

Object oriented programming In C++

Review

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Variable and constant

➤ Variable (변수, 变数) – can change the value

✓ declaration

- `int x;` // we have a 4-byte space in memory with name "x"
- `char c;` // we have a 1-byte space in memory with name "c"
- `float f;` // we have a 4-byte space in memory with name "f"
- `double d;` // we have a 8-byte space in memory with name "d"

✓ Assignment

- `x = 3;` // assign the value 3 to the variable 'x'
- `c = 'c';`
- `f = 2.9;`
- `d = 3.2;`

✓ Compound

- `int x = 3;` // we have a 4-byte space in memory with name "x" and assign the value 3 to the variable 'x'



Variable and constant

➤ Constant (상수, 常数) – can not change the value

✓ integer number, float number, character etc.

- Integer number : 1, 2, 1000, 10000, ...
- Float number : 1.2, 3.0, ...
- Character number: 'a', 'B', ...

✓ symbolic constant

- `#define pi 3.141592`
- `#define N 1000`

✓ “const” keyword

- `const double pi = 3.141592;`
- `const int N = 1000;`



Basic functions

➤ printf (c)

✓ `int x=4, y=6;`

✓ `printf("%d", x);` // print out one integer

✓ `printf("%d %d", x, y);` // print out two integers

➤ cout (c++)

✓ `cout << x;` // print out the x

✓ `cout << x << y;` // print out x and y

Basic functions

➤ scanf (c)

- ✓ `int x, y;`
- ✓ `scanf("%d", &x);` // read one integer
- ✓ `scanf("%d %d", &x, &y);` // read two integers

➤ cin (c++)

- ✓ `cin >> x;` // read one integer
- ✓ `cin >> x >> y;` // read two integers

Basic functions

```
int main() {
    float fNum = 3.1415926;
    printf("%10.2f\\n", fNum);
    cout << fNum << endl;
    return 0;
}
```

cout << setw(10) << setprecision(3) << fNum << endl;

C:\WINDOWS\system32\cmd.exe

```
3.14
3.14159
계속하려면 아무 키나 누르십시오 . . .
```

C:\WINDOWS\system32\cmd.exe

```
3.14
3.14
계속하려면 아무 키나 누르십시오 . . .
```

Basic functions

➤ Ex 1:

```
printf("it is %d\n", x);  
printf("they are %d and %d\n", x, y);
```

```
int n;  
scanf("%d", &n)  
printf("it is %d\n", n);
```

```
#include <stdio.h>  
int main(void) {  
    int n;  
    while (scanf("%d", &n)) {  
        printf("%d\n", n);  
    }  
    return 0;  
}
```

C++
style



Control flow statements

➤ *if* statements

```
if (x > y){  
    printf("%d is bigger than %d\n", x, y);  
}
```

➤ *if-else* statements

```
if (x > y){  
    printf("%d is bigger than %d\n", x, y);  
} else {  
    printf("%d is smaller than %d\n", x, y);  
}
```

Control flow statements

➤ *if-else if* statements

```
if (x > 90){  
    printf("the grade is A\n");  
} else if (x > 80){  
    printf("the grade is B\n");  
} else if (x > 70){  
    printf("the grade is C\n");  
} else {  
    printf("the grade is F\n");  
}
```

Control flow statements

➤ Nested *if* statements

```
if ( x > 50){  
    if (x > 80){  
        printf("%d is greater than 80\n", x);  
    } else {  
        printf("%d is between 50 and 80\n", x);  
    }  
}
```

Control flow staten

➤ *switch – case* statements

```

C:\Windows\system32\cmd.exe
Select the country
<1> Korea, <2> Japan
2
Select the City: <1> Osaka <2> Tokyo
2
you select the Korea Tokyo
계속하려면 아무 키나 누르십시오 . . .

```

```

C:\Windows\system32\cmd.exe
Select the country
<1> Korea, <2> Japan
1
Select the City: <1> Seoul, <2> Incheon
2
you select the Korea Incheon
계속하려면 아무 키나 누르십시오 . . .

