CS 2073
Computer Programming with Engineering Applications
Assignment 5
Due Monday November 12

1. (100 pts) Write a program that implements the following functions.

```
long factorial(int n)
double exponent(double x, int n)
```

The functions implemented should follow below guidelines

- *Factorial:* Computes $n! = n \times (n-1) \times \ldots \times 1$
- *Exponent:* Computes the sum of first n terms of e^x using the following approximation.

$$f(x,n) = e^x = \sum_{i=0}^{n} \frac{x^i}{i!} = \frac{x^0}{0!} + \frac{x^1}{1!} + \frac{x^2}{2!} + \ldots + \frac{x^n}{n!}$$

Read the value of n and x from the user and compute the first n terms of e^x using the function *exponent*. Print the result returned by the function and compare it with the value obtained by calling the math library function *exp*. When you increase the value of n your result should get closer to the result of *exp*.

Sample execution of the program is given below

```
Enter n and x
20 2.1
Approximation =    8.1753222282
Exact =    8.1661699126
```

Submit your program electronically using the blackboard system

The program you submit should be your own work. Cheating will be reported to office of academic integrity. Both the copier and copiee will be held responsible.