Median of a Running Stream

Given a running stream of integers, design an algorithm to print the **median** of the numbers in the stream each time a new integer is added to the stream.

Example

Input

Stream	4	6	2	5	3	1	7	9	8	. . .
Median	4	5	4	4.5	4	3.5	4	4.5	5	. . .

[4]

[4, 6]

[2, 4, 6]

[2, 4, 5, 6]

[2, 3, 4, 5, 6]

[1, 2, 3, 4, 5, 6]

assume size of stream is 'n'

Brute force

→ read a val. from the stream → C

→ insert it into sorted seq → n

→ find the median → C

} n^2

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x > median

5 4 1 2 3 [x] .....

median = 3

eg: x = 10

[1, 2, 3, 4, 5, 10]

[1, 2, 3, 4, 5]

→ viz

3.5

if x is > median then median ↑es

5 4 1 2 3 [x] median = 3

x < median

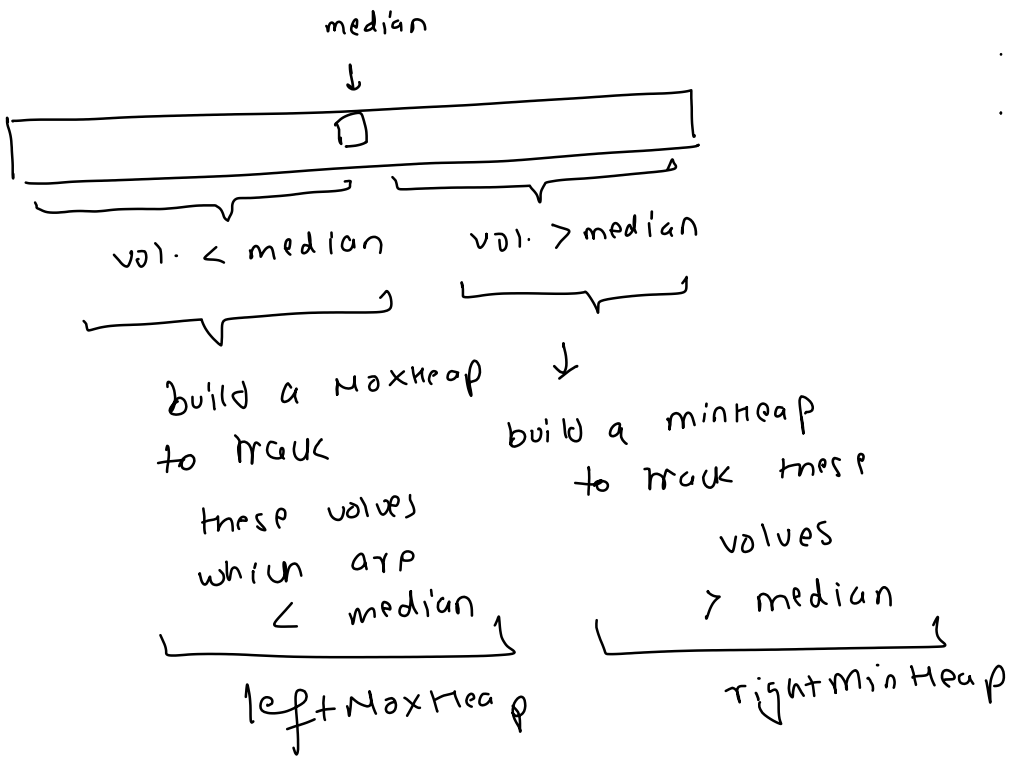
↓↓

median ↓es

eg: x = 0

[0, 1, [2 3], 4, 5]

2-5 < 3



Stream	4	6	2	5	3	1	7	9	8

median = 4 5 4 4.5 4 3.5 4 4.5

o/p : 4, 5, 4, 4.5, 4, 3.5, 4, 4.5