Que1

```cpp
#include <iostream>

using namespace std;

class Clock
{
private:
    int hour, minute, second;

public:
    Clock(int h, int m, int s);
    void Display();
    Clock operator+(const Clock &c) const;
};

Clock::Clock(int h, int m, int s)
{
    this->hour = h % 24;
    this->minute = m % 60;
    this->second = s % 60;
}

Clock Clock::operator+(const Clock &c) const
{
    Clock NewClock(0, 0, 0);
    NewClock.hour = ((this->hour + c.hour) + (this->minute + c.minute + (this->second + c.second) / 60) / 60) % 24;
    NewClock.minute = ((this->minute + c.minute) + (this->second + c.second) / 60) % 60;
    NewClock.second = (this->second + c.second) % 60;
    return NewClock;
}

void Clock::Display()
{
    printf("%02d : %02d : %02d\n", hour, minute, second);
}
int main()
{
    Clock c1(3, 4, 5);
    cout << "Clock.1 is ";
    c1.Display();

    Clock c2(12, 40, 55);
    cout << "Clock.2 is ";
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    c2.Display();

    cout << "Clock.1 + Clock.2 is "<<endl;
    (c1 + c2).Display();
}
```

Que2

```
#include <iostream>

using namespace std;

class Person
{
protected:
    string name;
    string gender;
    string birth;
    int ID;

public:
    virtual void Display();
    Person(string name, string gender, string birth, int ID);
    Person(const Person &s)
    {
        this->birth = s.birth;
        this->gender = s.gender;
        this->name = s.name;
        this->ID = s.ID;
    }
};

Person ::Person(string name, string gender, string birth, int ID)
{
    this->name = name;
    this->gender = gender;
    this->birth = birth;
    this->ID = ID;
}

void Person::Display()
{
    cout << name << endl;
}

class Student : public Person
{
```

```
protected:
    string native_place;
    int student_id;
    int age;
    int score;

public:
    Student(string name, string gender, string birth, int ID, string native_place, int studentid, int age, int score);
    void Display();
    Student(const Student &s) : Person(s)
    {
        this->name = s.name;
        this->gender = s.gender;
        this->birth = s.birth;
        this->age = s.age;
        this->ID = s.ID;
        this->native_place = s.native_place;
        this->student_id = s.student_id;
        this->score = s.score;
    }
    Student operator+(const Student &s) const;
};
Student::Student(string name, string gender, string birth, int ID, string native_place, int studentid, int age, int score) : Person(name, gender, birth, ID)
{
    this->native_place = native_place;
    this->student_id = studentid;
    this->age = age;
    this->score = score;
}

Student Student::operator+(const Student &s) const
{

    int score_sum = this->score + s.score;
    Student NewStudent("sum", "null", 0, 0, "null", 0, 00, score_sum);

    return NewStudent;
}

void Student::Display()
{
    cout << "Student:" << endl;
    cout << "Basic info:" << endl;
    cout << "姓名\t性别\t出生日期\t身份ID\n";
    cout << this->name << "\t" << this->gender << "\t" << this->birth << "\t" << this->ID << endl;
    cout << "籍贯\t学号\t年龄\t成绩\n";
```

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    cout << this->native_place << "\t" << this->student_id << "\t" << this->age << "\t" << this->score << endl;
}

class Teacher : public Person
{
protected:
    string position;

public:
    Teacher(string name, string gender, string birth, int ID, string position);
    void Display();
};

Teacher::Teacher(string name, string gender, string birth, int ID, string position) : Person(name, gender, birth, ID)
{
    this->position = position;
}

void Teacher::Display()
{
    cout << "Teacher:" << endl;
    cout << "Basic info:" << endl;
    cout << "姓名\t性别\t出生日期\t身份ID\n";
    cout << this->name << "\t" << this->gender << "\t" << this->birth << "\t" << this->ID << endl;
    cout << "职称" << endl;
    cout << this->position << endl;
}

class Stu_Teacher : virtual public Student, virtual public Teacher
{
public:
    Stu_Teacher(string name, string gender, string birth, int ID, string native_place, int studentid, int age, int score, string position);
    void Display();
};

Stu_Teacher::Stu_Teacher(string name, string gender, string birth, int ID, string native_place, int studentid, int age, int score, string position) : Student(name, gender, birth, ID, native_place, studentid, age, score), Teacher(name, gender, birth, ID, position)
{
}

void Stu_Teacher::Display()
{
    cout << "Student Teacher" << endl;
```

```
    // cout << "姓名\t性别\t出生日期\t身份ID\n";
    // cout << this->name << "\t" << this->gender << "\t" << this->birth << "\t" << this->ID << endl;
    // cout << "籍贯\t学号\t年龄\t成绩\n";
    // cout << this->native_place << "\t" << this->student_id << "\t" << this->age << "\t" << this->score << endl;
    // cout << "职称" << endl;
    // cout << this->position << endl;
}

int main()
{
    Person *p;
    // p.Display();

    Student s1("Hellen", "Female", "1998.05.09", 41223874, "江苏", 73913, 24, 78);
    p = &s1;
    p->Display();

    Student s2("Kate", "Female", "1997.06.09", 45523456, "湖北", 76153, 25, 89);
    p = &s2;
    p->Display();

    Student s3(s2);
    s3.Display();

    p = new Teacher("John", "Male", "1970.07.18", 68624053, "Professor");
    p->Display();

    Stu_Teacher st("Stephen", "Male", "1998.08.09", 65286523, "湖南", 56924, 24, 86, "助教");
    st.Display();

    (s1 + s2).Display();
}
```