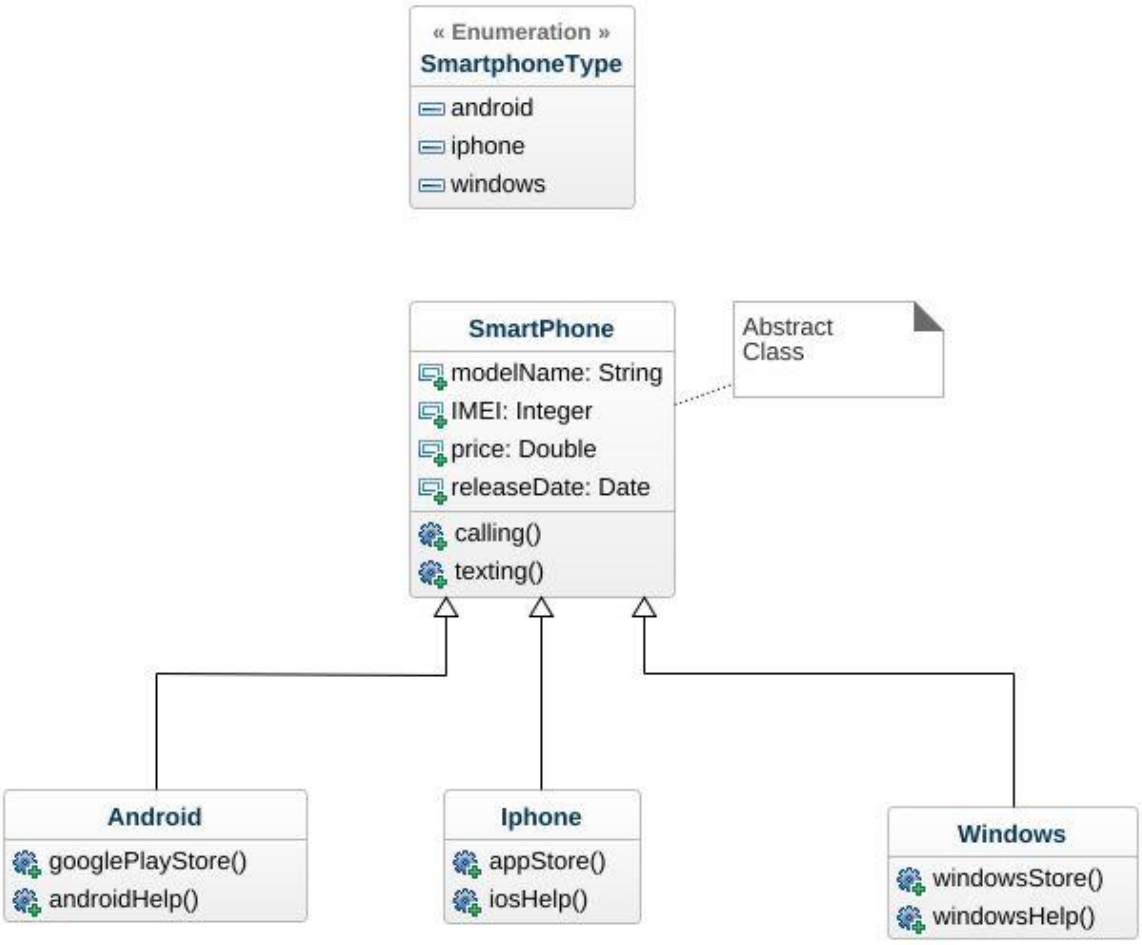
Design Pattern Assignment

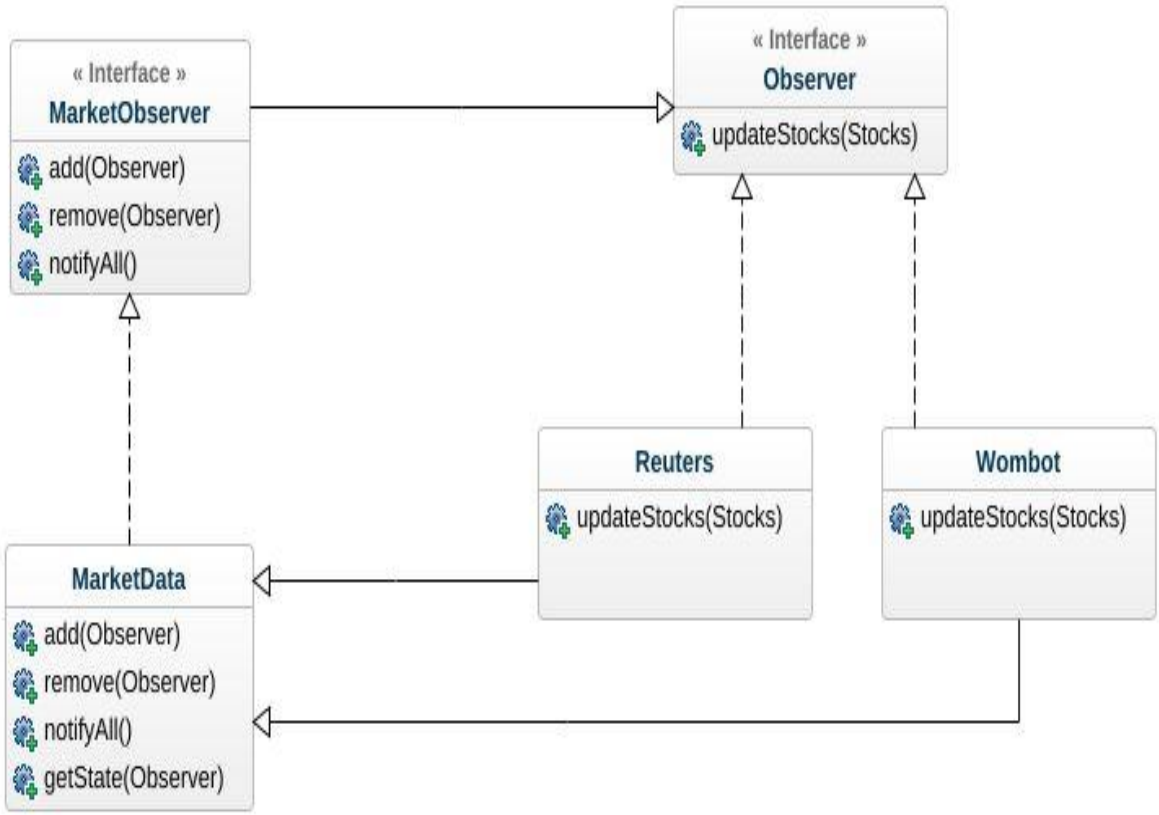
1. You have a Smartphone class and will have derived classes like IPhone, AndroidPhone,WindowsMobilePhone can be even phone names with brand, how would you design this system of Classes.

Ans. Here we can use the factory design pattern. We can make an SmartPhone abstract class which will be extended by all 3 classes i.e. Iphone, AndroidPhone and WindowsMobilePhone where they will implement common methods and can add their own methods.



2. Write classes to provide Market Data and you know that you can switch to different vendors over time like Reuters, wombat and maybe even to direct exchange feed , how do you design your Market Data system.

Ans. The observer pattern is being used here as we need to provide stock data real time and all the vendors will listen to the market.



3. What is the Singleton design pattern in Java ? write code for thread-safe singleton in Java and handle Multiple Singleton cases shown in slide as well.

Ans. Singleton design pattern says that define a class that has only one instance and provides a global point of access to it. There are many instances where we need only one instance of a class for example:

- the context of an application.
- Database connection object
- a thread manageable pool.
- registry settings.
- a driver to connect to the input or output console.

More than one object of that type can cause inconsistency to our code. So we need a Singleton design pattern here.

Thread Safe Singleton class to handle multiple Singleton Cases.

```
3  public class ThreadSafeSingleton {
4      private static volatile ThreadSafeSingleton instance;
5      private static Object lock = new Object();
6
7      private ThreadSafeSingleton() {
8
9      }
10
11     public static ThreadSafeSingleton getInstance() {
12         ThreadSafeSingleton result = instance;
13         if (result == null) {
14             synchronized (lock) {
15                 result = instance;
16                 if (result == null) {
17                     result = new ThreadSafeSingleton();
18                     instance = result;
19                 }
20             }
21         }
22         return result;
23     }
24 }
```

4. Design classes for Builder Pattern.

Ans. The Builder pattern is a creational design pattern that handles the construction of complex objects step by step. We will take an example of pizza construction.