

Design Patterns

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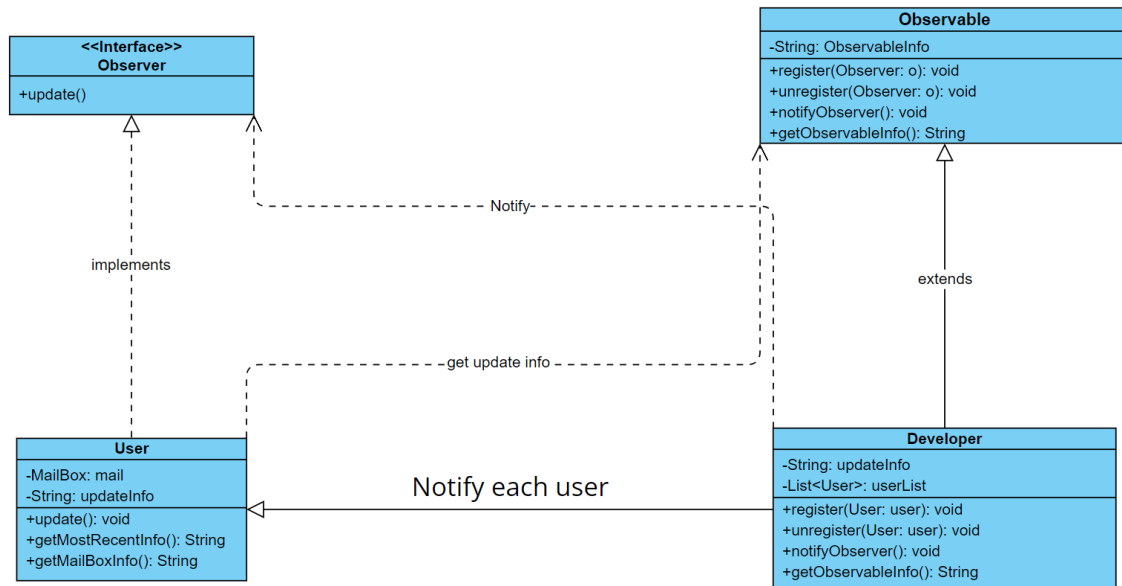
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Observer Pattern

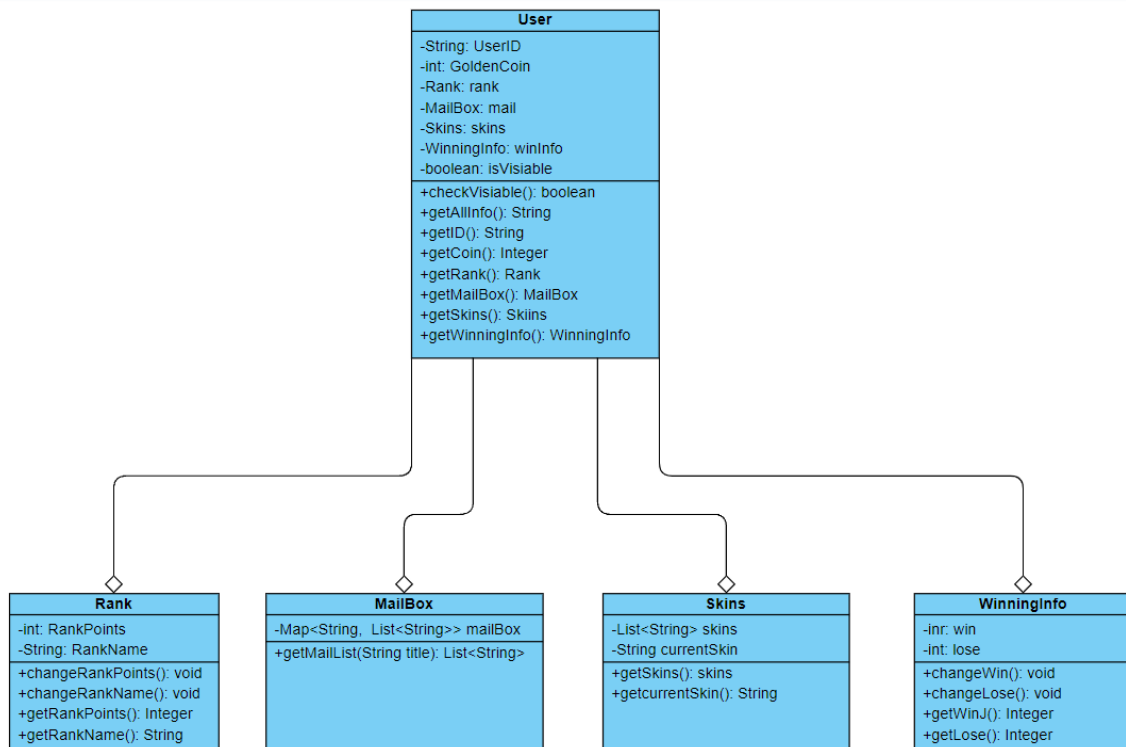
We will create a announcement part for developers publish update information. The User class should implements Observer interface for updating news to their mail box. Developer extends the Observable class that allow Developer register new user and remove the user who wants to delete his account. And once developers update a news, all users can be notified by notify function of Developer.



