Moore's Voting Algorithm

arr[] = [7, 7, 5, 7, 5, 1, 5, 7, 5, 5, 7, 7, 5, 5, 5, 5]

el = 7

cnt = 0 + 2 + 2 + 0

7 7 5 7 5 1

el = 7 (3 times) (+ + +)

other (5, 1) (3 times) (- - -)

cnt = 0

If we just consider this array 7 is definately Not majority el

Cause majority el (> n/2) so majority el won't get fully cancelled by others

suppose

arr[6] = {1, 2, 1, 1, 3, 1}

el = 1 (4 times) (+ + + +) other (2, 3) (- -)

cnt = 2

So when cnt get zero take next el as el

el = 5 [5 7]

el = 5 (+) other (7) (-)

cnt = 0 + 0

el = 5 [5 5 7 7]

el = 5 (++) other (- -)

cnt = 0 + 2 + 0

el = 5

cnt = 0 1 2 3 4

| 5 | 5 | 5 | 5 |

el = 5

(+ + + +)

Now if there exist a majority element then its 5 or else no maj el

suppose at the end instead of 5

| 1 | 1 | 1 | 1 |

el = 1

cnt = 4

But 1 isn't maj el

If Problem states there always will exist majority el then no need of this loop

So iterate through array to check wheather 5 (element in el) appears $> n/2$ times

Intution - Element that appears $> \frac{n}{2}$ times willn't get cancelled by others.

Time complexity : O(N)

Space complexity : O(1)