CS 319 - Object-Oriented Software Engineering

Analysis Report

movAPP

GROUP 6

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1. INTRODUCTION

1.1. Purpose of the System

MovApp is an application for passengers, who travel via buses or planes, usage. The main goal of this application is, users, view different categories of movies and watch them. The first interface of the system is a guest user menu, which has a limited action such as watching a movie from category part, and a login button. Thanks to MovApp users can see popular movies, and they can also create a list to watch later. Additionally, they can rate them according to their personal enjoyment of the film. Therefore, our main aim is to design an application that assists the user to choose, watch and rate any movie.

1.2. Design Goals

1.2.1. Adaptability

Java is one of the programming languages which provide cross-platform portability. Java has easy way to connect with database systems.

1.2.2. Efficiency

The system is going to response the orders with high performance. To provide smoothness while choosing and playing the movies. This is one of the important design goals because users should search and scan the menu and display the films easily and smoothly. Thanks to ProjectActionListener class all object in the program created together and program use same object till the end of execution thus program work efficiently.

1.2.3. Usability

One of the important and main design goal is our program is easy usage of it. Because this app is developed in order to provide tidy and helpful view for movies to users. Therefore, operability of our program is designed attentively. Main menu of system can be interpreted easily by user and also program direct the user to help them.

1.2.4. Reliability

During the project process, after completing every sub-section the program was tested to detect any crash situation or unexpected outputs. Boundary condition inputs were tried to execute and we fix the problems if there are any.

1.2.5. Security

1.2.6. Extensibility

Thanks to Object Oriented Design of the project new parts can easily inserted into the program. To exemplify, in order to create new movie category database of this category needed firstly. Afterwards very few line of code implementation is sufficient.

1.2.7. Portability and Adaptability

1.3. Trade-offs

1.3.1. Efficiency and Reusability

Reusability can be our concern, any data which have different sun-categories and common features can be viewed and searched via our program. For instance, this application can be converted into a program that contains a lot of game or contains a lot of type of music.

1.3.2. Functionality and Usability

Since the main purpose of program is entertainment and informing the user about movies we have focused on the ease usage of the program. Functionality of the program is basic in order to make usable the program. The interface of the program have useful directions on it. Users can experience the program without having any comprehensive knowledge about the use of it.

2. SOFTWARE ARCHITECTURE

2.1. Subsystem Decomposition

3-tier Architecture is one of the most popular design. Our system also in 3-tier which are data, logic and presentation tiers.

