

Gebze Technical University  
Computer Engineering

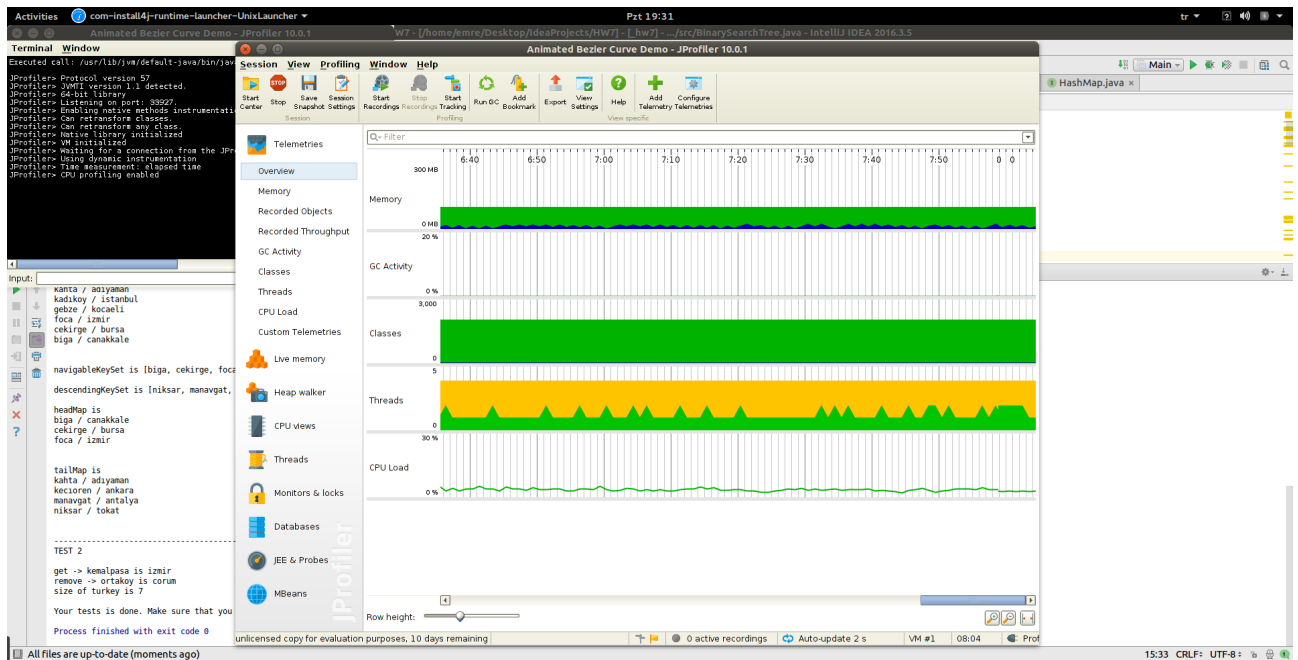
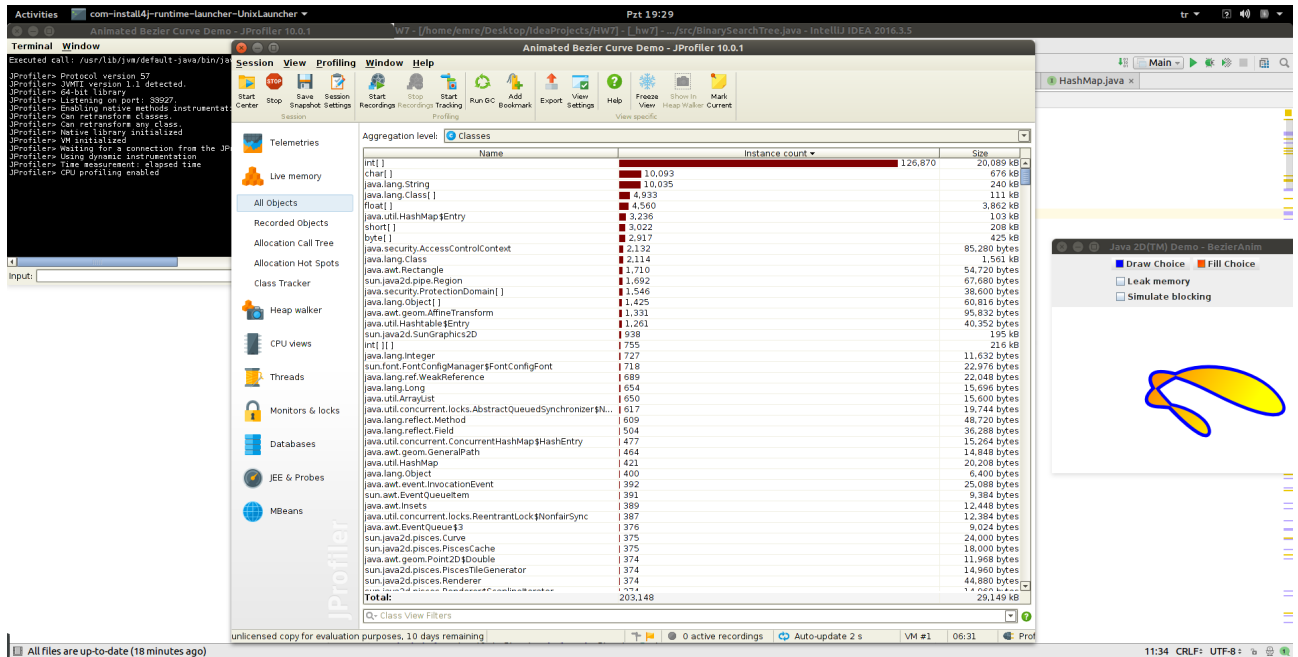
CSE 222  
2017 Spring

