

```
1 import java.util.Map;
2 import java.util.TreeMap;
3
4 public class PhoneDirectoryWithTreeMap {
5     private TreeMap<String,String> data;
6
7     public PhoneDirectoryWithTreeMap(){
8         this.data = new TreeMap<>();
9     }
10
11     public String getNumber(String name){
12         return this.data.get(name);
13     }
14
15     public void putNumber(String name, String number
16 ) {
17         if(name == null || number == null){
18             throw new IllegalArgumentException("name
19 and number cannot be null");
20         }
21         this.data.put(name, number);
22     }
23
24     public void print(){
25         for (Map.Entry<String,String> entry: this.
26 data.entrySet()) System.out.println(entry.getKey() +
27 ": " + entry.getValue());
28     }
29 }
30
```

```
1 public class TestPhoneDirectoryWithTreeMap {
2     public static void main(String[] args) {
3         PhoneDirectoryWithTreeMap directory = new
4         PhoneDirectoryWithTreeMap();
5         System.out.println("This program creates a
6         PhoneDirectoryWithTreeMap and");
7         System.out.println("adds several entries. It
8         then prints the contents of");
9         System.out.println("directory and does a few
10        lookups.");
11        System.out.println();
12        directory.putNumber("Fred", "555-1234");
13        directory.putNumber("Barney", "555-2345");
14        directory.putNumber("Wilma", "555-3456");
15        directory.putNumber("Wilma", "555-3456");
16        directory.putNumber("Wilma", "555-2563");
17
18        System.out.println("Contents are: ");
19        System.out.println();
20        directory.print();
21        System.out.println();
22        System.out.println("Number for Fred is " +
23        directory.getNumber("Fred"));
24        System.out.println("Number for Wilma is " +
25        directory.getNumber("Wilma"));
26        System.out.println("Number for Tom is " +
27        directory.getNumber("Tom"));
28        System.out.println("Number for Alex is " +
29        directory.getNumber("Alex"));
30    }
31 }
```