计算机与信息工程学院

C++程序设计入门

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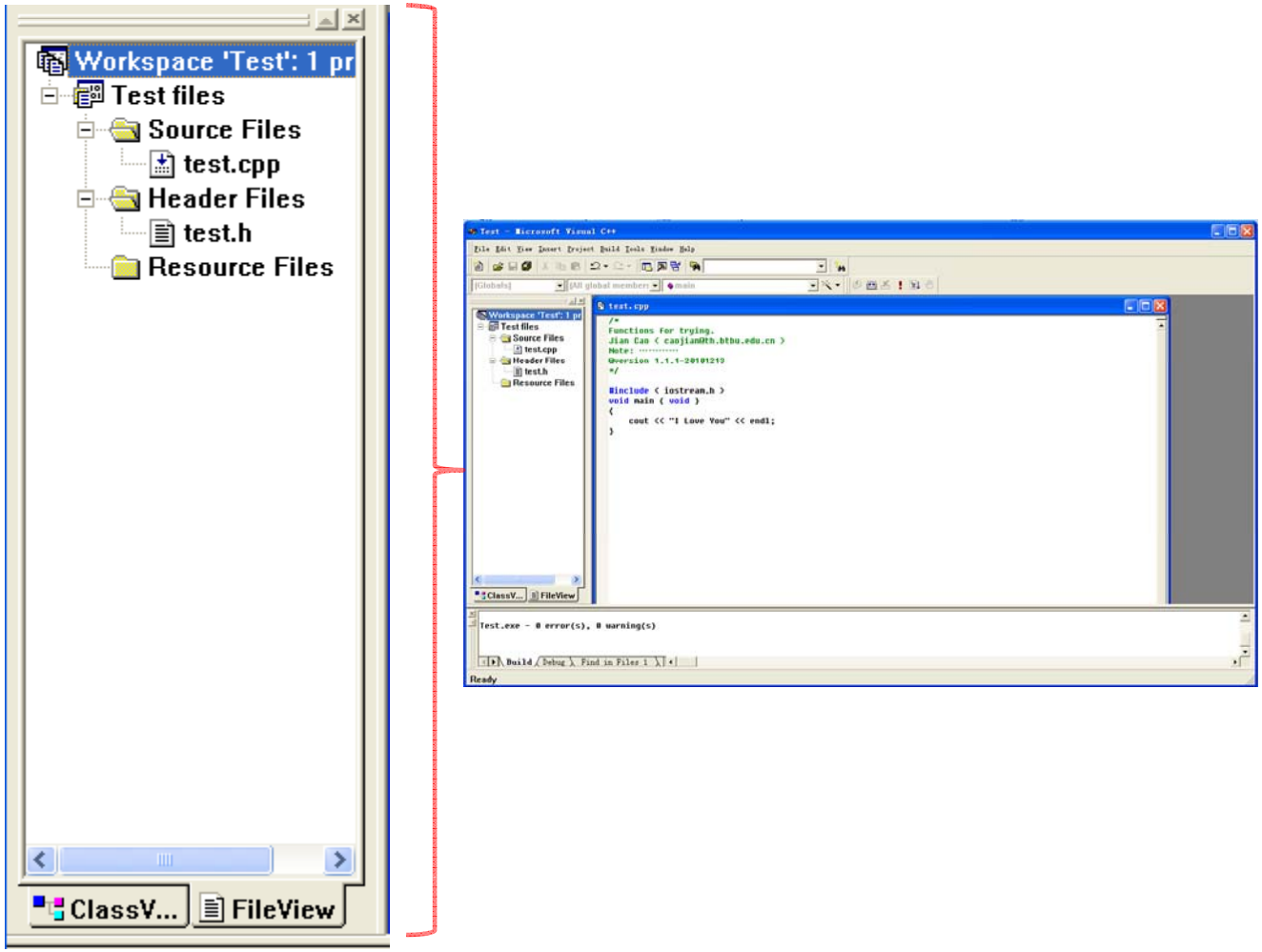
程序文件组织

- .h文件
- .cpp文件
- 其他文件



源程序文件结构

test.cpp

```
/*
Functions for trying.
Jian Cao < caojian@th.btbu.edu.cn >
Note: ……
version 1.1.1-20101213
*/


#include < iostream.h >
void main ( void )
{
        // “I Love You” will be listed on the screen
        cout << “I Love You” << endl;
}
```


```
I Love You
Press any key to continue
```

