## 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

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();
  
 }
  
}