

Project 5

Show implementation of a binary minHeap data structure in Java.

Implement your heap using an primitive array object or an ArrayList object. The minHeap must implement the following functions:

`void insert(Event);` // the minHeap insert algorithm; use it after build heap ; invalid to call before build heap command

`void add(Event);` // adds the event to the next available array slot, no percolation, called before build heap invalid to call after build heap.

`Event deleteMin();` // removes and returns the event with the smallest timeOfEvent

`boolean isEmpty();`

`void buildHeap();` // the minHeap build-Heap algorithm, that converts the array into a binary heap.

“Event” is a base class for three types of events, Arrival, EndOfService and Termination. Each of these has a class variable, double timeOfEvent, and a function void print() that is called when the object is removed from the queue. These print functions print the class name followed by the class variable, as follows:

Arrival Event at time 24.56.

EndOfService Event at time 50.66.

Termination Event at time 71.78.

All doubles must be printed with two digits before the point and two digits after the point.

The timeOfEvent field is used as the key for all heap operations.

An input must be read from System.in and all output must be to System.out.

Sample Run:

1. Add Event
2. Insert
3. Print Array
4. Build Heap
5. Delete Min
6. Quit

Option: 1
Event Type: Arrival
Time: 12.10
Done

Option: 1
Event Type: Arrival
Time: 11.45
Done

Option: 1
Event Type: EndOfService
Time: 11.40
Done

Option: 1
Event Type: Termination
Time: 13.45
Done

Option: 2
Can't insert into the heap use build heap first or just add

Option: 3
Arrival:12.10; Arrival:11.45; EndOfService:11.40; Termination: 13.45

Option: 4
Heap Built

Option: 3
EndOfService :11.40; Arrival:11.45; Arrival:12.10; Termination:13.45

Option: 2
Event Type: Arrival
Time: 13.40

Option: 1
Can't add into the heap use insert

Option: 7
Minimum Deleted
EndOfService Event at time 11.40

Option: 3

Arrival:11.45; Arrival 13:40; Arrival:12.10; Termination:13.45

Option: 8

Thank You.