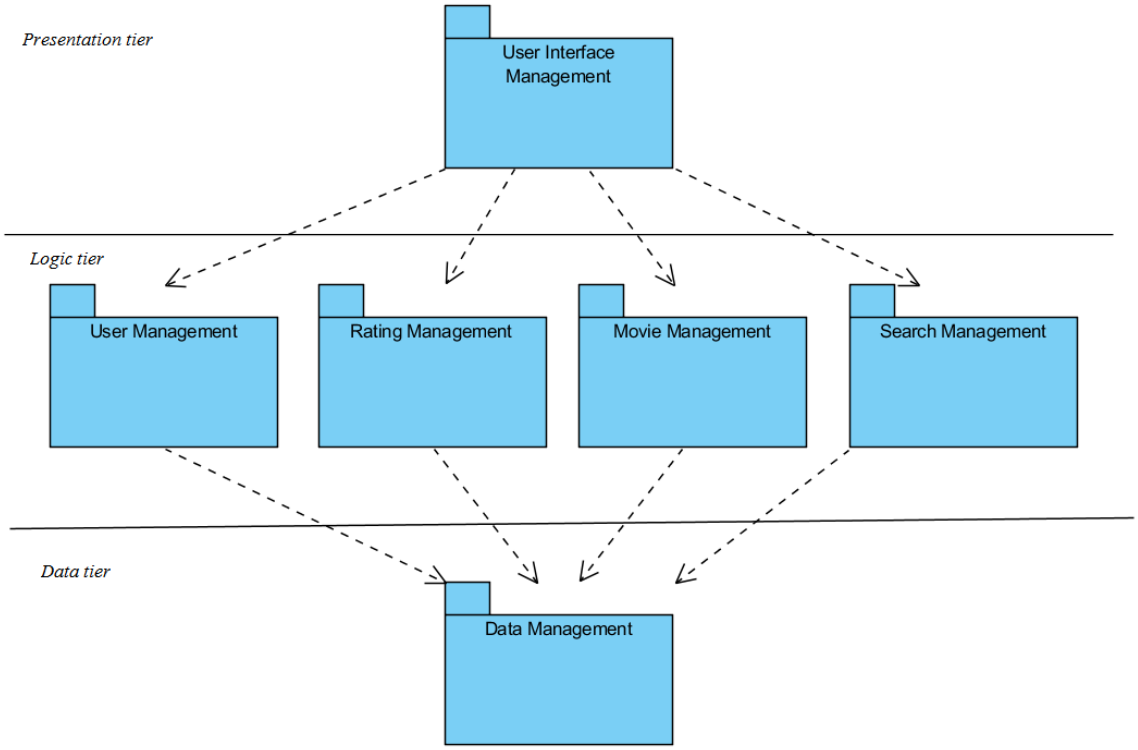


Figure 2.1.1 Subsystem Decomposition

Presentation Tier: The most top level of the program is the user interface. Purpose of the user interface is to translate abstract task and result into visual display. Therefore, user can understand and operate according to his or her needs. User Interface Layer is the only member of this tier. This layer is the monitor where users are able to operate.

Logic Tier: This layout is the core of our program. It coordinates the application, process commands, makes logical decisions and evaluations. Also, calculations are performed by this layout. Logic Tier is a kind of bridge in between Presentation and Data tier. It moves and processes data between the two surrounding layers. This tier is composed of four layers that are User Management Layer, Rating Management Layer, Movie Management Layer and Search Management Layer.

Data Tier: This layout is the memory of the program. Data tier stores movies, movie descriptions, movie rates, user's lists, movie posters. Also, it retrieves

information from database to Logic Tier. Data Tier includes Data Management Layer which has all classes about database.

2.2. Hardware/Software Mapping

MovApp has being developed in Java on NetBeans integrated development environment 8.2. Also, our database has being constructed by MySQL Work Bench 6.3. Since Java has own virtual machine, switching among different platforms is not a big problem for MovApp. In fact, we are developing it for desktop now, but the actual usage of MovApp will be on the mobile platform. That is why we have screen keyboard on some pages.

For now, our hardware requirements are keyboard and mouse connected to pc. Keyboard is needed for searching movie. Similarly, while selecting movies, movie categories, or any button (login, signup, logout etc.), we need a basic mouse. Since our database is local, we do not need internet connection. After MovApp has been used on the mobile platform, hardware requirements will be reduced.

2.3. Persistent Data Management

Most media items (like movies) occupy significant amount of memory. MovApp is not only a media player, it also stores movies and related items (like icons, descriptions, movie rates etc). We create our data tier with MySQL which is secure, compatible, and easy to use.

MovApp access the database when following scenarios happen.

- When the program started first, default movie icons, titles, and some other movie information is retrieved from database.
- While using search field, the program also uses the database in order to compare entered string with titles of movies.
- While selecting any category or list, database is also used to retrieve related movies.
- After selecting any movie, description will appear. Also, when user click watch button, media player will be displayed. These events work with database too.
- When a guest wants to log in, entered ID will be compared with stored IDs from database.
- Also, movie rates are stored in our database.

2.4. Access Control and Security

There two types of user correspondingly there two different access ways. There is no security check system for being guest users but they have limited access while

using the program. Guests can access the sub-categories and top movie list but they cannot create a list for themselves or they can see the rate of movies but cannot rate the movies. The second user type is registered user, which are needed to be login the system thus there is a security check for users. Obviously, these users have more extended access area while experiencing the program. They can access sub-categories, their individual lists, top list and can rate the movies. If any registered user rate any film rate will change automatically, every user can access the rate of movies but they cannot access the information that who did rate the movies.

2.5. Boundary Conditions

2.5.1. Initialisation

- What data need to be accessed at startup time?

Start-up time allowed user to see sub-categories, top lists and search button for movies. Also at the start time all movies can be watched.

- What services have to registered?

To reach registered user page, system require login from users. Registered user page additionally allow user to create UserTopList and WillWatchList and rate the movies.

- What does the user interface do at start up time?

Start-up time begins with guest user menu which have restricted usage of the system, also login and signup page buttons exist on it.

2.5.2. Termination

- Are single subsystems allowed to terminate?

While the movies are displayed on the page, display screen can be terminated without terminating all system.

Closing the any sub-list does not cause termination of whole system.

