LAB 3: The Basic of C – Part 1

For each problem below:

a) Analyze the problem by identifying input, output, formula, and condition
b) Design an algorithm to solve the problem using pseudocode (so that you could include the pseudocode in your program)
c) Prepare several, appropriate number of test data to verify the correctness of your program
d) Prepare, compile, link, and execute the program to solve the problem
e) Test your program using the prepared test data
f) Write proper documentation in the program. Include the following information to form a banner at the beginning of your program:

```
/*****************************************************
* Author: your name and student ID                    *
* Course: the course code only                        *
* Section: your specific section number               *
* Date: of lab session                                *
* Brief description:    of what problem the           *
*                       program tries to solve        *
* Pseudocode: write the algorithm to solve the        *
*             problem                                 *
* Test data: provide a set of test data               *
*              - input & expected output              *
*****************************************************/
```

QUESTIONS

1. Write a C program that asks users to enter 3 integer numbers. Print on the screen the numbers in reverse order in the following manner:

```
Enter first number: x
Enter second number: y
Enter third number: z

The numbers in  reverse order: z     y      x
```

*Hint: A good programming practice – set appropriate initial value to each variable during its declaration

2. Re-write the program in (1)and display the output in the following manner:

```
Enter three (3) numbers: x y z

The numbers in reverse order
z
      y
            x
```

3. Re-write the program in (2) but ask users to enter real numbers. Format the output using two decimal points.

4. Write a program that reads two real numbers from user and prints them on the screen several times. Display the output in the following manner:

```
Enter two numbers: x y

---------------------------------------------
                The two numbers
=============================================
      x.x                     y.yyyy
      x.xx                    y.yyy
      y.yyy                   x.xx
      y.yyyy                  x.x
---------------------------------------------
```

5. Using both scanf() and getchar() functions, write a program that read two characters from user and print them on the screen in the following manner:

```
Enter two characters (with a space), then press enter: a b

Enter two characters (without any space), then press enter: xy

The characters are:
a --> b
x --> y
```

(Hint: If you use `getchar()` function, you may need to use the fflush(stdin) function too)

6. Write a program that prints on the screen a smiling face as shown below. Next, evaluate the user’s LIKE to it. Display the input/output as follows:

```

     vvvvvvvvvvvvvv
  / vvvvvvvvvvvvvvvv \
  |   vvvvvvvvvvvv   |
  |                  |
  |   -----   -----  |
 (|     +       +    |)
  |         |        |
   \      \___/     /
     \            /
       \________/

      Smiling Face

Rate this face
How many LIKE?: x

The smiling face has x LIKE
```