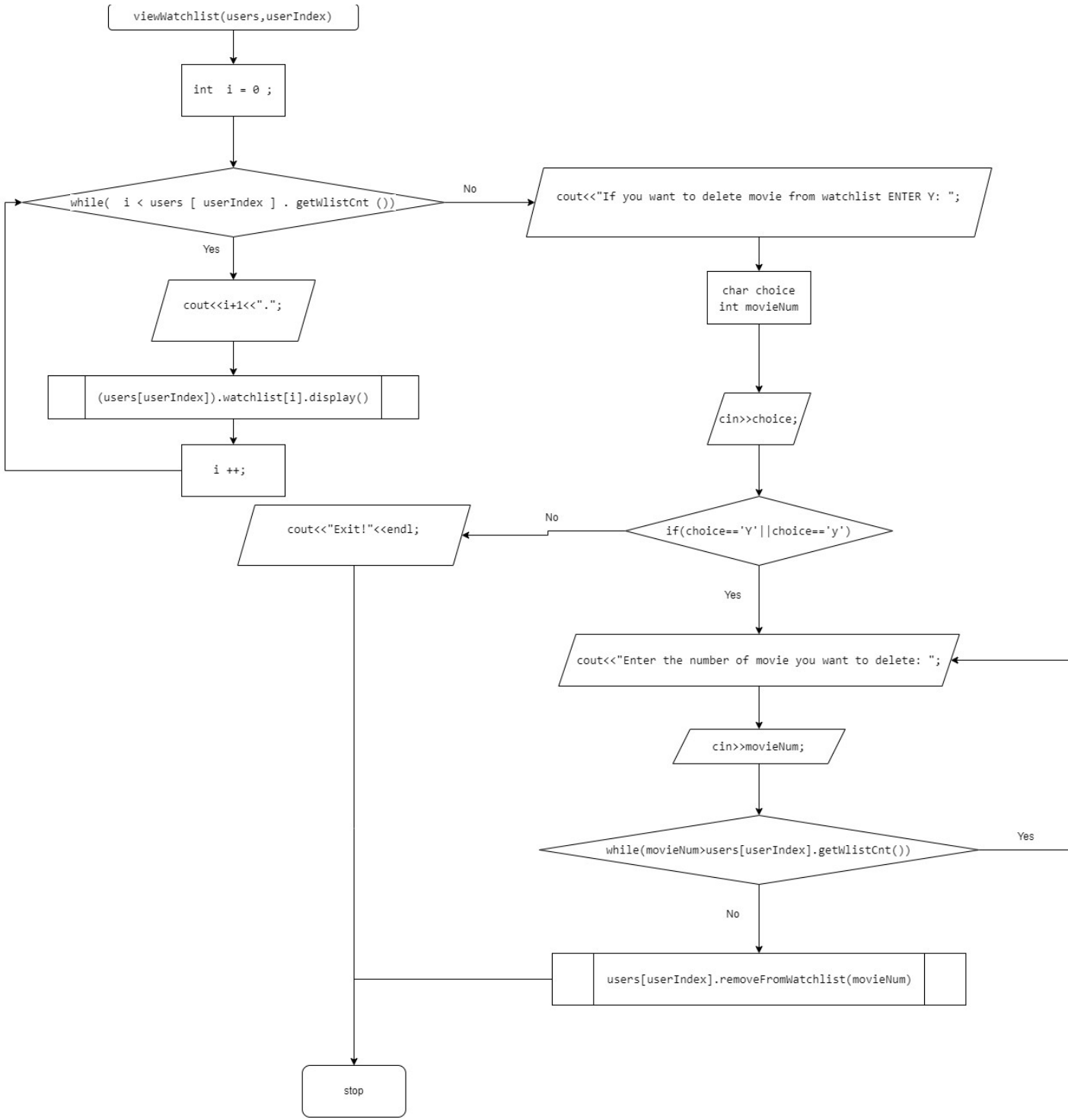
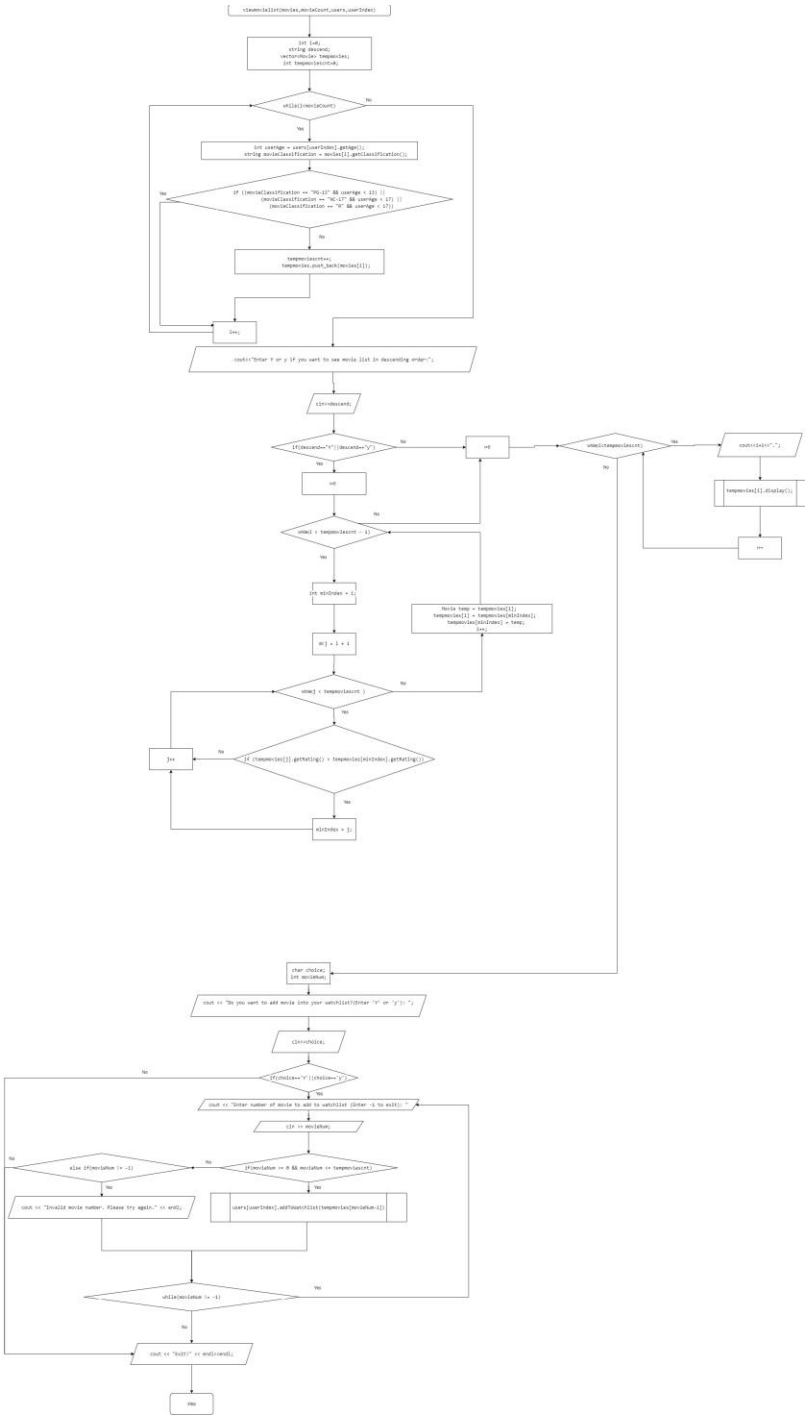
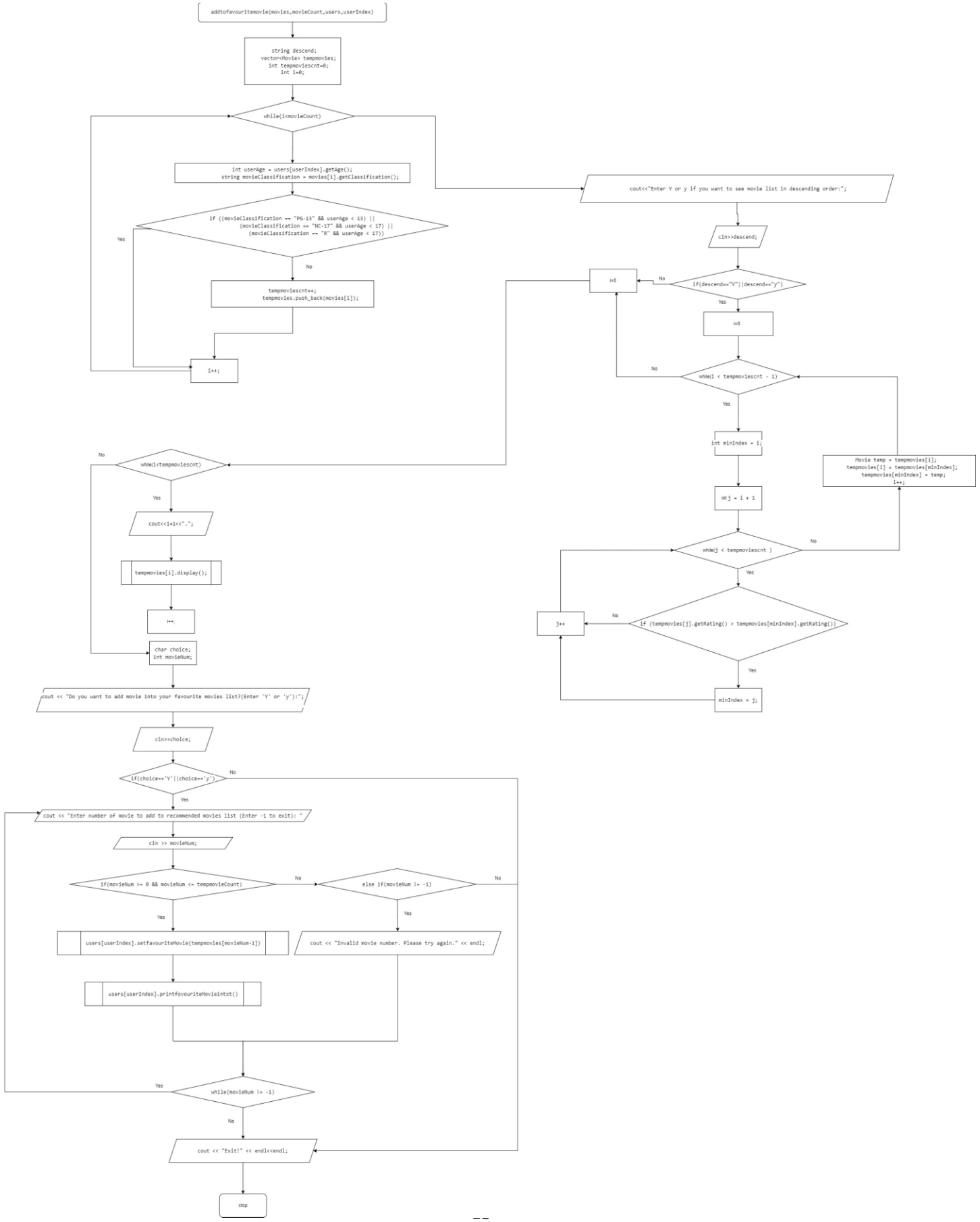


