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Guarantrees



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Problem Submissions Leaderboard Discussions

Construct a Data Structure with the following operations:

- 1. insert(k) Inserts an element into the DS.
- 2. delete(k) Deletes an element from the DS, if it exists.
- 3. min(k) Finds the k-th minimum element from the DS. Returns that element's value.

All of the above operations must **guarantee** a worst case complexity of $O(\log n)$

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Submissions: 64

Max Score: 50

Difficulty: Hard

We expect you to get familiar with C++ classes and use them in this assignment.

At the same time, try to write well-commented code. We will appreciate it when grading your submission.

Input Format

```
N (number of commands/lines)
<i|d|m> num ( i=insert ; d=delete ; m=min )
...
...
```

Constraints

$N \leq 10^6$

For i,d - num is a valid 32-bit integer.

For m - num is a valid rank i.e., there are atleast num elements in the DS at that time.

Output Format

```
< integer from m command >
...
...
```

Sample Input

12 i 10

i 21

i 13

i 7

i 8 i 1020

i 102 m 5

d 10

m 5 d 21

d 21 m 5

Sample Output

13 21

1020

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Explanation

After 7 inserts, the sorted order of elements is 5,7,8,10,13,21,1020.

The 5th min element is 13, which is printed.

10 is deleted now. This makes the list 5,7,8,13,21,1020.

The 5th min element is now 21, which is printed.

21 is deleted now. This makes the list 5,7,8,13,1020.

The 5th min element is finally 1020, which is printed.

```
C++
 Current Buffer (saved locally, editable) & 🗸
 1 ▼ #include <cmath>
 2 #include <cstdio>
 3 #include <vector>
    #include <iostream>
    #include <algorithm>
    using namespace std;
 8
 9 ▼ int main() {
        /* Enter your code here. Read input from STDIN. Print output to STDOUT */
10 ▼
11
        return 0;
12
    }
13
                                                                                                                 Line: 1 Col: 1
                                                                                                     Run Code
                                                                                                                  Submit Code
1 Upload Code as File
                      Test against custom input
```

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