Ques) Max sum of contiguous subarray

s

| 1 | 7 | -4 | 13 | -18 | 11 | 3 |

e

$\Rightarrow 17$

Brute Force

$T = O(n^2)$

$s = \cancel{0}\cancel{1}\cancel{3}\cancel{4}\cancel{17} -1$

$max = \cancel{-\infty}\cancel{3} 17$

Kadane's Algorithm

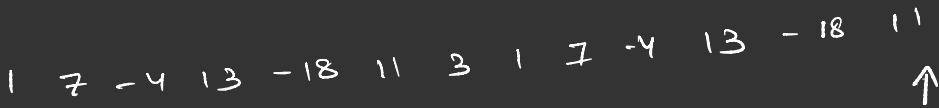| 1 | 7 | -4 | 13 | -18 | 11 | 3 |

↑
p

+ve   -ve

sum old   -val
+
val

$meh = \cancel{1}\cancel{8}\cancel{4}\cancel{17}\cancel{1}\cancel{1} 14$

$msf = \cancel{-\infty}\cancel{8} 17$

$T \Rightarrow O(n)$

Q. Kadane Max sum of contiguous

circular sub array

1	7	- 4	13	-18	11	3

⟹ 31

1 7 − 4 13 − 18 11 3 1 7 -4 13 − 18 11
↑

meh 1̶ 8̶ 4̶ 1̶7̶ 1̶ 1̶ 1̶4̶ 1̶5̶ 2̶2̶ 1̶8̶ 3̶1̶ 1̶5̶ 24

max 1̶ 8̶ 1̶7̶ 2̶2̶ 31

1	1	1	1

Sum = 4

1 1 1 1 1 1 ⟹ 7

1 4 -13 9 1 4 -13

meh 1̶ 8̶ ⟹8 9̶ 1̶0̶ 1̶1̶ −1
mgp 1̶ 5̶ 1̶6̶ 14

-1	4	-13	9

1   7   −4   13   −18   11   3   1   7   −4   13   −18   11   **3**
↑

msf $\cancel{1}$ $\cancel{7}$ $\cancel{=14}$ $\cancel{18}$ $\cancel{=7}$ $\cancel{/9}$ $\cancel{5}$ $\cancel{14}$ $\cancel{=4}$ $\cancel{8}$ $\cancel{=18}$ $\cancel{7}$ −4

min $\cancel{1}$ $\cancel{=4}$ −18

Array Sum = 13

$13 - (-18)$

$13 + 18$

$\Rightarrow 31$

7   −14   13   −18   11   3   7   −14   13   −18   11   **3**
↓

msh $\cancel{7}$ $\cancel{14}$ $\cancel{7}$ $\cancel{=17}$ $\cancel{8}$ $\cancel{5}$ $\cancel{2}$ $\cancel{=14}$ $\cancel{7}$ $\cancel{=14}$ $\cancel{8}$ −5

min $\cancel{7}$ $\cancel{-14}$ −19
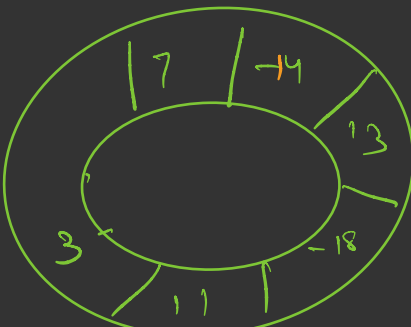
Ques over , k = 3

| 1 | -3 | 2 | 4 | $\rightarrow$ Repeat k times

1   -3   2   4   1 -3   2   4   1 -3   2   4

$T \Rightarrow O(n \times k)$

$S \Rightarrow O(n \times k)$