

Given an integer array nums, find subarray with largest sum  
return the sum.

e.g.

$[-2, 1, -3, 4, -1, 2, 1, -5, -4]$

Sum = ~~X~~

~~3~~  $3 + 2 = 5 + 1 = 6$

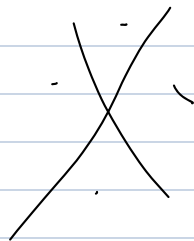
Brute-force  $\rightarrow O(n^3)$  time,  $O(1)$  space

for ( $i=0 \dots n-1$ )

for ( $j=0 \dots n-1$ )

for ( $k=i \dots j$ )

compute sum



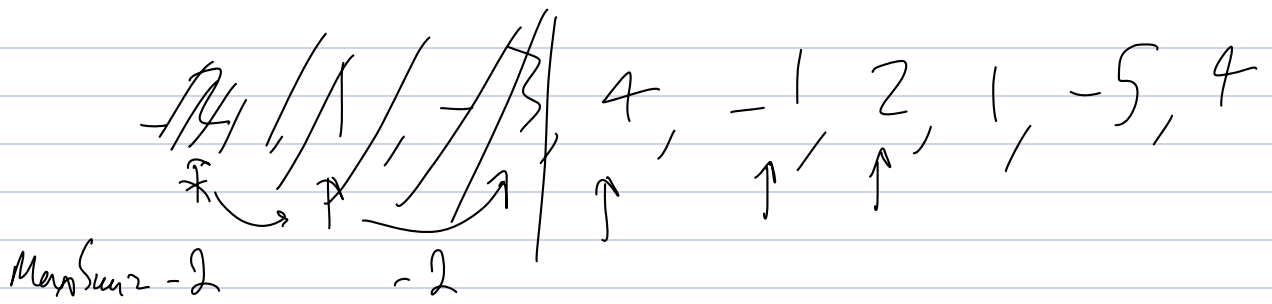
Brute force

for ( $i=0 \dots n-1$ )

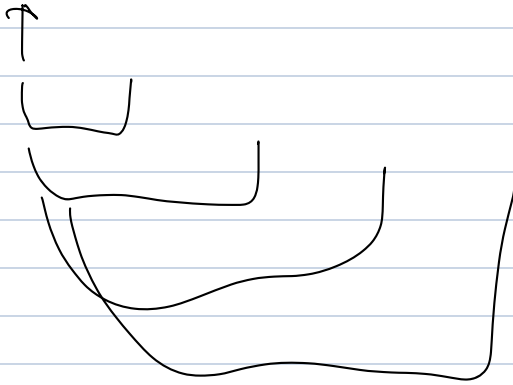
for ( $j=i \dots n-1$ )

currSum + nums[j]

$O(n^2)$  ~~X~~ still bad



-2, 1, -3, 4, -1, 2, 1, -5, 4



Kadane's Algorithm

$[-2, 2, 5, -11, 6]$

max. Sum = -2

$$[-2, 2] = 0$$

Divide and Conquer - recursive

-2, 1, -3, 4, -1, 2, 1, -5, 4

Pivot

$-2, 1, -3, 4$

$LSS=2$

$4$

$$\max(4, 3, 1) = 4$$

$-2, 1$

$-3, 4$

$LSS=2$   
 $RSS=1$   
 $LSS=1$

$-2$

$1$

$$\max(-2, 1, 1) \rightarrow 1$$