Bubble Up Part I

6 min

Our MinHeap needs to satisfy two conditions:

- The element at

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index

1 is the minimum value in the entire list.

- Every child element in the list must be larger than its parent.

Let's define an .add()

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method

which will allow us to add elements into the .heap

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array

. We will also define .bubbleUp() which will do the work of maintaining the heap conditions as we add additional elements.

Instructions

1. Checkpoint 1 Passed

1.

Inside **MinHeap.js**, define a MinHeap class method, .add(), below the constructor to add an element to its heap. Within .add():

    - define a parameter, value
    - add value to end of the array in this.heap

Optionally, display in .add():

    - a message showing the value to be added,
    - the current content of the heap before method returns

Hint

Since this.heap is an array, we use the .push() method to add an element to the end of the array, like so:

someArray.push(element);

We can log messages after pushing an element to the heap as follows:

console.log(`.. Adding ${element}`);

We can display the content of our heap array as follows:

console.log(this.heap);

2. Checkpoint 2 Passed

2.

After we added an element to the heap, we want to increase its heap count. Increment the size property by one.

3. Checkpoint 3 Passed

3.

Within **script.js**, call the .add() method with a value of 42. Run the test code within **script.js** to see the element 42 added to the heap.

Hint

After constructing a MinHeap instance, we can call its .add() method to add an element to the heap. For example:

```
const myHeap = new MinHeap();
myHeap.add(365);
```

4. Checkpoint 4 Passed

4.

Define another MinHeap class method, .bubbleUp(), below .add() whose task is to preserve the heap properties after an element is added to the heap. For now, log a message 'Bubble Up' inside the method.

5. Checkpoint 5 Passed

5.

We want to call .bubbleUp() each time we add an element. Return to the .add() method, and make a call to .bubbleUp()

6. Checkpoint 6 Passed

6.

Rerun the test code in **script.js**. What do you see as output?

Hint

You should see something like this on the console:

```
Content of heap [ null ]
.. Adding 42
.. Bubble Up
Content of heap [ null, 42 ]
```

MinHeap.js

```
class MinHeap {
  constructor() {
    this.heap = [ null ];
    this.size = 0;
  }

  add(value) {
    this.heap.push(value);
    console.log(`... Adding ${value}`);
    this.bubbleUp();
    console.log(`Content of heap: ${this.heap}`);
    this.size++;
  }

  bubbleUp() {
    console.log('... Bubble Up');
  }
}
module.exports = MinHeap;
```

script.js

```
const MinHeap = require('./MinHeap');

// instantiate MinHeap and assign to minHeap
const minHeap = new MinHeap();

// display content of minHeap
console.log('Content of heap', minHeap.heap);

minHeap.add(42);
```

>> Output

```
Content of heap [ null ]
... Adding 42
... Bubble Up
Content of heap: ,42
```