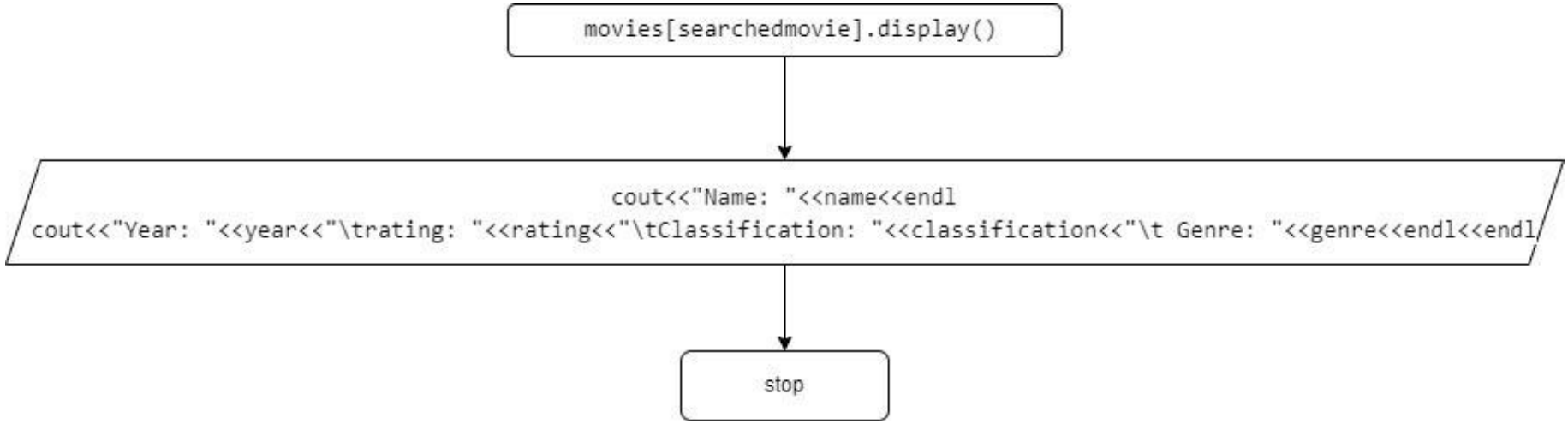
viewmovielist function



addtofavouritemovie function



Movie::display() function



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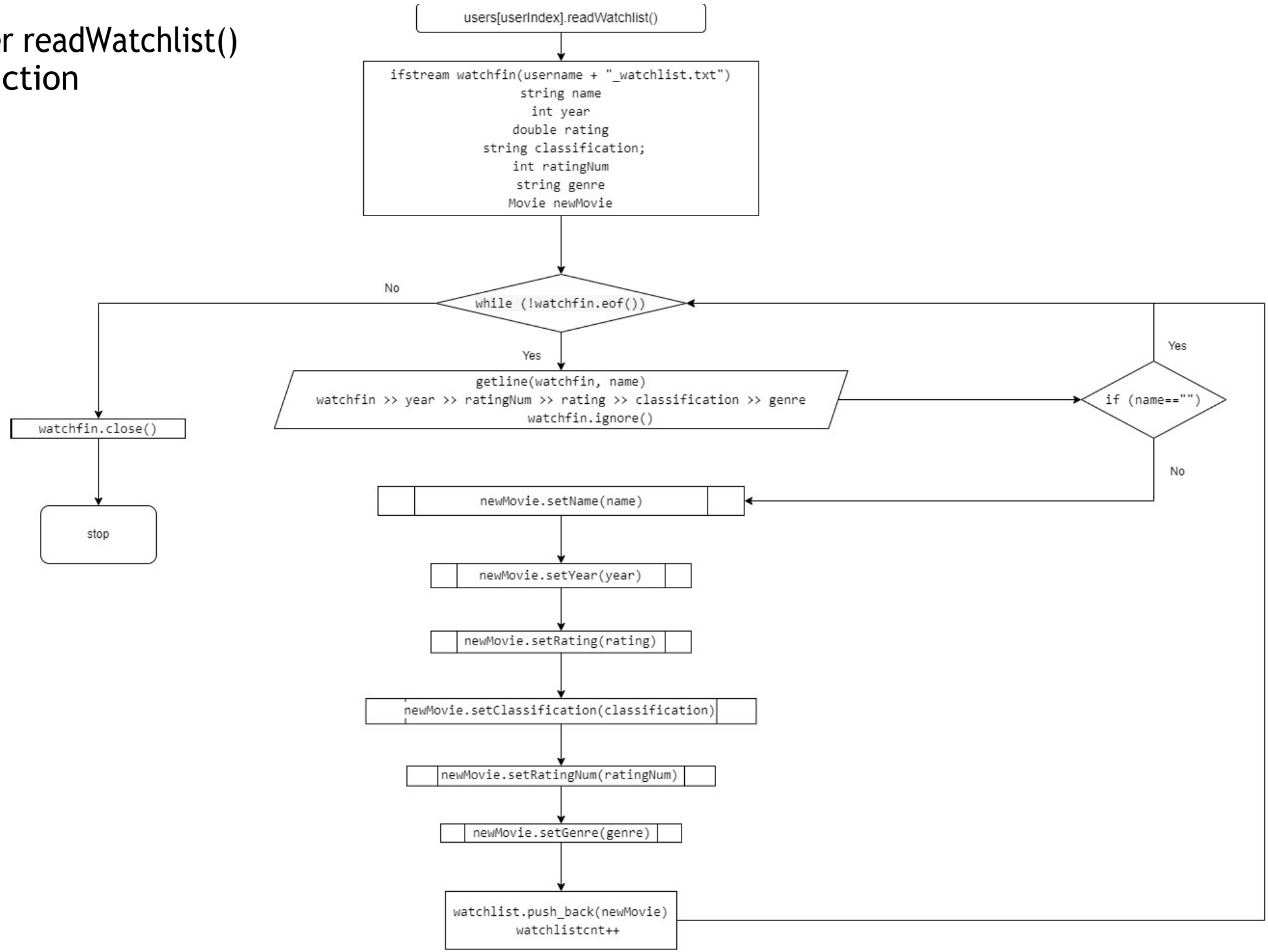
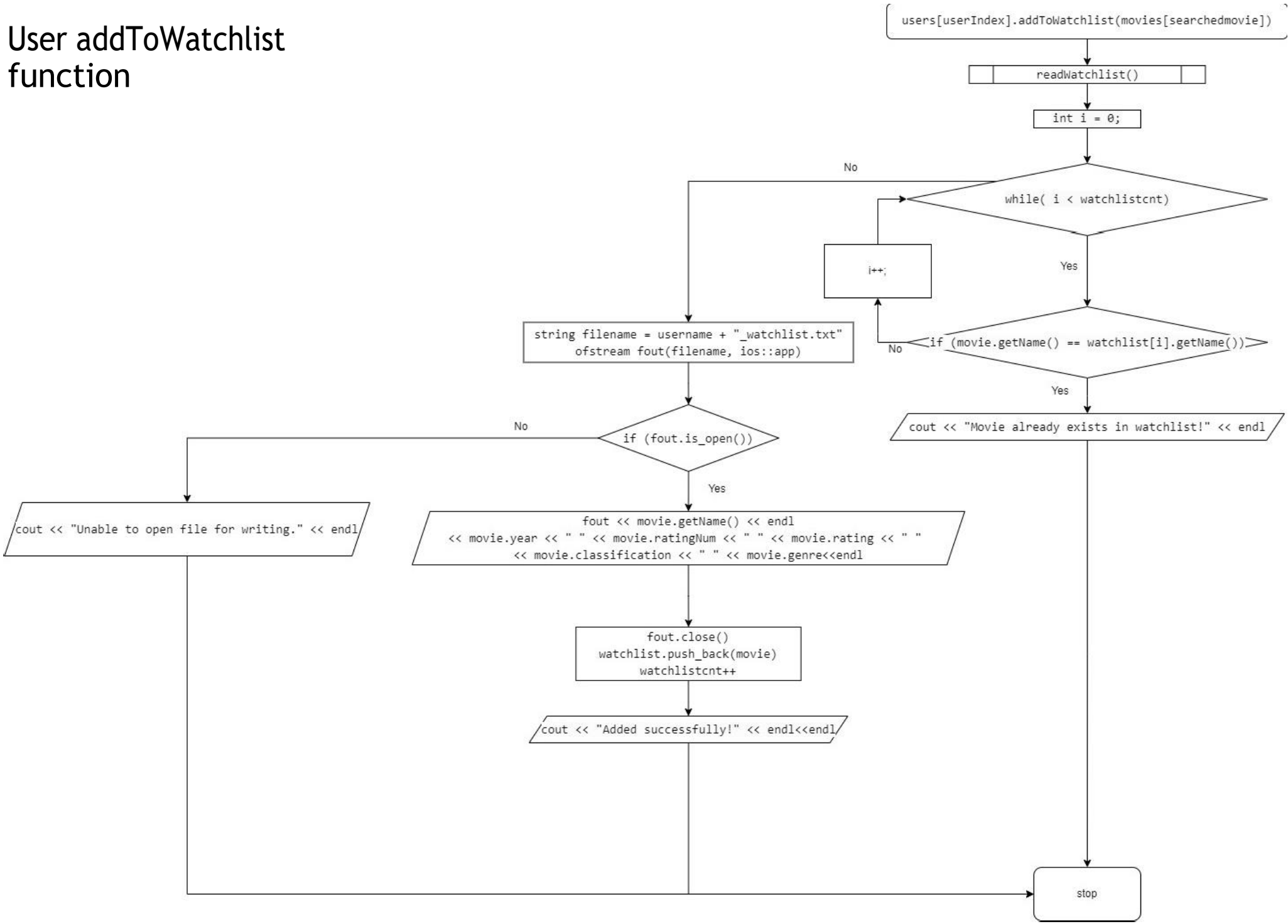


