Discussion Think-Pair-Share Activity:

The first program we need to write in assignment2 asks us to calculate the value of the Euler's number e to the power of x. The result can be approximated using an infinite sum:

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

Your program should use only the basic operations such as addition, subtraction, multiplication and division.

The goal is to compute the value of e^x such that the result has a precision of 3 decimal places.
For example, if the value of $e^{0.9}$ = 2.459603111…,
then your program should output
$e^{0.9}$ = 2.459xxxx (where "x" is any digit, no matter whether it is accurate or not).

Note: Please follow the same programming style as discussed in Lecture 2 for the cosine function (i.e. do not use any loops in your program).

To design this program, let us take a look at the following questions before we start programing.

1. What is the input of this program?

   The power x

2. What is the output of this program?

   The approximate value of e^x

3. How many variables will you use in this program? What are they for? Which type will you use for those variables.

   Two at least.
   double x as the power.
   double result as the approximate value.
   Note: the names of the variables can be different.

4. What will you do to achieve the precision of 3 decimal places? (How many terms will you need from the approximate equation in your program?)

   The more terms we use, the more precision will we have.
   Try having different number of terms until the precision is achieved.
   Be aware of the division of integer numbers and the division of floating point numbers.
   In this program, we need the division of floating point numbers to get the coefficients the terms in the approximate equation.