浙江大学2016–2017学年秋冬学期

《面向对象程序设计》课程期末考试试卷

课程号： 211C0010 ，开课学院： 计算机学院

考试试卷： √A卷、B卷（请在选定项上打√）

考试形式：√闭、开卷（请在选定项上打√），允许带 无 入场

考试日期： 2017 年 01 月 18 日,考试时间： 120 分钟

诚信考试，沉着应考，杜绝违纪。

考生姓名： 学号： 所属院系：

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| 评卷人 |  |  |  |  |  |  |  |  |  |

只能在本页答题，写在其他页无效。

1.

1)

2)

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1)

2)

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|  |  |  |  |
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| 1 |  | 14 |  |
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| 7 |  | 20 |  |
| 8 |  | 21 |  |
| 9 |  | 22 |  |
| 10 |  | 23 |  |
| 11 |  | 24 |  |
| 12 |  | 25 |  |
| 13 |  |  |  |

4.

FILL IN THE ANSWER SHEET. ANY WRITTEN BELOW WILL NOT BE COUNTED.

1. Write the output of the code below (assuming all the header files are taken care of) (30%)

1）

//head.h

#ifndef FUNCTION\_TEMPLATE

#define FUNCTION\_TEMPLATE

template <typename T>

inline T Max(T x,T y)

{

cout << "In template function Max, ";

return (x>y)?x:y;

}

inline int Max(int x, int y)

{

cout << "In function Max, ";

return (x>y)?x:y;

}

#endif

//test.cpp

#include "function\_template.h"

int main()

{

cout << Max(1,2) << endl;

cout << Max(1.0,2.0) << endl;

cout << Max(1,2.0) << endl;

}

2）

class Base{

public:

virtual int f1(char x) const { return (int)(x); }

virtual int f2(int x) { return (2\*x); }

virtual int f3(int x) { return (3\*x); }

};

class Derived : public Base{

public:

virtual int f1(char x) { return (int)(-x); }

virtual int f2(double x) { return (x/2); }

virtual int f3(int x) { return (x/3); }

};

void print(Base& b)

{

cout << b.f1('a') << "\t" << b.f2(97) << "\t" << b.f3(99) << endl;

}

int main()

{

Base b;

Derived d;

print(b);

print(d);

}

3）

class A{

int i;

public:

A(int ii=0):i(ii) { cout << "call A(int ii=0).\n"; }

A(const A& a) {

i = a.i;

cout << "call A(const A&).\n";

}

void print() const { cout << "A::i = " << i << endl; }

};

class B : public A{

int i;

A a;

public:

B(int ii = 0) : i(ii) { cout << "call B(int ii=0).\n"; }

B(const B& b) {

i = b.i;

cout << "call B(const B&).\n";

}

void print() const {

A::print();

a.print();

cout << "B::i = " << i << endl;

}

};

int main()

{

B b(2);

b.print();

B c(b);

c.print();

}

4)

class Exception{

public:

Exception(string name="none"):m\_name(name)

{

cout << "Generating an exception object，name is "<<m\_name<< endl;

}

Exception(const Exception& old\_e)

{

m\_name = string("ex\_") + old\_e.m\_name;

cout << "copy an exception object，name is "<<m\_name<< endl;

}

virtual ~ Exception ()

{

cout << "destroy an exception object，name is " <<m\_name<< endl;

}

string GetName() {return m\_name;}

protected:

string m\_name;

};

class A{

public:

A()

{

cout << "A()" << endl;

}

int f(int i)

{

if (i>=10) {

Exception ex\_obj1("ex\_obj1");

throw ex\_obj1;

}

else

return i;

}

~A()

{

cout << "~A()" << endl;

}

};

int main()

{

try

{

A a;

a.f(10);

A b;

b.f(10);

}

catch(Exception& m)

{

cout<<"catch exception"<<endl;

}

catch(...)

{

cout<<"catch unknow exception"<<endl;

}

}

5)

class A{

public:

int t;

A() {

t = 1;

cout<<"A()"<<t<<endl;

}

};

class B : virtual A{

public:

B() {

t++;

cout<<"B()"<<t<<endl;

}

};

class C : virtual B, virtual A{

public:

C() {

cout<<"C()"<<endl;

}

};

int main()

{

C c;

}

6)

class Parent {

int i;

public:

Parent(int ii) : i(ii) {

cout << "Parent(int ii)\n";

}

Parent(const Parent& b) : i(b.i) {

cout << "Parent(const Parent&)\n";

}

Parent() : i(0) { cout << "Parent()\n"; }

friend ostream&

operator<<(ostream& os, const Parent& b) {

return os << "Parent: " << b.i << endl;

}};

class Member {

int i;

public:

Member(int ii) : i(ii) {

cout << "Member(int ii)\n";

}

Member(const Member& m) : i(m.i) {

cout << "Member(const Member&)\n";

}

friend ostream&

operator<<(ostream& os, const Member& m) {

return os << "Member: " << m.i << endl;

}};

class Child : public Parent {

int i;

Member m;

public:

Child(int ii) : Parent(ii), i(ii), m(ii) {

cout << "Child(int ii)\n";

}

friend ostream&

operator<<(ostream& os, const Child& c){

return os << (Parent&)c << c.m

<< "Child: " << c.i << endl;

}};

int main() {

Child c(2);

