Name/Surname: Date:
Number: Grade:
EEF311E   **Numerical Analysis with Python, 1st Homework**   **Autumn 2023**

Write a "Python" program that reads coefficients and the right-hand side vector of a linear equation system from a given file (input.txt). The last row of the "input.txt" file is the right-hand side vector of a linear equation system. The coefficients of the linear equation will be integer as shown below.

$4x_0 + x_1 = 3$

$2x_0 + 5x_1 = 1$

The content of "input.txt" will be (_we will test your code by different "input.txt" files with different "Size" values_):
Size=2
4 1
2 5
3 1

(a) Print the given matrix to the "output.txt" file as shown below:

The content of the "output.txt" file:

+4x0 +1x1 = 3

+2x0 +5x1 = 1

(b) Solve the given linear equation system using the Gauss Elimination and Jacobi methods (pay attention to the convergence). Print the solutions to the "output_results.txt".

The content of the "output_results.txt" file should be (the 4th digit after the decimal point will be rounded):
The solution of the system by Gauss Elimination:
x1=0.7778
x2=-0.1111
The solution of the system by Jacobi Method:
x1=0.7778
x2=-0.1111

Note 1: Turnitin can be used to check for any cheating. Please submit your own work!
Note 2: The **text** in the output files and **names of the output file** should be correctly typed. Not even extra spaces and characters are allowed. In such cases, you may not get any grade.
Note 3: Please write your code by writing functions one for Gauss Elimination Method, one for Jacobi method, one for the data input from the text file and defining the system as Ax=bi.
Note 4: Your code should be properly commented on. Uncommented code will get partial credit.
Important: You have to do your assignment alone. Code sharing among students or using code from other sources is prohibited.

Upload your project's Python source files to "EEF311E Homework" field in your Ninova system.