```

```

1  //
2  #include <iostream>
3  using namespace std;
4  void main()
5  {
6      int country, city;
7      cout<<"Select the country"<<endl;
8      cout<<"(1) Korea, (2) Japan "<<endl;
9      cin>>country;
10     switch(country)
11     {
12     case 1:
13         cout<<"Select the City: (1) Seoul, (2) Incheon"<<endl;
14         cin>>city;
15         if (city==1)
16             cout<<"you select the Korea Seoul"<<endl;
17         else
18             cout<<"you select the Korea Incheon"<<endl;
19         break;
20     case 2:
21         cout<<"Select the City: (1) Osaka (2) Tokyo"<<endl;
22         cin>>city;
23         if (city==1)
24             cout<<"you select the Japan Osaka"<<endl;
25         else
26             cout<<"you select the Japan Tokyo"<<endl;
27         break;
28     default:
29         cout<<"Please select the 1 or 2"<<endl;
30     }
31 }

```

Control flow statements

➤ *for* loop statement

```
#include <iostream>
using namespace std;
void main() {
    int x;
    int m=0;      // m always remember the maximum number so far. init with zero.
    for(int i=0;i<10;i++){
        scanf("%d", &x);
        if (x > m){ // we found a number bigger than max
            m = x; // now m should remember this new max
        } //end if
    } // end for
    printf("the max is %d\n", m);
} // end main function
```

```
C:\Windows\system32\cmd.exe
3
4
3
4
4
4
4
54
34
3
2
the max is 54
계속하려면 아무 키나 누르십시오 . . .
```



Control flow statements

➤ infinite *for* loop statement

```
#include <iostream>
using namespace std;
void main() {
    int i=0;
    for (;;) {
        if (i == 100)
            break;
        else
            cout<<i<<endl;
        i++;
    } // end for
}
```

```
C:\Windows\system32\cmd.exe
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
계속하려면 아무 키나 누르십시오 . . .
```

Ex 1

1. Variables

- 1) Declare two integer variables: x and y . Store 10 and 20 to x and y . Output the values.
- 2) Modify 1) such that the program stores the sum of x and y into another variable, z . Output z .
- 3) Modify 1) such that the program displays the result of $x+y$, $x-y$, $x*y$, and x/y .
- 4) Declare the float constant pi . Store 3.14 to pi .

Ex 2

2. Data type

- 1) Read two integers and display in reverse.

Enter two numbers

40 23

they are 23 and 40.

- 2) Read two numbers and display the result of sum, sub, multiplication, division.

Enter two numbers

40 20

sum: 60 sub: 20 mul: 800 div: 2

HW#5

1. if-else or switch

- 1) Read 3 numbers and display the biggest one.

Enter 3 numbers

12 44 23

44 is the greatest.

- 2) Read two numbers and tell if the first one is a factor of the second one.

Enter two numbers

4 12

4 is a factor of 12.

- 3) Design the following menu system. Your code should display "there is no such menu" if the user selects an illegal menu.

Enter a menu number: rice(1), bread(2), drink(3), noodle(4)

3

You have selected a drink.



HW#5

1. if-else or switch

4) Implement following menu system.

```
food
  Korean
    Rice, Bulgogi
  American
    Hamburger, Salad
  Chinese
    Noodle, Dimsum
drink
  Cola, Orange juice, Water
```

Select a menu

1. food 2. drink

1

You have selected food. Which food?

1. Korean 2. American 3. Chinese

2

You have selected an American food. Which American food?

1. Hamburger 2. Salad

1

Enjoy your hamburger!

menu

execution

HW #5

2. Loop statements

- 1) Read 10 numbers and output the maximum and its location.

Enter 10 numbers

32 44 88 102 33 21 88 0 1 2

The max: 102

The location of max: 3

- 2) Read two number and display the bigger one. Repeat until the two numbers are same.

- 3) Write a calculator as follows.

1. add 2. sub 3. mul 4. div 5. quit

select operation

1

enter two numbers

12 22

the sum is 34

1. add 2. sub 3. mul 4. div 5. quit

select operation

3



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