

UEE1302(1066) F12: Introduction to Computers and Programming

Function



What you will learn from Lab 6

In this laboratory, you will learn what is function..

TASK 6-1 : MATH CALCULATION

- ✓ Compile lab6-1.cpp and execute program lab6-1.

```
//File: lab6-1.cpp
#include <iostream>
using namespace std;

int main()
{
    double x;
    cout << "Enter a value: ";
    cin >> x;

    cout << "sqrt(" << x << ") = " << sqrt(x) << endl;
    cout << "floor(" << x << ") = " << floor(x) << endl;
    cout << "ceil(" << x << ") = " << ceil(x) << endl;

    return 0;
}
```

- Note: If any error occurs, please correct them. Hint: #include <cmath>

TASK 6-2 : FUNCTION DECLARATION

- ✓ Please execute the program lab6-2. Note that the program contains some errors. Please check carefully the arrangement of functions in the program to correct the possible error(s).

```
//File: lab6-2.cpp
#include <iostream>
using namespace std;

int main()
{
    beginning();
    return 0;
}

void beginning();
void beginning()
```

```
{
    cout << "It was the beginning..." << endl;
    ending();
}
void ending();
void ending()
{
    cout << "... it was the ending." << endl;
}
```

- What can you conclude from observing the arrangement of function declarations?

TASK 6-3 : FUNCTION CALL

- ✓ Please predict the result of program lab6-3, and then execute this program to compare the result on screen with what you predict.

```
//File: lab6-3.cpp
#include <iostream>
using namespace std;

int func1(int x);
int func2(int x);

int main()
{
    int a;
    cout << "Enter a value (>0): ";
    cin >> a;

    cout << "func1(" << a << ") = " << func1(a) << endl;
    cout << "func2(" << a << ") = " << func2(a) << endl;

    return 0;
}

int func1(int x)
{
    return 2*x+5;
}

int func2(int x)
```

```
{  
    int sum = 0;  
    for (int idx = 0; idx < x; idx++)  
    {  
        sum += idx;  
    }  
    return sum;  
}
```

TASK 6-4 : COMPILE FUNCTIONS IN SEPARATE FILES

- ✓ Please do the following procedure to compile two files into one executable program.
- Partition the source file lab6-3.cpp into two files lab6-4.cpp and lab6-4.h.

```
//File: lab6-4.cpp  
#include <iostream>  
using namespace std;  
  
int func1(int x);  
int func2(int x);  
  
int main()  
{  
    int a;  
    cout << "Enter a value (>0): ";  
    cin >> a;  
  
    cout << "func1(" << a << ") = " << func1(a) << endl;  
    cout << "func2(" << a << ") = " << func2(a) << endl;  
  
    return 0;  
}
```

```
//File: lab6-4.h  
int func1(int x)  
{  
    return 2*x+5;  
}  
  
int func2(int x)
```

```
{  
    int sum = 0;  
    for (int idx = 0; idx < x; idx++)  
    {  
        sum += idx;  
    }  
    return sum;  
}
```

- Compile the two files with typing the command:
 - ✧ `>g++ lab6-4.cpp -o lab6-4`
- Hint: add `#include "lab6-4.h"` in `lab6-4.cpp`

TASK 6-5 : EXERCISES

- ✓ Write a C++ program to calculate the answer of the following equations.

$$S_1 = 1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n}$$

$$S_2 = 1 + \frac{1}{2!} + \frac{1}{3!} + \dots + \frac{1}{n!} \quad \text{where } n! = 1 * 2 * \dots * n$$

where n is a variable determined by users. Please meet the requirements as follows.

```
> ./ex6-1
Enter an integer value for the number of order n:
100
The result of S1 and S2 are:
S1 = 5.18738
S2 = 1.71828
>
```

- Note: Please use function in your program
- Note: Be careful with the type coercion and the precision digit.

- ✓ Design a perimeter calculation system which computes the perimeter of a rectangular, square, or circle, respectively. Please implement the computations into different functions. Both the selection and the repetition should be utilized to complete the task. An example for the required output format is shown as follows,

```
> ./ex6-2
=====
1.Rectangular 2.Square 3.Circle 4.Exit
Choose the type of perimeter you want to calculate:
1
Please enter the Length and Width respectively.
5
10
The perimeter of a rectangular with (Length,Width) = (5.000, 10.000) is
30.000
=====
1.Rectangular 2.Square 3.Circle 4.Exit
Choose the type of perimeter you want to calculate:
2
Please enter the Length.
6.2
The perimeter of a square with (Length) = (6.200) is 24.800
=====
1.Rectangular 2.Square 3.Circle 4.Exit
Choose the type of perimeter you want to calculate:
```

```
3
Please enter the radius of the circle.
5
The perimeter of a circle with (Radius) = (5.000) is 78.540
=====
1.Rectangular 2.Square 3.Circle 4.Exit
Choose the type of perimeter you want to calculate:
8
Please follow the instruction carefully.
=====
1.Rectangular 2.Square 3.Circle 4.Exit
Choose the type of perimeter you want to calculate:
4
Goodbye!
>
```

➤ Note: You should define PI as 3.1415926 for computing the case of circle by :

✧ `const double PI = 3.1415926`