User addToWatchlist function



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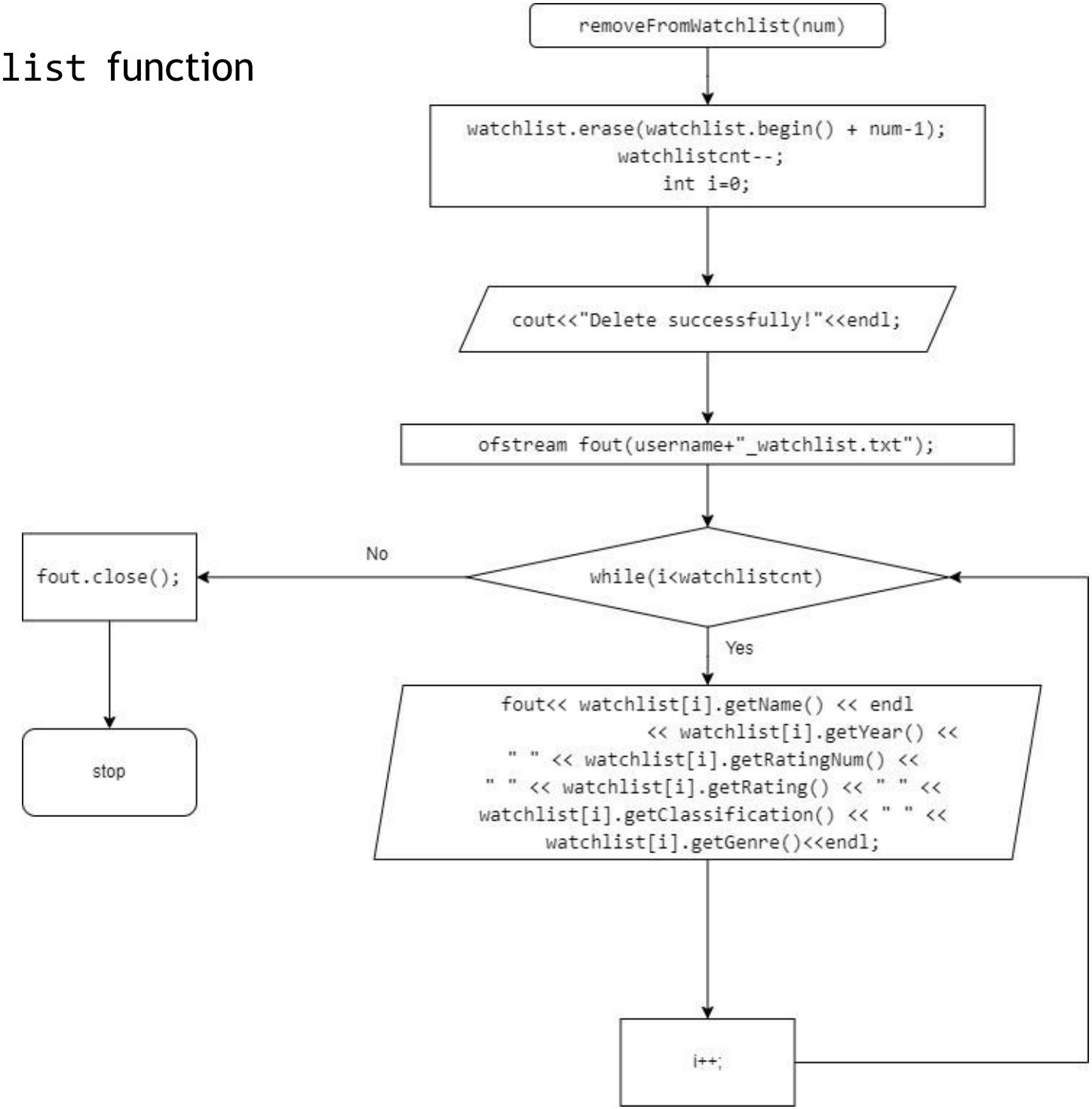
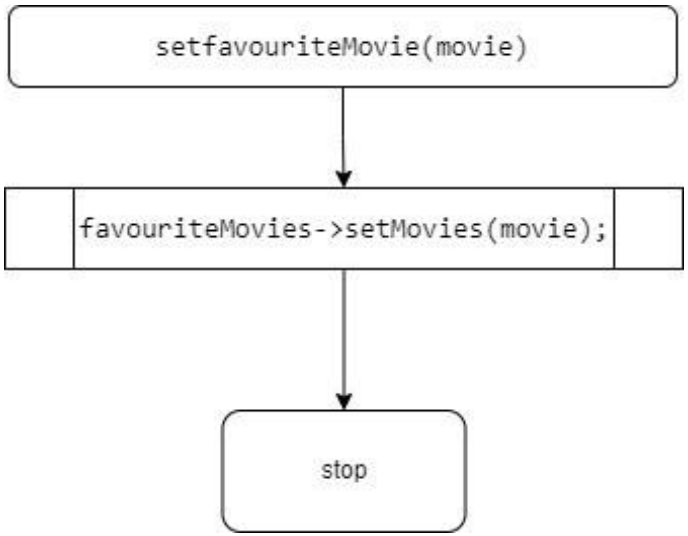


User::setfavouriteMovie function



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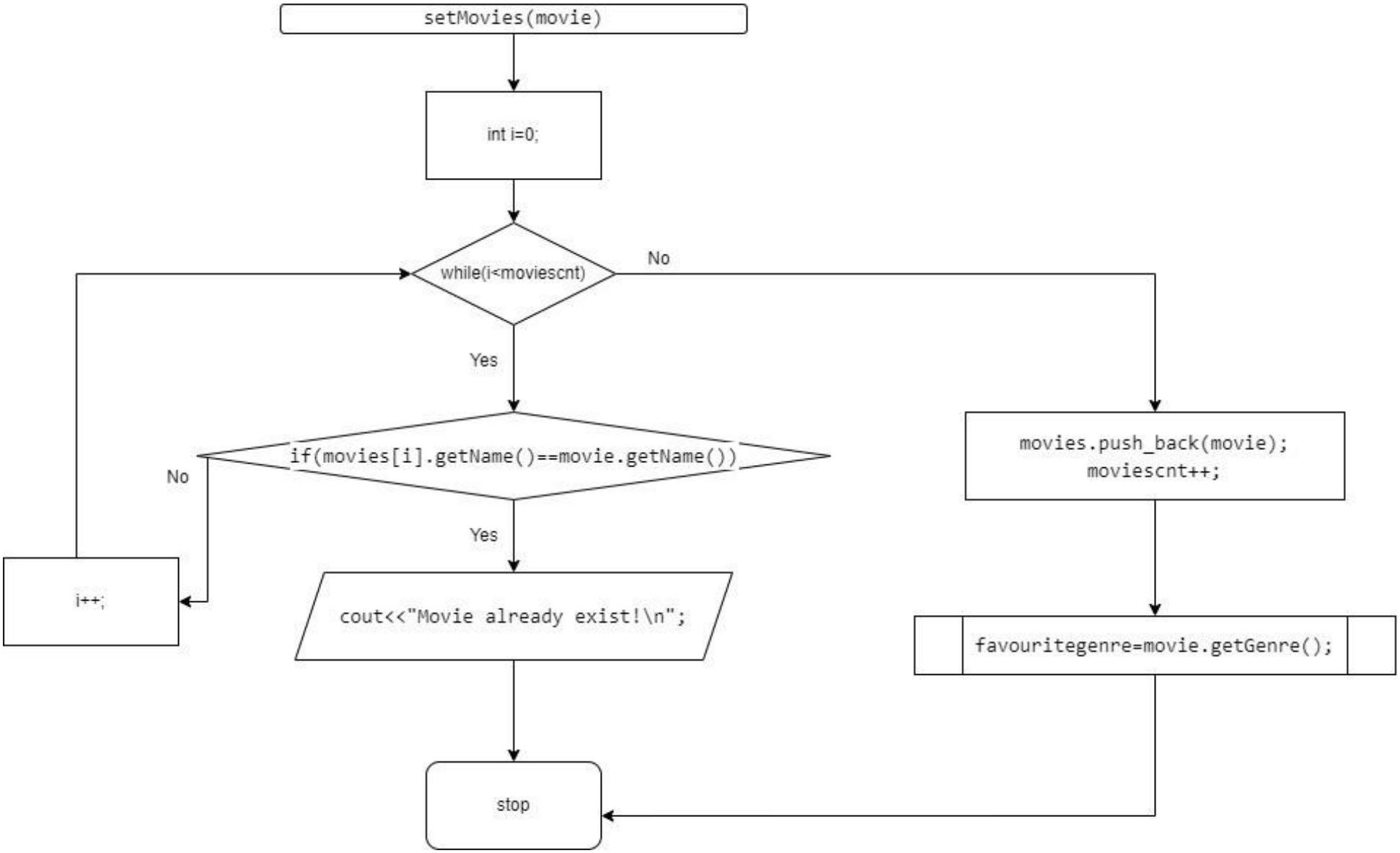

