

**Gebze Technical University
Computer Engineering**

CSE 443 - 2018 Fall

HOMEWORK I REPORT

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Q1) Problem Definition

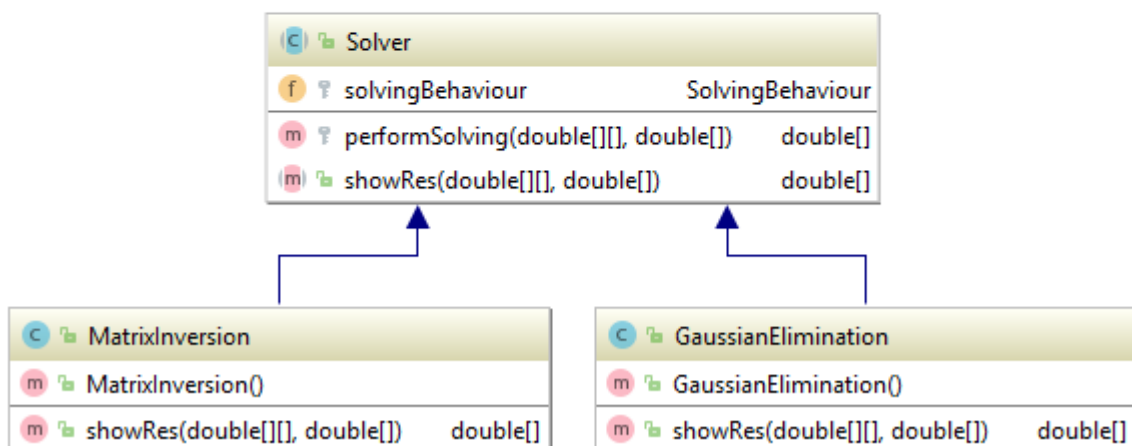
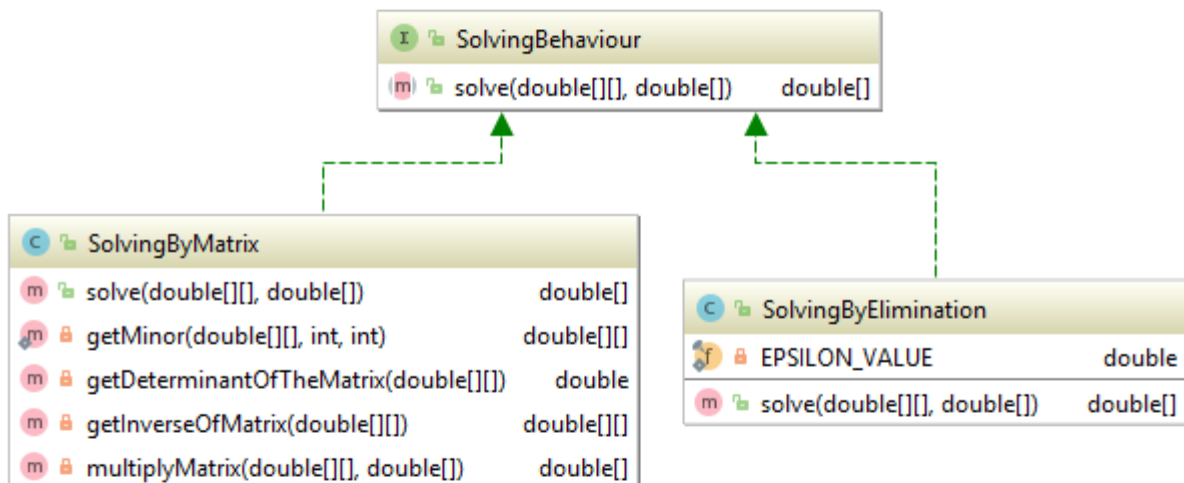
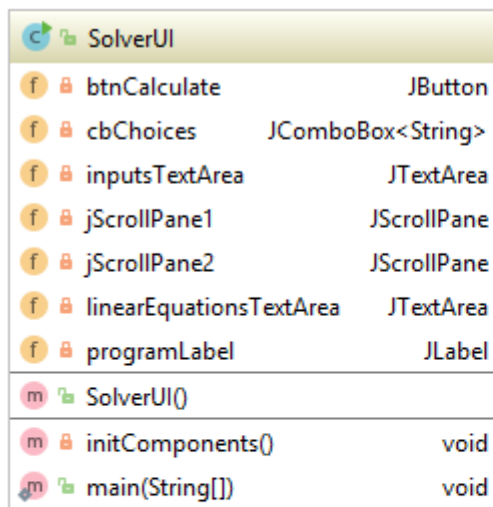
The problem is simply defined as following as customer wanted us. Customer wants us ;

- Create a project which will solve the linear equations.
- This projected should be supported by at least two methods when the solving the linear eqautions.
- It should provide to change dynamically between the methods.
- It might be need more functionalities in the future.

