Name: _____ Section: _____

NOTE: In this activity, you will be tested on your knowledge and understanding on the use of FOR loop as the looping construct. Please ensure to write your final answers in this activity sheet, clear and legibly.

Tracing #1: Give the screen output of the given program segment

```
int i, j;
for (i = 2 ; i <= 4; i++)
  for ( j = 5 ; j >= 3; j--)
        printf ("%d \n", i+j);
```

Answer (tracing #1):

Tracing #2: Give the screen output of the following program.

```
int main ()
 {  int num1, num2, x,y;
    num1 = 7; num2 = 4;
    for ( x = 1 ; x <= num2 ; x++)
    {
      for (y = 1 ; y <= num2-x; y++)
            printf("%d ",y);
      for (y = 1; y <= x; y++)
      {
            printf("%d ",num1);
            num1 = (num1 + 1) % 10;
      }
      printf("\n");
    }
    return 0;
 }
```

Answer (tracing #2):

Programming #1: Write a function that accepts an integer value n. The function will display:

1/1 1/2 1/3 1/4 1/5 ... 1/n-1

Answer (Programming#1):

Programming #2: Write function(s) that will compute and display the sum of the factorials of the numbers from 1 to n, where n is a nonnegative integer given by the user.

Example 1: If n = 3, then compute 1!+2!+3! = 9; thus display 9

Example 2: If n = 4, then compute 1!+2!+3!+4! = 33; thus display 33

Answer (Programming#2):

Programming #3: You were hired as a programmer by the Center for Disease Control (CDC). Your task is to write a **simulation program** for studying the population growth of bacteria. The inputs to the program are three numbers indicating (1) *the initial population of bacteria*, (2) *the growth rate per hour*, and (3) *the number of hours the bacteria are exposed*. The program should compute the new population every hour. The output of the program is a list of numbers indicating the population after every hour.

Assume that the inputs corresponding to the initial population of bacteria and the number of hours of exposure are whole numbers (integers), while the growth rate is a single precision floating point value. Assume also that all input values are correct (i.e., there is no need for data validation).

Examples of program interaction are shown below. The user inputs are shown in boldface; the rest are prompts and responses of the computer program.

Example Sample Run #1: The initial population is 100; the growth rate per hour is 3.5% and the number of hours of exposure is 4 hours.

```
Input the initial population of bacteria: 100
Input the growth rate per hour (in percentage): 3.5
Input the numbers of hours the bacteria will be exposed: 4
The population growth of bacteria is as follows:
Population after 1 hour: 103.50
Population after 2 hours: 107.12
Population after 3 hours: 110.87
Population after 4 hours: 114.75

End of bacteria population growth simulation program.
```

Example Sample Run #2: The initial population is 300; the growth rate per hour is 24.75% and the number of hours of exposure is 6 hours.

```
Input the initial population of bacteria: 300
Input the growth rate per hour (in percentage): 24.75
Input the numbers of hours the bacteria will be exposed: 6
The population growth of bacteria is as follows:
Population after 1 hour: 374.25
Population after 2 hours: 466.88
Population after 3 hours: 582.43
Population after 4 hours: 726.58
Population after 5 hours: 906.41
Population after 6 hours: 1130.74

End of bacteria population growth simulation program.
```

Answer (Programming#3):