פתרון אביב 1008 מועד ב

1. פתרון שאלת ADT:

א)

pDrawing CreateDrawing();

void DestroyDrawing(pDrawing);

Result AddShape(pDrawing, pShape pS, pDrawFunc pDrawF, pDelFunc pDelF, pPointInsideFunc pIsPF);

void RemoveShape(pDrawing, pShape);

pShape GetFromPoint(pDrawing, Point pnt);

void DrawDrawing(pDrawing);

ב)

typedef struct \_Drawing {

struct Node

{

pShape \_pShape;

pDrawFunc \_pDrawFunc;

pDelFunc \_pDelFunc;

pPointInsideFunc \_pPointInsideFunc;

struct Node\* \_pNext;

}\* \_pHead;

} Drawing;

ג)

pShape GetFromPoint(pDrawing pD, Point pnt)

{

struct Node\* pIter = pD->\_pHead;

while(pIter) {

if (pIter->\_pPointInsideFunc(pIter->\_pShape, pnt))

return pIter->\_pShape;

pIter = pIter->\_pNext;

}

return 0;

}

ד)

Result PointInsideDrawing(pShape pSh, Point pnt)

{

if (GetFromPoint((pDrawing)pSh, pnt))

return SUCCESS;

return FAILURE;

}

ה)

/\*Adding drw2 to drw1\*/

AddShape(drw1, drw2, DrawDrawing, DestroyDrawing, PointInsideDrawing);

2.

**פתרון:**

א.

#1:

A::A()

A::A()

B::B()

A::A()

B::B()

A::A()

C::C()

#2:

const C::f(int)

const C::f(int)

C::f(int)

C::f()

#3:

A::f

#4:

C::~C()

A::~A()

B::~B()

A::~A()

B::~B()

A::~A()

A::~A()

ב.

class A {

// A() {}; removed

public:

A() {}; //added

A(int i) {};

~A() {}

};

class B {

char\* str;

public:

B() {str = new char[5]; str[4] = '\0';}

B(const B& rhs) { str = new char[5]; strcpy(str, rhs.str); } //added due to memory leak

bool operator==(const A& rhs) {return 0;}

bool operator==(const B& rhs) {return 0;}//added

~B() {delete[] str;} //added due to memory leak

};

template<class T>

class C {

T arr[10];

public:

bool operator==(const C<T>& rhs) {return arr[0] == rhs.arr[0];}

~C() {}

};

int main() {

A a1; // should be fixed

A a2(5);

A a3 = a2;

B b1, b2;

b1 == b1; // should be fixed

b1 == a2;

b1 == 5;

C<A> c\_a; // should be fixed

C<B> c\_b1, c\_b2;

C<int> c\_int;

//bool res = (c\_b1 == c\_int); can't fix

bool res = (c\_b1 == c\_b2); // should be fixed

c\_b1 = c\_b2;

// memory leak

return 0;

}

3. **שאלה 3 – פתרון**

סעיפים א+ב+ג:

class genNumber

{

protected:

static bool locked;

public:

virtual double abs()=0;

void print() {cout << "Generic number" << endl;}

static void lock() {locked = true;}

static void unlock() {locked = false;}

};

bool genNumber::locked = false;

class Complex:public genNumber

{

protected:

double real;

double image;

public:

Complex(double r, double i):real(r),image(i){};

double abs(){

return sqrt(real\*real+image\*image);

}

void print(){cout << "Real: " << real << " Imaginary: " << image << endl;}

void setVal(double r, double i){

if(!locked) {

real = r;

image = i;

}

}

};

class Double:public genNumber

{

protected:

double val;

public:

Double(double v):val(v){};

double abs(){

if (val < 0)

return -val;

return val;

}

void print(){cout << "Value: " << val << endl;}

void setVal(double v){

if(!locked)

val = v;

}

};

class posBinary:public genNumber

{

protected:

int\* arr;

int length;

public:

posBinary(int\* inArr, int l):length(l){

arr = new int[length];

for (int i=0; i< length; i++)

arr[i] = inArr[i];

}

double abs(){

double res = 0.0;

int pow = 1;

for (int i=length-1; i>=0; i--){

res = res + pow\*arr[i];

pow = pow\*2;

}

return res;

}

void print(){

cout << "Binary value: ";

for(int i=0;i<length;i++)

cout << arr[i] << " ";

cout << endl;

}

void setVal(int\* inArr, int l){

if(!locked){

delete[] arr;

length = l;

arr = new int[length];

for(int i=0;i<length;i++)

arr[i] = inArr[i];

}

}

};

class signedBinary:public posBinary

{

protected:

bool pos;

public:

signedBinary(bool p, int\* inArr, int l):posBinary(int\* inArr, int l),pos(p){};

void print() {

if (!pos) cout << "-";

posBinary::print();

}

};

ד. הפתרון הוא להשתמש במנגנון ה-exceptions, במקרה של ביצוע setVal כאשר locked == true תיזרק חריגה שתתפס ותטופל מחוץ ל-setVal.

ה. הפתרון:

Double d1(2.5);

Double d2(3.7);

Double d3(-1.2);

int n = 0;

while (n != 3) {

try {

if (n == 0) {

d1.setVal(2.2);

f(d1);

n = 1;

}

if (n == 1) {

d2.setVal(0.0);

f(d2);

n = 2;

}

if (n == 2) {

d3.setVal(-12.3);

f(d3);

n = 3;

}

}

catch(...) {

genNumber::unlock();

}

}

4.

א.

#!/bin/csh

set n = 1

set line = ( $< )

while ($#line != 0)

echo $n $line

@ n++

set line = ( $< )

end

ב.

#!/bin/csh

foreach file ($1/\*)

if (-f $file) then

set a = `cat $file|head -2|tail -1|cut -c1-3`

if ( $a == "abc" ) /bin/rm $file

endif

end

ג.

#!/bin/csh

foreach file (\*)

if (-f $file) then

set length = `echo $file |wc -c`

if ($length[1] > 3) echo $file | cut -c1-3

endif

end