Object oriented programming In C++

Review

Professor 최학남

xncui@inha.ac.kr

Office: high-tech 401

Contents

- Variable and constant
- Basic functions
  - ✓ *printf*() function
  - ✓ *scanf*() function
- Control flow statements
  - ✓ Conditional statements
    - *if-else* statement
    - *switch* statement
  - ✓ *break* and *continue* statement
  - ✓ Loop statements
    - *while* statement
    - *do-while* statement
    - *for* statement

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

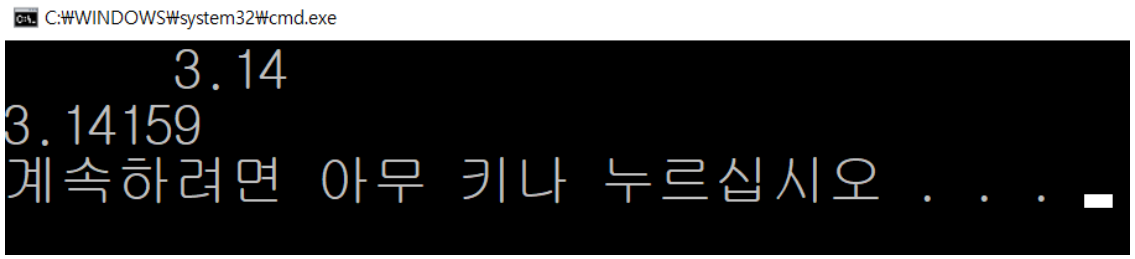
- scanf (c)
  - ✓int x, y;
  - ✓scanf("%d", &x); // read one integer
  - ✓scanf("%d %d", &x, &y); // read two integers

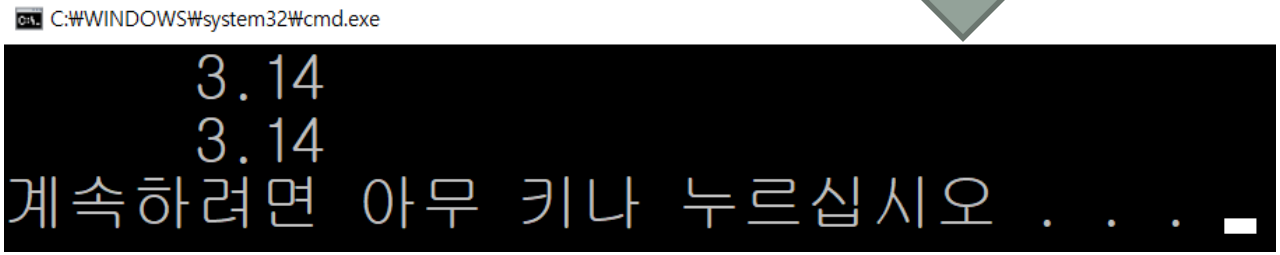
- cin (c++)
  - ✓cin >> x; // read one integer
  - ✓cin >> x >> y; // read two integers

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;
```





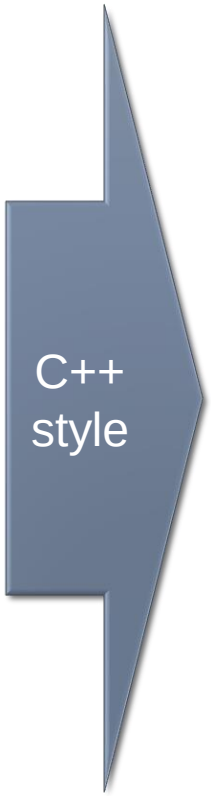
Basic functions

- 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;
}
```



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");
}
```

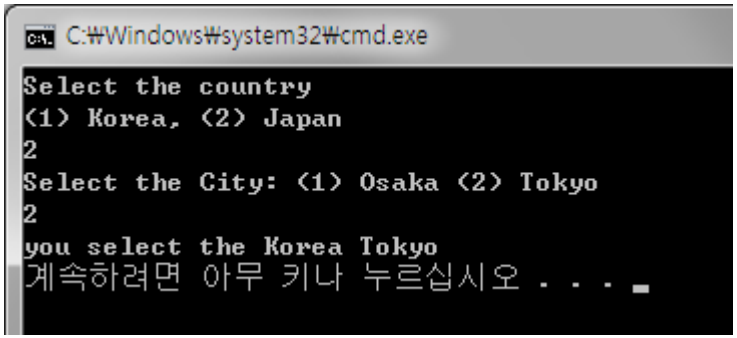
Control flow statements

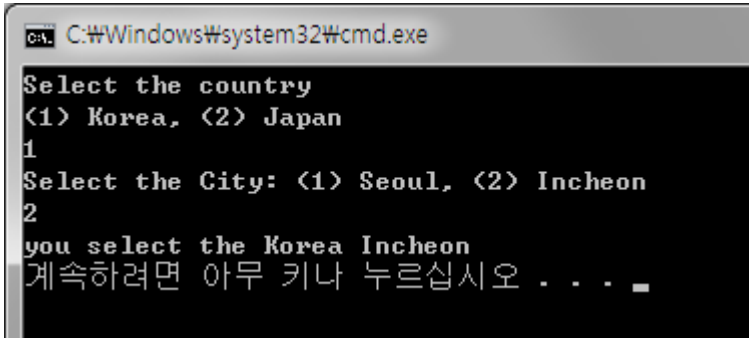
- Nested *if* statements

