

"Breaking up a stick" (or a road)



Value of a piece $[i, j] = v_{i,j}$

Chop "stick up" into pieces $[0, i], [i, j], \dots, [j, L]$

to maximise $v_{0,i} + v_{i,j} + \dots + v_{j,L}$

\Rightarrow possibilities = 2^{L-1}



Problem

max decision

Smaller problem

max decision

...

Check for subproblem

recurrence relation

compute all the values of

$f(l) = \text{max value of chopping up } [0, l], l \in [1, L]$

let $l \in [1, L]$

$= \max_{0 \leq i < l} \{v_{0,i} + f(l-i)\}$

$\Rightarrow \text{steps} = O(L^2)$

$f(0) = 0$