HOMEWORK 7 REPORT

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## Other Diagrams



## Problem Solutions Approach

İlk partta methodları implement edebilmek için elemanları entry olan binarysarchtree objesi tuttum.Bst'de entry'ler tutabilmek için entry'lerin comparable olması gerektiği için Map.Entry'yi implement edip comparable Entry sınıfımı yazdım.Methodların return degerleri Entry olmasına rağmen , o Entry'yi zaten implement ettiğim için kendi entry sınıfımı return etmem sorun oluşturmadı.

Sıralı eklemeyi gerçekleştirebilmek için bst'ye ek olarak inordertraverse yapan iterator yazdım.Bu sayede inorder yaparak elemanları sıralı alabilmiş oldum.BinaryNavMap'in methodlarını implement etmek için bu tree'nin inorder iteratorunu kullandım.Sonrasında iteratorle ilerleyip gerekli elde ettim.

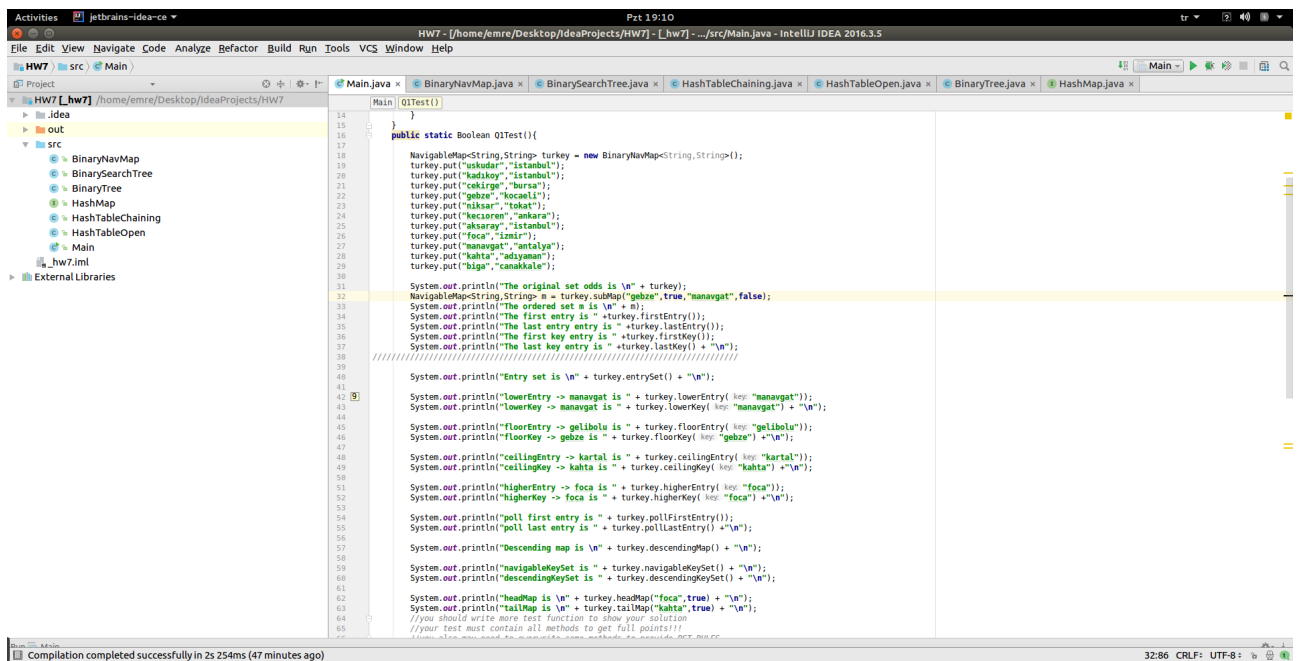
İkinci partta HashTableChaining sınıfında obje olarak HashTableOpen objesi tuttum.HashTableOpen'ı kitap kodundan aldım , fakat işimi görecek şekilde değişiklikler ve düzenlemeler yaptım.Array yerine entry'leri arraylist'te tuttum.Load factor'ü gerek kalmadığı için kaldırdım.Size problemi bulunmadığı için eleman eklerken linkedlistteki gibi baştan eklettim.HashTableChanining sınıfında ise normal linkedlist kullanırmış gibi aynı işlemleri yapıp sadece burada linkedlist yerine hashtableopen sınıfının objesini kullanarak implement ettim.Bu sınıfın elemanlarını for earch'le gezmek için HashTableOpen sınıfında arraylistin iteratorunu return eden bir iterator methodu implement ettim.

