Lab Sheet 2

Complete all of the following tasks described below.

1. Write a Python program that asks the user to enter a non-negative integer and that outputs the factorial of that number. Recall that the factorial of n (denoted $n!$) is defined as follows:

   $$n! = n \cdot (n-1) \cdot (n-2) \cdots 3 \cdot 2 \cdot 1$$

   Do not use the `math.factorial` function. Do not use lists.

2. Write a Python program that asks the user to enter a positive integer value and that determines whether or not that integer is prime or not and prints an appropriate message indicating the outcome. Recall that a prime number has the property that is has no integer divisors other than itself and one. So, 13 is prime as the only positive integers that divide evenly into it are 1 and 13 itself. However 12 is not prime because 2, 3, 4 and 6 all divide evenly into it as well as 1 and 12. Recall that `a % b` gives the remainder when a is divided by b (and hence zero in the case that b divides evenly into a). Base your solution on a simple for loop (not while). Do not use lists. Do not use break.

3. Write a Python program that requsts the user to enter a real number x and that calculates and prints an approximation of the quantity e^x based on the first hundred terms of the infinite sum

   $$e^x = \sum_{k=0}^{\infty} \frac{x^k}{k!}$$

   Recall that $k!$ denotes the factorial of k. Do not use the `math.factorial` function. Hint: It should not be necessary to compute ecah term in the sum from scratch.

Each file should contain a comment that contains a succinct description of what the program(s) does. Use a seperate file for each of the above. It should also include your name and id number. Ensure also that you choose meaningful names for any variables you use.