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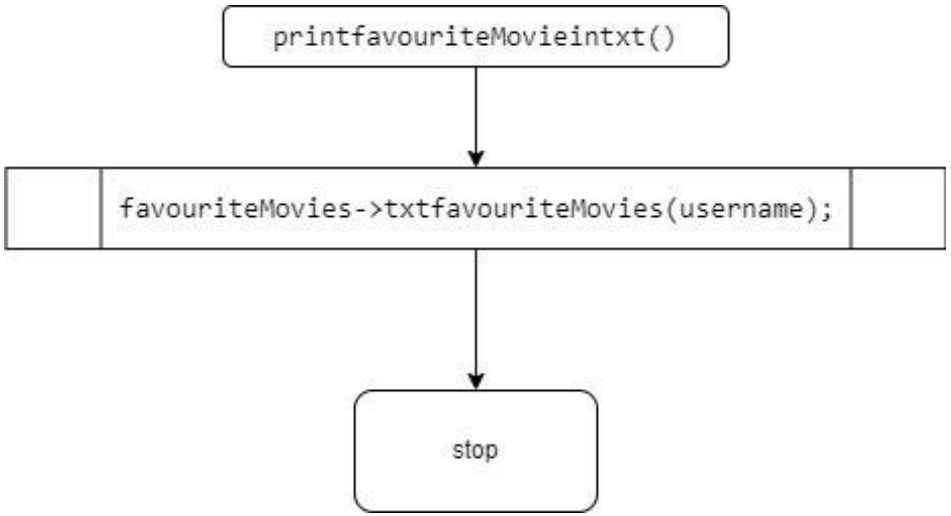

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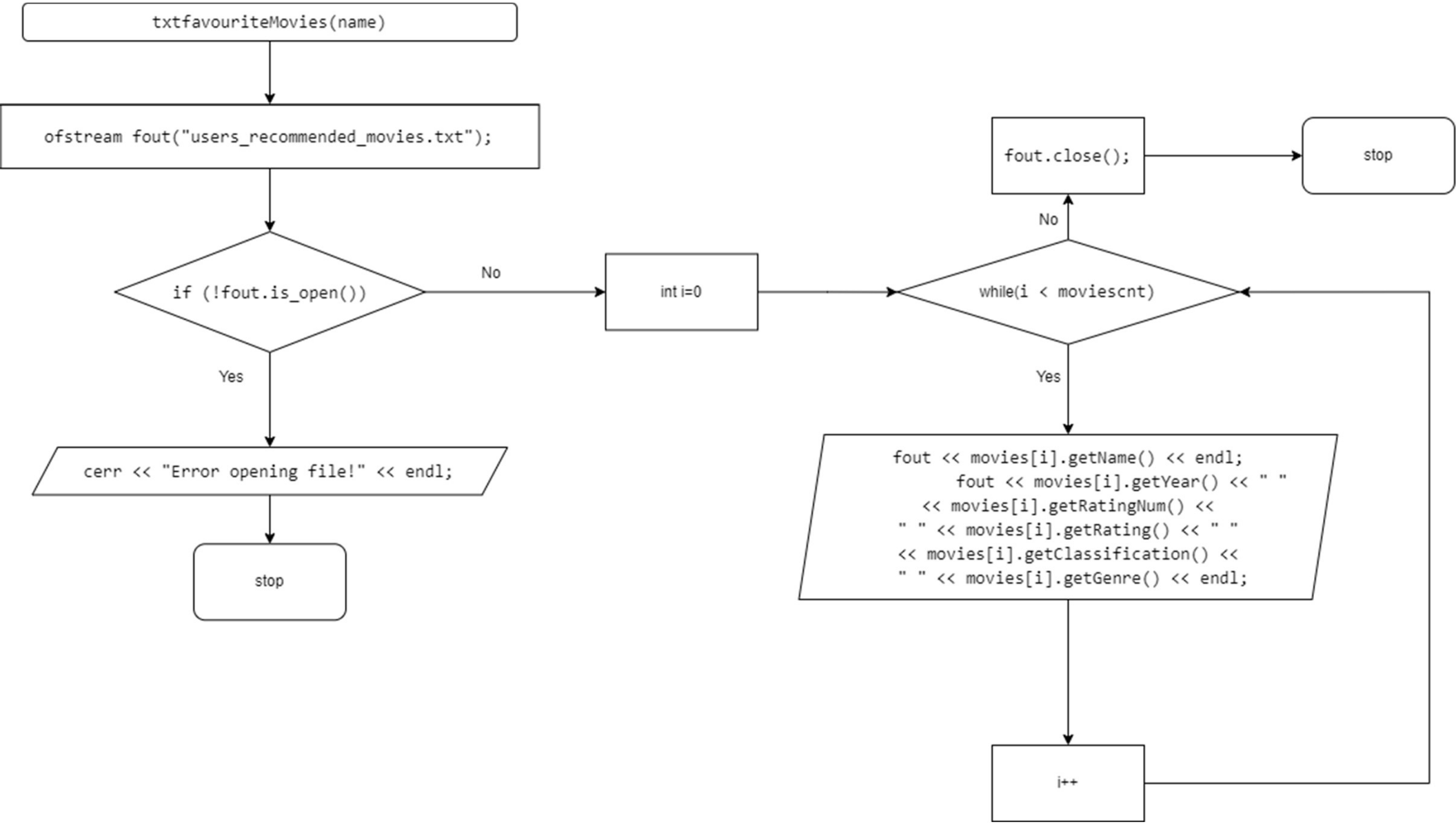

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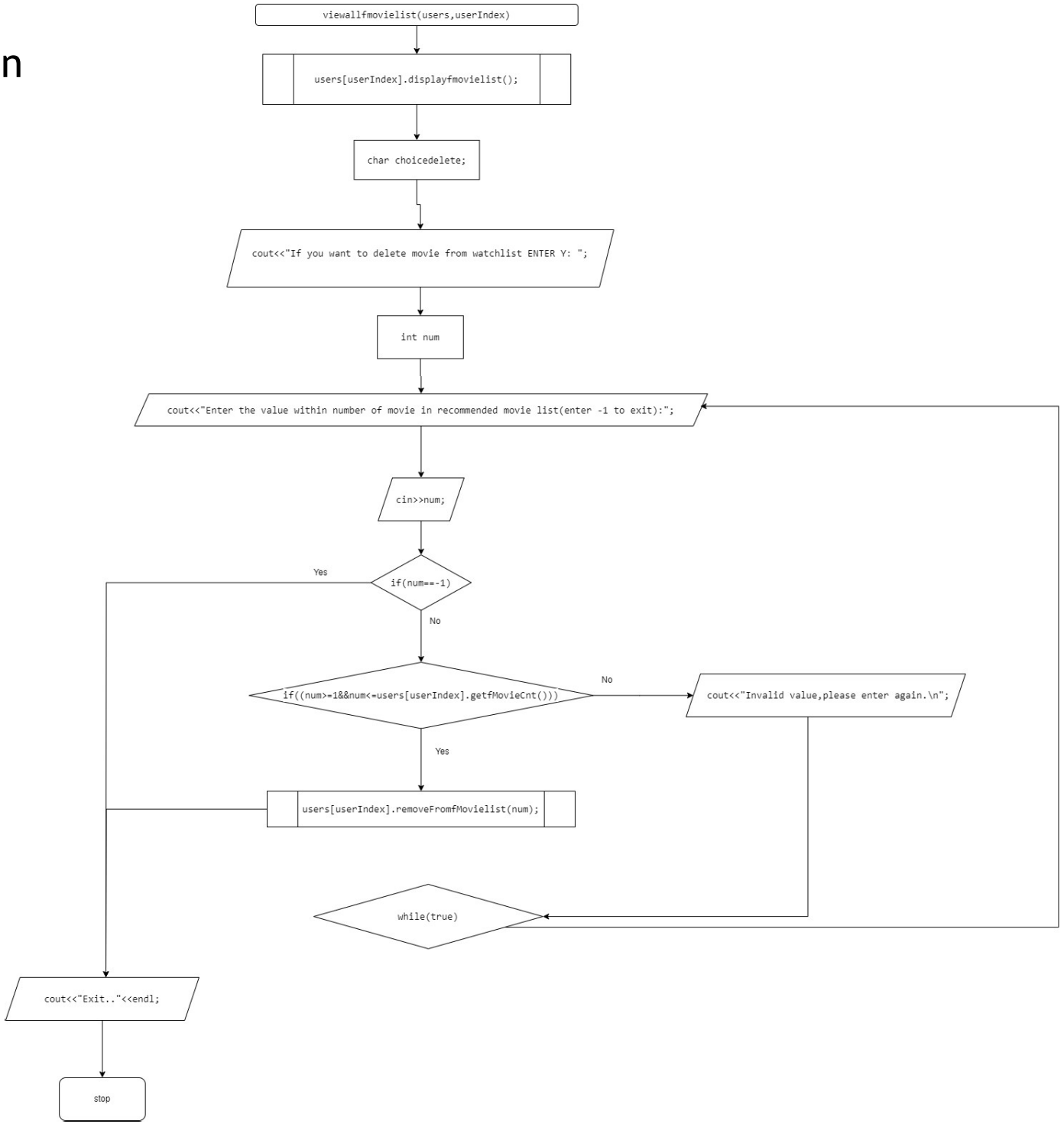

