Lab #02

Date: 2014/02/26

Recommend websites

- C++ Tutorial 1— http://www.cplusplus.com/doc/tutorial
  - Example: Operators
- C++ Tutorial 2— http://openhome.cc/Gossip/CppGossip
- Good programming style— http://geosoft.no/development/cppstyle.html#General
  - Example: Variable naming rules

Variable naming rules

- **Variable names** must be in mixed case starting with lower case.
  - `savingsAccount, studentId, userName`
- **Constant names** (including enumeration values) must be all uppercase using underscore to separate words
  - `MAX_ITERATIONS, COLOR_RED, PI`

Variable naming rules

例 1： 設有一 C 程式檔 file.c 其內容為：

```
#define MAXSIZE 100
main( )
{   int A[MAXSIZE];   }
```

於編譯時經過前置處理後，該程式變成

```
main( )
{   int A[100];   }
```

- The prefix ***is*** should be used for **boolean** variables and methods.
  - `isSet, isVisible, isFinished, isFound, isOpen`

Preprocessors

- Including header files
  - #include <iostream>
  - #include "C:\myHeader.h"
- Namespaces
  - using namespace std → cout<<
  - std::cout <<

Floating-point number

- Float and Double
  - Float uses 4 bytes to record values between $1.4 * 10^{-45}$ and $3.4 * 10^{38}$.
  - Double uses 8 bytes to record values between $4.9 * 10^{-324}$ and $1.8 * 10^{308}$.
- DON'T compare them for equality.
  - $1.0 == 1.0$

Magic Time

```
#include <iostream>
#include <math.h>
using namespace std;

int main()
{
 double a = 1, b = 3, c = 0.1, d = 0.3;

 double ab = a/b, cd = c/d;

 if (ab == cd){
  cout << "equal" << endl;
 } else {
  cout << "not equal" << endl;
 }
 //printf ("db = %.20f, dc = %.20f", ab, cd);

 return 0;
}
```

If else practice

- What's the difference between Ex1 and Ex2?
- Ex1.

```
if ( a > 0 ){
        //do A
} else if ( b > 0 ){
        //do B
}
```

(a>o, b>o) 、(a>o, b<o) do A
(a<o, b>o) do B
(a<o, b<o) do nothing

- Ex2.

```
if ( a > 0 ){
        //do A
}
if ( b > 0 ){
        //do B
}
```

(a>o, b>o) do A and B
(a>o, b<o) do A
(a<o, b>o) do B
(a<o, b<o) do nothing

Loop practice

- 1.

```
int sum = 0;
for (int i = 1; i <= 100; i++)
        sum += i  ;
cout << sum << endl;
```

Ans: compile error

Loop practice

- 2.

```
int sum = 0;
for (int i = 1; i <= 100; i++)
        sum += i ;
cout << sum << endl;
```

Ans: 1+2+…+100 = 5050

Loop practice

- 3.

```
int sum = 0, i = 1;
while ( i <= 100 ){
        sum += i ;
}
cout << sum << endl;
```

Ans: infinite loop!!!!!!

Loop practice

- 4.

```
int sum = 0, i = 1;
while ( i <= 100 ){
        sum += i ;
        i++;
}
cout << sum << endl;
```

Ans: 1+2+…+100 = 5050

Lab practice

- Write a program which can input a score. Use the rules as follow, and output the grade.
  - [80,100]: A
  - [70, 80): B
  - [60, 70): C
  - [0, 60): F
- If the input is not within the range(0~100), output “Wrong input.” and ask for another input.

- Hint
  - Use “if-else” to judge one’s grade.

Lab practice (cont'd)

- Form a loop which gets 5 scores from an user. Average the scores, and transform the result into letter grade by using the previous rules. Output the grade.

- If any of the scores is lower than 60, he fails anyway.
- If the input is not within the range(0~100), output "Wrong input." and ask for another input.

- Hint
  - Use "if-else" to judge one's grade.
  - You will have the chance to practice "break" and "continue".