```java
import java.util.Arrays;

public class StuffContainer2
{
   private Thing[] container;
   private int capacity;
   private int numberOfThings;

   public StuffContainer2()
   {
      this(5);
   }

   public StuffContainer2(int capacity)
   {
      container = new Thing[capacity];
      setCapacity(capacity);
      setNumberOfThings(0);
   }

   private void setCapacity(int cap)
   {
      capacity = cap;
   }

   private void setNumberOfThings(int num)
   {
      numberOfThings = num;
   }

   public int getCapacity()
   {
      return capacity;
   }
```

```
35
36    public int getNumberOfThings()
37    {
38       return numberOfThings;
39    }
40
41    public boolean isFull()
42    {
43       return numberOfThings == capacity;
44    }
45
46    public void addThing(Thing newThing)
47    {
48       if (isFull())
49          grow();
50       container[numberOfThings] = newThing;
51       setNumberOfThings(numberOfThings+1);
52    }
53
54    public Thing getThing(int index)
55    {
56       return container[index];
57    }
58
59    public void sort()
60    {
61       trim();
62       Arrays.sort(container);
63    }
64
65    public void trim()
66    {
67 System.out.println("SHRINKING CONTAINER TO NUMBER OF ITEMS CONTAINED");
68       Thing[] temp = new Thing[getNumberOfThings()];
```

```
69        for (int i =0; i<getNumberOfThings(); i++)
70           temp[i] = container[i];
71        container = temp;
72        setCapacity(getNumberOfThings());
73     }
74
75     public void grow()
76     {
77 System.out.println("INCREASING CAPACITY OF CONTAINER!!!");
78        Thing[] temp = new Thing[getNumberOfThings()*2];
79        for (int i =0; i<getNumberOfThings(); i++)
80           temp[i] = container[i];
81        container = temp;
82        setCapacity(getNumberOfThings()*2);
83     }
84
85     public static void main(String[] args)
86     {
87        StuffContainer2 myStuff = new StuffContainer2(10);
88        System.out.println("Capacity of myStuff = " + myStuff.getCapacity());
89        System.out.println("Number of things in myStuff = " +
   myStuff.getNumberOfThings());
90        Thing disk = new RoundThing("Blue", 10);
91        myStuff.addThing(disk);
92     Thing square = new SquareThing("Red",8);
93        myStuff.addThing(square);
94        Thing block = new RectangularThing("Green",10,3);
95        myStuff.addThing(block);
96        Thing d2 = new RoundThing("Yellow",2);
97        myStuff.addThing(d2);
98        for (int i = 0; i < myStuff.getNumberOfThings(); i++)
99           System.out.println(myStuff.getThing(i));
100    }
101 }
```

```java
import java.util.Scanner;

public class StuffApplication2
{
   public static void main(String args[])
   {
      StuffContainer2 myStuff = new StuffContainer2(5);
      Scanner input = new Scanner(System.in);
      char type;
      String color;
      int radius, length, width;
      while (input.hasNext())
      {
         type = input.next().charAt(0);
         color = input.next();
         if (type == 'C')
         {
            radius = input.nextInt();
            myStuff.addThing(new RoundThing(color, radius));
         }
         else if(type == 'S')
         {
            length = input.nextInt();
            myStuff.addThing(new SquareThing(color, length));
         }
         else if(type == 'R')
         {
            length = input.nextInt();
            width = input.nextInt();
            myStuff.addThing(new RectangularThing(color, length, width));
         }
         else
            System.out.println("Invalid input");
      }
```

```
35        for (int i = 0; i < myStuff.getNumberOfThings(); i++)
36           System.out.println(myStuff.getThing(i));
37
38        System.out.print("\nBefore sorting:");
39        System.out.println("Capacity of container = " + myStuff.getCapacity() + "
and number of items in container = " + myStuff.getNumberOfThings());
40        myStuff.sort();
41        System.out.print("\nAnd after sorting:");
42        System.out.println("Capacity of container = " + myStuff.getCapacity() + "
and number of items in container = " + myStuff.getNumberOfThings() + "\n");
43
44        for (int i = 0; i < myStuff.getNumberOfThings(); i++)
45           System.out.println(myStuff.getThing(i));
46
47
48     }
49  }
```