max moves

We will get the max number of moves by moving the extreme nodes to fill the internal gaps. only one step at a time i.e. after one move one gap is reduced

so max no. of moves will be equal to total no. of gaps

no. of gaps = range - occupied

$$(stones[n-1] - stones[0] + 1) - (n)$$

but as soon as we move an extreme (smallest / largest) stone to into center all the next gaps (for smallest) & all the prev gaps (for largest) will get invalidated and hence don't need to be filled

x → stone

0 → gap.

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

total gaps = 6 (count)

or

$(11 - 1 + 1) - (5)$

range − occupied

$11 - 5 = 6$

now if we move the smallest to reduce the gap.

X O O X X X O O O O X

1 2 3 4 5 6 7 8 9 10 11

O O O X X X O O O X X

you can notice here these gaps no longer need to be filled.

X X X O O X X

X X X O X X

X X X X X

Total steps = 4

so, if we use the smallest first to fill the internal gap we would take stones[1] - stones[0] - 1 steps less

so the gap b/w 2^{nd} & 1^{st} stone needs to reduced from no. of total gaps from 1^{st} to n^{th} stone

If we move the largest stone first, the gap b/w stones[n-1] - stones[n-2] - 1 would be reduced in 1 move

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

x x 0 x x x
 x x x x x
```

4 gaps reduced in first move.

total moves = 2

i.e. total no. of gaps $- [\text{stones}[n-1] - \text{stones}[n-2] - 1]$

$11 - 6 - 1$

$= 6 - 4$

$= 2$

to maximize the no. of moves we have to move smallest / largest depending upon which reduces the gaps by less no.

$$total\_gaps = (stones[n-1] - stones[0] + 1) - n$$

$$total\_gaps - \min(stones[1] - stones[0] - 1, \; stones[n-1] - stones[n-2] - 1)$$

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there's another way to calculate this.

that we can calculate the no. of gaps b/w

smallest & second largest

OR

second smallest & largest

& take the maximum

$$
\max \begin{cases} stones[n-2] - stones[0] + 1 \\ \quad - (n-1) \\ \text{OR} \\ stones[n-1] - stones[1] + 1 \\ \quad - (n-1) \end{cases}
$$

→ because we don't consider largest stone -

what this means is.

$stones[n-2] - stones[0] + 1 - (n-1)$

gaps b/w smallest & second largest stones is the max no. of moves because the internal gaps will be filled one step at a time

$$\underbrace{\underset{1}{X}\ \underset{2}{O}\ \underset{3}{O}\ \underset{4}{O}\ \underset{5}{X}\ \underset{6}{X}}\ \underset{7}{O}\ \underset{8}{O}\ \underset{9}{X}$$

3 steps

$$\max\begin{cases} 6-1+1-(4-1) \\ \text{OR} \\ 9-5+1-(4-1) \end{cases}$$

How)

X O O O X X O O X

→ X X O O X X

→ X X O X X

→ X X X X

$$\max\begin{cases} 3 \\ 2 \end{cases}$$

||ly consider the example

X O O X X X O O O O X

$$\max\begin{cases} 2 \\ 4 \end{cases}$$

moving the smallest to right would lead to more steps.