源程序文件结构

```
#include < iostream.h >
void main ( void )
{
    cout << "**********************************" << endl;
    cout << "*****                        *****" << endl;
    cout << "*****     I Love You         *****" << endl;
    cout << "*****                        *****" << endl;
    cout << "**********************************" << endl;
}
```

```
**********************************
*****                        *****
*****     I Love You         *****
*****                        *****
**********************************
Press any key to continue
```

源程序文件结构

求两个整数之和

```
//This is a C++ program.
//Functions for calculating the sum of two integer numbers
#include < iostream.h >
void main ( void )
{
    int x, y, z;
    cout << "Enter two integer numbers: " << endl;
    cin >> x >> y;
    z = x + y;
    cout << "x + y = " << z <<endl;
}
```

预处理命令

主函数

整型变量

字符串常量

运算语句

输入和输出

数据类型

常用数据类型举例

char	1字节
short	2字节
int	4字节
float	4字节
double	8字节

条件语句

求两个数之和或积

```
Enter two numbers:
2.5
3.6
Enter the operator ( '+' or '*'):
+
x + y = 6.1
Press any key to continue
```

```
//This is a C++ program.
//Functions for calculating the sum or product of two numbers
#include < iostream.h >
void main ( void )
{
    double x, y, z;
    char op;
    cout << "Enter two numbers: " << endl;
    cin >> x >> y;
    cout << "Enter the operator ( '+' or '*'): " << endl;
    cin >> op;
    //Select the operator
    if ( op == '+')
        z = x + y;
    else
        z = x * y;
    cout << "x " << op << " y = " << z <<endl;
}
```

条件语句

求两个数之和或积

```
Enter two numbers:
3.6
5.2
Enter the operator ( '+' or '*'):
_
Enter the wrong operator ( The operator must be '+' or '*')
Press any key to continue
```

```
//This is a C++ program.
//Functions for calculating the sum or product of two numbers
#include < iostream.h >
void main ( void )
{
    double x, y, z;
    char op;
    cout << "Enter two numbers: " << endl;
    cin >> x >> y;
    cout << "Enter the operator ( '+' or '*'): " << endl;
    cin >> op;
    //Select the operator
    if ( op == '+')
    {
        z = x + y;
        cout << "x " << op << " y = " << z <<endl;
    }
    else if ( op == '*')
    {
        z = x * y;
        cout << "x " << op << " y = " << z <<endl;
    }
    //Offer the prompt when the operator is wrong
    else
        cout << "Enter the wrong operator ( The operator must be '+' or '*') " << endl;
}
```

开关语句

求两个数之和或积

```
//This is a C++ program.
//Functions for calculating the sum or product of two numbers
#include < iostream.h >
void main ( void )
{
    double x, y, z;
    char op:
    cout << "Enter two numbers: " << endl;
    cin >> x >> y;
    cout << "Enter the operator ( '+' or '*'): " << endl;
    cin >> op;
    //Select the operator
    switch ( op ){
    case '+' :
        z = x + y;
        cout << "x " << op << " y = " << z <<endl;
        break;
    case '*' :
        z = x * y;
        cout << "x " << op << " y = " << z <<endl;
        break;
    //Offer the prompt when the operator is wrong
    default :
        cout << "Enter the wrong operator ( The operator must be '+' or '*') " << endl;
    }
}
```

注意break

循环语句

多次求两个数之和或积

```
//This is a C++ program.
//Functions for calculating the sum or product of two numbers
#include < iostream.h >
void main ( void )
{
    double x, y, z;
    char op , c;
    do
    {
        cout << "Enter two numbers: " << endl;
        cin >> x >> y;
        cout << "Enter the operator ( '+' or '*'): " << endl;
        cin >> op;
        //Select the operator
        switch ( op ){
        case '+' :
            z = x + y;
            cout << "x " << op << " y = " << z <<endl;
            break;
        case '*' :
            z = x * y;
            cout << "x " << op << " y = " << z <<endl;
            break;
        //Offer the prompt when the operator is wrong
        default :
            cout << "Enter the wrong operator ( The operator must be '+' or '*') " << endl;
        }
        cout << "Continue ( Enter 'Y' or 'N'): " << endl;
        cin >> c;
    } while ( c == 'Y');
}
```

```
Enter two numbers:
3.6
10.2
Enter the operator ( '+' or '*'):
*
x * y = 36.72
Continue ( Enter 'Y' or 'N'):
Y
Enter two numbers:
12.1
56.7
Enter the operator ( '+' or '*'):
+
x + y = 68.8
Continue ( Enter 'Y' or 'N'):
N
Press any key to continue
```