## Test Cases

İki soru için de gerekli test methodlarını yazıp ekran görüntülerini Running and Results kısmına koydum.

## Running Command and Results

### Q1 Test Methodu



```
14 public static Boolean Q1Test(){
15 }
16
17 public static Boolean Q1Test(){
18     NavigableMap<String,String> turkey = new BinaryNavMap<String,String>();
19     turkey.put("eskudar","istanbul");
20     turkey.put("kadikoy","istanbul");
21     turkey.put("cokirgin","bursa");
22     turkey.put("gebbe","kocaeli");
23     turkey.put("niksar","tokat");
24     turkey.put("beceren","sakarya");
25     turkey.put("aksaray","istanbul");
26     turkey.put("foca","izmir");
27     turkey.put("manavgat","antalya");
28     turkey.put("kahta","adiyaman");
29     turkey.put("biga","canakkale");
30
31     System.out.println("The original set odds is \n" + turkey);
32     NavigableMap<String,String> m = turkey.subMap("gebbe",true,"manavgat",false);
33     System.out.println("The ordered set m is \n" + m);
34     System.out.println("The first entry is " + turkey.firstEntry());
35     System.out.println("The last entry is " + turkey.lastEntry());
36     System.out.println("The first key entry is " + turkey.firstKey());
37     System.out.println("The last key entry is " + turkey.lastKey() + "\n");
38     ///////////////////////////////////////////////////////////////////
39
40     System.out.println("Entry set is \n" + turkey.entrySet() + "\n");
41
42     System.out.println("lowerEntry -> manavgat is " + turkey.lowerEntry( key: "manavgat"));
43     System.out.println("lowerKey -> manavgat is " + turkey.lowerKey( key: "manavgat") + "\n");
44
45     System.out.println("floorEntry -> gelibolu is " + turkey.floorEntry( key: "gelibolu"));
46     System.out.println("floorKey -> gebze is " + turkey.floorKey( key: "gebbe") + "\n");
47
48     System.out.println("ceilingEntry -> kartal is " + turkey.ceilingEntry( key: "kartal"));
49     System.out.println("ceilingKey -> kahta is " + turkey.ceilingKey( key: "kahta") + "\n");
50
51     System.out.println("higherEntry -> foca is " + turkey.higherEntry( key: "foca"));
52     System.out.println("higherKey -> foca is " + turkey.higherKey( key: "foca") + "\n");
53
54     System.out.println("poll first entry is " + turkey.pollFirstEntry());
55     System.out.println("poll last entry is " + turkey.pollLastEntry() + "\n");
56
57     System.out.println("Descending map is \n" + turkey.descendingMap() + "\n");
58
59     System.out.println("navigableKeySet is " + turkey.navigableKeySet() + "\n");
60     System.out.println("descendingKeySet is " + turkey.descendingKeySet() + "\n");
61
62     System.out.println("headMap is \n" + turkey.headMap("foca",true) + "\n");
63     System.out.println("tailMap is \n" + turkey.tailMap("kahta",true) + "\n");
64     //you should write more test function to show your solution
65     //your test must contain all methods to get full points!!!
66 }
```