- How are updates communicated to the database?

When users rate any movie, this movie's mean rate (which composed by different users who give rate for this movies) should be updated. We have use MySQL for store our database of program. First the code reaches old rate and number of user who rated the film before and then take the new rate of user. Finally, calculate the new rate of the movie and update it.

2.5.3. Error

- How does the system behave when a node or communication link fails?

When guest users want to rate any movies system will warn the users their boundaries, and want them to register to the system.

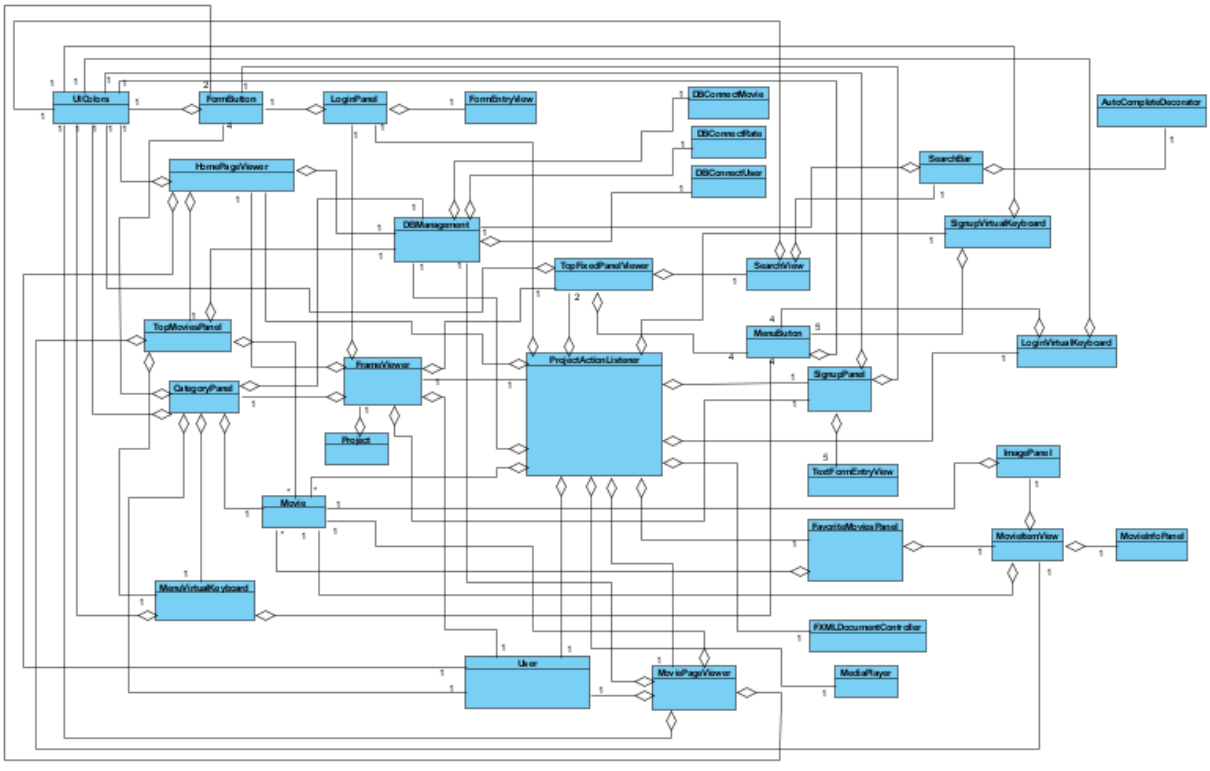
If user enter wrong ID while registering the system, program will warn the user.

2.6. Design Patterns

In the software development process, the system is called the Design Pattern, which is the result of reusing the codes, solving the emerging software problems and coding these solutions as standards and reusable. Design templates are the standard and the most appropriate solution that are developed by considering the solutions that software developers have produced over time in response to the problems they encounter. These methods can be used by all software developers. As we mention before, our design is in 3-tier architecture which is an appropriate pattern for a long time. In addition, we have used some other patterns too. These are 'search algorithm' and 'screen keyboard'. We have added 'search feature' to find directly a specific movie. We will need screen keyboard when the application starts to be used in mobile platform. Both of these are being used most mobile applications.

