# Heaps

DSA Practice Lab

March 14, 2018

## Question 1

Given a sequence of numbers $A$, you have to check whether the sequence represents a MinHeap, MaxHeap or None.

### Constraints

$1 \leqslant n \leqslant 10^6$
$-10^9 \leqslant A_i \leqslant 10^9$

### Input

The first line of input contains one integer $n$, the number of elements in a sequence.
The second line contains $n$ integers of the sequence.

### Output

The output contains one line on basis of the following conditions:
Print MINHEAP if sequence represents MinHeap
Print MAXHEAP if sequence represents MaxHeap
Print NONE if sequence represents neither a MinHeap nor a MaxHeap

## Sample Case

### Input 1

6
9 115 10 3 -12 11

### Output 1

NONE

### Input 2

6
99 47 89 24 -5 -100

### Output 2

MAXHEAP

### Input 3

6
-100 -5 4 89 47 99

### Output 3

MINHEAP

# Question 2

Given k sorted arrays of size n each, merge them and print the sorted output. (Try implementing this without using C++ STL priority_queue and sorting functions)

## Constraints

$1 \leqslant n \leqslant 2 * 10^3$
$1 \leqslant k \leqslant 10^2$
$-10^9 \leqslant$ *each array element* $\leqslant 10^9$

## Input

The first line of input contains two integers $k$ and $n$, the number of sorted arrays and size of each array.
Each of the remaining $k$ lines contain $n$ space separated integers each.

## Output

The output will be the the sorted merged array.

## Sample Case

### Input

3 4
0 3 6 9
1 4 7 10
2 5 8 11

### Output

0 1 2 3 4 5 6 7 8 9 10 11