

**GIT Department of Computer Engineering**

**CSE 222/505 - Spring 2020**

**Homework #5 Part 3 Report**

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## PROBLEM SOLUTION APPROACH

STEP 1 – Extend BinaryTree, BinarySearchTree, SearchTree to implement AgeSearchTree

STEP 2 – To implement AgeSearchTree , implemented AgeData which holds age and number of people at that age, as Comparable

STEP 3 – After all of that, implemented add(), remove(), find(), youngerThan(), olderThan()

STEP 4 – add() adds an AgeData

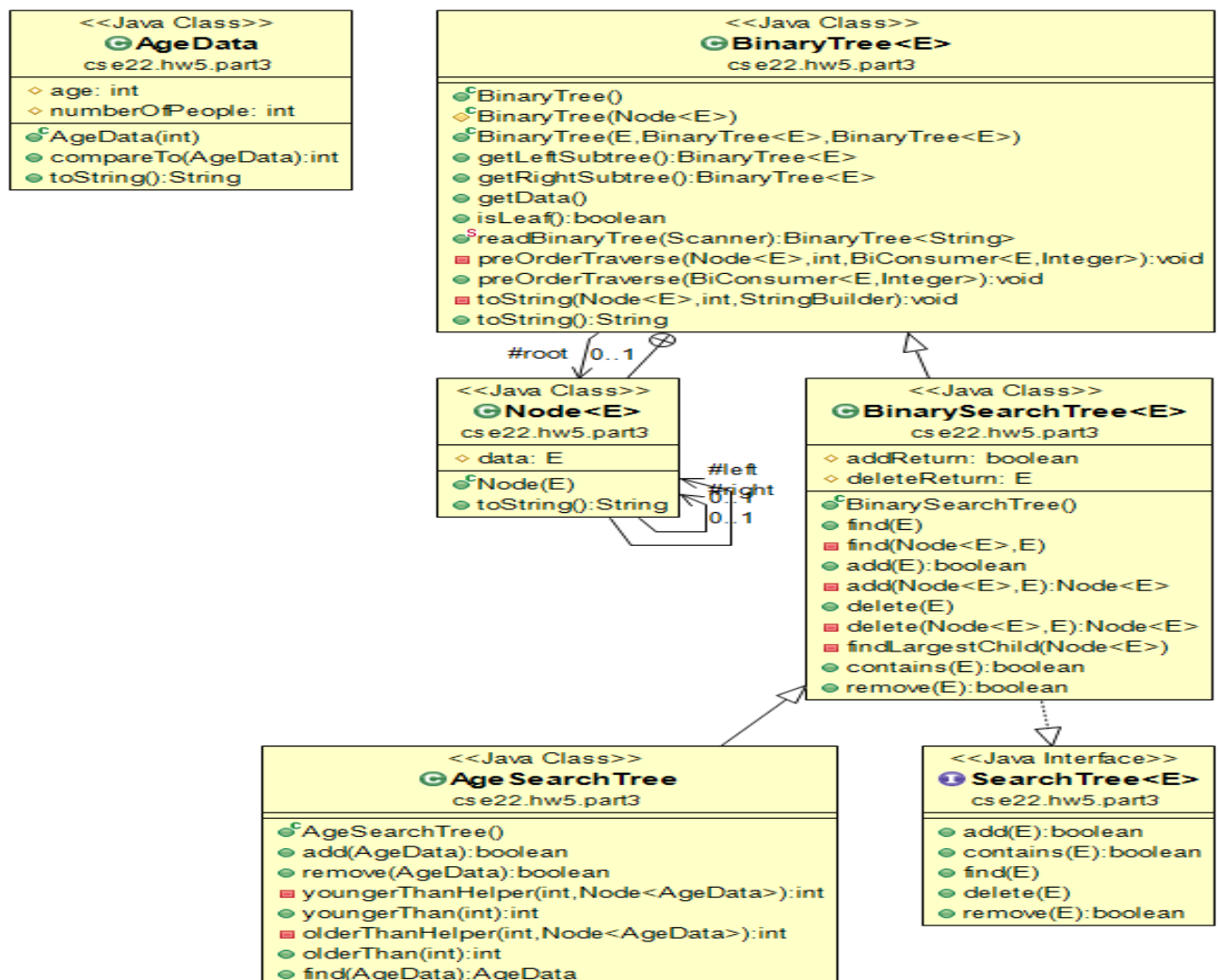
STEP 5 – remove() removes an AgeData and return it

STEP 6 – find() find data and return it

STEP 7 – youngerThan() find and print all data younger than given age

STEP 8 – olderThan() find and print all data older than given age

## CLASS DIAGRAM



## TEST CASES

| TEST ID | Scenario        | Test Data | Expected Results      | Actual Results | Pass/Fail |
|---------|-----------------|-----------|-----------------------|----------------|-----------|
| TEST01  | AgeSearchTree() |           | Successfully Created  | As Expected    | Pass      |
| TEST02  | add(null)       | null      | Exception Thrown      | As Expected    | Pass      |
| TEST03  | remove(null)    | null      | Exception Thrown      | As Expected    | Pass      |
| TEST04  | find(null)      | null      | Exception Thrown      | As Expected    | Pass      |
| TEST05  | youngerThan(13) | 13        | Successfully Returned | As Expected    | Pass      |
| TEST06  | olderThan(8)    | 8         | Successfully Returned | As Expected    | Pass      |
| TEST07  | find(15)        | 15        | Successfully Printed  | As Expected    | Pass      |
| TEST08  | remove()        | 15        | Successfully Removed  | As Expected    | Pass      |
| TEST09  | remove()        | 15        | Successfully Removed  | As Expected    | Pass      |

## RUNNING AND RESULTS

TEST01 - Testing AgeSearchTree no parameter constructor

Successfully Created

TEST02 - Testing add() with null

java.lang.NullPointerException

TEST03 - Testing remove() with null

java.lang.NullPointerException

TEST04 - Testing find() with null

java.lang.NullPointerException

After add some data

12 - 2

10 - 2

5 - 2

null

8 - 1

null

null

null

20 - 3

15 - 2

13 - 1

null

null

null

null

TEST05 - Testing youngerThan() with 13

7

```
12 - 2
10 - 2
  5 - 2
    null
    8 - 1
      null
      null
    null
20 - 3
15 - 2
  13 - 1
    null
    null
  null
null
```

TEST06 - Testing olderThan() with 8  
10

```
12 - 2
10 - 2
  5 - 2
    null
    8 - 1
      null
      null
    null
20 - 3
15 - 2
  13 - 1
    null
    null
  null
null
```

TEST07 - Testing find() with 15  
15 - 2

```
12 - 2
10 - 2
  5 - 2
    null
    8 - 1
      null
      null
    null
  20 - 3
    15 - 2
      13 - 1
        null
        null
      null
    null
  null
```

TEST08 - Testing remove() with 15

```
12 - 2
10 - 2
  5 - 2
    null
    8 - 1
      null
      null
    null
  20 - 3
    15 - 1|
      13 - 1
        null
        null
      null
    null
  null
```

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```
12 - 2
10 - 2
  5 - 2
    null
    8 - 1
      null
      null
    null
20 - 3
  15 - 1
    13 - 1
      null
      null
    null
  null
```

TEST09 - Testing remove() with 15

```
12 - 2
10 - 2
  5 - 2
    null
    8 - 1
      null
      null
    null
20 - 3
  13 - 1
    null
    null
  null
```

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