

# Assignment 1

Numerical Computing  
B. Math. Year 1,  
January - May 2022.

Due on: March 10<sup>th</sup>, 2022.

Please give arguments where necessary. If it is unclear from your answer why a particular step is being taken, full credit will not be awarded. Please feel free to discuss amongst yourselves; however, copying the assignment solutions from someone else is strictly prohibited and both persons involved will be penalized.

Each one of you must submit your own answers. Total: **60 points**.

Please note the following abbreviation for this and subsequent assignments:

- **(SB)**: *Introduction to Numerical Analysis* by J. Stoer and R. Bulirsch, III<sup>rd</sup> edition.
1. **(SB)** Exercises after Chapter 1, Problems 1,2,3 and 4 [Each of the four problems carries 10 points.]
  2. Write a code (in any language you prefer) to LU-decompose a  $N \times N$  matrix ( $N$  should be obtained as an user-defined positive-definite integer input,  $N > 1$ , and your code should ascertain that the matrix is non-singular). Apply your code to the following matrix:

$$M = \begin{bmatrix} 4 & -1 & 0 \\ 2 & 3 & 5 \\ -1 & 7 & 2 \end{bmatrix}$$

and show the result. The code and the output should be uploaded on Moodle. [20 points]