Ahsanullah University of Science and Technology (AUST)
Department of Computer Science and Engineering

Course No. : CSE2202
Course Title : Numerical Methods Lab

Date of Performance: 10.02.2019

Date of Submission: 3.03.2019

Name :Drubojit Saha

ID : 17.01.04.027

Section : A2

Online 4:Implementation of GaussElimination Method

```
package gausseliminationtest;
import java.util.Scanner;
public class GaussEliminationTest {
 public static double coeffecient[][] = new double[10][10];
   public static double rightsidevector[] = new double[10];
   public static double resultvector[] = new double[10];
   public static int flag;
    public static void gauss(int size) {
      double pivot, factor, sum;
        for (int k = 1; k <= size - 1; k++) {
         pivot = coeffecient[k][k];
         if (pivot < 0.000001) {
            flag = 0;
            break;
         }
         flag= 1;
         for (int i = k + 1; i <= size; i++) {
            factor = coeffecient[i][k] / pivot;
            for (int j = k + 1; j <= size; j++) {
               coeffecient[i][j] = coeffecient[i][j] - factor * coeffecient[k][j];
            }
            rightsidevector[i] = rightsidevector[i] - factor * rightsidevectorvector[k];
         }
      }
      resultvector[size] = rightsidevector[size] / coeffecient[size][size];
      for (int k = size - 1; k >= 1; k--) {
         sum = 0.0;
         for (int j = k + 1; j <= size; j++) {
            sum = sum + coeffecient[k][j] * resultvector[j];
         }
         resultvector[k] = (rightsidevector[k] - sum) / coeffecient[k][k];
      }
   }
```

```
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int size;
        System.out.println("Enter the size of the system: ");
        size = input.nextInt();
        System.out.println("one row at a time");
        for (int i = 1; i <= size; i++) {
            for (int j = 1; j <= size; j++) {
                coeffecient[i][j] = input.nextDouble();
            }

        }
        System.out.println("Enter the input vectors: ");
        for (int i = 1; i <= size; i++) {
            rightsidevectorvector[i] = input.nextDouble();

        }
        gauss(size);
        if (flag != 0) {
            System.out.println("Solution vector: ");
            for (int i = 1; i <= size; i++) {
                System.out.println(resultvector[i]);
            }

        } else {
            System.out.println("No solution vector");
        }
    }
}
```