

Design Pattern Midterm

Question 1

Read the following description of SportsMania and answer all the questions.

"SportsMania is a fantastic sport site for sport lovers. They cover almost all kinds of sports and provide the latest news, information, matches scheduled dates, live commentary or scores of matches as an SMS service, but only for their premium users. Their aim is to SMS the live score, match situation and important events after short intervals. As a user, you need to subscribe to the package and when there is a live match you will get an SMS to the live commentary. The site also provides an option to unsubscribe from the package whenever you want to.

As a developer, the SportsMania asked you to provide this new feature for them. The reporters of the SportsMania will sit in the commentary box in the match, and they will update live commentary to a commentary object. As a developer your job is to provide the commentary to the registered users by fetching it from the commentary object when it's available. When there is an update, the system should update the subscribed users by sending them the SMS."

- a. **Identify one design pattern that you can use to provide the new feature required by SportsMania.**

Observer Design Pattern

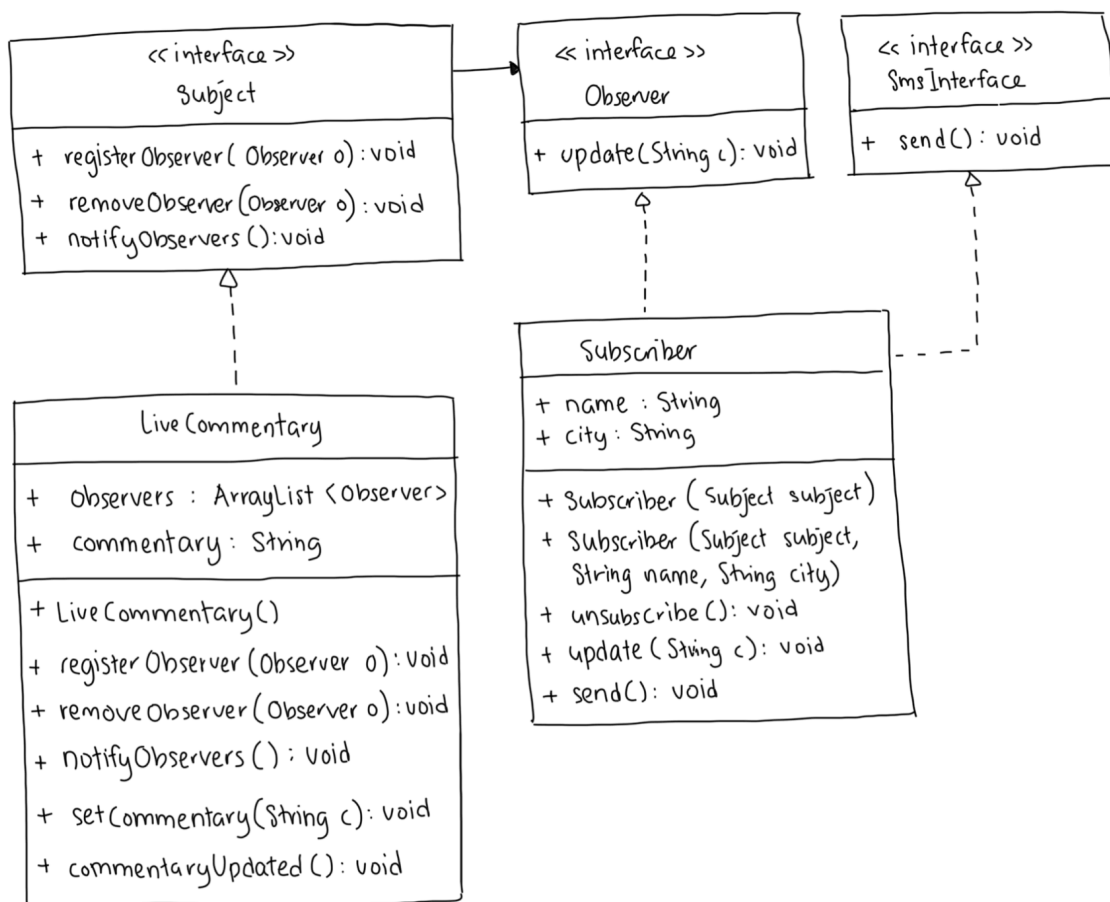
- b. **With reference to GoF's categorization of design patterns, the design pattern you stated in Question 1.a. falls into which category of pattern? State also whether the category is object or class scope.**

According to GoF categorization of design patterns, Observer Design Pattern falls under **Behavioural Patterns** category. The category is object scope.

c. Justify why you choose the design pattern in Question 1.a.

