

GaussianElimination66051068.java

```
1 package Guassian;
2
3 import java.util.Scanner;
4
5 public class GaussianElimination {
6     public static void main(String[] args) {
7         Scanner sc = new Scanner(System.in);
8         System.out.print("Enter the size of the matrix : ");
9         int size = sc.nextInt();
10
11         double[][] matrix = new double[size][size + 1];
12
13         System.out.println("Enter the elements of the matrix : ");
14         for (int i = 0; i < size; i++) {
15             for (int j = 0; j <= size; j++) {
16                 matrix[i][j] = sc.nextDouble();
17             }
18         }
19
20         for (int i = 0; i < size; i++) {
21             for (int j = i + 1; j < size; j++) {
22                 if (Math.abs(matrix[i][i]) < Math.abs(matrix[j][i])) {
23                     double[] temp = matrix[i];
24                     matrix[i] = matrix[j];
25                     matrix[j] = temp;
26                 }
27             }
28             for (int j = i + 1; j < size; j++) {
29                 double factor = matrix[j][i] / matrix[i][i];
30                 for (int k = i; k <= size; k++) {
31                     matrix[j][k] -= factor * matrix[i][k];
32                 }
33             }
34         }
35         double[] result = new double[size];
36         for (int i = size - 1; i >= 0; i--) {
37             result[i] = matrix[i][size];
38             for (int j = i + 1; j < size; j++) {
39                 result[i] -= matrix[i][j] * result[j];
40             }
41             result[i] /= matrix[i][i];
42         }
43
44         System.out.println("result is : ");
45         for (int i = 0; i < result.length; i++) {
46             if (result[i] == -0.0) {
47                 result[i] = 0.0;
48             }
49             System.out.println("x" + (i + 1) + " = " + result[i]);
50         }
51         sc.close();
52     }
53 }
54
```