

Two Values

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Need two recursive values:

INCLUDE(i): sum of the maximum sum subarray among elements from 0 to i that includes index i in the sum

OPT(i): sum of the maximum sum subarray among elements 0 to i (that might or might not include i)

How can you calculate these values? Try to write recurrence(s), then think about memoization and running time.

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Example (1)

A	0	1	2	3	4	5	6	7
	5	-6	3	4	-5	2	2	4
$OPT(i)$	0	1	2	3	4	5	6	7
	5							
$INCLUDE(i)$	0	1	2	3	4	5	6	7
	5							

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LIS Recurrence

$LIS(i, j)$ is "Number of elements of the maximum increasing subsequence from $0, \dots, i$ where every element of the sequence is at most $A[j]$ "

Need a recurrence

$$LIS(i, j) = \begin{cases} ? & \text{if } i < 0 \\ ? & \text{if } i = 0 \\ ? & \text{if } A[i] > A[j] \\ ? & \text{otherwise} \end{cases}$$

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LIS (fill in yourself)

	$\leftarrow j \rightarrow$									
	0, 5	1, -6	2, 3	3, 6	4, -5	5, 2	6, 8	7, 10		
i	0, 5	1	0	0	1	0	0	1	1	
1, -6	1	1	1	1	1	1	1	1	1	
2, 3	2									
3, 6										
4, -5										
5, 2										
6, 8										
7, 10										

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