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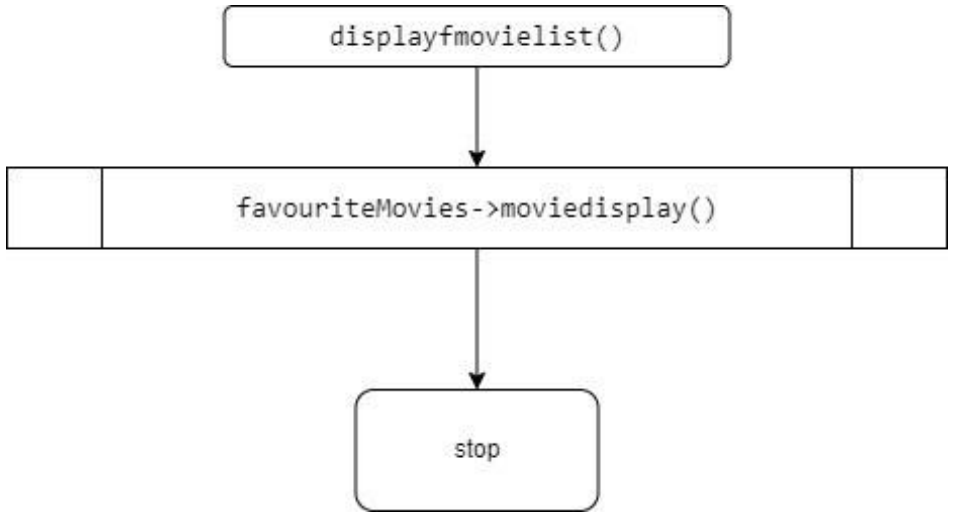

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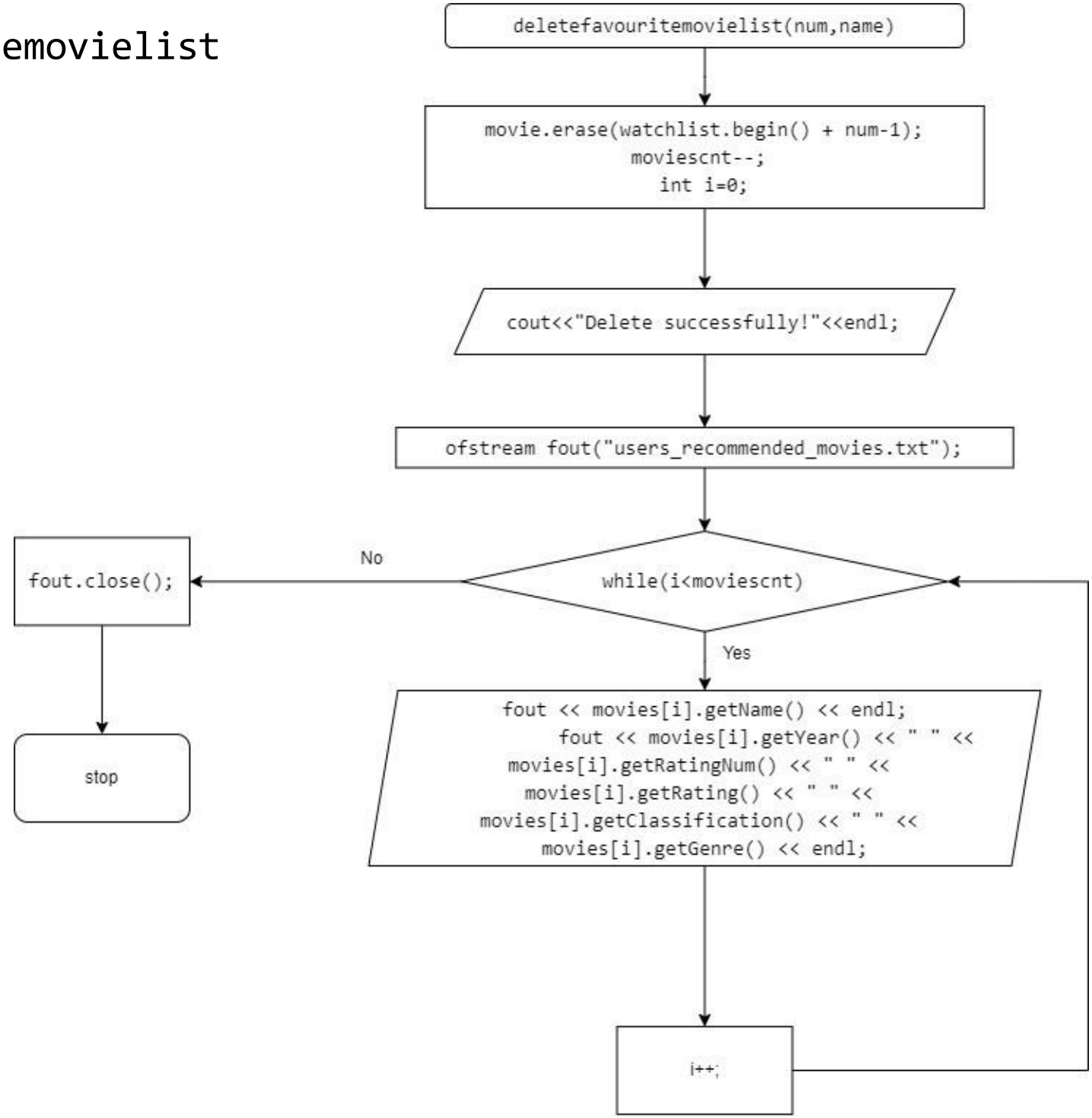
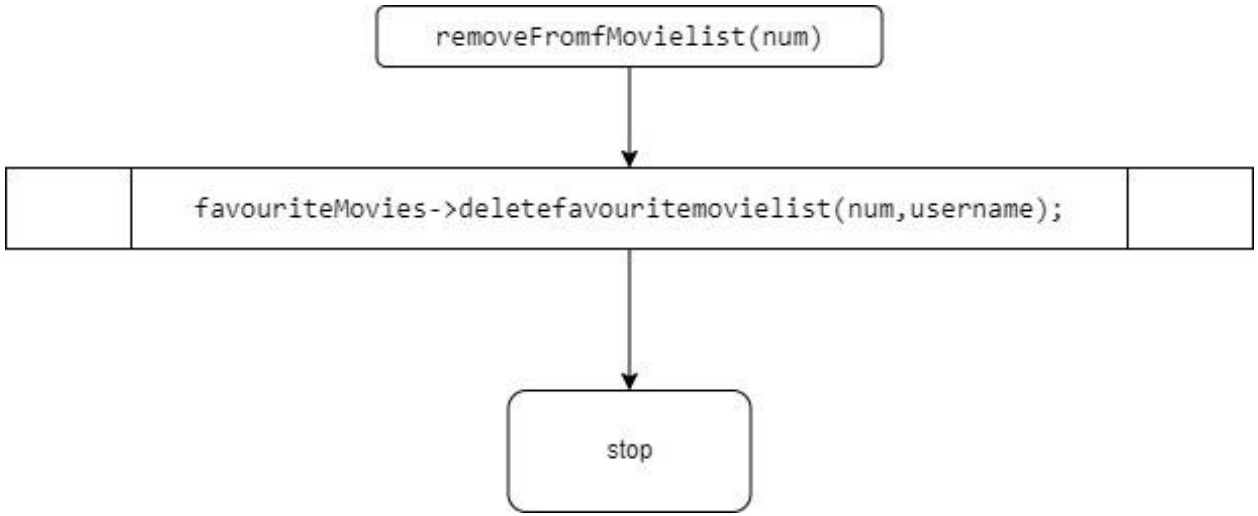


User::removeFromMovielist(num) function



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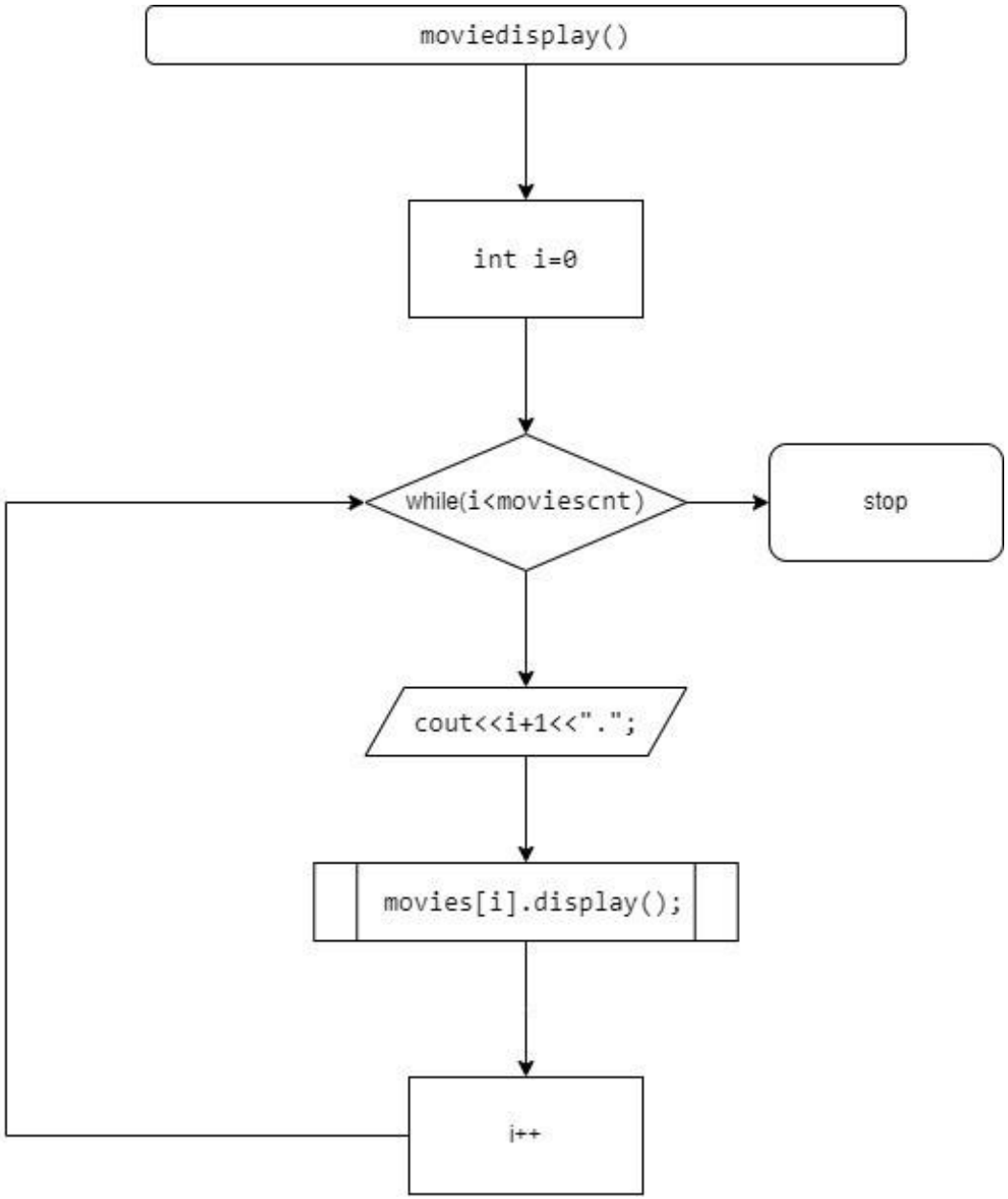

