Computer Programming Lab 7

2018.04.13

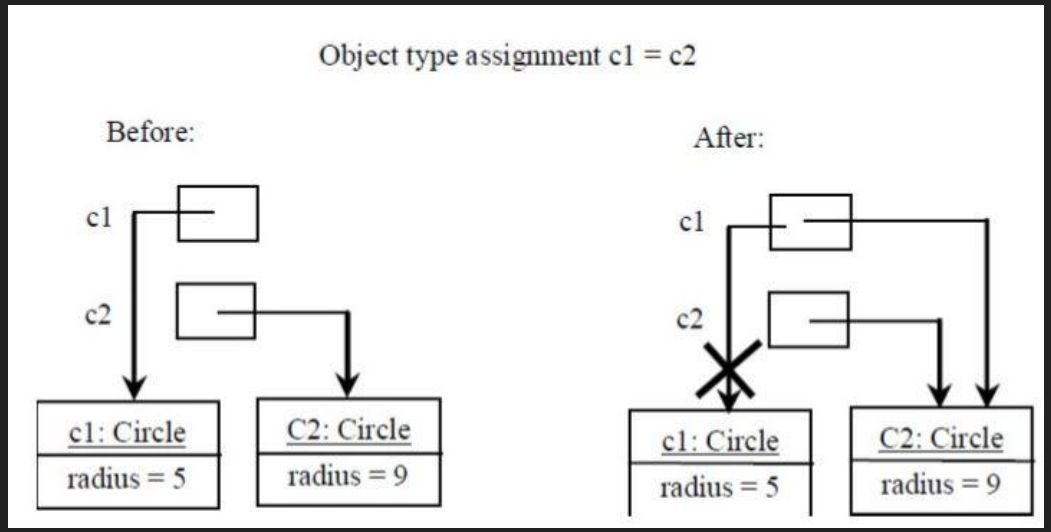
Java Class

```
public class Work
{
    private static int n = 0;
    private int a;
    public static void main(String[] args)
    {
        Work a1=new Work(10);
        Work a2=new Work(5);
        System.out.println("Total number of Work object is " + a2.numWork());
        System.out.println(a1.sampleFunc());
        System.out.println(a2.sampleFunc());
        a1=a2;
        a1.setVar(50);
        System.out.println(a1.sampleFunc());
        System.out.println(a2.sampleFunc());
    }
    public Work(int b)
    {
        a = b;
        n++;
    }
    public String sampleFunc()
    {
        return "Value holding is " + a;
    }
    public int numWork()
    {
        return n;
    }
    public void setVar(int b)
    {
        a = b;
    }
}
```

Output

```
jvl@jvm ~/wyp $ javac Work.java
jvl@jvm ~/wyp $ java Work
Total number of Work object is 2
Value holding is 10
Value holding is 5
Value holding is 50
Value holding is 50
jvl@jvm ~/wyp $
```

Copying variable of an Object



this keyword

this: Refers to the implicit parameter inside your class. (a variable that stores the object on which a method is called)

Example

```
public class LabSub{

	public static int mNumber = 0;

	public int a;

	public LabSub(int a){

		this.a = a;

		mNumber++;

	}

}
```

Task

Define a structure that defines complex number. A complex number is of the form a+bi (a: real part b: imaginary part).

And Make these functions.

1. Get two complex values and return their sum.
2. Get two complex values (x and y), and return their difference (x – y).

Use skeleton code on ETL, and compress java file to task.zip. And submit on ETL Attendance Mission.

Example

input

Input the real part of first number : 5

input the imaginary of first number : 5

Input the real part of second number : 3

input the imaginary of second number : 3

output

Sum : 8+8i

Difference : 2+2i

Optional task 1

Write map method applies func(function) to integer argument. The argument func for the map method is given as a String. Rules for func are:

Function is always a polynomial in x, and its degree is at most 100. Also, it is given in the order of descending powers.

Use * for the multiplication and ^ for exponentiation when representing the polynomial as a String.

Applying these rules, 125x^3+34x^2-17x+25 is represented as “125*x^3+34*x^2-17*x^1+25”.

int map(String func,int x)

Optional task 2

Write a method

String findcomb(int n,int k,int index)

that gets combination sequence. index starts at 0.

findcomb(5,3,0) => “123” findcomb(5,3,1) => “124” findcomb(5,3,2) => “125”

findcomb(5,3,7) => “235” findcomb(8,4,1) => “1235”

We will give n_choose_k function.

```
public class Binomial
{
   private static long n_choose_k(int n, int k)
   {
            if (k>n-k)
            k=n-k;
            long b=1;
            for (int i=1, m=n; i<=k; i++, m--)
            b=b*m/i;
            return b;
   }
}
```

Optional task 3

Write a class FindSmallestContainer which has three methods

1. **void setPoints(String filePath)**: It receives points in R^2 from a text file whose path is filePath and saves into some data structure S. The format of the file is in the next slide.

2. **int getNumberOfPoints()**: It returns the number of points it received.

3. **void getRadius()**: It finds the circle with the smallest radius satisfying 1) it is centered at some point in S. 2) All points in S fall into the circle. And then prints its radius. Note that setPoints must be called first to run this method.

An example of input file