

```
1 public class ThingID
2 {
3     private char type;
4     private String seqNo;
5
6     public ThingID()
7     {
8         this('~',"000");
9     }
10
11     public ThingID(char newType, String newSeqNo)
12     {
13         setType(newType);
14         setSeqNo(newSeqNo);
15     }
16
17     public ThingID(String newID)
18     {
19         char type = newID.charAt(0);
20         String seq = newID.substring(1);
21         setType(type);
22         setSeqNo(seq);
23     }
24
25     public void setType(char newType)
26     {
27         type = newType;
28     }
29
30     public void setSeqNo(String newCode)
31     {
32         seqNo = newCode;
33     }
34
```

```
35     public char getType()
36     {
37         return type;
38     }
39
40     public String getSeqNo()
41     {
42         return seqNo;
43     }
44
45     public String getID()
46     {
47         return getType() + getSeqNo();
48     }
49
50     public static void main(String[] args)
51     {
52         ThingID diskID = new ThingID('C', "123");
53         System.out.println("diskID = " + diskID.getID());
54
55         ThingID squareID = new ThingID("S579");
56         System.out.println("squareID " + squareID.getID() + " has type = " +
57             squareID.getType() + " and seqNo = " + squareID.getSeqNo());
58     }
59 }
```

```
1 public class Thing implements Comparable<Thing>
2 {
3     private static int counter;
4     private String color;
5     private ThingID id;
6
7     public Thing()
8     {
9         this("", '~');
10    }
11
12    public Thing(String color, char type)
13    {
14        setColor(color);
15        setId(type, String.format("%03d", getNextCounter()));
16    }
17
18    public void setColor(String color)
19    {
20        this.color = color;
21    }
22
23    public void setId(char type, String seqNo)
24    {
25        id = new ThingID(type, seqNo);
26    }
27
28    public String getColor()
29    {
30        return color;
31    }
32
33    public String getId()
34    {
```

```
35     return id.getID();
36 }
37
38 public static int getNextCounter()
39 {
40     counter++;
41     return getCounter();
42 }
43
44 public static int getCounter()
45 {
46     return counter;
47 }
48
49 public int compareTo(Thing other)
50 {
51     String thisField = getColor()+id.getSeqNo();
52     String otherField = other.getColor()+other.id.getSeqNo();
53     return thisField.compareTo(otherField);
54 }
55
56
57 public String toString()
58 {
59     return "I am a "+getColor()+" thing with ID " + getId();
60 }
61
62 public static void main(String[] args)
63 {
64     Thing x = new Thing("Red", 'U');
65     System.out.println(x);
66 }
67 }
```

```
1 public class RoundThing extends Thing
2 {
3     private int radius;
4
5     public RoundThing()
6     {
7         this("",1);
8     }
9
10    public RoundThing(String color, int radius)
11    {
12        super(color, 'C');
13        setRadius(radius);
14    }
15
16    public void setRadius(int r)
17    {
18        radius=r;
19    }
20
21    public int getRadius()
22    {
23        return radius;
24    }
25
26    public String toString()
27    {
28        return "I am a " + getColor() + " round thing, my radius is "+getRadius()
29        + " and my ID is " + getId();
30    }
31
32    public static void main(String[] args)
33    {
34        RoundThing rt1 = new RoundThing("Blue",10);
```

```
34     System.out.println(rt1);  
35 }  
36 }
```

```
1 public class SquareThing extends Thing
2 {
3     private int length;
4
5     public SquareThing()
6     {
7         this("",1);
8     }
9
10    public SquareThing(String color, int length)
11    {
12        super(color, 'S');
13        setLength(length);
14    }
15
16    public void setLength(int length)
17    {
18        this.length=length;
19    }
20
21    public int getLength()
22    {
23        return length;
24    }
25
26    public String toString()
27    {
28        return "I am a "+getColor()+" Square thing with sides "+getLength()+"
29        units long with ID " + getId();
30    }
31
32    public static void main(String[] args)
33    {
34        SquareThing block = new SquareThing("Green",10);
```

```
34     System.out.println(block);
35 }
36 }
```



```
1 public class RectangularThing extends Thing
2 {
3     private int length;
4     private int width;
5
6     public RectangularThing()
7     {
8         this("",1,1);
9     }
10
11     public RectangularThing(String color, int length, int width)
12     {
13         super(color, 'R');
14         setLength(length);
15         setWidth(width);
16     }
17
18
19     public void setLength(int length)
20     {
21         this.length=length;
22     }
23
24     public void setWidth(int width)
25     {
26         this.width = width;
27     }
28
29     public int getLength()
30     {
31         return length;
32     }
33
34     public int getWidth()
```

```
35     {
36         return width;
37     }
38
39     public String toString()
40     {
41         return "I am a "+getColor()+" Rectangular thing with length "+getLength()
42         +" and width "+getWidth() + " and ID " + getId();
43     }
44
45     public static void main(String[] args)
46     {
47         RectangularThing block = new RectangularThing("Green",10,5);
48         System.out.println(block);
49     }
```