程设第十三次作业

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1. 将第六题程序做如下修改：
   - 将main函数第2行改为const Student stud(101, 78.5)

     报错
   - 在上面基础上修改，使之能正常运行，用change函数修改数据成员num和score的值

```
#include<iostream>
using namespace std;
class Student {
public:
    Student(int n, float s) :num(n), score(s) {}
    void change(int n, float s)const { num = n; score = s; }
    void display()const { cout << num << " " << score << endl; }
private:
    mutable int num;
    mutable float score;
};
int main() {
    const Student stud(101, 78.5);
    stud.display();
    stud.change(101, 80.5);
    stud.display();
    return 0;
}
```

     运行结果如下：

```
101 78.5
101 80.5
```

   - 修改mian函数：

```
#include<iostream>
using namespace std;
class Student {
public:
    Student(int n, float s) :num(n), score(s) {}
    void change(int n, float s) { num = n; score = s; }
    void display() { cout << num << " " << score << endl; }
private:
    int num;
    float score;
};
int main() {
    Student stud(101, 78.5);
    Student* p = &stud;
    p->display();
    p->change(101, 80.5);
```

```
    p->display();
    return 0;
}
```

运行结果如下：

```
101 78.5
101 80.5
```

- 在（2）的基础上修改main函数第三行前加const

```
#include<iostream>
using namespace std;
class Student {
public:
    Student(int n, float s) :num(n), score(s) {}
    void change(int n, float s) { num = n; score = s; }
    void display()const { cout << num << " " << score << endl; }
private:
    int num;
    float score;
};
int main() {
    Student stud(101, 78.5);
    const Student* p = &stud;
    p->display();
    stud.change(101, 80.5);
    p->display();
    return 0;
}
```

运行结果如下：

```
101 78.5
101 80.5
```

- 再将main函数第三行改为Student* const p = &stud;

```
#include<iostream>
using namespace std;
class Student {
public:
    Student(int n, float s) :num(n), score(s) {}
    void change(int n, float s) { num = n; score = s; }
    void display(){ cout << num << " " << score << endl; }
private:
    int num;
    float score;
};
int main() {
    Student stud(101, 78.5);
    Student* const p = &stud;
    p->display();
    p->change(101, 80.5);
    p->display();
```

```
    return 0;
}
```

运行结果如下：

```
101 78.5
101 80.5
```

2. 将例9.13 程序中的 display 函数不放在 Time 类中,而作为类外的普通函数,然后分别在 Time 和 Date 类中将 display 声明为友元函数。在主函数中调用 display 函数display 函数分别引用Time和 Date 两个类的对象的私有数据输出年月和时分秒请读者完成并上机调试。

```
#include <iostream>
using namespace std;
class Date;
class Time
{
public:
    Time(int, int, int);
    friend void display(const Date&, const Time&);
private:
    int hour;
    int minute;
    int sec;
};

Time::Time(int h, int m, int s)
{
    hour = h;
    minute = m;
    sec = s;
}

class Date
{
public:
    Date(int, int, int);
    friend void display(const Date&, const Time&);
private:
    int month;
    int day;
    int year;
};

Date::Date(int m, int d, int y)
{
    month = m;
    day = d;
    year = y;
}

void display(const Date& d, const Time& t)
{
    cout << d.month << "/" << d.day << "/" << d.year << endl;
    cout << t.hour << ":" << t.minute << ":" << t.sec << endl;
```

```
}


int main()
{
    Time t1(10, 13, 56);
    Date d1(12, 25, 2004);
    display(d1, t1);
    return 0;
}
```

运行结果：

```
12/25/2004
10:13:56
```

3. 将例 9.14 改写为在类模板外定义各成员函数的

```
#include <iostream>
using namespace std;
template<class numtype>
class Compare
 {public:
   Compare(numtype a,numtype b);
   numtype max();
   numtype min();
  private:
   numtype x,y;
 };
template <class numtype>
Compare<numtype>::Compare(numtype a,numtype b)
  {x=a;y=b;}
template <class numtype>
numtype Compare<numtype>::max()
 {return (x>y)?x:y;}
template <class numtype>
numtype Compare<numtype>::min()
  {return (x<y)?x:y;}

int main()
{Compare<int> cmp1(3,7);
 cout<<cmp1.max()<<" is the Maximum of two integer numbers."<<endl;
 cout<<cmp1.min()<<" is the Minimum of two integer numbers."
<<endl<<endl;
 Compare<float> cmp2(45.78,93.6);
 cout<<cmp2.max()<<" is the Maximum of two float numbers."<<endl;
 cout<<cmp2.min()<<" is the Minimum of two float numbers."<<endl<<endl;
 Compare<char> cmp3('a','A');
 cout<<cmp3.max()<<" is the Maximum of two characters."<<endl;
 cout<<cmp3.min()<<" is the Minimum of two characters."<<endl;
 return 0;
}
```

运行结果：

```
7 is the Maximum of two integer numbers.
3 is the Minimum of two integer numbers.

93.6 is the Maximum of two float numbers.
45.78 is the Minimum of two float numbers.

a is the Maximum of two characters.
A is the Minimum of two characters.
```