**Uncle Grandpa and heap median**

**Note:** This problem will be graded for 1%. Your coding style will contribute 30% toward your grade for the lab

(Almost copy-pasted statement dab dab)

After winning the Binary Tree Challenge last week, this week our Grandpa is doing experiments with Heap. He wants to build a special heap that supports the following 2 operations:

* : Insert the number to the heap
* Print out the median of the heap (or if the current heap size is even, print out two medians of the heap)

Actually, our Grandpa has already finished implementing that special heap, but for the purpose of writing the statement, he will still ask for your help. Can you help him?

## Input

The first line contains a single integer – the number of operation

In the next lines, each will contain one query of the above 2 types. In all query,

## Output

For each query of the 2nd type, if the heap is empty, print . Else, print as follows:

* If the heap size is odd, print a single integer is the median of the heap
* Else, print two integers of which both are median of the heap and

## Examples

|  |  |
| --- | --- |
| Input (median1.in) | Output (median1.out) |
| 7  1 5  1 8  2  1 20  2  1 17  2 | 5 8  8  8 17 |

## Explanation:

We have the state of the heap after each query as follows:

After the 1st query:

After the 2nd query:

After the 3rd query: the two medians are

After the 4th query:

After the 5th query: the median is

After the 6th query:

After the 7th query: the two medians are

## Hints:

One of the possible solution to this problem is to use 2 Priority Queue with different properties.

## Important Note:

## For the purpose of learning, you are highly encouraged to use heap-related DS to solve the problem. You are strictly forbidden from using TreeMap, TreeSet and all its variants (Constructing your own tree is fine).

## Note:

1. A skeleton file has been given to help you. You should not create a new file or rename the file provided. You should develop your program using this skeleton file.
2. You are free to define your own helper methods and classes (or remove existing ones) if it is suitable but you must put all the new classes, if any, in the same skeleton file provided

## Skeleton File

You can find the skeleton file Median.java in the lab package.