

Online 3

Time: 25 minutes

A stock trading company wants to build an app that helps their clients track stock prices in real-time. If the price of a stock that a client is interested in changes, the app should automatically notify them.

In this app, each user can follow multiple stocks. Whenever the price of a stock changes, all users who are tracking that stock should receive an update.

Each stock has these details:

- Stock name
- Stock price

The app will allow users to:

- Add or remove the stocks they want to track.
- Get informed when the price of the stocks they are following changes.

Your task is to design and implement this stock tracking system using a suitable design pattern.

A sample (incomplete) main function and corresponding output is provided below:

Main function

```
public static void main(String[] args) {  
  
    // Create stocks  
    Stock googleStock = new Stock("Google", 1500);  
    Stock appleStock = new Stock("Apple", 1200);  
  
    // Create users  
    User user1 = new User("Alice");  
    User user2 = new User("Bob");  
  
    // Code for following stocks  
  
    // Simulate price changes  
    System.out.println("Updating Google stock price...");  
    googleStock.setPrice(1550);  
  
    System.out.println("\nUpdating Apple stock price...");  
    appleStock.setPrice(1250);  
  
    // Code for unfollowing stocks  
  
    // Simulate price changes again
```

Output

```
Updating Google stock price...  
  
Alice has been notified: The price of Google is now 1550.0  
Bob has been notified: The price of Google is now 1550.0  
  
Updating Apple stock price...  
  
Alice has been notified: The price of Apple is now 1250.0  
  
Updating Google stock price again...  
  
Bob has been notified: The price of Google is now 1600.0
```