Software Engineering Assignment # 3

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Question 1:

Factory Patterns. As discussed in class with the logistics example the factory pattern can be used for designs in which we can select one thing from multiple options and can add new options with minor change in code.

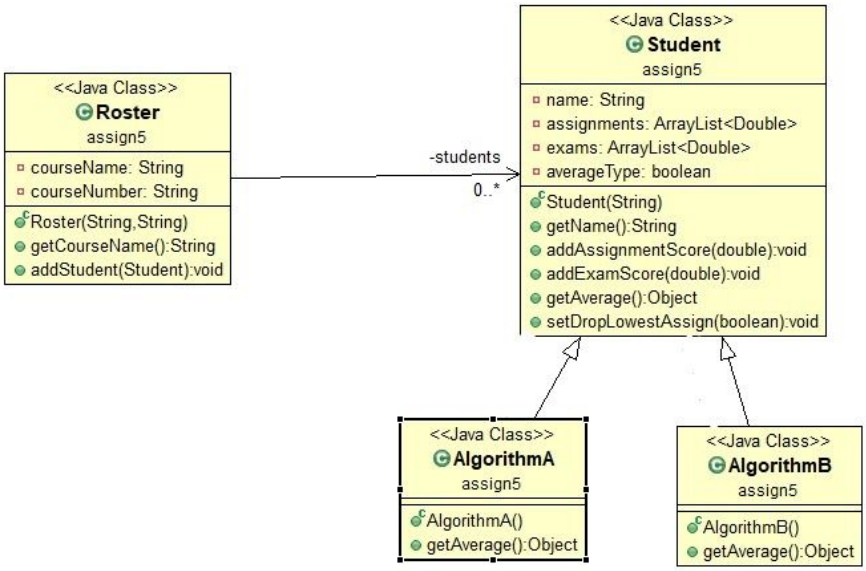
For example :

We can add an additional average algorithm by :

```
public Object getAverage() {
		// TODO Auto-generated method stub

		if(averageType)
		{
			return new AlgorithmB().getAverage();

		}
		else
		{
			return new AlgorithmA().getAverage();
		}
	}

public Object getAverage() {
		// TODO Auto-generated method stub

		if(averageType == 2)
		{
			return new AlgorithmB().getAverage();

		}
		if(averageType == 3)
		{
			return new AlgorithmC().getAverage();
		}
		else
		{
			return new AlgorithmA().getAverage();
		}
```

We just added a third average computing algorithm with just little changes which can be seen above.

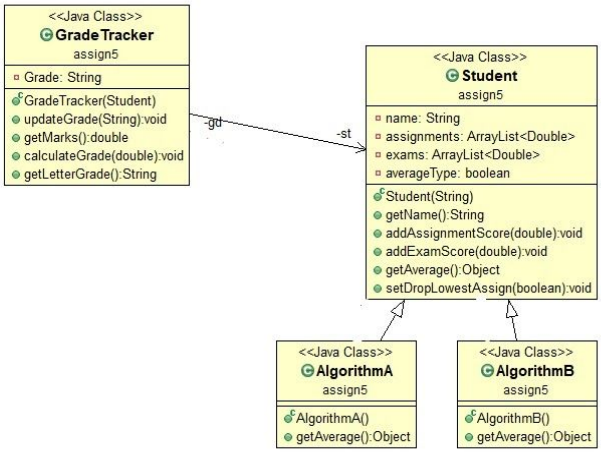
Class Diagram for Question 1:



Question 2:

Observer Patterns.

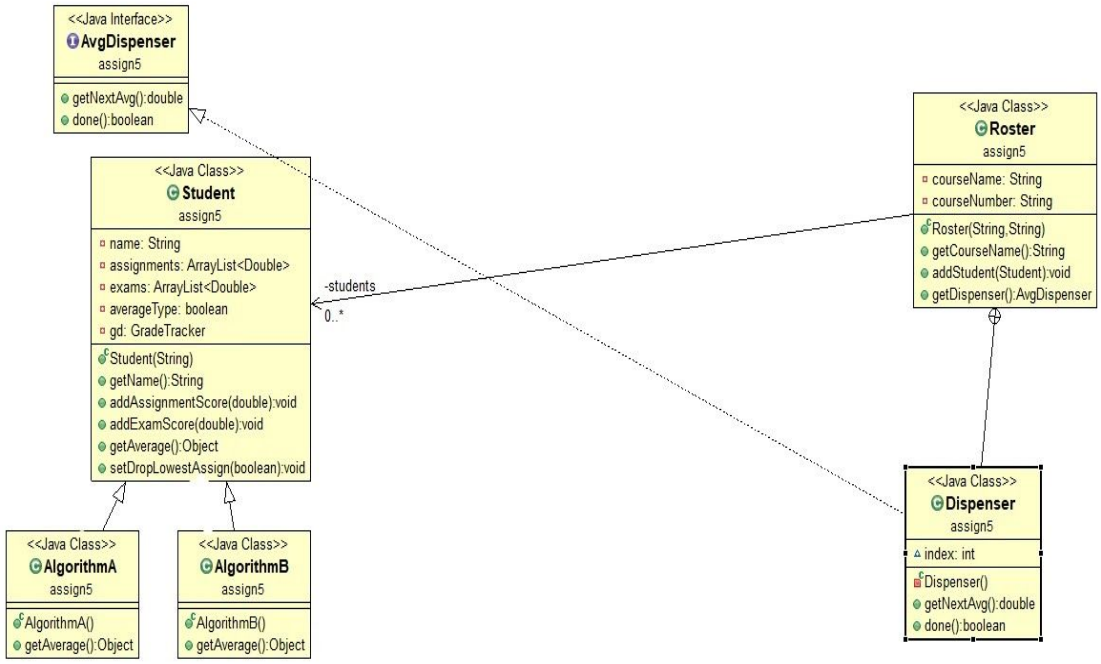
In question 2 we had to be careful as whenever the student object is changed , the tracker had to be updated automatically. For this the design pattern used should be Observer Pattern as it is used when one object is modified, its dependent objects are to be notified automatically.



Question 3:

Iterator Patterns.

The Design pattern to be used in this question is Iterator patterns as this pattern is used to get a way to access the elements of a collection object in a sequential manner without any need to know its underlying representation.



I have completed the bonus task which was to implement these designs in Java. The below picture is evidence which proves that my codes are perfectly fine as they are giving the correct output on the test cases which were provided to us in the Driver class.