```
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 statem

- *switch – case* statements



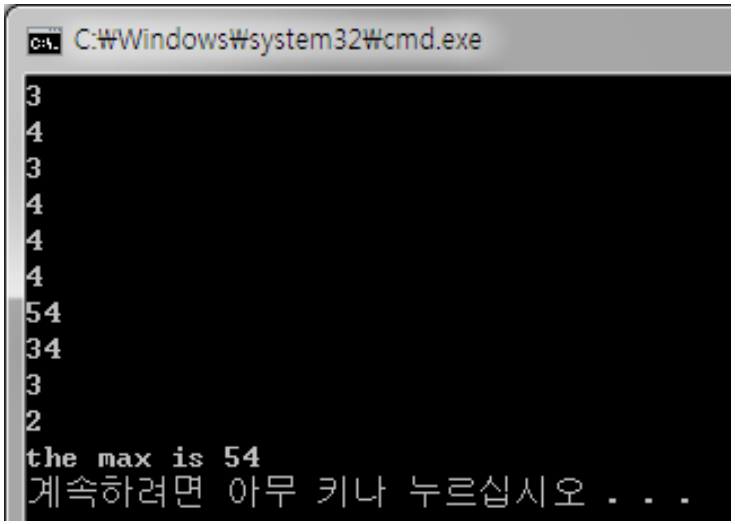



```
1  ///*
2  #include <iostream>
3  using namespace std;
4  void main()
5  {
6      int country, city;
7      cout<<"Select the country"<<endl;
8      cout<<"(1) Korea, (2) Japan "<<endl;
9      cin>>country;
10     switch(country)
11     {
12     case 1:
13         cout<<"Select the City: (1) Seoul, (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

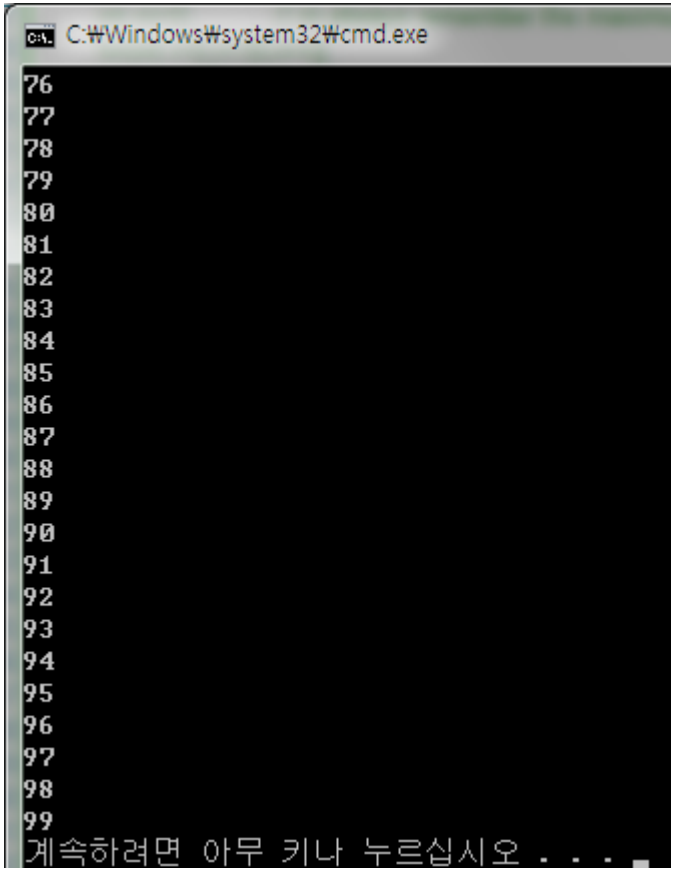
```
#include <iostream>
using namespace std;
void main() {
    int x;
    int m=0;          // m always remember the maximum number so far. init with zero.
    for(int i=0;i<10;i++){
        scanf("%d", &x);
        if (x > m){  // we found a number bigger than max
            m = x;   // now m should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



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
}
```



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
```

menu

```
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!
```

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
```