



### Object Oriented Modeling and Design 4<sup>th</sup> Assignment

#### Question:

We need to write a class `ModifyAndPrint` with a method `operate` that performs different operations in various orders on integers.

The `operate` method gets the address of an integer from the object (`Client`) that calls it, prints the value and modifies the original value if it is required. The condition that determines the modifications and their order are given by the user of the program in run time.

Some exemplary sequences:

Print, Increment, Multiply (f);

Print; (no other function);

Multiply (f), Print;

Increment, Print;

If necessary, the integer factor `f` is also taken from the object that calls method `operate`.

- a. Design this part of the program using GoF software design patterns and draw the UML class diagram. Show parameters of the methods. Mention the design patterns that are used in your solution.
- b. Write the code of the classes in your design in C++.
- c. Explain what happens when the `operate` method of the class `ModifyAndPrint` is invoked? Which methods are called in which order if the required sequence is: Print, Increment, Multiply(f);
- d. How is the flexibility achieved in terms of
  - i) Adding a new function (for example `SendOverNetwork(IPAddress)` ) to the system, where `IPAddress` is taken from the `Client` object?
  - ii) Changing the sequence of functions in run time?

#### SUBMISSION:

- Prepare your solution as a file(s) only in pdf or jpg format. You may split your drawing in separate pages and create more than one files. In this case you have to combine them in a zip file.
- Upload the file (pdf, jpg, zip) to Ninova until 23.00 on 4 May 2016, **Wednesday**. Late submitted assignments are not accepted.
- **Cheating** will not be tolerated. If cheating is discovered, all responsible students will be punished. Punishment for cheating is the highest possible **negative** score plus to be subject to the University disciplinary proceedings.  
It is allowed to discuss how to solve a problem with your classmates; however, **this assignment is not group homework. The actual solution should be an independent effort.**