

# MA1011: Problem Sheet 4 (Programming)

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## Date of Submission

2 January 2023 by 1200 IST. If I am not in the office (F-7) then please slide your submission under the door.

## General Rules

- This problem sheet will be graded, the numbers in the brackets denote the points for each question.
- You can work in groups and you are free to consult any material that you wish to, but please mention them when you write down your answers/solutions. You must also mention your roll number and branch at the top of your submission.
- Submit the code file and the output separately via email to `manjil@iiitmanipur.ac.in`. It is preferable that you use either C or Python for the exercises.

## Problems

1. Write a computer program to calculate the solution of a system of linear equations where the first input is the number of equations and the second input is the augmented matrix. The output is then the solution of the system. [**10 points**]
2. Write a computer program to compute the determinant of a given square array using the co-factor method where the first input is the array and the second input is row number to do the Laplace expansion. The output should first specify the equation the program is using to compute the determinant. [**10 points**]
3. Using the previous program, compute the inverse of a given matrix. [**5 points**]
4. Write a computer program which takes as an input a rectangular  $m \times n$  matrix and gives as output the pivot columns and the free columns. [**5 points**]