Builder Pattern

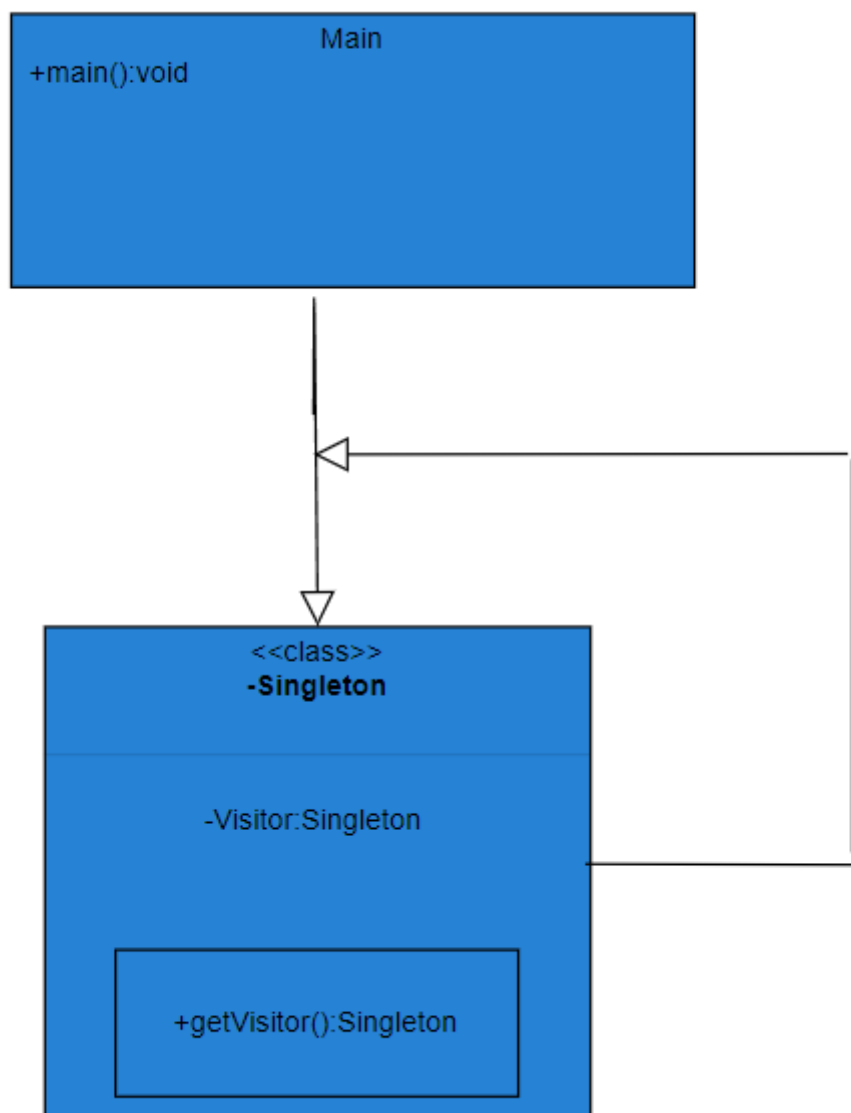
The builder pattern is used for creating User instance. A User class should include UserID, GoldenCoin, rank, mail, skins, winInfo, isVisible attributes. The UserID is a unique ID for each user and it is a String type.

The rank is a instance of class Rank and class Rank includes current user's rank points and rank name. Such as rank points(1600) represents "GOLD". The MailBox is a class that use Map to save mail information. The key of a Map is the title of a piece of information which is a String type. The value of a Map is used for storing list of messages. The Skins is a class for storing user owned skins information and which skin is being used by user currently. WinningInfo is a class that shows how many games that user already won and lost. Then setting different value for those class and combining those class to User can create a new instance of a user.



