IDC101 (Introduction to Computation) :
Lab Exercise 7 :

General Instruction :
First decide how you will solve the problem on paper. Only after this, you should start writing your program.

Here's the checklist :
a) Read the problem carefully. Decide the inputs required.
b) Decide your step-by-step algorithm. That is, decide how you will solve your problem step-by-step.
c) Then, write your program following your algorithm.

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1. Write a python program to create a file containing your name, roll number in separate lines. Use the open syntax to do it. Check the output file. Next, add another line, say your date of birth, using append.

2. Read the above-generated data file by opening it in the reading mode. Use different syntax: read, readline and readlines to read the file and understand their functions.

3. Using any editor of your choice, create a data file by name `mydata.dat` with about 10 to 15 real numbers.
Modify the sample program `avg3.py` (provided on course webpage)to read data from this data file `mydata.dat`. Your program should read the data from this file and report the values of average and standard deviation. You may want to use numpy functions `loadtxt` and `savetxt`.

4. A sample program `food1.py` is given to you. Run the program and understand how it works. Spend some time to understand the features of this program.

5. Read the data in file `stsam.dat`. Find the sum, mean and standard deviation using numpy functions such as `numpy.sum`, `numpy.mean` and `numpy.std`.

6. A data file `eepvsp.dat` is provided to you on the course webpage. Download this data file and save it to your computer. Now, write a program that will read the data. Your program should write the following outputs;
a) Number of rows and columns in the data.

b) Average of each column of data.

c) Average of all the numbers in the data.

d) Find the average of all the numbers greater than 0.001 in the third column.

e) Find the element-wise sum of 2nd and 4th column of data. The answer should another column vector.

f) Find the total sum of all the elements of 3rd and 4th columns of data.

g) Find the variance of 3rd column of data.

7. You are given two data files; `eepvsp.dat` (**A**) and `baffin.dat` (**B**). Write a program to read these data files. Extend your program to find the following;

a) Find the element-wise difference between 2nd column of file B and 4th column of file A.

b) Find the sum of element wise product of 3nd column of file B and 3rd column of file A.

c) Find the variance of each of the column of numbers in file B.

d) Find the mean of each of the column of numbers in file B.