3. SUBSYSTEM SERVICES

3.1. Detailed Object Design



3.2. User Interface Management Subsystem

3.2.1. Guest Home Page / Logged in Home Page

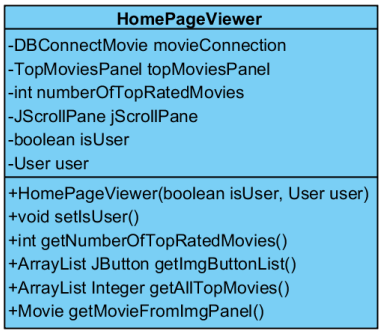


Figure 3.2.1.1 HomePageViewer Class

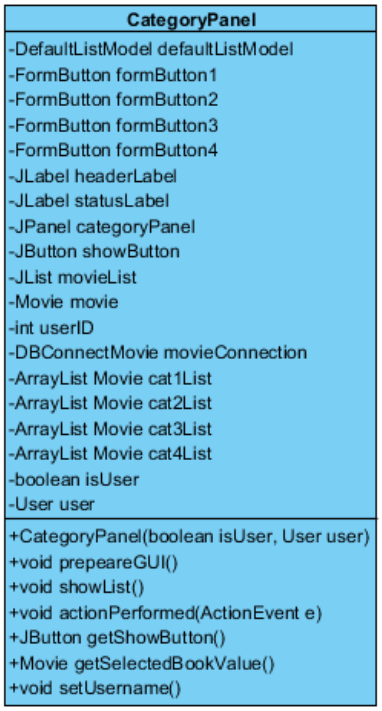


Figure 3.2.1.2 CategoryPanel Class

Common for Guest and Logged in User:

Homepage is the first screen that will be instantiated when the MovApp is first executed. It displays categories, show button for choosing movie from categories, top movies, virtual-touchable keyboard, movies and top fixed panel where logo, search bar, and other user related buttons such as log in button, sign up button, user's top movies panel and logout button.

Categories will be shown at the left middle corner and users can click the desired category and it shows movies in the just below the category panel.

Show button will be used when user chooses the category in order to demonstrate sub section movies of that category.

Virtual - touchable keyboard is the one of the essential requirement of the screen. It will be shown just below at the show button. In order to search movies, user need to access keyboard in the screen.

Top movies panel shows the well-liked twenty-five movies inside the home page according to their total rates which was given by the logged in users. Top movies panel is just under the top fixed panel.

Search bar will be shown at the top of the screen with search box in order to find desired movies.

On the top of the left part of the Top Fixed Panel, application has its own logo. Thanks to this logo, users can directly go back to the home page whenever they click this logo.

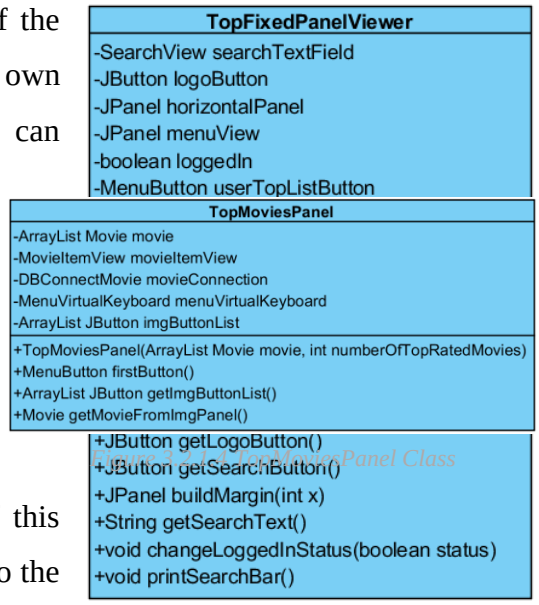


Figure 3.2.1.3 TopFixedPanelViewer Class

Guest User:

Log in button is placed at the top right corner of the HomePageViewer. With the help of this button, guest users can easily log in to the application called MovApp. This button clears the whole panel and creates a new login panel.

Signup button helps to users which does not have an account to sign up via webpage, SMS or directly inside the application.

Logged in User:

After user logged in to the application, user will see his or her personal top movies button, will watch list button and logout button rather that login and signup button.

Personal Top Movies shows the user's highly rated top 10 movies. Moreover, will watch list button shows the user's to watch list.

