

CO1107 Algorithm, Data Structure & Advanced Programming - Workshop Week 4

Task 1: Write a recursive function that takes as input a positive integer **n** and returns a list **L** that contains the factorial values, $1!$, $2!$, ..., $n!$.

For example: If the input is $n=5$, then the output should be:

[1, 2, 6, 24, 120].

Task 2: write a recursive function to compute the sum of a list of numbers:

For example, if the list is : $a = [1, 2, 3, 4, 5]$, then the sum is : 15

Task 3: Write a recursive function **printToN** that takes as input a positive integer n and prints the numbers 1 to n .

Once you have done this, create a similar function **printSquares** so that it now prints the first n square numbers.

Finally, create a recursive function **sumOfSquares** that returns (not prints) the sum of the first n square numbers.

Task 4: Write a recursive function to find the smallest item in a list.

Task 5: Consider the following sequence of numbers: **S : 1; 2; 4; 7; 11; 16; 22; 29; ...**

In this sequence, the first two items are 1 and 2 and each successive item in the sequence is the previous value plus one more than the difference between it and the one before it.

Write up a recursive python function which implements this relationship explicitly. This function should be called **incChange** and should accept as input N and return the item at that position in the sequence. For example **incChange(5)** would return 16 (as the 1 is considered position 0).