Observer Pattern provides an object design where the subjects and observers are loosely coupled. This allows us to add new observers at any time. When adding a new observer, we don't need to modify the subjects.

d. Draw a UML class diagram to show you apply the design pattern in Question 1.a. in developing the new feature for SportsMania.



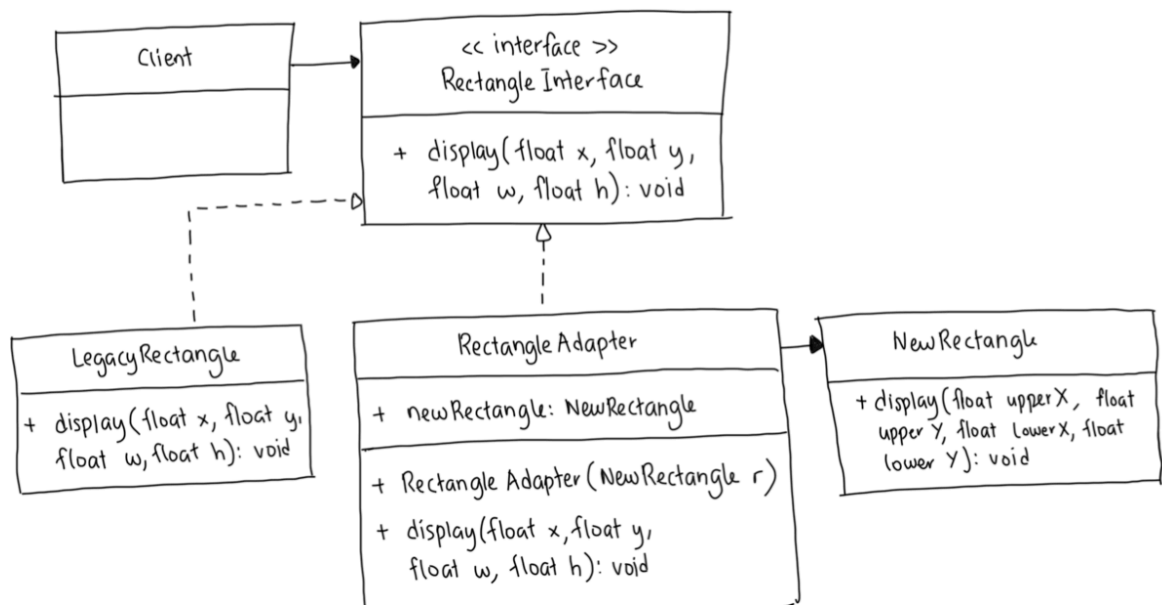
Question 2

A legacy *Rectangle* has a *display* method that expects to receive "x, y, w, h" parameters to draw a rectangle, where x and y represent the upper left x and y coordinates of the rectangle, w represents the width of the rectangle and h represents the height of the rectangle. However, the client wants to pass "upper left x and y coordinates" and "lower right x and y coordinates" of a rectangle to the *display* method to draw the rectangle.

- a. Identify one design pattern that you can use to provide the new feature required by SportsMania.

Adapter Design Pattern

- b. Draw a UML class diagram to show how you apply the design pattern in Question 2.a. to solve the problem.



- c. With reference to GoF's categorization of design patterns, the design pattern you applied in Question 2.b. falls into which category of pattern? State also whether the category is object or class scope.

Adapter Design Pattern falls in the structural category of GoF. The category defines the relationship between the classes or objects.