

Program na06

Overview: Compare the solution of systems of equations with and without using scaled partial pivoting.

Introduction: Copy the module for scaled row pivoting, **LUpivot**. You will also need the module for LU decomposition. You may wish to add the option **modifyOriginal** with the default **True** to each of these modules. Do problem 6 page 77 and problem 19, page 82. In the main program file, write a subroutine to solve each of these problems. The main program should call each of these subroutines. Use a try/except construct to handle errors in case a method fails due to division by zero.

Input: All input should be done from the standard input. Put the system for problem 4 in the file **na06in.txt**. For problem 19, construct the matrices algorithmically.

Output: Output to the standard output.

The output for problem 4 should contain the following along with blank lines to make it look nice:

<Title: e.g. 'Problem 6, page 77'>

[A|b] = <augmented matrix>

Scaled partial pivoting yields:

x = <print the vector x>T.

Check: $\max |Ax - b| = \max(\text{abs}(Ax-b))$

Without pivoting we get:

x = <print the vector x>T.

Check: $\max |Ax - b| = \max(\text{abs}(Ax-b))$

Use a similar model for problem 19, but include "n = " <n> for each matrix.

Checklist:

Folder: **na06<lastname>**

Module files: **matIO.py**, **LUdecomp.py**, **LUpivot.py**

Main program file: **na06.py**

Input file: **na06in.txt**