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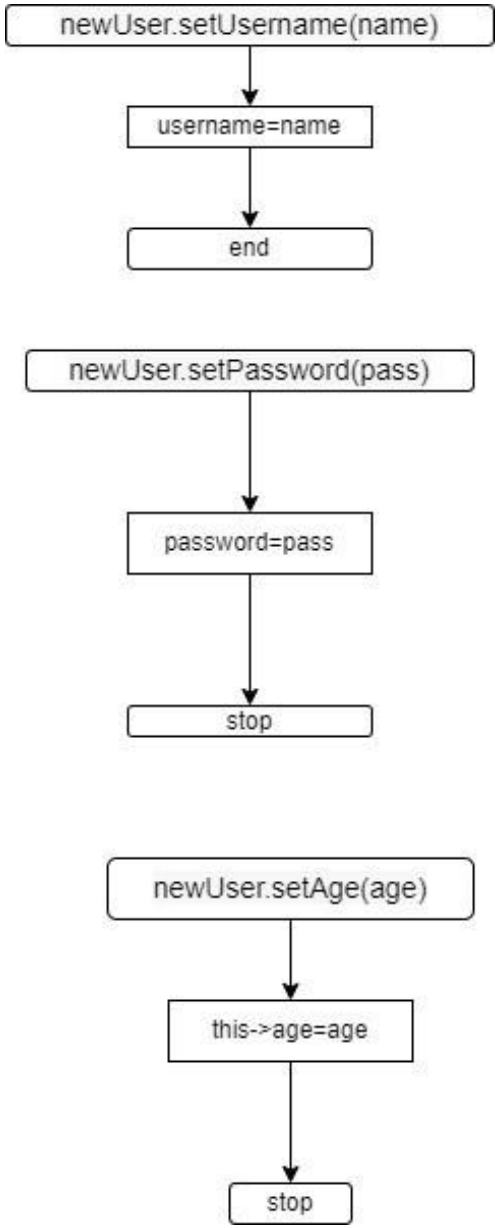
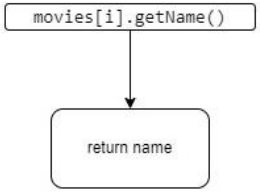
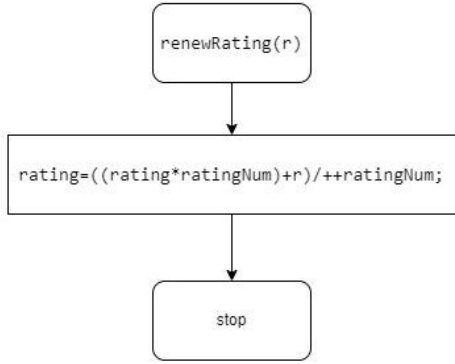
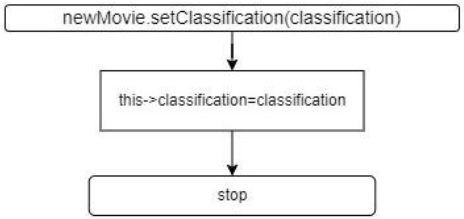
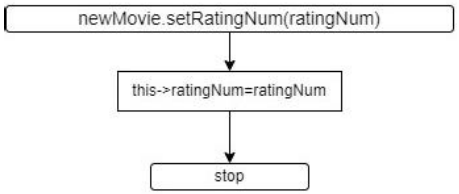


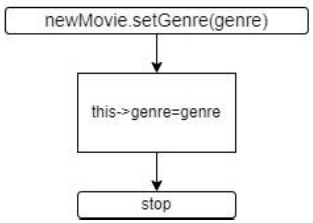
Movie class accessor,mutator and function











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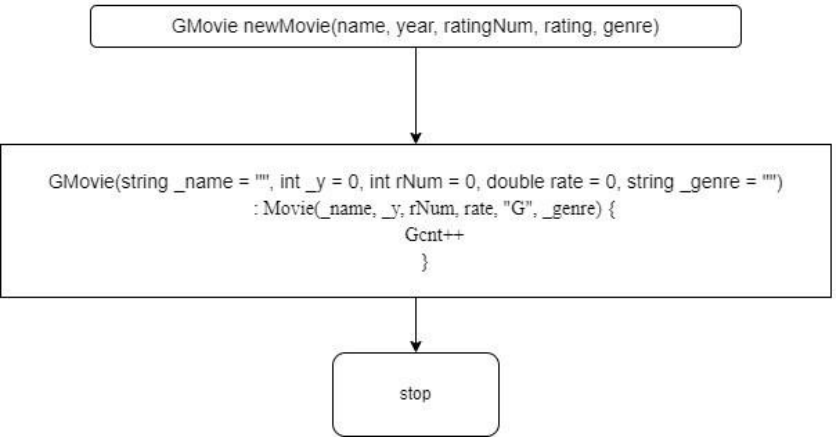

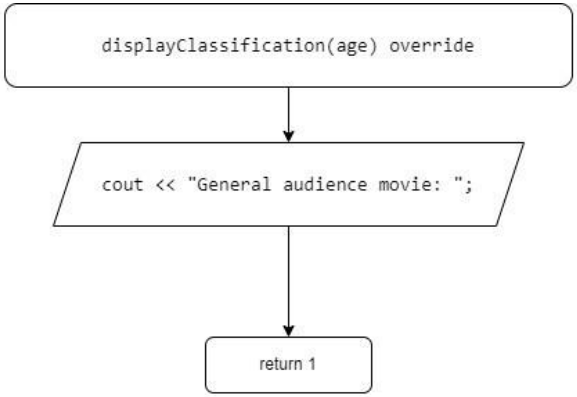

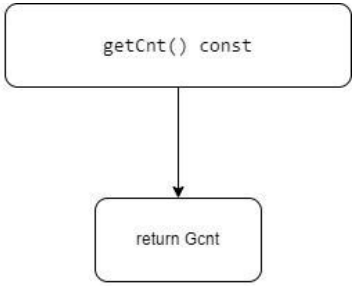

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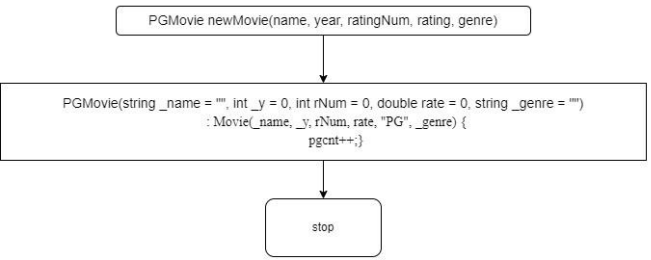

