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Computer Engineering Department
Assoc.Prof. Feza BUZLUCA
http://faculty.itu.edu.tr/buzluca

Object Oriented Modeling and Design 4th Assignment

Question:
Assume that you have to design a part of "student administration software" for a university.

- There are different types of students at the university, such as undergraduate student, master student. *In future a new type of student can be added to the system (for example Ph.D. student).*
- Assume that the GPAs of the students can be calculated in different ways because of changes in the regulations of the university. When the regulations change, a new algorithm is used for new students, whereas the GPAs of previously registered students are calculated using the old algorithm. *In future a new algorithm can be added to the system, and the algorithm of the existing students can also be changed.*
- Same or different algorithms can be used for different types of students (graduate, undergraduate etc.).
- Different algorithms for GPA calculation may require different attributes of students such as registration year, department etc.
- The responsibility for calculating the GPA is assigned to the students (getGPA() method). The system will decide which calculation algorithm to be used by the getGPA method.

o Construct and draw the proper design class diagram according to the given requirements by considering object oriented design principles and patterns.
o State the patterns used to design the system.
o Explain how the required flexibility is achieved in your design. How can the GPA calculation algorithm of an existing student changed?
o You may assume that the necessary initial operations have been performed and all information about students reside in the memory in proper data structures.
o You don't need to create use cases or domain models.

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 jpg 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 27 April 2015, **Monday**. 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**.