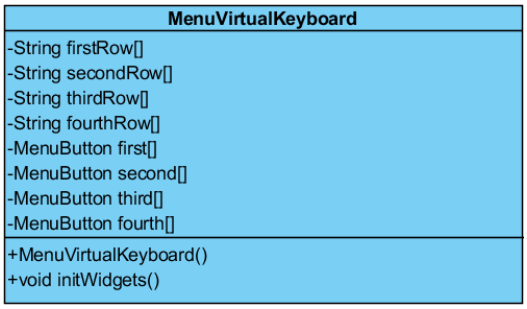


Figure 3.2.1.5 MenuVirtualKeyboard Class

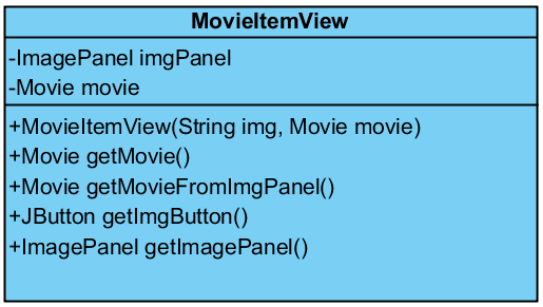


Figure 3.2.1.6 MovieItemView Class

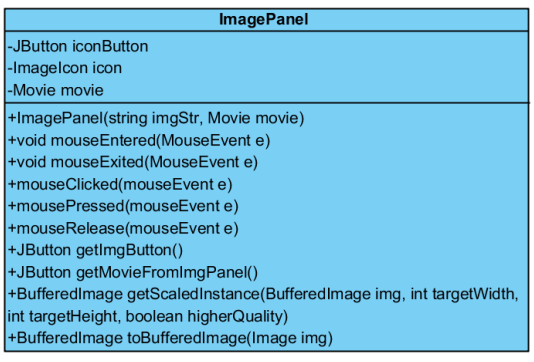
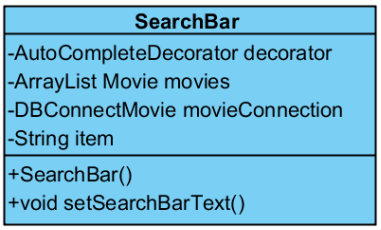


Figure 3.2.1.6 ImagePanel Class

3.2.2. Search Results

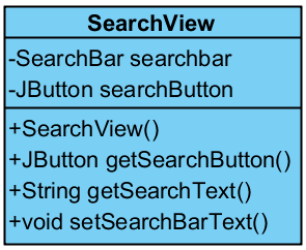
SearchBar:

Search Results is initiated when the results should be displayed. With the help of AutoCompleteDecorator class, this application auto completes according to desired text entry.



SearchView:

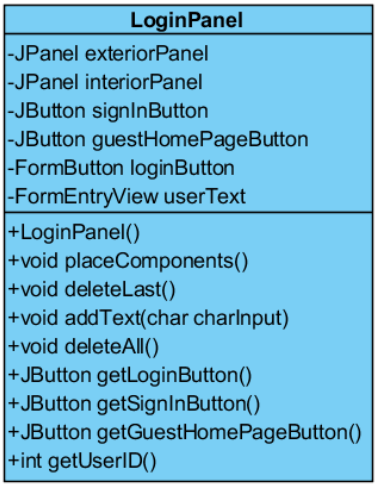
SearchView includes the SearchBar class and also some user-friendly images.



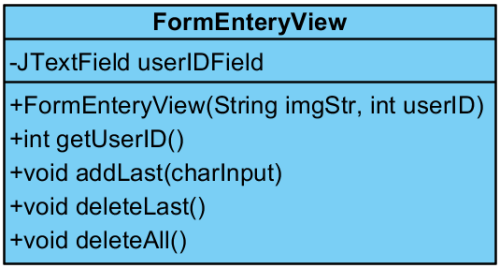
3.2.3. Login Screen

LoginPanel:

"LoginScreen" is initiated when user is directed from "MainMenu" to login or when the user is directed from "SignUpScreen". In order to login or sign up, virtual-touchable keyboard will be accessible in these screens. In this class there are two text-fields for username and password, and there are two buttons: login button and a button that links the user to "SignUpScreen" view.