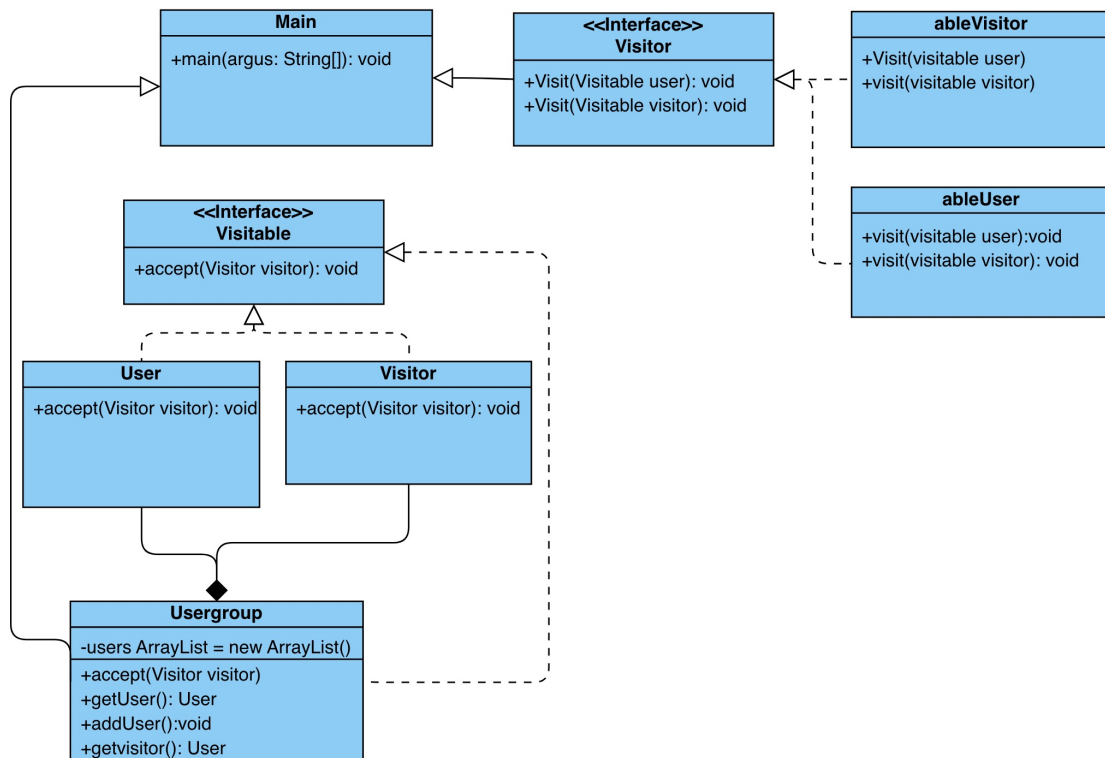
Singleton Pattern

For those user who are not willing to register account, they will be treated as visitor. Visitors can only experience the game, the result of the game cannot be counted in the ranking, and they cannot get gold coins and points. The purpose of singleton is to ensure that in a process, a certain class has and only one instance. Visitor's coin and point will always be none, because we won't save and update their information. So we don't need to consider visitors when we need to create users frequently, Therefore, system resources can be saved and system performance can be improved



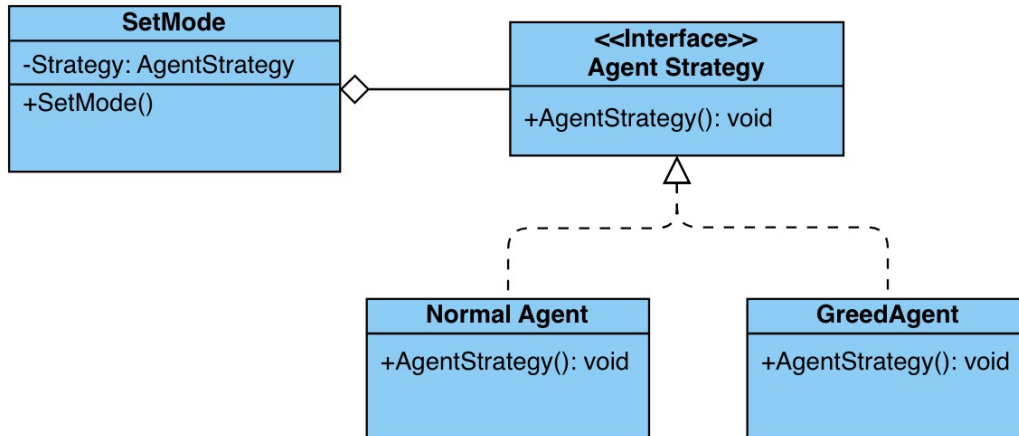
Visitor Pattern

In the Visitor Pattern, we use a visitor class that changes the execution algorithm of the element class. In this way, the execution algorithm of the element can change as the visitor changes. If the user type (user or visitor) can access some game data for example shops and person information UI which user can but visitor cannot. The `getUser()` and `getVisitor()` is from Class User and Class visitor. Then Store the User into an arraylist for further process.



Strategy Pattern

In strategy Pattern,we define a series of algorithms, encapsulate them one by one, the behavior of a class or its algorithm can be changed while program is running. In the Three Musketeers,there are two algorithm normal agent and greedy agent. In the case of those two are similar algorithms, using if...else is complicated and difficult to maintain or debug. By using strategy pattern they are independent, will not mix with the code that no need to change, will make the program structure more flexible.



MVC Pattern

This is the Model Control View Pattern, one of the most crucial components of the game. Using this pattern, we will create a GUI and link all the other features of said GUI. The main application uses the controller class where it will get data from the user. Once the user gives the data, the controller will use that data and manipulates the Threemusketeers model accordingly. Which then the view class will change the GUI to reflect the changes.