循环语句

多次求两个数之和或积

```
#include < iostream.h >
void main ( void )
{
    double x, y, z;
    char op , c;
    bool bo = true;
    while ( bo )
    {
        cout << "Enter two numbers: " << endl;
        cin >> x >> y;
        cout << "Enter the operator ( '+' or '*'): " << endl;
        cin >> op;
        switch ( op ){
        case '+' :
            z = x + y;
            cout << "x " << op << " y = " << z <<endl;
            break;
        case '*' :
            z = x * y;
            cout << "x " << op << " y = " << z <<endl;
            break;
        default :
            cout << "Enter the wrong operator ( The operator must be '+' or '*') " << endl;
        }
        cout << "Continue ( Enter 'Y' or 'N'): " << endl;
        cin >> c;
        if ( c != 'Y')
            bo = false;
    }
}
```

循环语句

多次求两个数之和或积

```
#include < iostream.h >
void main ( void )
{
    double x, y, z;
    char op , c;
    int Con = 1;
    while ( Con )
    {
        cout << "Enter two numbers: " << endl;
        cin >> x >> y;
        cout << "Enter the operator ( '+' or '*'): " << endl;
        cin >> op;
        switch ( op ){
        case '+' :
            z = x + y;
            cout << "x " << op << " y = " << z <<endl;
            break;
        case '*' :
            z = x * y;
            cout << "x " << op << " y = " << z <<endl;
            break;
        default :
            cout << "Enter the wrong operator ( The operator must be '+' or '*') " << endl;
        }
        cout << "Continue ( Enter 'Y' or 'N'): " << endl;
        cin >> c;
        if ( c != 'Y')
            Con = 0;
    }
}
```

循环语句

多次求两个数之和或积

```
#include < iostream.h >
void main ( void )
{
    double x, y, z;
    char op , c;
    int i = 1;
    for ( ; i == 1; )
    {
        cout << "Enter two numbers: " << endl;
        cin >> x >> y;
        cout << "Enter the operator ( '+' or '*'): " << endl;
        cin >> op;
        switch ( op ){
        case '+' :
            z = x + y;
            cout << "x " << op << " y = " << z <<endl;
            break;
        case '*' :
            z = x * y;
            cout << "x " << op << " y = " << z <<endl;
            break;
        default :
            cout << "Enter the wrong operator ( The operator must be '+' or '*') " << endl;
        }
        cout << "Continue ( Enter 'Y' or 'N'): " << endl;
        cin >> c;
        if ( c != 'Y')
            i = 0;
    }
}
```

循环语句

P77 百钱百鸡

```
#include < iostream.h >
void main ( void )
{
    int cock, hen, chicken;
    for ( cock = 1; cock < 16; cock++ )          //买的公鸡数在1~16只之间
        for ( hen =1; hen < 31; hen++)           //买的母鸡数在1~31只之间
        {
            chicken = 100 - cock - hen;          //小鸡的数目是3的倍数
            if ( ( 5*cock + 3*hen + chicken/3 == 100 ) && ( chicken % 3 ==0 ))
            {
                cout << "cock = " << cock << "  ";
                cout << "hen = " << hen << "  ";
                cout << "chicken = " << chicken << endl;
            }
        }
}
```

函数调用

求两个整数之和

```
#include < iostream.h >
void main ( void )
{
    int x, y, z;
    cout << "Enter two integer numbers: " << endl;
    cin >> x >> y;
    z = x + y;
    cout << x << " + " << y << " = " << z <<endl;
}
```

函数调用

求两个整数之和

```
#include < iostream.h >
int add ( int i , int j )
{
    return ( i + j );
}
void main ( void )
{
    int x, y, z;
    cout << "Enter two integer numbers: " << endl;
    cin >> x >> y;
    z = add ( x , y );
    cout << x << " + " << y << " = " << z <<endl;
}
```

函数调用

求两个整数之和

```
#include < iostream.h >
int add ( int i , int j );

void main ( void )
{
    int x, y, z;
    cout << "Enter two integer numbers: " << endl;
    cin >> x >> y;
    z = add ( x , y );
    cout << x << " + " << y << " = " << z <<endl;
}

int add ( int i , int j )
{
    return ( i + j );
}
```

```
int add ( int , int );
```

```
int add ( int x , int y )
{
    return ( x + y );
}
```

函数调用

求两个整数之和

```
#include < iostream.h >
int add ( int , int );          // The function declaration

void main ( void )
{
    int x, y, z;
    cout << "Enter two integer numbers: " << endl;
    cin >> x >> y;
    z = add ( x , y );
    cout << x << " + " << y << " = " << z <<endl;
}

int add ( int x , int y )
{
    int z;
    z = x + y;
    x = 0;
    y = 0;
    return z;
}
```