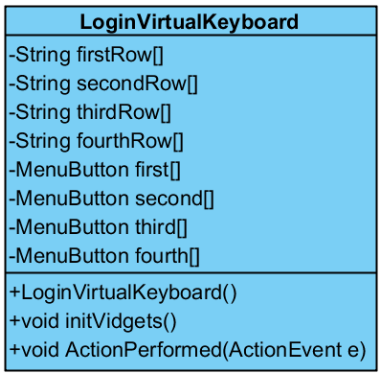


FormEntryView:



When user wants to login, "FormEntryView" will be initiated and program will ask user to give login information which is ID, the must because every transportation in Turkey, when transporters buy ticket, they have to give their ID information to the sellers. Hence, ID is a core requirement for transportation. As a matter of fact, in the MovApp, the obligation for login is ID.

LoginVirtualKeyboard:

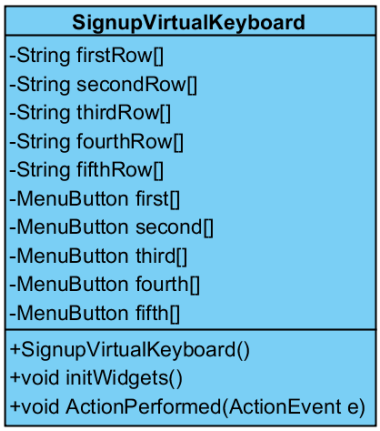


LoginVirtualKeyboard is a virtual keyboard that helps the guest user to login the movAPP application. Because of the idea that this application will work on touchable screens, movAPP needs a virtual keyboard for users who want to log in to the program.

3.2.4. Sign Up Screen

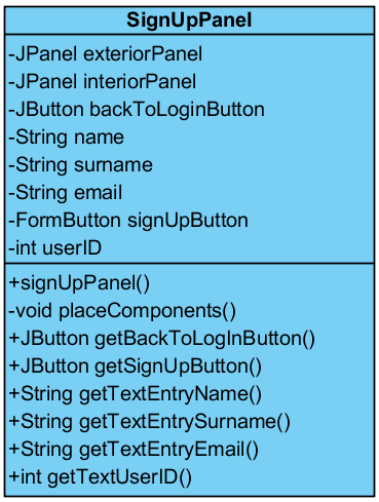
SignupVirtualKeyboard:

SignupVirtualKeyboard is a virtual keyboard. Thanks to this, guest users can sign up to the movAPP application. Because of the idea that this application will work on touchable screens, movAPP needs a virtual keyboard for users who want to sign up to the program.

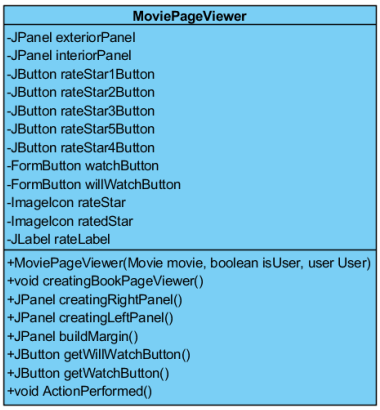


SignUpPanel:

SignUpPanel screen is initiated when user is linked from home page screen.



3.2.5. Movie Screen



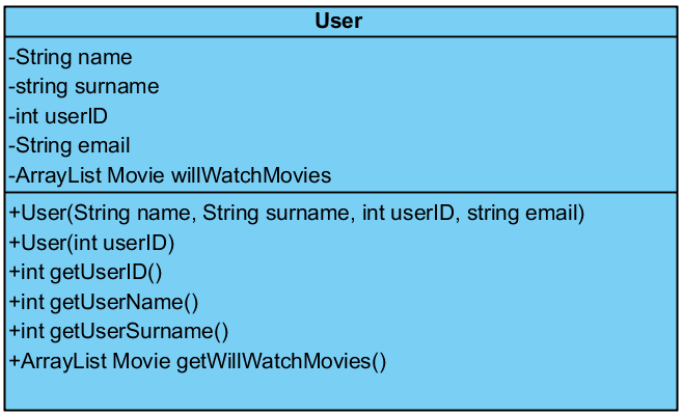
This page will be replaced inside the homepage with the Top Movies Page regardless of the user's logged in situation.

Users can reach this page from category panel, top movies panel and search button.

With the help of this panel, users can see a small description about a movie like director, year, duration, category and rate. Furthermore, users can see the cast and the summary about the desired movie. Only the users that were logged in can rate or add the movies to their will watch list. Logged in users can see and change the rate which was given by themselves before.

Users can watch the selected movies regardless of their status of logged in.

