Exercise: The Observer Pattern

In this exercise, you will design a stock trading system in which stocks values are continuously updated and in which you can buy and sell stocks. Through this, you will get familiar with the use of the GoF Observer pattern.

The situation: You are to design and implement a system, which consists of a number of parts:

- *Stocks*, which live a life of their own. Their values are periodically updated, and when this happens, a Portfolio must be informed of the changes.
- A *Portfolio*, which keeps track of the currently owned stocks (stock name, amount of stocks and value) and the total stock value.
- A *Portfolio Display*, which is used to output information on the currently held portfolio.

You shall work in small groups (2-5) persons.

Exercise 1:
Considering the GoF Observer pattern, what is/are the *subject(s)*, and what is/are the *observer(s)* in the stock trading system?
Which variant of GoF Observer is applicable – or would you rather create your own?

Exercise 2:
Design a system in which *Stocks* may be added to a *Portfolio,* which should then automatically be notified if the value of the Stock changes. When this happens, the Portfolio Display should make sure that the stocks in the portfolio are printed to screen.
Changing stock values could be done from a command line interface, e.g. VESTAS 570.50 or GOOGLE: 943.29.
Create a design document, with a short description of your design and design choices and the class diagram(s) and sequence diagram(s) you need to explain your design (at least one of each).

Exercise 3:
Implement and test your system. As always, remember that any changes to the design discovered during implementation and/or test must be reflected in the design documentation (class diagram etc.)

Exercise 4:
Revise your system so that the stocks have a life of their own: They should update their values (e.g. within the range +/- 5%) at regular intervals.

Exercise 5 (optional):
Create a market from which it is possible to buy and sell stocks.