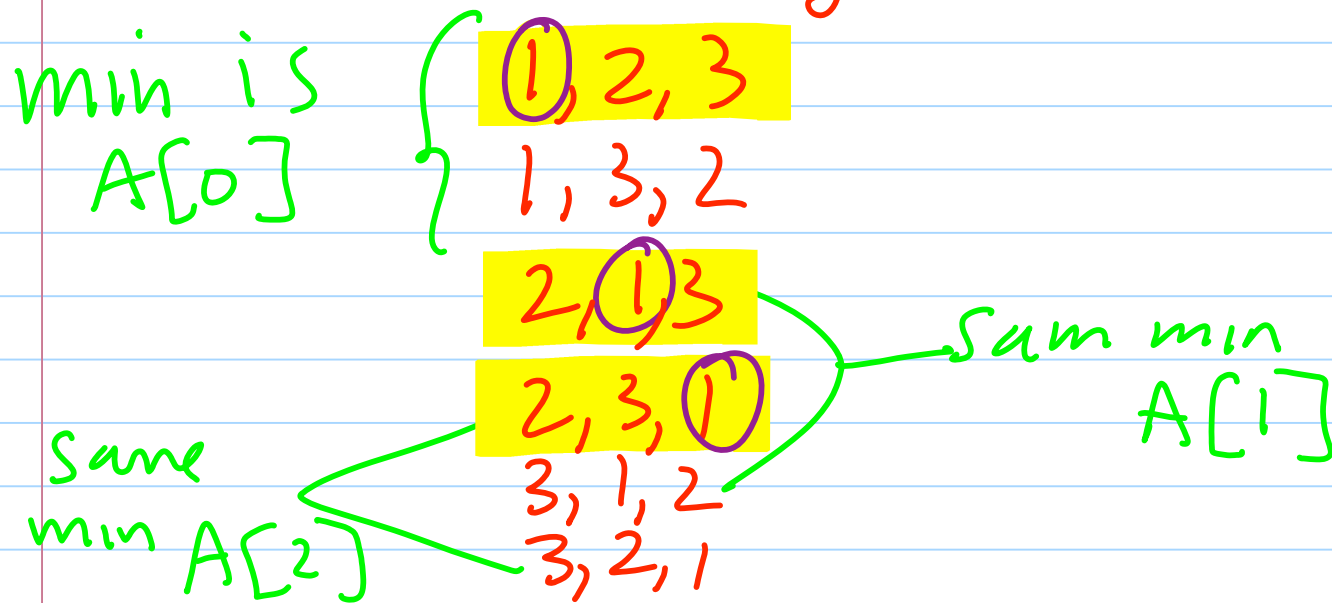


problem of  
Consider  $\downarrow$  finding minimum element  
in an Array of  $n$  elements

What's wrong with starting with  
the following list when  $n=3$ ?



Adv can have a list  $L$  with  $n$  inputs where min element is in a different position.

$\Rightarrow$  # comparisons to find min  $\geq \lceil \log_2 n \rceil$

L

others 2, 3, 4, 5, 6

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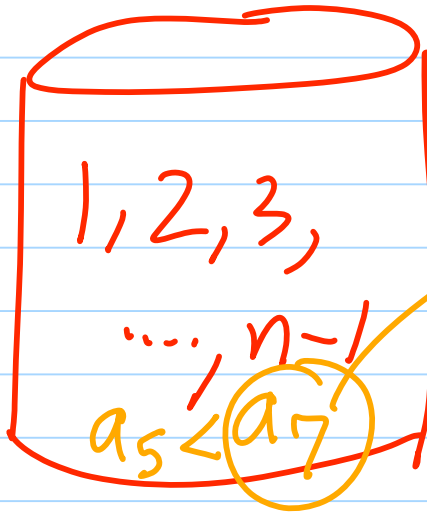
Different adversary strategy

possible positions for min:

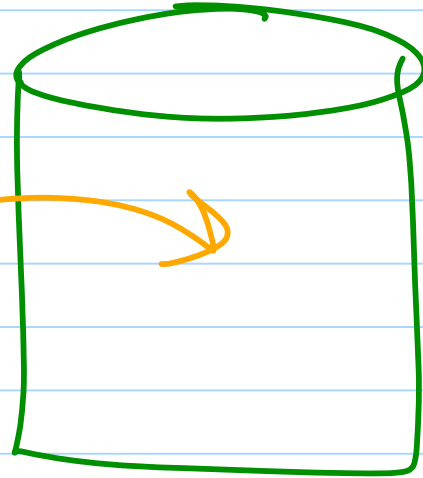
0, 1, 2, 3, ..., n-1

Any question can be answered  
to remove only one possible  
candidate for min.

possible mins



not possible min



pos min < pos min : Answer "yes"  
move larger to not possible min

pos min < not pos min : yes

not pos min < not pos min : be consistent w/ part

there's  $n$  elements initially  
in possible mins

Each comparison moves  $\leq 1$   
to not possible min.

How many times do we subtract  
1 from  $n$  until only 1 left.

$$n-1$$