Lab 10/16

1. Please write a complete program to calculate cos(x), and print out the results. Let user input angle x in radius, complete the cosine function as following,

$$\cos(x) = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \cdots$$

Stop when the added or subtracted term is less than 10^{-12} (1E-12), and show the answer to the 10^{th} decimal place.

2. Please write a complete program to calculate combination. Let user input integer n and k, and to find the following result,

$$C_k^n = \frac{n!}{(n-k)!\,k!} = \frac{\overbrace{n \cdot (n-1) \cdot (n-2) \cdots}^{k}}{\underbrace{1 \cdot 2 \cdot 3 \cdots}_{k}}$$

For example,

$$C_2^{1000} = \frac{1000 \cdot 999}{1 \cdot 2} = 499500$$

3. Please write a program to estimate and print out the first n rows of pascal triangle, where n is read from the keyboard.
For example,

```
n = 10
                    1
                  1   1
                1   2   1
              1   3   3   1
            1   4   6   4   1
          1   5  10  10   5   1
        1   6  15  20  15   6   1
      1   7  21  35  35  21   7   1
    1   8  28  56  70  56  28   8   1
  1   9  36  84 126 126  84  36   9   1
```

Hint: You can use the result of problem 2.