Lab 09/23

1. **(A)** Write a program that does the following:

   a. Prompts the user to input five floating-point numbers (real numbers).
   b. Prints the five floating-point numbers.
   c. Adds the five floating-point numbers.
   d. Prints the sum and average of the five floating-point numbers.

   Case I: Complete the program by using any number of variables.
   Case II: Complete the program just by using two variables

   (B) If a five-digit number is input through the keyboard:
   (a). Write a program to calculate the sum of its digits.
   (b). Write a program to print a new number by adding one to each of its digits. For example, if the input number 12391, then the output should be displayed as 23502.

Input/Output Example:

```
(A)
--- Case I ---
Please input five floating-point numbers:
1.2 2.3 3.4 4.5 5.6
Inputs are  1.200000  2.300000  3.400000  4.500000  5.600000
sum = 17.000000
average = 3.400000

--- Case II ---
Please input five floating-point numbers:
Inputs: 1.2
Input is 1.200000
Inputs: 3.4
Input is 3.400000
Inputs: 5.6
Input is 5.600000
Inputs: 7.8
Input is 7.800000
Inputs: 9.11
Input is 9.110000
sum = 27.110001
average = 5.422000

(B)
Please input a five-digit number:
32768

--- (a) ---
Sum of digits of 32768 is 26
--- (b) ---
After adding one to each of its digits of 32768 is 43879.
```

2. (A) Write a program that reads in a temperature in degrees Fahrenheit and prints the corresponding temperature in degrees Celsius. The conversion formula is

$$C = \frac{5}{9}(F\text{-}32)$$

The following is a sample run of the program

Program to convert Fahrenheit to Celsius.
Fahrenheit temperature?   212
Celsius equivalent: 100

(B) Write a program to evaluate the polynomial:

$$f(x) = x^3 + 5x^2 + 10x + 15$$

Read the data for the x from the keyboard and output the value of $f(x)$

Input/Output Example:

```
(A)
Program to convert Fahrenheit to Celsius.
Fahrenheit temperature?  100
Celsius equivalent: 37.777779

(B)
The polynomial is f(x) = x^3 + 5x^2 + 10x + 15
Please input x: 87
f(87) = 697233
```

3. Please write a program to evaluate

$$f(x,y)=2/3*a/b*x^3+(c-d)*y^2$$

Prompts the user to input a, b, x, c, d, and y sequentially, and calculate the value of *f(x,y)* **in coefficients order**. Please just use **3 variables** to complete your program.

Input/Output Example:

```
Input a: 1
Input b: 2
Input x: 3
Input c: 4
Input d: 5
Input y: 6
ans = -27.000000
```

4. Find out the errors of the following codes in part (A) and correct them. Point out and explain the errors when you demonstrate the result to TA. The errors may appear not only in main function but also elsewhere. Complete the codes in part (B) to find the least number of coins that can make change from 1 to 99 dollars. The coins are NT $1, $5, $10 and $50. You can only use **one variable** in part (B).

```
#inlcude <stdio,h>

int mian()
(
    // Part (A)
    int a1 = 10
    int a2 a3 a4 a5
    double 2b = 1.1, 3c = 2.2;
    float student score = 100;

    Printf(Input:\n)
    scanf("%d\n", a2)
    scanf("%d\n", a3)
    scanf("%d %d ", a4 a5)

    Printf("\n")
    Printf("1. %d %d %d %d\n",a1 a2 a3 a4 a5)
    Printf( 2. %lf\n , 3c+2);
    Printf("3. %d\n,a1+10");
    Printf("4. %f\n",student score);
    Printf(' 5. %d\n',a1+2b);

    // Part (B)
    int m;
    printf("Input Money: ");
    scanf("%d", &m);
    printf(......);   // complete this line

    return 0;
)
```

Input/Output Example:

```
Input:
12
34
56 789

1. 10 12 34 56 789
2. 4.200000
3. 20
4. 100.000000
5. 11.100000

Input Money: 99
Output:
50: 1
10: 4
5: 1
1: 4
```