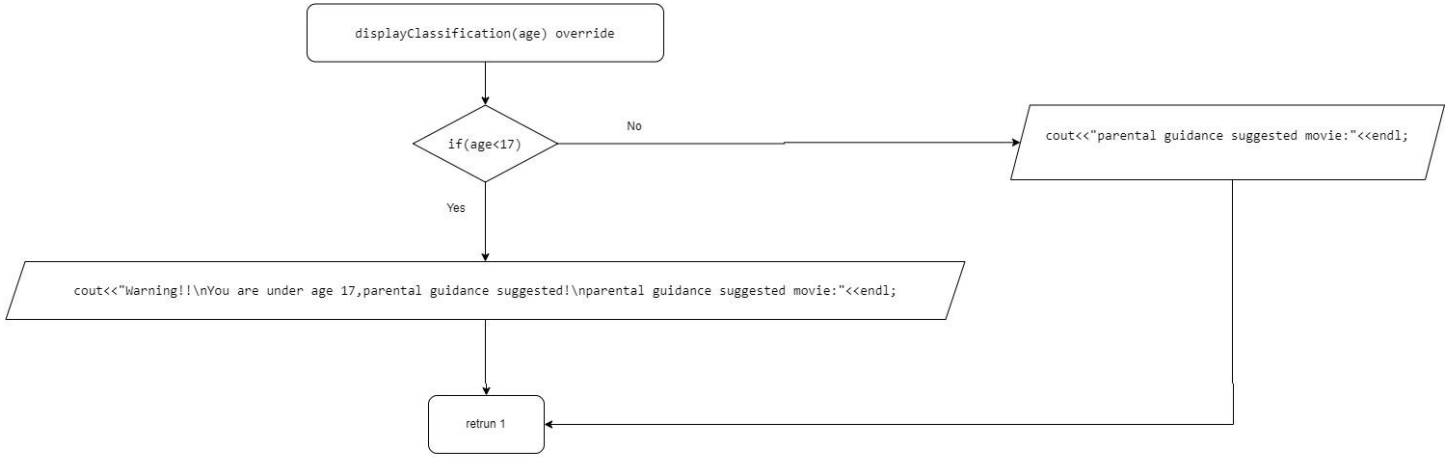

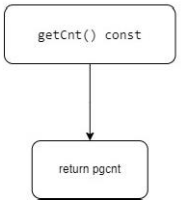

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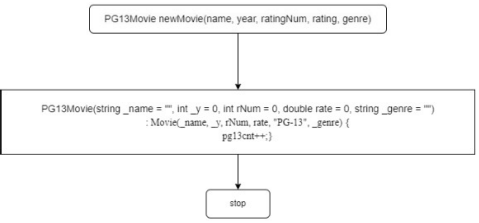
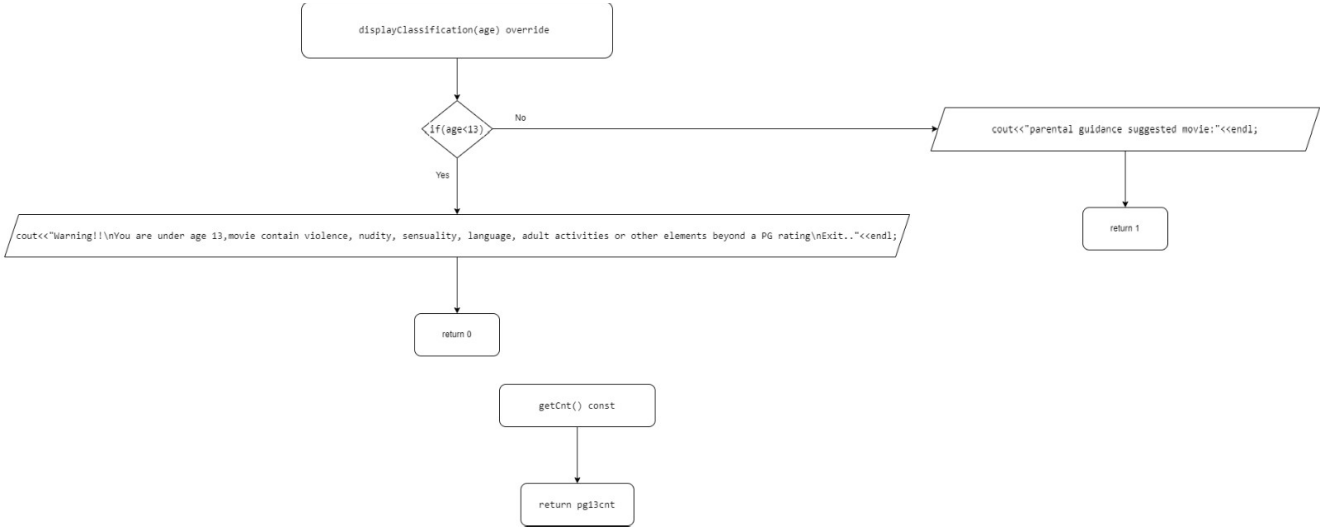
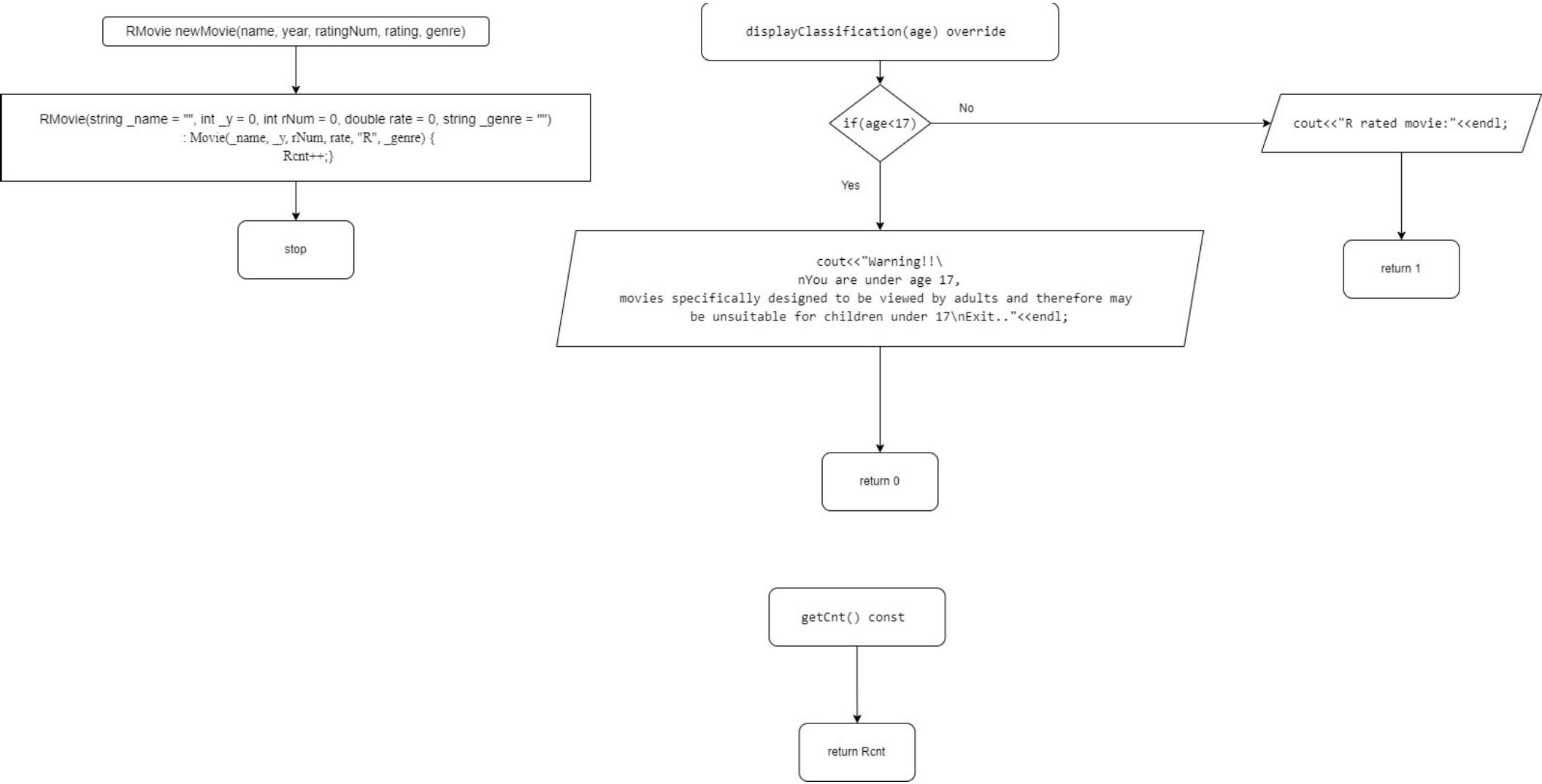
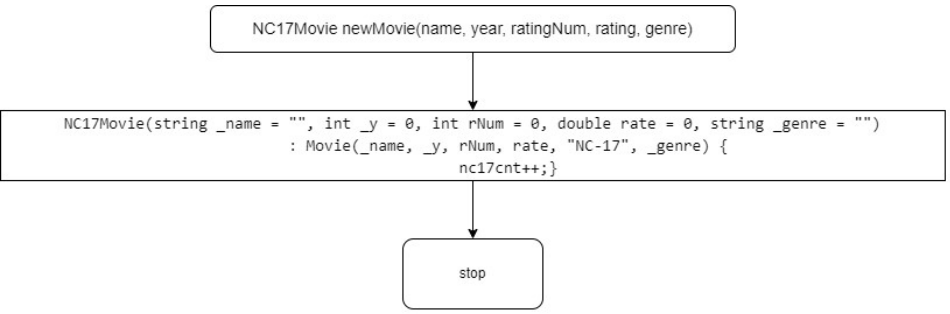


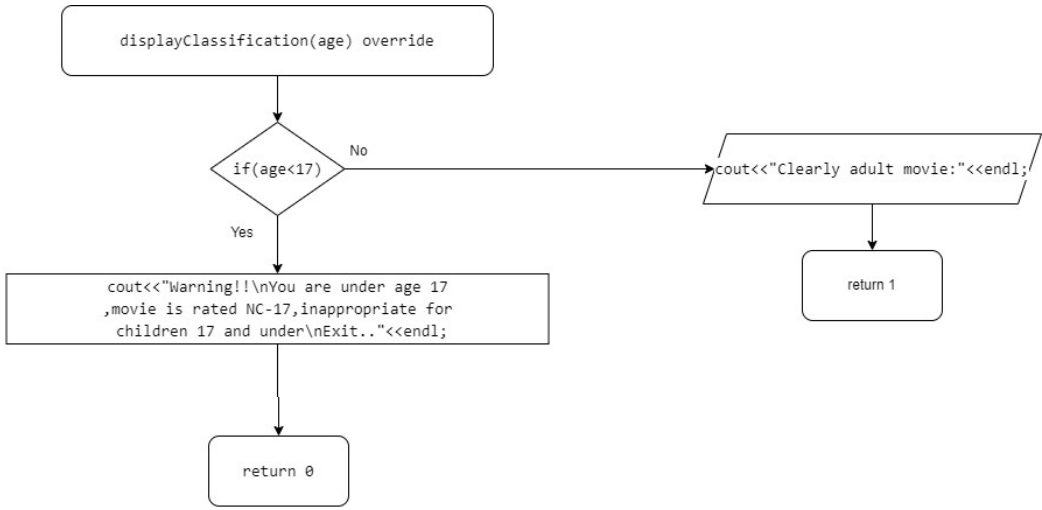


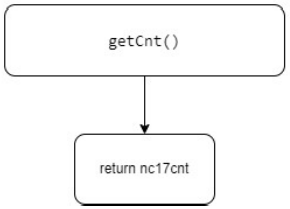
RMovie class



NC17Movie class







Section B: Problem Analysis

From the flowchart prepared in Section A, we are able to identify the objects and classes involved in the movie recommendation system project. Moreover, we can determine the class relationships, including association relationships (aggregation and composition) and inheritance relationships.

