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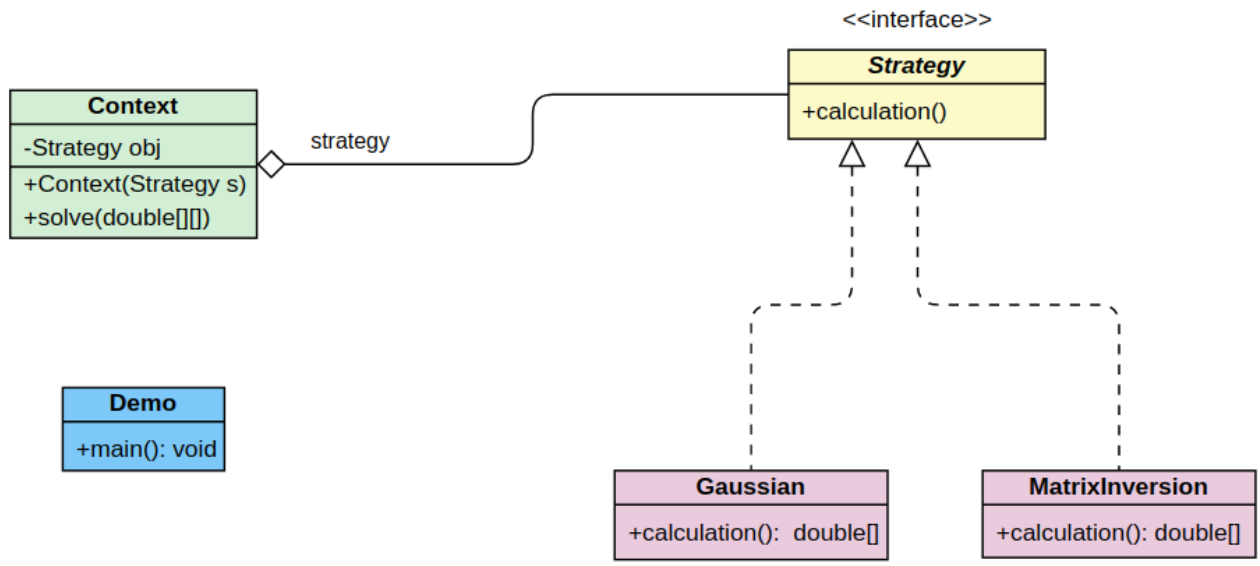
CSE443 – Homework 1 / Part 1 Report

The customer needs some methods to solve a system of linear equations. These methods can be able to change between solving methods dynamically.
The Strategy Pattern is a behavioral software design pattern that enables selecting an algorithm at runtime.
So, it is wisely to use Strategy Pattern for this project.
If the customer wants any other new method to solve equations, we can easily add the method to our project.



To implement this system, first we need to create a class diagram for the project. There is a Strategy interface as a base of our methods. Interface keeps a calculation function because all the methods need to implement the calculation.

Gaussian is a concrete class that implements Strategy interface. This class has methods for solving linear equations using Gaussian Elimination.
Gaussian elimination is an algorithm in linear algebra to solve a system of lineal equations.

MatrixInversion is a concrete class that implements Strategy interface. This class has methods for solving linear equations using Matrix Inversion.
Methods:
-Cofactor(): Function to get cofactor of related matrixes
-determinant(): A recursive function to find the determinant.
-adjoint(): This function gets adjoint of A[N][N] in adj[N][N].
-multiplier(): This function gets 2 matrix and returns the multiplycation of them.

Context class is a tool to choose calculation method by Demo. It keeps a Strategy object for choice. Demo starts the calculation using its calculate method.