CSCI/MATH 3180
Lab Assignment #5

Part I. Use Maple to find the solutions for the linear systems given in class.

Part II. Use Visual Studio 2015 to find the solutions for the linear systems.

1. Create a C++ console application project in Visual Studio 2015 and name your project YourLastName5.
2. Write a program that implements 1) the Naïve Gaussian Elimination and 2) Gaussian Elimination with Partial Pivoting for linear systems.
3. All floating point arithmetic will be double precision.
4. Input to the main program: Name of a data file that contains a sequence of augmented matrices each of which represents a linear system
5. Program output:
   For each linear system
   - Original augmented matrix
   - Upper triangular matrix obtained by the Naïve Gaussian Elimination
   - Solution from the Naïve Gaussian Elimination
   - Upper triangular matrix obtained by the Gaussian Elimination with Partial Pivoting
   - Solution from the Gaussian Elimination with Partial Pivoting
6. Analyze your output and write a short report including the following
   - Description of your experiment
   - For each of the data sets
     - Program input
     - Program output
   - Your conclusion/findings
   - Save your report as **YourLastNameReport5**.

Submission

1. Delete the following from your Visual Studio project folder.
   - *Debug* sub-folder
   - *Debug* sub-sub-folder under your project folder(second level down)
   - *sdf* file.
2. Save the following in a compressed (zipped) folder.
   PartI :
   YourLastNameMaple5.mw
   PartII :
   YourLastName5 -- *main project folder*
   Note: A data file must be in the project folder.
   YourLastNameReport5 -- *report on the experiment*
3. Submit the compressed folder to D2L.
4. **Confirm** your submission.
   - **Download** the zipped folder which you have submitted and **check the contents**.
   - Multiple submissions are allowed, but the last submission will be graded.

NOTE: LABS MUST BE INDEPENDENT WORK.

LAB #5 EVALUATION RUBRIC

Part I		Use Maple to find the solutions for the linear systems.	__/1.5
Part II	1	Solve the assigned problem using methods described in program description. See Requirements #1 through #5	__/2
	2	Compilation/Execution ✓ Compile without errors. ✓ Execute without crashing. ✓ Work for all data and produce correct answers. ✓ The program output well formatted and properly labeled.	__/4
	3	Main Comment Block includes the following. file name due date author course # program description input output	__/0.5
	4	Documentation, indentation, and white space usage ✓ Meaning variable names are used and they are briefly described. ✓ Each section of statements in the program is well documented. ✓ Proper INDENTATION is used to make the program easier to read. ✓ WHITE SPACES are used in appropriate places for readability.	__/0.5

	5	Contents of report
		• Brief description of your experiment
		• For each of the data sets
		  ○ Program input
		  ○ Program output
		• Your conclusion/findings
			__/1.5

Submission		Contents of zipped folder
		✓ Zip folder contains the following.
		  ❖ Maple worksheet.
		  ❖ Zip folder contains the project folder and the report.
		  ❖ Project folder contains a data file.
		✓ The project folder does NOT contain the following.
		  ❖ Debug sub-folder
		  ❖ Debug sub-sub-folder
		  ❖ .sdf file
			__/0.5

TOTAL			__/10

```
2
3      2      4
-6     -4     6

2
6      -3     6
-2     1      -2

2
0      2      4
1      -1     5

3
1      1      2      4
1      1      0      2
0      1      1      0

3
3      2      -5     0
2      -3     1      0
1      4      -1     4

3
3      4      3      10
1      5      -1     7
6      3      7      15

4
6      -2     2      4      16
12     -8     6      10     26
3      -13    9      3      -19
-6     4      1      -18    -34

4
1      -1     2      1      1
3      2      1      4      1
5      8      6      3      1
4      2      5      3      -1

5
9      3      2      0      7      35
7      6      9      6      4      58
2      7      7      8      2      53
0      9      7      2      2      37
7      3      6      4      3      39
```