**Final Examination Of C++ Programming**

(by Wingo WU,2020-11-9)

2020-2021 Fall Term

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| **Course** | C++ Programming | **type** | A |
| **Form** | Practice , partly open | **class** | 18 CS |
| **Marks** |  | **Comments** |  |

**(the exam file name should be in form of yourid\_yourname.docx.**

**For online student,please send your finished exam to my email:397753587@qq.com, with subject as C++ exam)**

**For students on campus, you send your exam file under my instructiion )**

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| --- | --- | --- | --- | --- |
| **Question** | **Q1** | **Q2** | **Q3** | **total** |
| **Full Mark** | **50** | **30** | **20** | **100** |
| **your Mark** |  |  |  |  |

**(The exam should be finished in 3 hours)**

Q1: This question is about Circle class. First read the program in main() and the output screen. please pay attention to output result. You are required to design a Circle class to complete it.

int main( )

{

Circle c1(20);

Circle c2(10);

Circle c3,c4,c5,c6,c7;

c3=c1+c2;

cout<<"c3="<<c3.GetR()<<endl;

c4+=c1;

cout<<"c4="<<c4.GetR()<<endl;

c5.SetR(c1.GetR()+c2.GetR());

cout<<"c5="<<c5.GetR()<<endl;

cout<<"enter radius for c6 and c7:";

cin>>c6>>c7;

if(c6>c7)

cout<<"c6 is larger than c7"<<endl;

else

cout<<"c6 is smaller than c7"<<endl;

cout<<"c6:"<<c6<<endl;

cout<<"c7:"<<c7<<endl;

return 0;

}

c3=30

c4=20

c5=30

enter radius for c6 and c7:3.5 5.2

c6 is smaller than c7

c6:Radius=3.5 Circum=21.9911 Area=38.4845

c7:Radius=5.2 Circum=32.6725 Area=84.9486

请按任意键继续. . .

For Q1:

[Insert your source code file(.cpp) here]

[Insert your release executable file(.exe) here]

Q2:(30 marks )

You are required to design school management system. We already provide for you a base class(Person), each person has a name and citizen ID.

class Person

{

char ID[20];

char name[20];

int type;// 1 for student,2 for teacher,3 for worker, 4 for ....

public:

Person(char id1[],char name1[],int t1=0){ strcpy(ID,id1);strcpy(name,name1);type=t1;}

virtual void Show(){ cout<<ID<<" "<<name<<" ";}

int GetType(){ return type;}

void SetType(int t){ type=t;}

void SetName(char name1[]) { strcpy(name,name1);}

char \*GetName() { return name;}

void SetID(char id[]) { strcpy(ID,id);}

char \*GetID(){ return ID;}

};

Based on this base class, you design two classes,one for student, one for teacher. each student has student id and mark beside his name and citizen id. Each teacher has teacher id and salary besides his name and citizen id. then based on these two class, you write a main program which can add students and teachers to the list, and also list teachers and students separately.

Your program should implement the following functions:

1. add student,

2. add teacher

3. list students

4. list teacher

5. list all students and teachers.

0.exit

1.Add student

2.Add teacher

3.List all Students

4.List all Teachers

5.List all Students and Teachers

Enter your selection(By Wingo):

You may use the following test data:

1

330302199601011234 Student1 101 234

2

330302199601011234 DengTeacher1 201 3234.13

1

330312199502035211 Student2 102 312

2

330302197511034512 DengTeacher2 202 1234.98

1

332315199811211621 Student3 105 298

2

330302198706032135 DengTeacher3 203 5224.83

2

330302199203085321 DengTeacher4 204 8254.43

For Q2:

[Insert your complete source code file(.cpp) here]

[Insert your release executable file(.exe) here]

Q3:(20 Marks)

Following program is designed by some student to implement Complex class. But when he run this program, the result is always not correct. So now he ask you to debug the program and find the bug for him.

1. if you locate the position which causes the bug(5 Marks)

2. and if you correct it and run it ,get correct results( 5 Marks).

3. explain to him why it is wrong in detail ( 10 Marks).

Program for Q3:

#include<iostream>

using namespace std;

class Complex

{

double r;

double im;

public :

Complex(double r1,double im1):r(r1),im(im1){}

Complex() { r=0;im=0;}

Complex(Complex &c) { r=c.r; im=c.im;}

double GetR() { return r;}

double GetIm() { return im;}

void SetR(double r1) { r=r1;}

void SetIm(double im1) { im=im1;}

Complex operator =(Complex &c);

friend istream & operator>>(istream &is, Complex &c1);

friend ostream & operator<<(ostream &os, Complex &c1);

Complex& operator+(const Complex& z1);

void Ouput();

};

istream & operator>>(istream &is, Complex &c1)

{

is>>c1.r>>c1.im;

return is;

}

ostream & operator<<(ostream &os, Complex &c1)

{

os<<c1.r<<" "<<c1.im;

return os;

}

Complex& Complex:: operator+(const Complex& z1)

{

double r1 = this->r + z1.r;

double im1 = this->im + z1.im;

return Complex(r1, im1);

}

Complex Complex::operator =(Complex &c)

{

return Complex(c.r,c.im);

}

void Complex::Ouput()

{

cout<<r<<"+"<<im<<" i"<<endl;

}

int main( )

{

Complex z1(3,5),z2,z3,z4;

cin>>z2;

z3=z1;

z4=z1+z2;

cout<<z4<<endl;

return 0;

}

For Q3:

[Insert your source code file(.cpp) here]

[Insert your release executable file(.exe) here]