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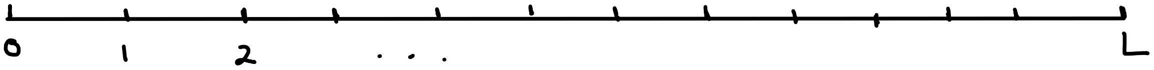
Breaking a stick.



Each section $[i, i+1, \ldots, j]$ has a value V_{ij}.

Problem: cut up stick to maximise total value

$f(\ell)$ = max. obtainable from 0 ——— ℓ

$$= \max_{0 \le k < \ell} \left[V_{k,\ell} + f(k) \right] \qquad f(0) = 0$$

Suppose we want stick cut into s pieces.

$$f_s(\ell) = \max_{s-1 \le k < \ell} \left[V_{k,\ell} + f_{s-1}(k) \right]$$

Production problem with random demands.

Case 1: demand for the month known after choice of production level

$f_r(i)$ = minimum expected cost of proceeding $r, r+1, \dots$

$$= \min_x \left[c(x) + \sum_{d=0}^{\infty} P_r(d_r = d) \left(\pi(d-x-i) + f_{r+1}(\min(H, x+i-d)) \right) \right]$$

penalty for unmet demand