# Q1 Output

```
Activities JetBrains-idea-ce-2016.3.5 Pt1 19:11
HW7 - [home/jemre/Desktop/ideaProjects/HW7] - [hw7] - .../src/Main.java - IntelliJ IDEA 2016.3.5
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
HW7 Main
Run Main
The original set odds is
aksaray / istanbul
biga / canakkale
cekirge / bursa
foca / izmir
gebze / kocaeli
kadikoy / istanbul
kahta / adiyaman
kecioren / ankara
manavgat / antalya
niksar / tokat
uskudar / istanbul

The ordered set m is
gebze / kocaeli
kadikoy / istanbul
kahta / adiyaman
kecioren / ankara

The first entry is aksaray / istanbul
The last entry is uskudar / istanbul
The first key entry is aksaray
The last key entry is uskudar

Entry set is
[aksaray / istanbul, biga / canakkale, cekirge / bursa, foca / izmir, gebze / kocaeli, kadikoy / istanbul, kahta / adiyaman, kecioren / ankara, manavgat / antalya, niksar / tokat, uskudar / istanbul]

lowerEntry -> manavgat is kecioren / ankara
lowerKey -> manavgat is kecioren

floorEntry -> gelibolu is gebze / kocaeli
floorKey -> gebze is gebze

ceilingEntry -> kartal is kecioren / ankara
ceilingKey -> kahta is kahta

higherEntry -> foca is gebze / kocaeli
higherKey -> foca is gebze

poll first entry is aksaray / istanbul
poll last entry is uskudar / istanbul

Descending map is
niksar / tokat
manavgat / antalya
kecioren / ankara
kahta / adiyaman
kadikoy / istanbul
gebze / kocaeli
foca / izmir
cekirge / bursa
biga / canakkale

navigableKeySet is [biga, cekirge, foca, gebze, kadikoy, kahta, kecioren, manavgat, niksar]
1 chars, 2 lines 55:1 CRLF: UTF-8: 100%
```

```
Activities JetBrains-idea-ce-2016.3.5 Pt1 19:12
HW7 - [home/jemre/Desktop/ideaProjects/HW7] - [hw7] - .../src/Main.java - IntelliJ IDEA 2016.3.5
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
HW7 Main
Run Main
kecioren / ankara

The first entry is aksaray / istanbul
The last entry is uskudar / istanbul
The first key entry is aksaray
The last key entry is uskudar

Entry set is
[aksaray / istanbul, biga / canakkale, cekirge / bursa, foca / izmir, gebze / kocaeli, kadikoy / istanbul, kahta / adiyaman, kecioren / ankara, manavgat / antalya, niksar / tokat, uskudar / istanbul]

lowerEntry -> manavgat is kecioren / ankara
lowerKey -> manavgat is kecioren

floorEntry -> gelibolu is gebze / kocaeli
floorKey -> gebze is gebze

ceilingEntry -> kartal is kecioren / ankara
ceilingKey -> kahta is kahta

higherEntry -> foca is gebze / kocaeli
higherKey -> foca is gebze

poll first entry is aksaray / istanbul
poll last entry is uskudar / istanbul

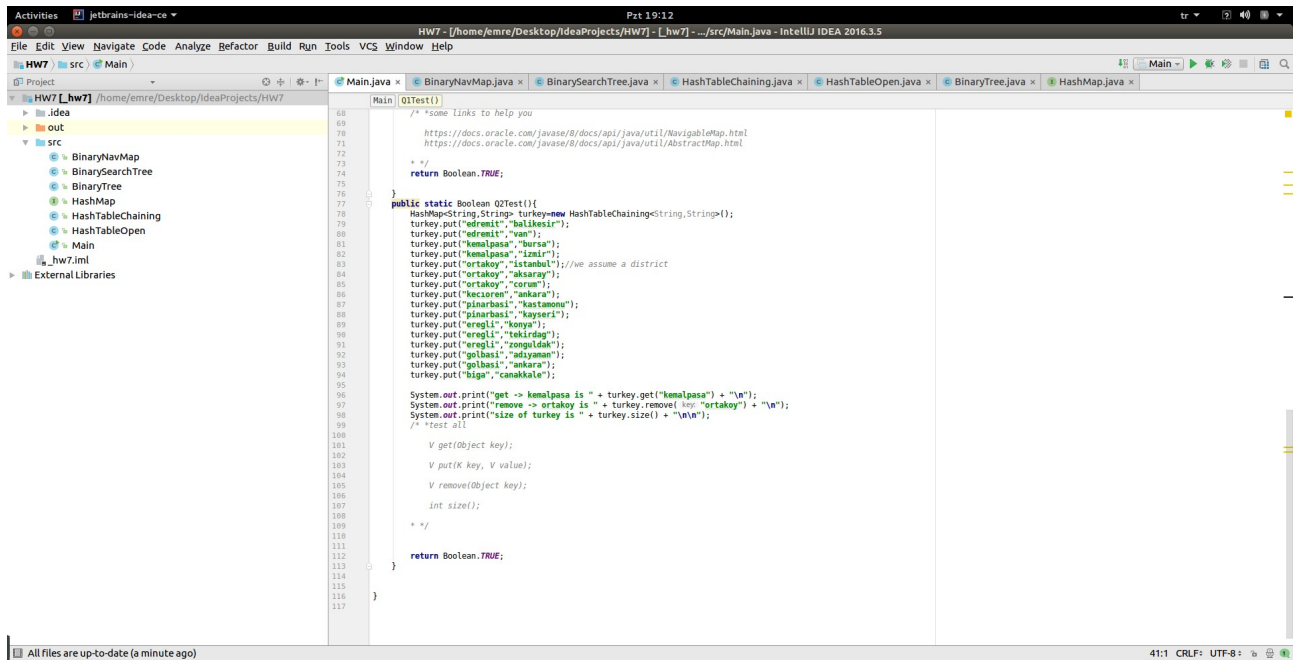
Descending map is
niksar / tokat
manavgat / antalya
kecioren / ankara
kahta / adiyaman
kadikoy / istanbul
gebze / kocaeli
foca / izmir
cekirge / bursa
biga / canakkale

navigableKeySet is [biga, cekirge, foca, gebze, kadikoy, kahta, kecioren, manavgat, niksar]
descendingKeySet is [niksar, manavgat, kecioren, kahta, kadikoy, gebze, foca, cekirge, biga]

headMap is
biga / canakkale
cekirge / bursa
foca / izmir

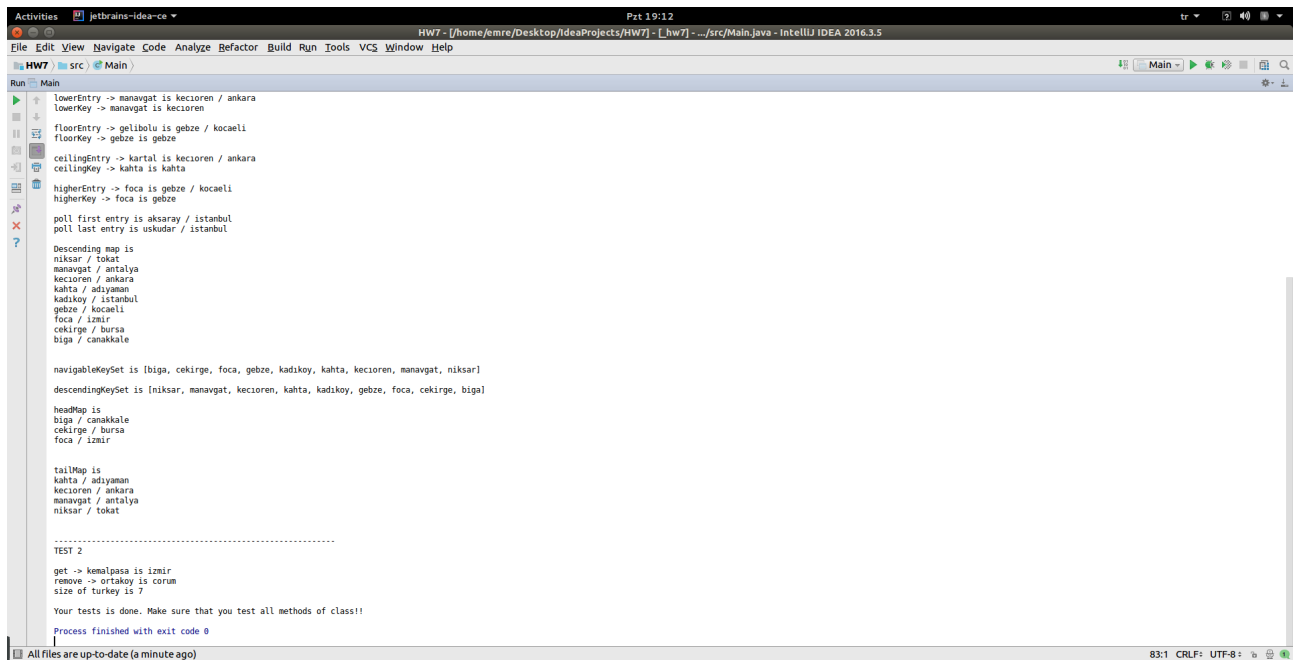
tailMap is
kahta / adiyaman
kecioren / ankara
manavgat / antalya
niksar / tokat
.....
1 chars, 2 lines 55:1 CRLF: UTF-8: 100%
```

