Find the Running Median

Problem | Submissions | Leaderboard | Discussions

The median of a set of integers is the midpoint value of the data set for which an equal number of integers are less than and greater than the value. To find the median, you must first sort your set of integers in non-decreasing order, then:

- If your set contains an odd number of elements, the median is the middle element of the sorted sample. In the sorted set $\{1, 2, 3\}$, 2 is the median.
- If your set contains an even number of elements, the median is the average of the two middle elements of the sorted sample. In the sorted set $\{1, 2, 3, 4\}$, $\frac{2+3}{2} = 2.5$ is the median.

Given an input stream of n integers, perform the following task for each i^{th} integer:

1. Add the i^{th} integer to a running list of integers.
2. Find the median of the updated list (i.e., for the first element through the i^{th} element).
3. Print the updated median on a new line. The printed value must be a double-precision number scaled to 1 decimal place (i.e., **12.3** format).

Example

$a = [7, 3, 5, 2]$

Sorted	Median
[7]	7.0
[3, 7]	5.0
[3, 5, 7]	5.0
[2, 3, 5, 7]	4.0

Median → sort

n → odd

1 2 3 4 5

(1)

{ 1 2 3 4 }

m1 = 1.0

m2 = 1.5

m3 = 2.0

m4 = 2.5

★ data set should be sorted to find median

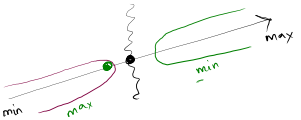
★ n → even → Avg. of 2 middle

→ odd → middle val

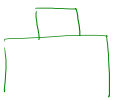
Logic

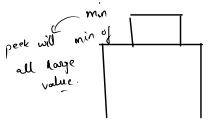
2 pq → min

→ max

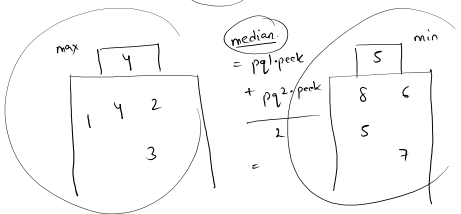


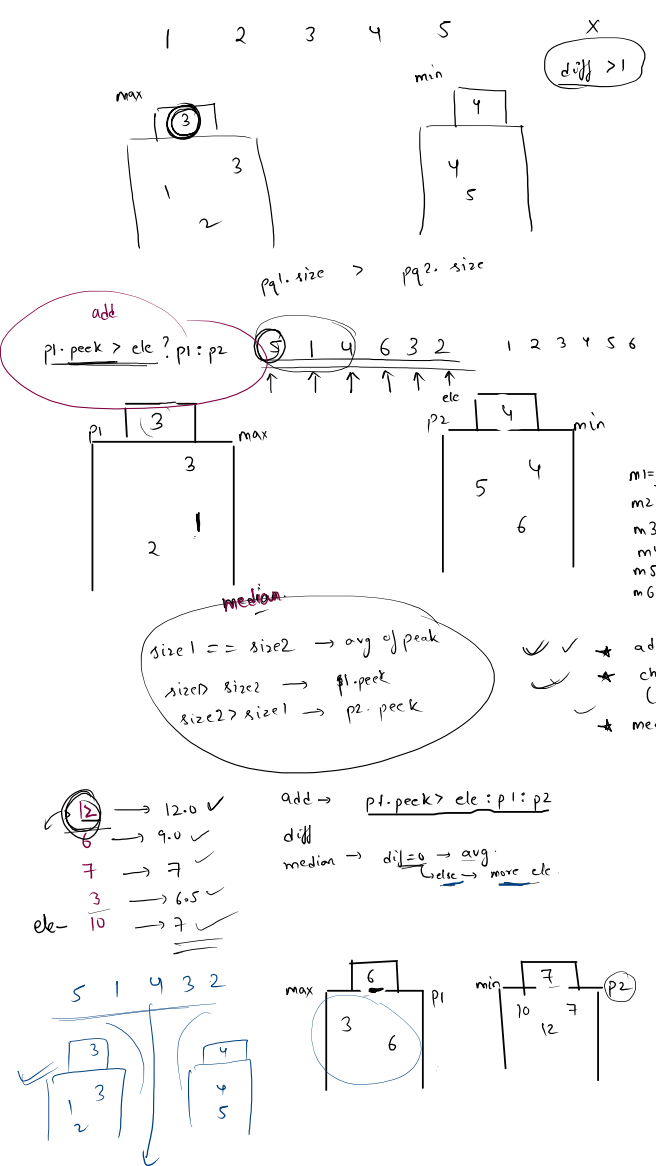
max → peek will max of all small values





1 2 3 4 5 6 7 8

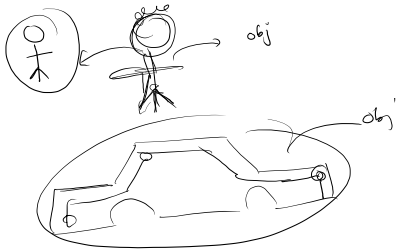



1 2 3 4 5 X
diff > 1
max
min
pq1.size > pq2.size
add
p1.peek > ele ? p1 : p2
elc
p1
p2
m1= 5.
m2 = 3
m3 = 4.
m4 = 4.5
m5 = 4
m6 = 3.5
median.
size1 == size2 → avg of peak
size1 > size2 → p1.peek
size2 > size1 → p2.peek
add
check diff (>1) X
median.
add → p1.peek > ele : p1 : p2
diff
median → dif = 0 → avg
else → more ele
ele
12.0
9.0
7
6.5
7
5 1 4 3 2
6
3
10
7
12

OOPs → Object Oriented Programming.

- theory
- example
- code

class → blueprint of obj. (structure of obj)



Car (genric)

- brand : Maruti
- topSpeed : 80
- mileage : 30
- no. of tyre : 4
- color : white
- no. of doors : 4
- (category) :- SUV / sedan / hatchback

Alto → hatchback

City → sedar

Honda
- 140
- 20
- 4
- white
- 4
- sedan

Class → Car (genric)
- brand
- topSpeed
- color

Obj → Alto

City

Maruti 80 White

Rastero

Honda 140 Silver

Audi

nano tata

1 Class → ① obj ② obj ③ ...

1 class can have multiple obj