第十一章程序清单

程序清单11-1

```
package work6;

public class GeometricObject {
    private String color = "white";
    private boolean filled;
    private java.util.Date dateCreated;

    public GeometricObject() {
        dateCreated = new java.util.Date();
    }

    public GeometricObject(String color, boolean filled) {
        dateCreated = new java.util.Date();
        this.color = color;
        this.filled = filled;
    }

    public String getColor() {
        return color;
    }

    public void setColor(String color) {
        this.color = color;
    }

    public boolean isFilled() {
        return filled;
    }

    public void setFilled(boolean filled) {
        this.filled = filled;
    }

    public java.util.Date getDateCreated() {
        return dateCreated;
    }

    public String toString() {
        return "created on " + dateCreated + "\ncolor: " + color + " and filled:
" + filled;
    }

}
```

程序清单11-2

```
package work6;

public class Circle extends GeometricObject {
    private double radius;

    public Circle() {
    }

    public Circle(double radius) {
        this.radius = radius;
    }

    public Circle(double radius, String color, boolean filled) {
        this.radius = radius;
        setColor(color);
        setFilled(filled);
    }

    public double getRadius() {
        return radius;
    }

    public void setRadius(double radius) {
        this.radius = radius;
    }

    public double getArea() {
        return radius * radius * Math.PI;
    }

    public double getDiameter() {
        return radius * 2;
    }

    public double getPerimeter() {
        return 2 * radius * Math.PI;
    }

    public void printCircle() {
        System.out.println("The circle is created " + getDateCreated() + " and
the radius is " + radius);
    }

}
```

程序清单11-3

```
package work6;

public class Rectangle extends GeometricObject {
    private double width;
    private double height;
```

```
    public Rectangle() {
    }

    public Rectangle(double width, double height) {
        this.width = width;
        this.height = height;
    }

    public Rectangle(double width, double height, String color, boolean filled)
{
        super(color, filled);
        this.width = width;
        this.height = height;
        setColor(color);
        setFilled(filled);
    }

    public double getWidth() {
        return width;
    }

    public void setWidth(double width) {
        this.width = width;
    }

    public double getHeight() {
        return height;
    }

    public void setHeight(double height) {
        this.height = height;
    }

    public double getArea() {
        return width * height;
    }

    public double getPerimeter() {
        return 2 * (width + height);
    }
}
```

程序清单11-4

```
package work6;

public class TestCircleRectangle {
    public static void main(String[] args) {
        Circle circle = new Circle(1);
        System.out.println("A circle " + circle.toString());
        System.out.println("The color is " + circle.getColor());
        System.out.println("The radius is " + circle.getRadius());
        System.out.println("The area is " + circle.getArea());
        System.out.println("The diameter is " + circle.getDiameter());

        Rectangle rectangle = new Rectangle(2, 4);
```

```
        System.out.println("\nA rectangle " + rectangle.toString());
        System.out.println("The area is " + rectangle.getArea());
        System.out.println("The perimeter is " + rectangle.getPerimeter());
    }
}
```

程序清单11-5

```
package work6;

public class PolymorphismDemo {
    public static void main(String[] args) {
        displayObject(new Circle(1, "red", false));
        displayObject(new Rectangle(1, 1, "black", true));
    }

    public static void displayObject(GeometricObject object) {
        System.out.println("Created on " + object.getDateCreated() + ". Color is
" + object.getColor());
    }
}
```

程序清单11-6

```
package work6;

public class DynamicBindingDemo {
    public static void main(String[] args) {
        m(new GraduateStudent());
        m(new Student());
        m(new Person());
        m(new Object());
    }

    public static void m(Object x) {
        System.out.println(x.toString());
    }
}

class GraduateStudent extends Student {
}

class Student extends Person {
    @Override
    public String toString() {
        return "Student";
    }
}

class Person extends Object {
    @Override
    public String toString() {
        return "Person";
    }
```

```
}
```

程序清单11-7

```
package work6;

public class CastingDemo {
    public static void main(String[] args) {
        Object object1 = new Circle(1);
        Object object2 = new Rectangle(1, 1);

        displayObject(object1);
        displayObject(object2);
    }

    public static void displayObject(Object object) {
        if (object instanceof Circle) {
            System.out.println("The circle area is " + ((Circle)
object).getArea());
            System.out.println("The circle diameter is " + ((Circle)
object).getDiameter());
        } else if (object instanceof Rectangle) {
            System.out.println("The rectangle area is " + ((Rectangle)
object).getArea());
        }
    }
}
```

程序清单11-8

```
package work6;

import java.util.ArrayList;

public class TestArrayList {
    public static void main(String[] args) {
        ArrayList<String> cityList = new ArrayList<>();
        cityList.add("London");
        cityList.add("Denver");
        cityList.add("Paris");
        cityList.add("Miami");
        cityList.add("Seoul");
        cityList.add("Tokyo");

        System.out.println("List size? " + cityList.size());
        System.out.println("Is Miami in the list? " +
cityList.contains("Miami"));
        System.out.println("The location of Denver in the list? " +
cityList.indexOf("Denver"));
        System.out.println("Is the list empty? " + cityList.isEmpty());

        cityList.add(2, "Xian");

        cityList.remove("Miami");
```

```
        cityList.remove(1);

        System.out.println(cityList.toString());

        for (int i = cityList.size() - 1; i >= 0; i--) {
            System.out.print(cityList.get(i) + " ");
        }
        System.out.println();

        ArrayList<Circle> list = new ArrayList<>();

        list.add(new Circle(2));
        list.add(new Circle(3));

        System.out.println("The area of the circle? " + list.get(0).getArea());
    }
}
```

程序清单11-9

```
package work6;

import java.util.Scanner;
import java.util.ArrayList;

public class DistinctNumbers {
    public static void main(String[] args) {
        ArrayList<Integer> list = new ArrayList<>();

        Scanner input = new Scanner(System.in);
        System.out.print("Enter integers (input ends with 0): ");
        int value;

        do {
            value = input.nextInt();
            if (!list.contains(value) && value != 0) {
                list.add(value);
            }
        } while (value != 0);

        System.out.print("The distinct numbers are: ");
        for (int i = 0; i < list.size(); i++) {
            System.out.print(list.get(i) + " ");
        }
        input.close();
    }
}
```

程序清单11-10

```java
package work6;

import java.util.ArrayList;

public class MyStack {
    private ArrayList<Object> list = new ArrayList<>();

    public boolean isEmpty() {
        return list.isEmpty();
    }

    public int getSize() {
        return list.size();
    }

    public Object peek() {
        return list.get(list.size() - 1);
    }

    public Object pop() {
        Object o = list.remove(list.size() - 1);
        list.remove(list.size() - 1);
        return o;
    }

    public void push(Object o) {
        list.add(o);
    }

    @Override
    public String toString() {
        return "Stack: " + list.toString();
    }
}
```