Q1) Problem Solution Approach

- As the problem defined above, I thought, firstly I should implement at least two method for solving the linear equations independently.
- After finishing the implementing the methods I started to think about the how to design the structures of the classes.
- Customer wants us to change dynamically between the methods and might want more functionalities in the future. So, thats why I should design the class structure to avoid from the overriding the functions I need for every class.
- I thought most proper pattern for this part will be Strategical Pattern which wants us to retrieve the most used functionalities and make it an interface then create classes just as you need.
- Then I created an Interface named as SolvingBehaviour, whenever customer needs to new method, We can check that if we need only its class we just create its class and choose the best method from the classes which implements the SolvingBehaviour class. This way we wouldnt need to rewrite the functions again.

Q1 Class Diagrams



Q1) Test Cases

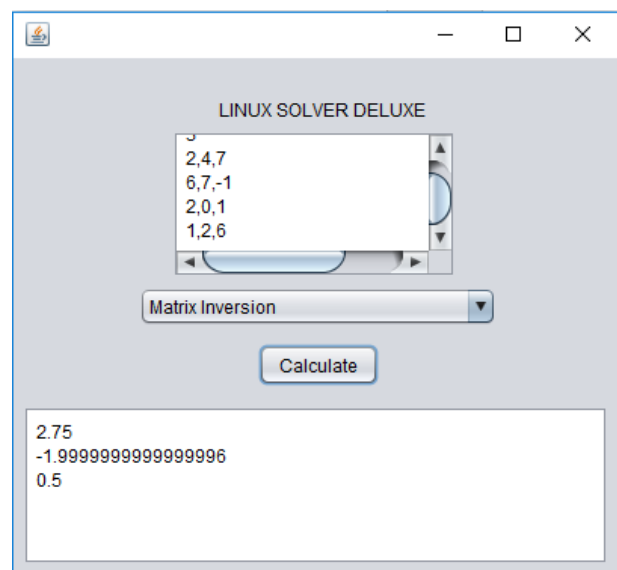
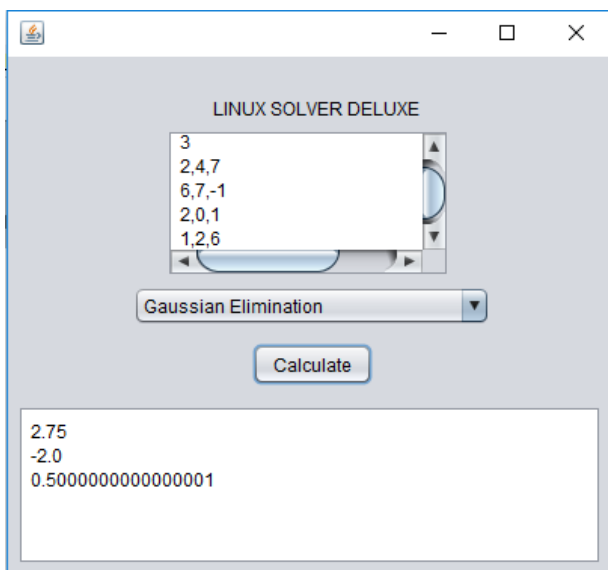
For the test cases there is a text area to write the input. Given input should be like following example statements:

$$\begin{aligned}x + 2y + 3z &= 4 \\ 7x + 8y + 6z &= 6 \\ 2x + 4y + 3z &= 8\end{aligned}$$

3 → indicates row and col of coefficient matrix
1,2,3} → following 3 statements are coefficient matrix
7,8,6}
2,4,3}
4,6,8 → values matrix which is nx1 matrix where n is equal to 3

The output file is provided as LinearSolver.jar file in the directory homework sent. You can just run without compile the whole project.

Q1) Running Results



Q2) Class Diagrams

According to the given wants it should be designed with Observer Pattern. Class Diagram of the design is below.

