

PL UID: dev

## Question 1: heap\_shorts\_array\_implementation\_mc

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{ "heap\_array": [ { "key": "a", "html": "\n The third-smallest element is at either  $\text{arr}[2]$  or  $\text{arr}[3]$ . \n }, { "key": "b", "html": "\n Using the heap to sort the array is asymptotically as efficient as using mergeSort. \n }, { "key": "c", "html": "\n Swapping the last and the second last element in the array results in another valid heap. \n }, { "key": "d", "html": "\n The heap order property may be violated by swapping the contents of two adjacent locations in  $\text{arr}$  so that \n the first is now smaller than the second. \n } ] }

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### Question 1.1: heap\_array

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INCORRECT: 0

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[ { 'key': 'b', 'html': "\n Using the heap to sort the array is asymptotically as efficient as using mergeSort. \n }, { 'key': 'd', 'html': "\n The heap order property may be violated by swapping the contents of two adjacent locations in  $\text{arr}$  so that \n the first is now smaller than the second. \n } ]

---

[ 'a', 'c' ]

## Question 2: heap\_shorts\_build\_heap

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```
{"input": {"_type": "dataframe", "_value": {"data": [[85, 32, 88, 61, 52, 5, 46, 37, 13, 72]], "index":  
["key"], "columns": [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]}}
```

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### Question 2.1: arr

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INCORRECT: 0

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[5, 13, 46, 32, 52, 88, 85, 37, 61, 72]

---

[89, 8, 890, 89, 890, 809, 809, 89, 89, 89]

### Question 3: heap\_shorts\_operations

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```
{"graph": "strict digraph {\n  node [label=\"\\N\\"]; \n  0 [label=16]; \n  1 [label=21]; \n  0 -> 1; \n  2 [label=20]; \n  0 -> 2; \n  3 [label=54]; \n  1 -> 3; \n  4 [label=53]; \n  1 -> 4; \n  5 [label=23]; \n  2 -> 5; \n  6 [label=92]; \n  2 -> 6; \n  7 [label=89]; \n  3 -> 7; \n  8 [label=95]; \n  3 -> 8; \n  9 [label=83]; \n  4 -> 9; \n  10 [label=59]; \n  4 -> 10; \n} \n", "removed_values":  
16  
20  
21  
23  
53  
54  
59  
83  
89  
92  
95", "inserted_values":  
16  
20  
21  
23  
53  
54  
59  
83  
89  
92  
95", "heap_manipulation_insert": [{"key":  
"a", "html": "16"}, {"key": "b", "html": "20"}, {"key": "c", "html": "21"}, {"key": "d", "html": "23"},  
{"key": "e", "html": "53"}, {"key": "f", "html": "54"}, {"key": "g", "html": "59"}, {"key": "h", "html":  
"83"}, {"key": "i", "html": "89"}, {"key": "j", "html": "92"}, {"key": "k", "html": "95"}],  
"heap_manipulation_remove": [{"key": "a", "html": "16"}, {"key": "b", "html": "20"}, {"key": "c",  
"html": "21"}, {"key": "d", "html": "23"}, {"key": "e", "html": "53"}, {"key": "f", "html": "54"}, {"key":  
"g", "html": "59"}, {"key": "h", "html": "83"}, {"key": "i", "html": "89"}, {"key": "j", "html": "92"},
```

```
{"key": "k", "html": "95"}}
```

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Question 3.1: heap\_manipulation\_insert

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INCORRECT: 0

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Expected: [{'key': 'c', 'html': '21'}, {'key': 'e', 'html': '53'}, {'key': 'g', 'html': '59'}]

---

f

### Question 3.2: heap\_manipulation\_remove

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---

INCORRECT: 0

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Expected: [{'key': 'a', 'html': '16'}, {'key': 'b', 'html': '20'}, {'key': 'd', 'html': '23'}, {'key': 'g', 'html': '59'}]

---

b

## Question 1: disjt\_unions

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```
{"n": 15, "arr": {"_type": "dataframe", "_value": {"data": [[3, -1, 14, -11, 14, 14, 7, -3, 3, 7, 3, 12, 3, 12, 3]], "index": ["arr"], "columns": [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14]}}, "bigdata": 82309, "bigunions": 44123}
```

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### Question 1.1: height

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INCORRECT: 0

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Expected: 2

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890

Question 1.2: unions

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INCORRECT: 0

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Expected: 12

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908



Question 1.3: uptreenum

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INCORRECT: 0

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Expected: 38186

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890

## Question 1.4: files

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INCORRECT: 0

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playListAns.cpp

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```
void playList(vector<char> &A)

{

    bool Tay = // YOUR CODE HERE!!

        for (int i = 1; i < A.size(); i++)

        {

            int next = findNext(A, i, Tay);

            swap(A[next], A[i]);

            Tay = !Tay;

        }

}
```

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## Phrase Emphasis

Markdown: Some of these words are emphasized. Some of these words are emphasized also. Use two asterisks for strong emphasis. Or, if you prefer, use two underscores instead.

## Lists

- Red
- Green
- Blue

Ordered (numbered) lists use regular numbers, followed by periods, as list markers:

1. Red
2. Green
3. Blue

## Code

```
This is a code indent!
```

To specify an entire block of pre formatted code, indent every line of the block by 4 spaces or 1 tab. Just like with code spans, `&`, `<`, and `>` characters will be escaped automatically.

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