实参

形参

函数的传值调用

函数调用

书上P86 例子

```
主函数: a = 4 , b = 7   函数 swap: x = 7 , y = 4        主函数: a = 4 , b = 7
Press any key to continue
```

```
#include < iostream.h >
void swap ( float , float );            // The function declaration

void main ( void )
{
    float a = 4 , b = 7;
    cout << "主函数: a = " << a << " , b = " << b << '\t';
    swap ( a , b );
    cout << "主函数: a = " << a << " , b = " << b << '\n';
}

void swap ( float x , float y )
{
    float t;
    t = x;
    x = y;
    y = t;
    cout << "函数 swap: x = " << x << " , y = " << y << '\t';
}
```

函数调用

函数的引用调用

```
主函数: a = 4 , b = 7   函数 swap: x = 7 , y = 4        主函数: a = 7 , b = 4
Press any key to continue
```

```
#include < iostream.h >
void swap ( float & , float & );            // The function declaration

void main ( void )
{
    float a = 4 , b = 7;
    cout << "主函数: a = " << a << " , b = " << b << '\t';
    swap ( a , b );
    cout << "主函数: a = " << a << " , b = " << b << '\n';
}

void swap ( float &x , float &y )
{
    float t;
    t = x;
    x = y;
    y = t;
    cout << "函数 swap: x = " << x << " , y = " << y << '\t';
}
```

函数调用

求两个整数的平方和 $x^2 + y^2$

```
#include < iostream.h >
int add ( int , int );
int power_of_2 ( int );

void main ( void )
{
    int x, y, xx , yy , z;
    cout << "Enter two integer numbers: " << endl;
    cin >> x >> y;
    xx = power_of_2 ( x );
    yy = power_of_2 ( y );
    z = add ( xx , yy );
    cout << "( x * x ) + ( y * y ) = " << z <<endl;
}

int add ( int i , int j )
{
    return ( i + j );
}


int power_of_2 ( int i )
{
    return ( i * i );
}
```

```
Enter two integer numbers:
9
6
( x * x ) + ( y * y ) = 117
Press any key to continue
```

函数调用

求两个整数的平方和 x^2+y^2

```
#include < iostream.h >
int sum_of_sq ( int , int );
int add ( int , int );
int power_of_2 ( int );

void main ( void )
{
    int x, y;
    cout << "Enter two integer numbers: " << endl;
    cin >> x >> y;
    cout << "( x * x ) + ( y * y ) = " << sum_of_sq ( x , y ) <<endl;
}

int sum_of_sq ( int i, int j)
{
    int a , b , c;
    a = power_of_2 ( i );
    b = power_of_2 ( j );
    c = add ( a , b );
    return c;
}

int add ( int i , int j )
{
    return ( i + j );
}


int power_of_2 ( int i )
{
    return ( i * i );
}
```

函数调用

test.cpp

```
/*
Functions for trying.
Jian Cao < caojian@th.btbu.edu.cn >
Note: ···········
@version 1.1.1-20101213
*/

#include < iostream.h >
#include "test.h"

void main ( void )
{
    int x, y;
    cout << "Enter two integer numbers: " << endl;
    cin >> x >> y;
    cout << "( x * x ) + ( y * y ) = " << sum_of_sq ( x , y ) <<endl;
}
```

