Worksheet 07

General Instructions: Do not copy-paste from this file to terminal. If you have doubts, contact the instructors or TAs. Do not panic!

- Use python program-name to run your programs from a Linux terminal
  Create a directory called Worksheet07 under your home directory
- The name of the programs should be prob-n.py for nth problem.
  Create a text file called Worksheet07-solutions that will contain the results/output of each of your python programs.
- After you finish, create an archive of the worksheet07 directory and upload in WeLearn.

1. Write a python code that calculates the following sums in a single loop

$\sum$ i and $\sum$ i^2, where i goes from 1 to n.

Also calculate the expected answers by using the following:

$$\sum_{i=1}^{n} i = \frac{1}{2} n(n+1) \qquad \text{and} \qquad \sum_{i=1}^{n} i^2 = \frac{1}{6} n(n+1)(2n+1)$$

2. The python command sum can calculate the sum of all elements of a given list. The syntax is sum(list-variable). Also note that the following command creates a list for all integers from 1 to n with each element being m^{th} power of the corresponding integer
[i**m for i in range(1,n+1)]
Copy prob-1.py to prob-2.py and use the sum command to get the same result (as that of prob-1.py).

3. Create a list of numbers having following pattern
[1,0,3,0,5,0,7,0,9,: : :].

4. Create a list of integers where nth item of the list is given by $S_n = \sum_{i=1}^{n} i^3$

5. Calculate (using for loop) the value of

$$1+\cfrac{n}{1+\cfrac{n-1}{1+\cfrac{n-2}{1+\cfrac{\cdots}{1+\cfrac{2}{1+\cfrac{1}{1}}}}}}$$