

Dept of Electronics and Communication Engineering, TKMCE Kollam

Scientific Computing Lab Aug-Dec 2020

Lab 2: Familiarization of Scientific Computing

Experiment:

1. Write a program to compute the factorial of an integer using function. Execute the program and upload the results.
2. Write a program to compute the sum of first 'N' Fibonacci numbers using function. Execute the program and upload the results.
3. Represent a complex number in python using built in function, display its real part, imaginary part and absolute value using built in functions.
4. Plot a sine wave in python with frequency 100 Hz and sampling rate $f_s = 10000$ Hz.
5. Plot a sinc function in python.

- $$\begin{matrix} & 0 & 1 & 2 & & & -4 & -3 & 2 \\ & & & & & & 0 & 2 & 1 \\ 6. \text{ Consider 2D arrays } x & 6 & 7 & 8 & = & 3 & 4 & 5 & y = & 1 & 4 & 2 \end{matrix}$$
- Write a python program to
- a) Find $x + y$
 - b) Add '2' to each element in the first row of y
 - c) Find the sum of all elements in x
 - d) Find a 1D array by summing over the rows within each column of y
 - e) Find element by element multiplication of x and y
- Compute the above values using non vectorized method and vectorized method

Reports:

Preliminary Lab report:

1. Write a short note on different arithmetic functions such as abs, sine, real, imag, complex and sinc in python.
2. Write a short note on vectorized computation in python.
3. Write the algorithm/ flowchart for the experiments listed in preceding section

Final Lab Report:

In addition to the Pre-lab report, document the code, comment each line and clearly report the results of each program (wherever applicable).