BLG 468E

OBJECT-ORIENTED

MODELLING AND DESIGN

CRN: 22538

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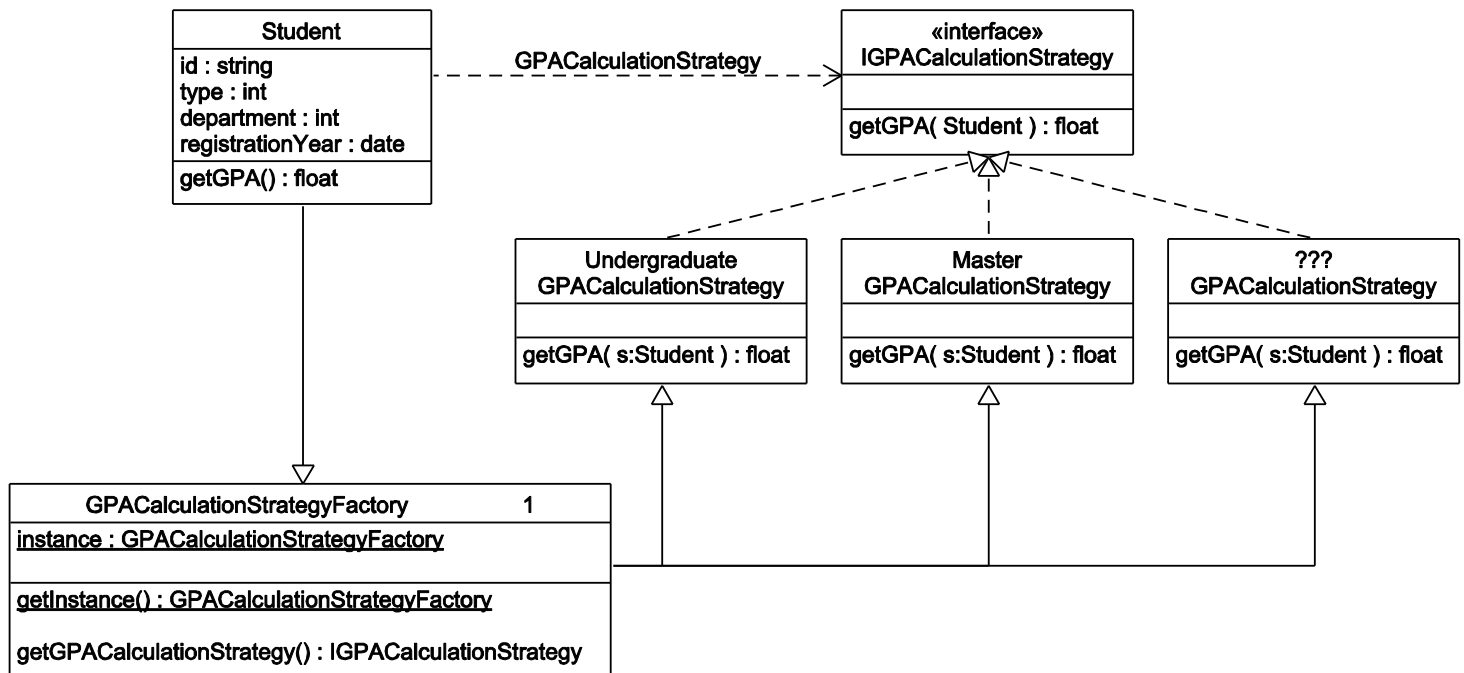
ASSIGNMENT #4

Submission Date: 27.04.2015

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STUDENT NUMBER: 040100117

a) UML Class diagram

Student
- id : string
- type : int
- department : int
- registrationYear : date
- getGPA() : float

GPACalculationStrategy

«interface»
IGPACalculationStrategy
- getGPA(Student) : float

Undergraduate GPACalculationStrategy
- getGPA(s:Student) : float

Master GPACalculationStrategy
- getGPA(s:Student) : float

??? GPACalculationStrategy
- getGPA(s:Student) : float

GPACalculationStrategyFactory   1
- instance : GPACalculationStrategyFactory
- getInstance() : GPACalculationStrategyFactory
- getGPACalculationStrategy() : IGPACalculationStrategy

b) Design patterns

- Factory and strategy design patterns are used.
- Factory pattern is used for **GPACalculationStrategyFactory** to create different GPA calculation strategies.
- Strategy pattern is used for switch between different GPA calculation strategies which implements GPA calculation strategy interface.

c) Flexibility

- Strategy pattern gives flexibility to change GPA calculation strategies on run time with the help of polymorphism. All strategies implements one GPA calculation interface which supplies common interface for different strategies. Students' **GPACalculationStrategy** pointer points to the selected GPA calculation strategy.
- Student can get a strategy from factory in runtime and change its behavior dynamically. Factory gives necessary GPA calculation strategy pointers to the student.