İTÜ
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Object Oriented Modeling and Design 5th Assignment

Problem:

We are designing a software system that includes a class **A** with an attribute x and a method m(). To calculate the value of x the method m() calls different functions depending on some conditions. Sometimes it calls only one function, for example f1() (x=f1();), sometimes only f2() (x=f2();) for the same calculation. However, sometimes it calls a group of these individual functions, and the result is the average of return values (x= AVG [f1() , f2() , f3()];). The average calculation can also contain the average of a group (x= AVG [f1() , AVG [f1() , f3()]];). In the future, new functions (i.e. f4(), f5() ...) can be added to the system that are called under different conditions. For example, the value of x can be calculated as follows: x= AVG [f2() , f5()]. The functions that are involved in the calculation of x may change at run-time.

To Do:

a) Design the system using GoF software design patterns to achieve the required flexibility and draw the UML class diagram. Mention the GoF design patterns that are used in your solution.

b) Assume that the method m() is currently using only the function f1() for the calculation of x. While the program is running, the method m() is called again and it needs to calculate x, but the conditions change and the method m() must now call a group of functions for the same calculation as follows: x= AVG[f1(), AVG[f2(),f3()]] . Draw the UML sequence diagram for the method m(), which shows the operations that are performed in the system for this calculation.

SUBMISSION:

- Prepare your solution as a file(s) only in pdf format. You may split your drawings in separate pages and create more than one pdf files. If you have multiple files combine them in a zip file.
- Upload the file (pdf, zip) to Ninova until **23.00 on 31 May 2020**, **Sunday**. Late submitted assignments are not accepted.
- **Cheating** will not be tolerated. If cheating is discovered, all responsible students will 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**.