Homework 5

Djuro Radusinovic

171044095

Question 4

Problem-solution approach

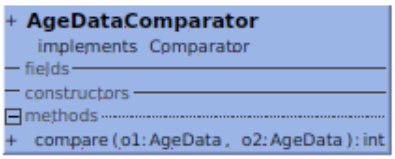
Here max heap is used to implement the same thing as in the 4th question. I didn't use a generic class(was said it does not matter which one it is) because this is very close to MaxHeap class that contains AgeData inside of it. Data is inside of an ArrayList which is manipulated like a Heap. Removal and addition will depend on the number of people of that age. Required change in the heap after addition/removal will be done. There is also Comparator class which is used for comparing elements of the AgeData type as was wanted in the homework. Find and youngerThan and olderThan are methods that are just implemented directly by examining the elements of the array list. There is no order in age so heap was not very helpful here since it is ordered with regard to the people with the same age.

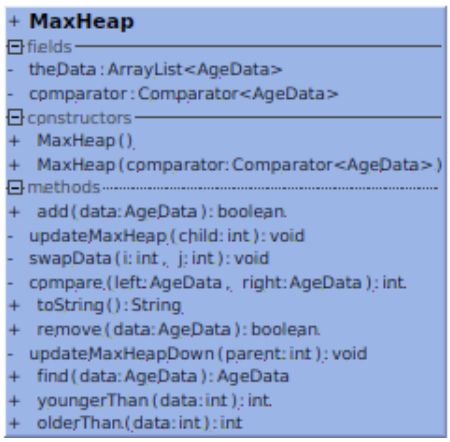
Tests cases

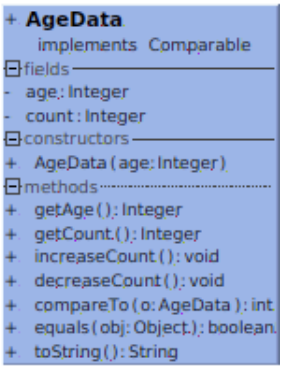
Test cases are run inside the virtual machine provided. Its actual results can be confirmed from the attached screenshots.

Test Scenario	Expected Results	Actual Results
Creating a maxHeap and adding elements to it: 10, 5 , 70, 10, 50, 5, 15	Elements should be successfully added and both 10 and 5 should have a count of 2	As expected
Checking number of people younger than 10	Should find 2 people	As expected
Older than 10	Should find 3 people	As expected
Find method for AgeData of 10	10-2 should be found	As expected
Removing 10 and 5 once	Counter should decrease	As expected
Adding one person of 15 years old	Should be added and since the counter is incremented it should become the root of the heap	As expected

Class diagram







Running command and results

Output of the code executed in the virtual machine is provided in here

```
Komut İstemi
Microsoft Windows [Version 10.0.18363.418]
(c) 2019 Microsoft Corporation. Tüm hakları saklıdır.

C:\Users\cse222>cd Desktop\HWK5\src

C:\Users\cse222\Desktop\HWK5\src>javac AgeData.java AgeDataComparator.java Main.java MaxHeap.java

C:\Users\cse222\Desktop\HWK5\src>java Main
10 - 2
5 - 2
70 - 1
50 - 1
15 - 1

Number of people younger than 10
2
Number of people older than 10
3
Finding someone with the age of 10
10 - 2
Now removing 10 and 5, one person each
5 - 1
10 - 1
70 - 1
50 - 1
15 - 1

Now adding one person for 15
15 - 2
5 - 1
70 - 1
50 - 1
10 - 1


C:\Users\cse222\Desktop\HWK5\src>
```