**Introduction To Computing**

**Section B**

**Spring 2018**

**Assignment #2**

**Deadline: 16th March 2018**

## Question #1:

a) Write a program that reads a nonnegative integer and computes and prints its factorial.
b) Write a program that estimates the value of the mathematical constant $e$ by using the formula:

$$e = 1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \dots$$

c) Write a program that computes the value of $e^x$ by using the formula

$$e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$$

## Question #2:

Given n and x, write a C++ program to compute the series

$$s(x) = \frac{1}{x + x^2 + \cdots + x^{n-1}} + \frac{2}{(x+1) + ([x+1])^2 + \cdots + ([x+1])^{n-2}} + \frac{3}{(x+2) + ([x+2])^2 + \cdots + ([x+2])^{n-3}} + \dots + \frac{n-1}{(x+n-2)^1}$$

## Question# 3:

One of the most interesting Number Patterns is Pascal's Triangle. In Pascal triangle $i^{th}$ row contains the total number of combinations of i objects taken j at a time for all j such that $0 \leq j \leq i$ . The total number of combinations of i objects taken j at a time are computed as $\frac{i!}{(i-j)! * j!}$

Below is the Pascal triangle containing all combinations of i objects for $0 \leq i \leq 4$

```
    1
   1 1
  1 2 1
 1 3 3 1
1 4 6 4 1
```

Write a C++ program which takes an integer n from the user and output the first n+1 rows of Pascal triangle.

**Question #4:**

**Print table from 2 to 10 in the form of table like below. (only two are given in you have to print from 2 to 10)**

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|---|---|---|---|---|---|---|---|---|---|
| **2** | **4** | **6** | **8** | **10** | **12** | **14** | **16** | **18** | **20** |
| **3** | **6** | **9** | **12** | **15** | **18** | **21** | **24** | **27** | **30** |

**Question #5:**

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