Introductory computation session

Linux basics

- `vi` – To edit files on the terminal
- `gedit` – To edit files in a separate window
- `latex` – Compile tex document on terminal
- `Libre office` – Document writer, excel sheet, etc.

Simple programs in `C++`

1. Basics
   - Your first program
2. Array operations
   - Create and retrieve elements
   - Array addition
   - Dot product
3. Matrix operations
   - Create and retrieve elements
   - Matrix Addition
   - Matrix Multiplication

Plotting tool – `gnuplot`

- Line plot
- `gimp, document viewer` – Image viewer

Assignment 1

General Instructions

- Can work in teams of two, yet write your **own** solution
- Put down your roll number and name on your solution
- Attach your printed code with your solution

Problems

1. Consider random matrices A and B of size $N \times N$ (user input). Convince yourself computationally that matrix product is not commutative: *i.e.* $AB \neq BA$.

2. Consider a random matrix A of size $N \times N$ (user input). Convince yourself computationally that $(A + A^T)$ is symmetric.

3. Adapt the function to *multiply two matrices* to perform a *matrix* $(N \times N)$ and *vector* $(N \times 1)$ *product*. Check the time taken for $N = 256$, $N = 512$, $N = 1024$, $N = 2048$, and $N = 4096$.