AlgoExpert Quad Layout C++ 12px Sublime Monokai 00:00:0

Our Solution(s) Run Code

Solution 1

```cpp
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#include <vector>
using namespace std;

class MinHeap {
public:
  vector<int> heap;

  MinHeap(vector<int> vector) { heap = buildHeap(&vector); }

  // O(n) time | O(1) space
  vector<int> buildHeap(vector<int> *vector) {
    int firstParentIdx = (vector->size() - 2) / 2;
    for (int currentIdx = firstParentIdx; currentIdx >= 0; currentIdx--) {
      siftDown(currentIdx, vector->size() - 1, vector);
    }
    return *vector;
  }

  // O(log(n)) time | O(1) space
  void siftDown(int currentIdx, int endIdx, vector<int> *heap) {
    int childOneIdx = currentIdx * 2 + 1;
    while (childOneIdx <= endIdx) {
      int childTwoIdx = currentIdx * 2 + 2 <= endIdx ? currentIdx * 2 + 2 : -1;
      int idxToSwap;
      if (childTwoIdx != -1 && heap->at(childTwoIdx) < heap->at(childOneIdx)) {
        idxToSwap = childTwoIdx;
      } else {
        idxToSwap = childOneIdx;
      }
      if (heap->at(idxToSwap) < heap->at(currentIdx)) {
        swap(currentIdx, idxToSwap, heap);
        currentIdx = idxToSwap;
        childOneIdx = currentIdx * 2 + 1;
      } else {
        return;
      }
    }
  }

  // O(log(n)) time | O(1) space
  void siftUp(int currentIdx, vector<int> *heap) {
    int parentIdx = (currentIdx - 1) / 2;
    while (currentIdx > 0 && heap->at(currentIdx) < heap->at(parentIdx)) {
      swap(currentIdx, parentIdx, heap);
      currentIdx = parentIdx;
      parentIdx = (currentIdx - 1) / 2;
    }
  }

  int peek() { return heap[0]; }

  int remove() {
    swap(0, heap.size() - 1, &heap);
    int valueToRemove = heap.back();
    heap.pop_back();
    siftDown(0, heap.size() - 1, &heap);
    return valueToRemove;
  }

  void insert(int value) {
    heap.push_back(value);
    siftUp(heap.size() - 1, &heap);
  }

  void swap(int i, int j, vector<int> *heap) {
    int temp = heap->at(j);
    heap->at(j) = heap->at(i);
    heap->at(i) = temp;
  }
};
```

Your Solutions Run Code

Solution 1 **Solution 2** **Solution 3**

```cpp
#include <vector>
using namespace std;

// Do not edit the class below except for the buildHeap,
// siftDown, siftUp, peek, remove, and insert methods.
// Feel free to add new properties and methods to the class.
class MinHeap {
public:
  vector<int> heap;

  MinHeap(vector<int> vector) { heap = buildHeap(&vector); }

  vector<int> buildHeap(vector<int> *vector) {
    // Write your code here.
    return {};
  }

  void siftDown(int currentIdx, int endIdx, vector<int> *heap) {
    // Write your code here.
  }

  void siftUp(int currentIdx, vector<int> *heap) {
    // Write your code here.
  }

  int peek() {
    // Write your code here.
    return -1;
  }

  int remove() {
    // Write your code here.
    return -1;
  }

  void insert(int value) {
    // Write your code here.
  }
};

```

Custom Output **Raw Output** Submit Code

Run or submit code when you're ready.