## Q2 Test Methodu



```
68  /* Some links to help you
69
70  https://docs.oracle.com/javase/8/docs/api/java/util/NavigableMap.html
71  https://docs.oracle.com/javase/8/docs/api/java/util/AbstractMap.html
72
73  */
74  return Boolean.TRUE;
75
76
77
78  public static Boolean Q2Test(){
79      HashMap<String,String> turkey=new HashMap<String,String>();
80      turkey.put("edremit","balıkesir");
81      turkey.put("edremit","van");
82      turkey.put("kmalpasa","bursa");
83      turkey.put("kmalpasa","izmir");
84      turkey.put("ortakoy","istanbul");//we assume a district
85      turkey.put("ortakoy","aksaray");
86      turkey.put("ortakoy","corum");
87      turkey.put("pınarbaşı","kastamonu");
88      turkey.put("pınarbaşı","kayseri");
89      turkey.put("eregli","konya");
90      turkey.put("eregli","tekirdag");
91      turkey.put("eregli","zonguldak");
92      turkey.put("gelibasi","adiyaman");
93      turkey.put("gelibasi","ankara");
94      turkey.put("biga","canakkale");
95
96      System.out.print("get -> kmalpasa is " + turkey.get("kmalpasa") + "\n");
97      System.out.print("remove -> ortakoy is " + turkey.remove("ortakoy") + "\n");
98      System.out.print("size of turkey is " + turkey.size() + "\n\n");
99      /* test all
100
101      V get(Object key);
102
103      V put(K key, V value);
104
105      V remove(Object key);
106
107      int size();
108
109
110  */
111  return Boolean.TRUE;
112  }
113
114
115
116
117  }
```