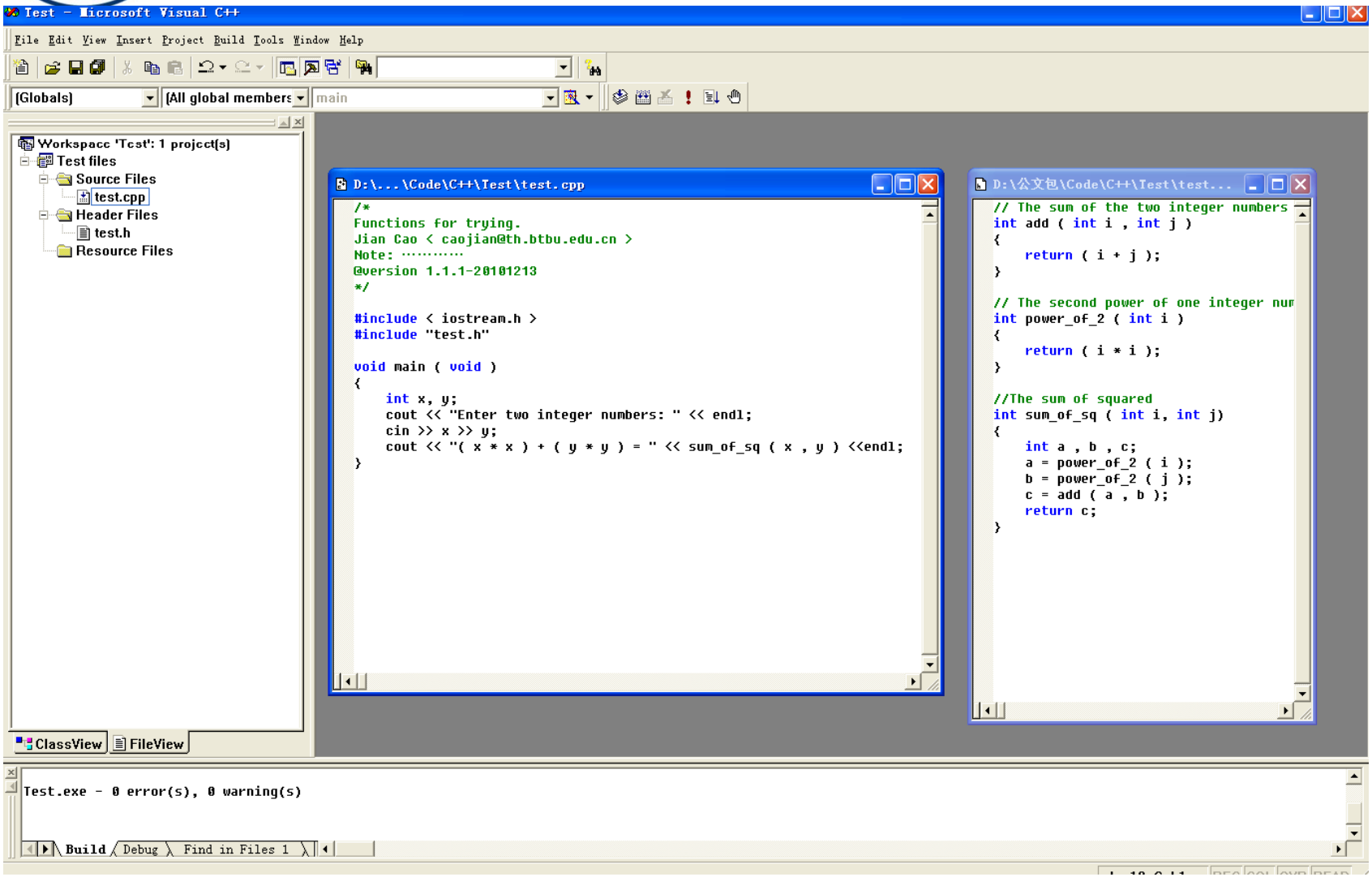
test.h

```
// The sum of the two integer numbers
int add ( int i , int j )
{
    return ( i + j );
}

// The second power of one integer nu
int power_of_2 ( int i )
{
    return ( i * i );
}

//The sum of squared
int sum_of_sq ( int i, int j)
{
    int a , b , c;
    a = power_of_2 ( i );
    b = power_of_2 ( j );
    c = add ( a , b );
    return c;
}
```

函数调用


Test - Microsoft Visual C++
File Edit View Insert Project Build Tools Window Help
(Globals)
(All global members
main
Workspace 'Test': 1 project(s)
Test files
Source Files
test.cpp
Header Files
test.h
Resource Files
ClassView
FileView
D:\...\Code\C++\Test\test.cpp
/*
Functions for trying.
Jian Cao < caojian@th.btbu.edu.cn >
Note: ·····
@version 1.1.1-20101213
*/
#include < iostream.h >
#include "test.h"
void main (void)
{
int x, y;
cout << "Enter two integer numbers: " << endl;
cin >> x >> y;
cout << "(x * x) + (y * y) = " << sum_of_sq (x , y) <<endl;
}
D:\公文包\Code\C++\Test\test...
// The sum of the two integer numbers
int add (int i , int j)
{
return (i + j);
}
// The second power of one integer num
int power_of_2 (int i)
{
return (i * i);
}
//The sum of squared
int sum_of_sq (int i, int j)
{
int a , b , c;
a = power_of_2 (i);
b = power_of_2 (j);
c = add (a , b);
return c;
}
Test.exe - 0 error(s), 0 warning(s)
Build
Debug
Find in Files 1

书看千行不如手敲一行！