3.3. User Management Subsystem



Because the application has only one type of user, User management is far more easy than the other management subsystems. The user is a general class that holds all the information about the user. When guest user want to login to the application

3.4. Movie Management Subsystem

3.5. Rating Management Subsystem

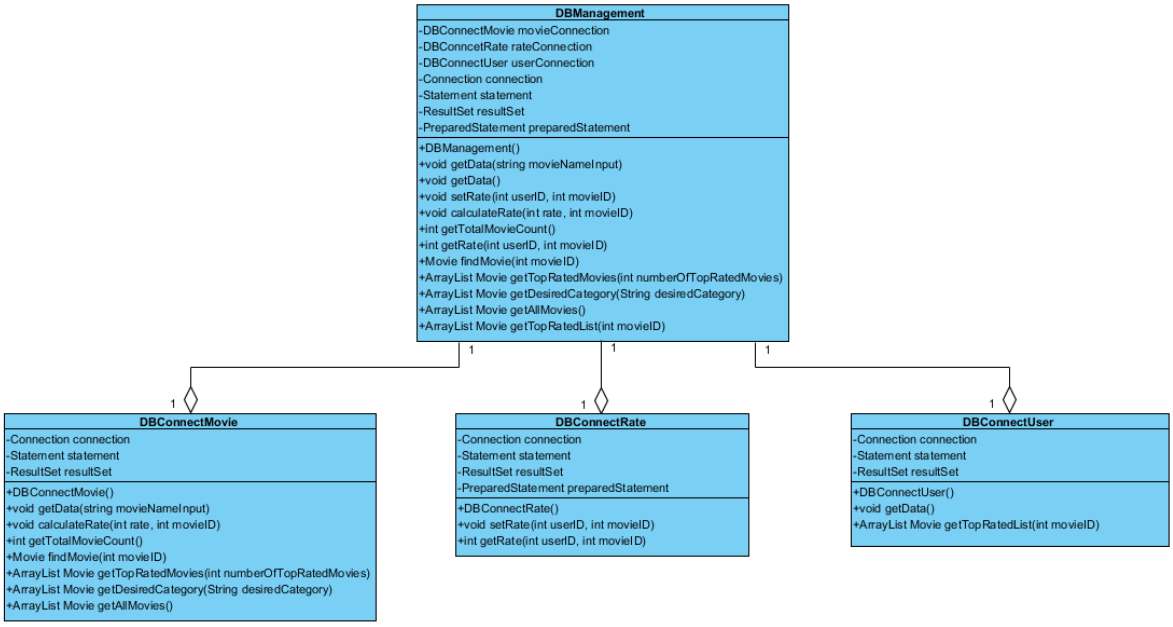
The rating process is only available for the logged in users. Hence, this system needs to reach users login information whether let them rate the movies or not. This is a subsystem which uses one of the database classes in order to access movies' rates. Moreover, logged in users can rate the movies. After the user's rating process, rating management system will be updated in order, demonstrate the new rate of the selected movie. Lastly, after user rates the movie, he/she can see his/her own rate for this movie when they re-enter the movie information page.

3.6. Search Management Subsystem

The MovApp is created crucially for being a user-friendly program. One of the most desired features from MovApp is to use it or access it in a fast and easy way. Search Management Subsystem is an example of it. Search management Subsystem is a simple subsystem where only one class handles the necessary task. AutoCompleteDecorator is a critical task which is basically a word completion. MovApp's search button pop ups the strings when they become pairs and compare them within database's pairs. Hence, it is connected to the database system in order to access the movies' name.

