Practice 7

§ Functions

```
int print_hello( int printTimes );

int print_hello( int printTimes )
{
    printf("Hello Jacky Prince!\n");
    return printTimes++;
}
```

Return Type − A function may return a value. The **return type** is the data type of the value the function returns. Some functions perform the desired operations without returning a value. In this case, the return type is the keyword ***int***.

Function Name −This is the actual name of the function. The function name and the parameter list together constitute the function signature. In the above case, function name is ***print_hello***.

Parameters − A parameter is like a placeholder. When a function is invoked, you pass a value to the parameter. This value is referred to as actual parameter or argument. The parameter list refers to the type, order, and number of the parameters of a function. Parameters are optional; that is, a function may contain no parameters. Here is ***printTimes***.

Function Body − The function body contains a collection of statements that define what the function does.

§ Recursive

Recursion is the process of repeating items in a self-similar way. In programming languages, if a program allows you to call a function inside the same function, then it is called a recursive call of the function.

§ Fibonacci sequence

Numbers of Fibonacci sequence are known as Fibonacci numbers. First few numbers of series are 0, 1, 1, 2, 3, 5, 8 etc, Except first two terms in sequence every other term is the sum of two previous terms, For example 8 = 3 + 5 (addition of 3, 5). This sequence has many applications in mathematics and Computer Science.

$$F_0 = 0$$

$$F_1 = 1$$

$$F_n = F_{n-1} + F_{n-2}$$

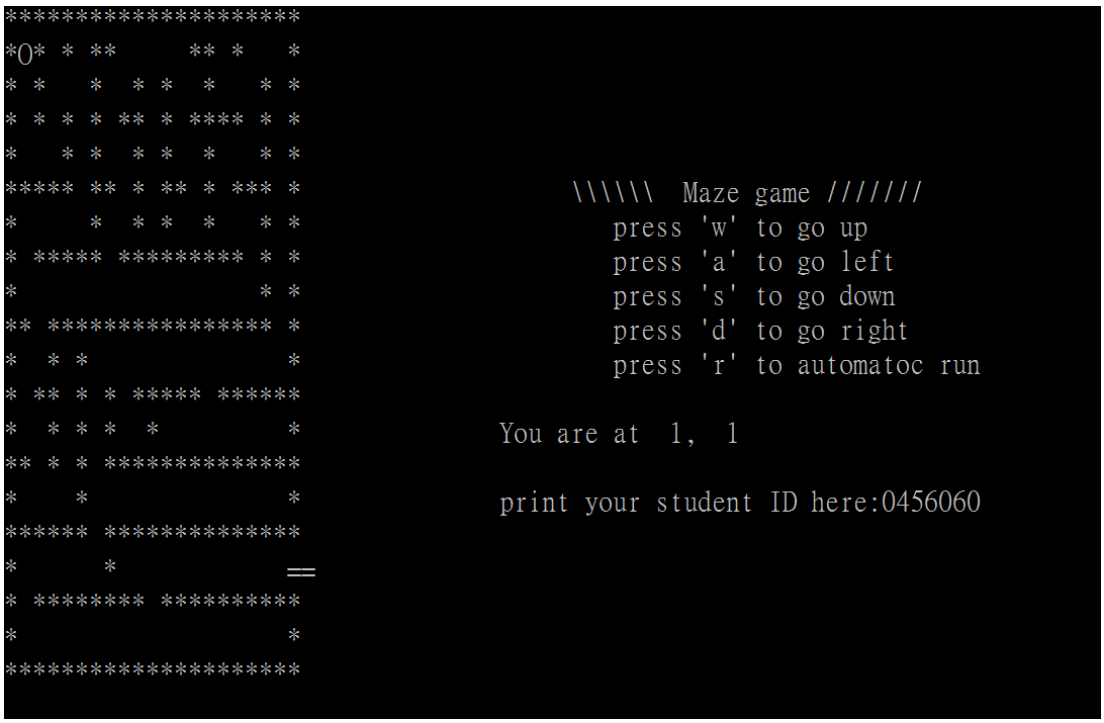
Problem A

Please write a program with **recursive** function to compute Fibonacci sequence. Make sure your code can **repeat query** for calculating Fibonacci numbers. Save your code as studentID_a.c for submission.

```
Enter the number of n
5
f(5) = 5
```

Problem B (function.c)

In the second part of the practice, the code function.c is a simple maze game. Player can use keyboard ‘w’, ‘a’, ‘s’ and ‘d’ to control a character moving in the character maze. Goal is to arrive character, ‘=’. But anyway there is still some bug in the code. Please help us to **revise them**, and **write a report** for the bugs you find.
(Remind: this program is only for windows.)



Answer the following question in your report.

Name and student ID should be on the top of the report.

1. What does the function ***CursorGotoXY()*** do? And what does the variables ***escape_X*** & ***escape_Y*** do?
2. Which function is not used in the program?
3. Modify the function ***print_st_ID()*** to print your student ID after the query **"print your student ID here:"**. Explain how in the report.
4. The path passing by should be deleted. What is the modification?
5. Find a situation that automatic run cannot work. Show how to correct code with one parameter.
6. Let the winning message printed when achieve the goal. Explain what's wrong.
7. Sketch a flowchart of this program.

Problem C (bonus)

Please add a function to randomly generate different maze while pressing the keyboard 'g'.

Submission

Please name your file as following:

Problem A:	0123456_a.c	
Problem B:	0123456_b.c	
	0123456_report.pdf	(or .doc)
Problem C:	0123456_c.c	(optimal for bonus).