Objects

In OOP, an object is an instance of a class. Here are the specific elements for each object in our movie recommendation system:

1. Movie Object
2. Favourite Movie Object
3. General Movie Object
4. Parent Guidance (PG) Movie Object
5. PG13 Movie Object
6. NC17 Movie Object
7. Restricted Movie Object
8. User Object

Classes

A class in OOP is a blueprint for creating objects. It defines a type by encapsulating data and methods that work on the data. Here are the specific elements for each class in our movie recommendation system:

1. **Movie Class**
   Attributes: name, year, rating, classification, ratingNum, genre
   Methods: Movie(), setName(), setYear(), setRating(), setClassification(), setRatingNum(), setGenre(), renerRating(), getName(), getGenre(), getRating(), getYear(), getClassification(), getRatingNum(), display(), displayClassification() virtual

2. **fMovie Class**
   Attributes: moviescnt, favouritegenre, movies
   Methods: setMovies(), txtfavouriteMovies()

3. **GMovie Class**
   Attributes: Gcnt
   Methods: GMovie(), getCnt(), displayClassification()

4. **PG Movie Class**
   Attributes: pgcnt
   Methods: PGMovie(), getCnt(), displayClassification()

5. **PG13 Movie Class**
   Attributes: pg13cnt
   Methods: PG13Movie(), getCnt(), displayClassification()

6. **NC17 Movie Class**
   Attributes: nc17cnt
   Methods: NC17Movie(), getCnt(), displayClassification()

7. **RMovie Class**
   Attributes: Rcnt
   Methods: RMovie(), getCnt(), displayClassification()

8. **User Class**
   Attributes: username, password, watchlist, watchlistcnt, age, favouriteMovies
   Methods: User(), getName(), getAge(), setUsername(), setPassword(), setAge(), getWatchlistCnt(), createAccount(), readID(), readWatchlist(), readfavouritelist(), addToWatchlist(), removeFromWatchlist(), setfavouriteMovie(), printfavouriteMovieintxt(), viewWatchlist()

Class Relationships

Association Relationships:

--Aggregation Relationships:

1. **fMovie – User**
   Reason: A user can have a list of recommended movies but these movies exist independently and can be access by multiple users.

--Composition Relationships

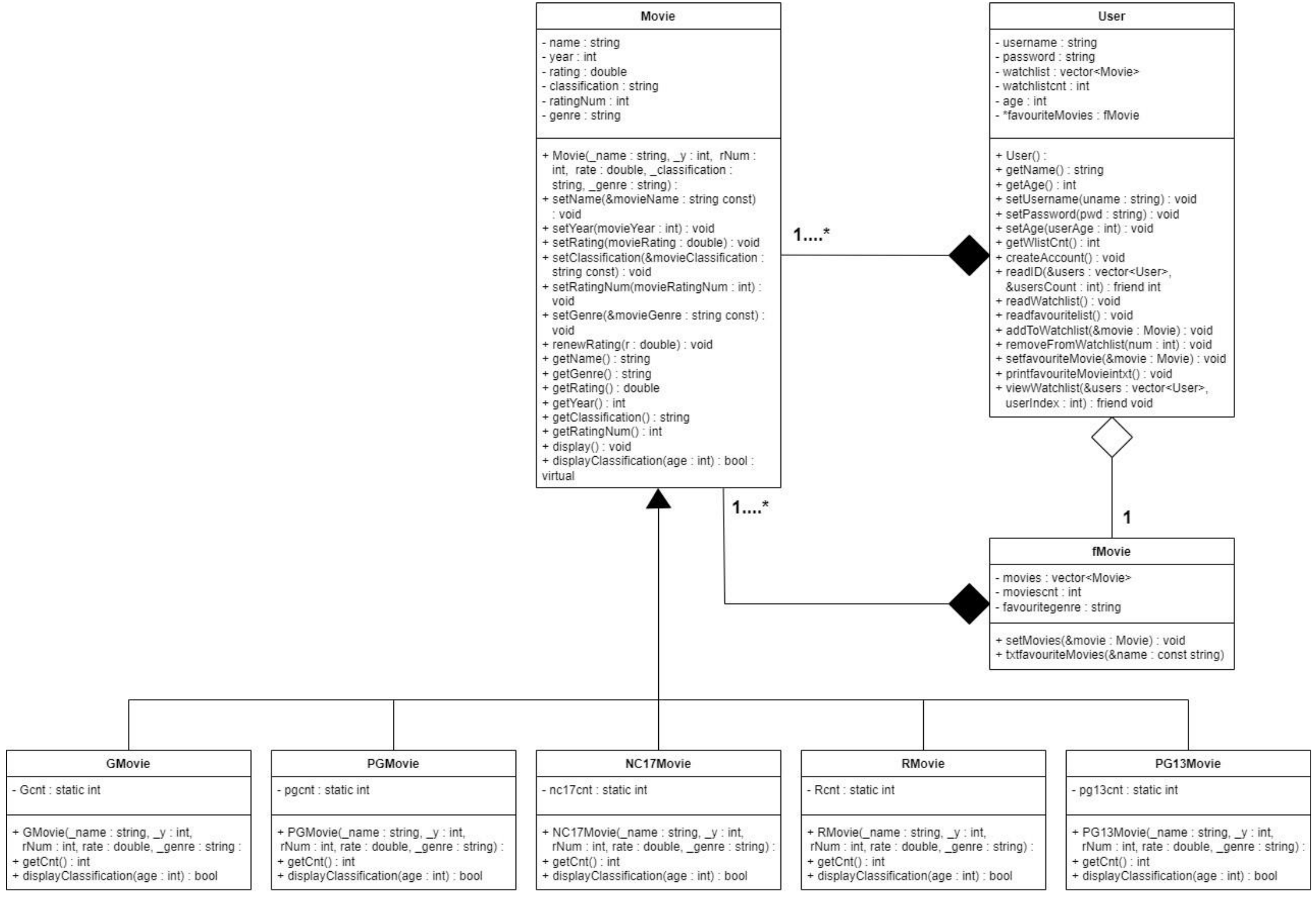
1. **User – Movie**
   Reason: User specific interactions with these movies (such as personal ratings and watchlists) because when user account is deleted, these user specific data points are also deleted.

2. **fMovie – Movie**
   Reason: The presence or absence of a movie in the user's recommended movie list is directly affects the user's recommended movies, this is reflecting their personal preferences and influencing their interaction with the movie recommendation system.

Inheritance relationships:

1. **GMovie – Movie**
2. **PGMovie – Movie**
3. **PG13Movie – Movie**
4. **NC17Movie - Movie**
5. **RMovie – Movie**

Reason: GMovie is a movie. PGMovie is also a movie. Moreover, PG13Movie, NC17Movie and RMovie are also a movie. Whereby movie is the base class. GMovie, PGMovie, PG13Movie, NC17Movie and RMovie are the derived classes. Hence, GMovie, PGMovie, PG13Movie, NC17Movie and RMovie are inherited from class Movie.


Movie
- name : string
- year : int
- rating : double
- classification : string
- ratingNum : int
- genre : string
+ Movie(_name : string, _y : int, rNum : int, rate : double, _classification : string, _genre : string) :
+ setName(&movieName : string const) : void
+ setYear(movieYear : int) : void
+ setRating(movieRating : double) : void
+ setClassification(&movieClassification : string const) : void
+ setRatingNum(movieRatingNum : int) : void
+ setGenre(&movieGenre : string const) : void
+ renewRating(r : double) : void
+ getName() : string
+ getGenre() : string
+ getRating() : double
+ getYear() : int
+ getClassification() : string
+ getRatingNum() : int
+ display() : void
+ displayClassification(age : int) : bool : virtual
User
- username : string
- password : string
- watchlist : vector<Movie>
- watchlistcnt : int
- age : int
- *favouriteMovies : fMovie
+ User() :
+ getName() : string
+ getAge() : int
+ setUsername(uname : string) : void
+ setPassword(pwd : string) : void
+ setAge(userAge : int) : void
+ getWlistCnt() : int
+ createAccount() : void
+ readID(&users : vector<User>, &usersCount : int) : friend int
+ readWatchlist() : void
+ readfavouritelist() : void
+ addToWatchlist(&movie : Movie) : void
+ removeFromWatchlist(num : int) : void
+ setfavouriteMovie(&movie : Movie) : void
+ printfavouriteMovieintxt() : void
+ viewWatchlist(&users : vector<User>, userIndex : int) : friend void
1....*
1....*
1
fMovie
- movies : vector<Movie>
- moviescnt : int
- favouritegenre : string
+ setMovies(&movie : Movie) : void
+ txtfavouriteMovies(&name : const string)
GMovie
- Gcnt : static int
+ GMovie(_name : string, _y : int, rNum : int, rate : double, _genre : string :
+ getCnt() : int
+ displayClassification(age : int) : bool
PGMovie
- pgcnt : static int
+ PGMovie(_name : string, _y : int, rNum : int, rate : double, _genre : string) :
+ getCnt() : int
+ displayClassification(age : int) : bool
NC17Movie
- nc17cnt : static int
+ NC17Movie(_name : string, _y : int, rNum : int, rate : double, _genre : string) :
+ getCnt() : int
+ displayClassification(age : int) : bool
RMovie
- Rcnt : static int
+ RMovie(_name : string, _y : int, rNum : int, rate : double, _genre : string) :
+ getCnt() : int
+ displayClassification(age : int) : bool
PG13Movie
- pg13cnt : static int
+ PG13Movie(_name : string, _y : int, rNum : int, rate : double, _genre : string) :
+ getCnt() : int
+ displayClassification(age : int) : bool