Gebze Technical University Computer Engineering

CSE222/Homework 5 Report

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Part one : Definition of the problem and requirements

a)Definition of the problem:

Four questions are asked and those are supposed to be solved.

a)Requirements:

Given questions requires implementations and on paper solutions

Part two : Class Diagrams

Part three : Problem solution approach

→Solutions for q1

$$\sum_{i=1}^{h} (i-1).2^{(i-1)} + \left(n - \sum_{i=0}^{h-1} 2^{i}\right).h$$

n = total number of all nodes
h = height of complete binary tree

$$\frac{\sum_{i=1}^{h} (i-1).2^{(i-1)} + \left(n - \sum_{i=0}^{h-1} 2^{i}\right).h}{n-1}$$

→

→For q3 , an BinaryTree class is implemented and extended by binaryHeap class.This binaryHeap class also has HeapNode class that inherits Node class from BinaryTree and it has

functions to add data and check validity for asked conditions.BinaryHeap class has recursive functions to add data to given index and these functions uses functions of HeapNode.

→Question 4

Part four : Test Cases

```
yagiz@p-MacBook-Air hw % make
javac com/YagizHakki/*.java
Note: com/YagizHakki/BinaryHeap.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
java com.YagizHakki.Main
succes 10 --> 15
succes 10 --> 30
succes 15 --> 40
succes 15 --> 50
succes 30 --> 100
succes 30 --> 40
Invalid Element for heap 40 --> 50
Invalid Element for heap 40 --> 30
succes 40 --> 50
yagiz@p-MacBook-Air hw %
```