**Object-Oriented Programming Language**

**10/06/2016**

# Lab Assignment 2

**Due 2030**

**Lab Grading Policy: Attendance 20%, Score 80%**

In case you have difficulty in finishing the exercises on time, you should upload them before **noon on Saturday** and a penalty of 20% discount will be applied on your score. No late submission is permitted. We will in general post the reference solutions **by Sunday**.

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**Exercise 1 (40%):** Write a C++ program that inputs a triangle with three vertices then determines if the given triangle is a right triangle (直角三角形). You should define the following struct in proper header files with header guard. You should then include these types in your client code and report the vertex with the right angle.

```
struct Vertex {
    double x;
    double y;
};
```

```
struct Triangle {
    Vertex A;
    Vertex B;
    Vertex C;
};
```

Two sample runs of the program are as follows:

```
C:\WINDOWS\system32\cmd.exe
Please input the x & y coordinates of the 1st vertex:
1 1
Please input the x & y coordinates of the 2nd vertex:
-1 1
Please input the x & y coordinates of the 3rd vertex:
0 0
This is a right triangle!
The right angle is at the Vertex 3
請按任意鍵繼續 . . .
```

```
C:\WINDOWS\system32\cmd.exe
Please input the x & y coordinates of the 1st vertex:
1 2
Please input the x & y coordinates of the 2nd vertex:
3 4
Please input the x & y coordinates of the 3rd vertex:
5 6
This is not a right triangle!
請按任意鍵繼續 . . .
```

**Exercise 2 (40%):** Read a sequence of words from an input file `SilentSpring.txt` (given in the course website) and store the values in a `vector`. After you've read all the words, look for whitespace and punctuation. Print the total number of whitespace and punctuation as well as the number of whitespace and punctuation occurred in each line.

```
C:\Windows\system32\cmd.exe
Please input the file name.
input here: NightSpringGame.txt

The file does not exist!
Please input the file name again.
input here: SilentSpring.txt

File was opened correctly.

Total punctuation: 13
Total spaces: 90

Line 1
        Punctuation: 2
        Spaces: 4

Line 2
        Punctuation: 1
        Spaces: 17

Line 3
        Punctuation: 3
        Spaces: 23

Line 4
        Punctuation: 4
        Spaces: 20

Line 5
        Punctuation: 3
        Spaces: 26

Press any key to continue . . .
```

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