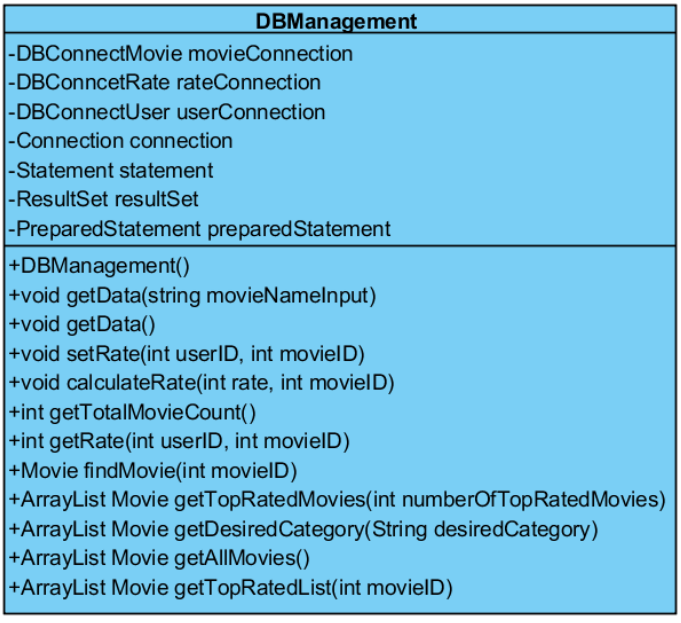
3.7. Homepage Management Subsystem

3.8. Data Management Subsystem



The figure that was shown above is the applications Data Management Subsystem. This system has four total classes. One class is related with all the other tree classes. Every database class inside the subsystem is directly related with one the specific topics such as rating, getting movie.

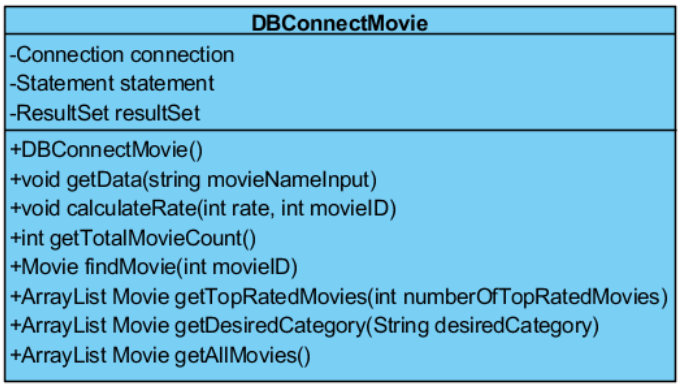
3.8.1. DBManagement



DBManagement class is like a roof class for the other database classes. This class connects all database classes in one class. By using this class, database classes are connected themselves with a class that behaves like a controller.

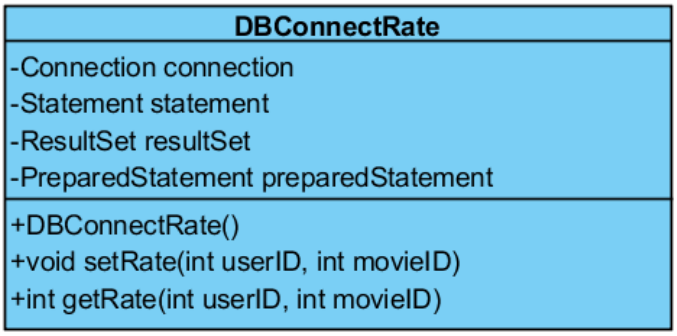
Moreover, rather than calling all database classes in project classes, this database class will be created automatically by the application.

3.8.2. DBConnectMovie



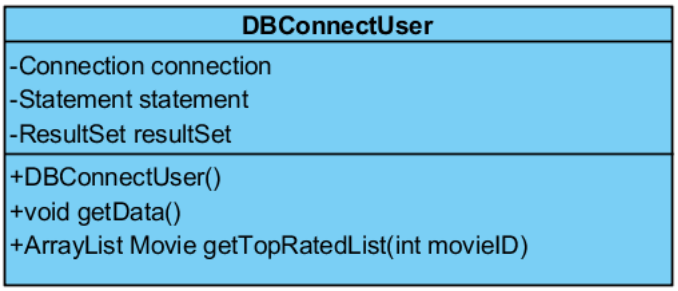
DBConnectMovie class is one of the sub database classes in MovApp desktop application. This class is used by the main database class which called "DBManagement". With the help of this class, application creates a connection with the database which holds movie information such as name, director, description.

3.8.3. DBConnectUser



DBConnectRate class is used for the purpose of reaching movie rates which was given by the logged in users. This database class holds only which users give which grade to which film. By using this class, applications main database class DBManagement generates the total rate for each movie. After the rates generated individually, DBManagement class writes the data to the related classes.

3.8.4. DBConnectRate



DBConnectUser is a database class that checks the user id if it is exists in the database or not. This class contains other data information such as user's name and surname. Moreover, this class will be used for the new users as well. If guest user wants to open an account for this application, all his or her information will be written to the database with the help of this class.

3.9. Integration Between Classes in the Context of Use Cases

3.9.1. Guest User Login

3.9.2. Search Movie

3.9.3. Rate Movie

3.9.4. Watch Movie

3.9.5. User's Top List Panel