

Lab 09/27

Please do not use math functions, loop, if/else, and array in this Lab.

■ Lab Part

1. Find out the errors of the following codes 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.

Note:

The **number** and **order** of the **format specifier**(%d,%f,...) and **variables** in each line are not in the errors, so do not modify them.

e.g., `Print("The reverse of the number: %d/n/n", ...);` become

`Print("The reverse of the number: %d%d%d%d%d/n/n", ...);` is not allowed.

```
#Include ``studio,h``

int mian()
(
    int n
    int 1a == 87
    int 2a、3a、4a、5a
    double 2b==5,038. double 3c==2.3
    flaot student score=60

    Print(Input a 5-digit number: );
    Scan("%d/n", &n);
    Print("The reverse of the number: %d/n/n", ...);

    printf('Input integers parallel sides and height of trapezoid: ')
    scanf("%d, %d\n", 1a, 2a)
    scanf("%d\n", 3a)
    printf("The area of trapezoid is %d\n\n, [1a+2a]*3a/2")

    printf"Input scores of 5 students:=> "
    scanf(" %d %d %d %d %d", 1a, 2a, 3a, 4a, 5a)

    print('\n');
    print(`The scores of 5 students are %f %f %f %f %f/n``, 5a, 4a, 3a, 2a, 1a);
    print("1. %f\n", c3+10.123);
    print(`2. %lf\n, a1+2`);
    print('3. %d\n', a1*b2);
    print('The pass mark of student is %f./n/n', student score);

    print('The radius is %d and height is %d.\n, a4, a5');
    print('The volume of cylinder is %lf\n'', 4a^2*5a*3.141592654)

    retrun o
)
```

Input/Output Example:

```
Input a 5-digit number: 30928
The reverse of the number: 82903

Input integers parallel sides and height of trapezoid: 13 14 15
The area of trapezoid is 202.500000

Input scores of 5 students:
=> 12 34 56 78 90

The scores of 5 students are 90 78 56 34 12
1. 12.423000
2. 14
3. 60.456000
The pass mark of student is 60.000000.

The radius is 78 and height is 90.
The volume of cylinder is 1720210.473624.

-----
Process exited after 13.6 seconds with return value 0
請按任意鍵繼續 . . . _
```

2. Please write a program to evaluate

$$f(x,y) = 37/29 * (a - b) * x^2/19 + c * d * y^3/(17 + e)$$

Let user input integers a, b, x, c, d, y, e sequentially, and calculate the value of $f(x,y)$ in coefficients order. Please just use 2 int variables and 1 double variable to complete your program.

Input/Output Example:

```
Input a,b,x: 9 5 7
a,b,x are 9 5 7

Input c,d,y,e: 4 6 8 2
c,d,y,e are 4 6 8 2

Ans = 659.898367

-----
Process exited after 6.065 seconds with return value 0
請按任意鍵繼續 . . . _
```

3. There are many students going to take the ICP exam. They are split up into 10 groups according to their student ID.

The rule is as follows:

- 1) Divide 9-digit student ID into three terms 3-digit number and sum up these three numbers into a 4-digit number.
- 2) Reverse the order of the 4-digit number.
- 3) Insert 0 between each digit.
- 4) Treat the 7-digit number as a hexadecimal number and convert it to a decimal number.
- 5) Add up each digit of the decimal number.
- 6) The group number is the last digit plus one.

EX: 111512666 -> 1289 -> 9821 -> (9080201)₁₆ -> (151519745)₁₀ -> 38
-> Group 9

Please write a program to let students input their student id. Then print out the corresponding class number. You only can use **one variable** in this problem!

Input/Output Example:

```
Input student ID: 111512666
Group number: 9

-----
Process exited after 4.992 seconds with return value 0
請按任意鍵繼續 . . . ■
```

Homework Part

4. Write a program that reads in a temperature in degrees Fahrenheit and prints the corresponding temperature in degrees Celsius. The conversion formula is

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

Please follow the operand order in the above equation to implement your code.

If you write this program carelessly, the answer always comes out 0. What bug causes this result? Describe and print out your answer in the last line of the output.

Modification:

- 1) Adding two temperature conversions formula.

from Celsius to Rankine: $R = \frac{9}{5}(C + 273.15)$.

from Rankine to Delisle: $D = \frac{5}{6}(671.67 - R)$.

For each formula, please use **different method** to avoid the bug.

- 2) Again, please follow the operand order in the above equation.

e.g., $C = 5 * (F - 32)/9$ is not acceptable.

Input/Output Example:

```
Program to convert Fahrenheit to Celsius.
Fahrenheit temperature? 3034
Celsius equivalent: 1667.777778
Rankine equivalent: 3493.670000
Delisle equivalent: -2351.666667
The bugs comes from ...

-----
Process exited after 47.41 seconds with return value 0
請按任意鍵繼續 . . . _
```

5. Write a program that allows the user to enter a length of time in seconds. The program should then output the number of hours, minutes, and seconds that corresponds to that number of seconds.
-

Modification:

- 1) Adding the **number of days** into the output. (1 days = 24 hours)

Input/Output Example:

```
Time conversion:
Input time in seconds: 123456

The conversion result of 123456 seconds is
Days: 1
Hours: 10
Minutes: 17
Seconds: 36

-----
Process exited after 3.485 seconds with return value 0
請按任意鍵繼續 . . .
```

6. A Fibonacci number is a member of a set in which each number is the sum of the previous two numbers. (The Fibonacci series describes a form of a spiral.) The series begins:

0, 1, 1, 2, 3, 5, 8, 13, 21, ...

Write a program that calculate and prints the first 10 Fibonacci numbers in the Fibonacci series. **You are to use only three variables:** fib1, fib2, and fib3.

Modification:

- 1) Let user input two values replace the initial value 0, 1 and generate a new sequence like Fibonacci series.
- 2) Prints the first 10 numbers in the new sequence.

Input/Output Example:

```
The first 10 Fibonacci numbers:
0 1
0 1 1 2 3 5 8 13 21 34

-----
Process exited after 120.7 seconds with return value 0
請按任意鍵繼續 . . .
```