Child c2 = c;

cout << c2;

}

2. Please correct the following programs（point out the errors and correct them）(10%)

1)

class A{

int i;

public:

A(int ii):i(ii){}

};

class B: public A{

char \*p;

public:

B(char \*p)

{

p = new char[strlen(p)+1];

strcpy(p, p);

}

~B()

{

delete p;

}

};

int main()

{

B b("hello");

A \*p = new B("world!");

}

2)

class Exception {};

class OneException : public Exception {};

void f(int index) throw()

{

if ( index < 0 ) throw new OneException();

}

int main()

{

int k;

cin >> k;

try {

f(k);

} catch (...) {

cout << "caught ... " << endl;

} catch (Exception) {

cout << "caught Exception" << endl;

} catch (OneException) {

cout << "caught OneException" << endl;

}}

3. Fill in the blanks（25%）Pay attention to the comments. No fill may also be an answer.

#include <iostream>

#include <cmath>

using namespace std;

#define PI 3.14159

class Shape {

private:

int ID;

static int counter;

public:

Shape():ID(counter++) {}

int objectID() const { return ID; }

virtual void error() const ;

virtual double area() = 0;

static int getcounter() { return counter; }

};

\_\_\_\_(1)\_\_\_\_\_

/\* Default error handling function provided by base class Shape, to display default code for error.\*/

\_\_\_\_(2)\_\_\_\_\_

class Ellipse: public Shape

{

private:

int lax,sax;

static int counter;

public:

Ellipse(int l,int s): \_\_\_\_(3)\_\_\_\_\_

{

if (lax!=sax) counter++;

}

\_\_\_\_(4)\_\_\_\_\_

/\* Ellipse class to handle errors \*/

\_\_\_\_(5)\_\_\_\_\_

static int getcounter() { return counter; }

};

\_\_\_\_(6)\_\_\_\_\_

class Circle: public Ellipse

{

public:

Circle(int r): \_\_\_\_(7)\_\_\_\_\_

{

\_\_\_\_(8)\_\_\_\_\_

}

static int getcounter() { return counter; }

\_\_\_\_(9)\_\_\_\_\_

/\* The Circle class does not want to make any special behavior for the error \*/

\_\_\_\_(10)\_\_\_\_\_

private:

static int counter;

};

\_\_\_\_(11)\_\_\_\_\_

class Rectangle: public Shape

{

protected:

int width,length;

static int counter;

public:

Rectangle(int w,int l): \_\_\_\_(12)\_\_\_\_\_

{

\_\_\_\_(13)\_\_\_\_\_;

}

\_\_\_\_(14)\_\_\_\_\_

/\* Rectangle class to handle errors \*/

\_\_\_\_(15)\_\_\_\_\_

static int getcounter() { return counter; }

};

\_\_\_\_(16)\_\_\_\_\_

class Square: public Rectangle

{

public:

Square(int r): \_\_\_\_(17)\_\_\_\_\_

{

\_\_\_\_(18)\_\_\_\_\_;

}

\_\_\_\_(19)\_\_\_\_\_

/\* The Square class does not want to make any special behavior for the error \*/

\_\_\_\_(20)\_\_\_\_\_

static int getcounter() { return counter; }

private:

static int counter;

};

\_\_\_\_(21)\_\_\_\_\_;

class Triangle: public Shape

{

int a,b,c;

static int counter;

public:

Triangle(int a, int b, int c): \_\_\_\_(22)\_\_\_\_\_

{

counter++;

}

\_\_\_\_(23)\_\_\_\_\_

/\* Rectangle class to handle errors \*/

\_\_\_\_(24)\_\_\_\_\_

static int getcounter() { return counter; }

};

\_\_\_\_(25)\_\_\_\_\_;

int main ()

{

Shape \*list[6] = {

new Ellipse(2,4), new Circle(3),

new Rectangle(3,5), new Square(4),

new Triangle(1,2,2),new Ellipse(1,3)};

for (int i=0; i<6; i++) {

cout << list[i]->area() << '\n';

list[i]->error();

}

cout << Ellipse::getcounter() << endl; //output: 2

cout << Circle::getcounter() << endl; //output: 1

cout << Rectangle::getcounter() << endl; //output: 1

cout << Square::getcounter() << endl; //output: 1

cout << Triangle::getcounter() << endl; //output: 1

}

4. Program Design（35%）

Design a matrix class template: Matrix(m 🞨 n)，m is the number of rows of the matrix, n is the number of columns of the matrix. Support the following code:

//test.cpp

#include "matrix.h"

#include <iostream>

using namespace std;

int main()

{

Matrix<int> m1(2,3),m2(2,3);

cin >> m1; //if at runtime enter: 1 2 3 4 5 6

cin >> m2; //if at runtime enter: 6 5 4 3 2 1

Matrix<int> m = m1 + m2;

m(1,2) = 0;

cout << m << endl; //output is

// 7 7 7

// 7 7 0

}

Part of the code has been given:

//Matrix.h

#ifndef MATRIX\_H

#define MATRIX\_H

#include <iostream>

using namespace std;

template <typename T>

class Matrix {

public:

friend ostream& operator<< <>(ostream& os, const Matrix<T>& n);

friend istream& operator>> <>(istream& in, Matrix<T>& n);

//Please add the rest of the code

};

#endif