## Q2 Output (– Test 2 yazan yerden sonraki kısım)



```
Run: Main
lowerEntry -> manavgat is kecioren / ankara
lowerKey -> manavgat is kecioren
floorEntry -> gelibolu is gebze / kocaeli
floorKey -> gebze is gebze
ceilingEntry -> kartal is kecioren / ankara
ceilingKey -> kahta is kahta
higherEntry -> foca is gebze / kocaeli
higherKey -> foca is gebze
poll first entry is aksaray / istanbul
poll last entry is uskudar / istanbul
Descending map is
niksar / tokat
manavgat / antalya
kecioren / ankara
kahta / adiyaman
kadikoy / istanbul
gebze / kocaeli
foca / izmir
cekirge / bursa
biga / canakkale
navigableKeySet is [biga, cekirge, foca, gebze, kadikoy, kahta, kecioren, manavgat, niksar]
descendingKeySet is [niksar, manavgat, kecioren, kahta, kadikoy, gebze, foca, cekirge, biga]
headMap is
biga / canakkale
cekirge / bursa
foca / izmir
tailMap is
kahta / adiyaman
kecioren / ankara
manavgat / antalya
niksar / tokat
TEST 2
get -> kmalpasa is izmir
remove -> ortakoy is corum
size of turkey is 7
Your tests is done. Make sure that you test all methods of class!!
Process finished with exit code 0
```