

## Assignment I: Algorithm or Logic Building (5%)

**Due Date: Wednesday May 9 2018**

Write Pseudo code and draw flow chart that helps to:

1. Compute factorial of a given number.
2. Print the first 12 multiples of a given number.
3. Tell if a number is prime or not.
4. Tell if a number is perfect or not. Definition: a **perfect number** is a positive integer that is equal to the sum of its proper positive divisors, that is, the *sum of its positive divisors excluding the number itself*. E.g 6 is a perfect number b.c  $1 + 2 + 3 = 6$ .
5. Generate the first 15 terms of Fibonacci series: 1, 1, 2, 3, 5, 8, ...
6. Generate the first n terms of the Fibonacci series
7. Compute the values of the following series
  - a.  $1 + 4 + 9 + \dots + n^2$
  - b.  $1 + 4 + 27 + \dots + n^n$
  - c.  $1! + 2! + 3! + \dots + n!$
8. Generate all prime numbers less than 1000.
9. Generate all perfect numbers less than 1000.
10. Generate the first n prime numbers.
11. Generate the hailstone sequence of a given number. The Hailstone sequence is generated from a starting positive integer, n by the following rules:
  - If n is 1 then the sequence ends.
  - If n is even then the next term of the sequence is  $n/2$
  - If n is odd then the next term of the sequence is  $(3 * n) + 1$

For example the hailstone sequence of 3 is: 3 10 5 16 8 4 2 1 and the hailstone sequence of 7 is: 7 22 11 34 17 52 26 13 40 20 10 5 16 8 4 2 1