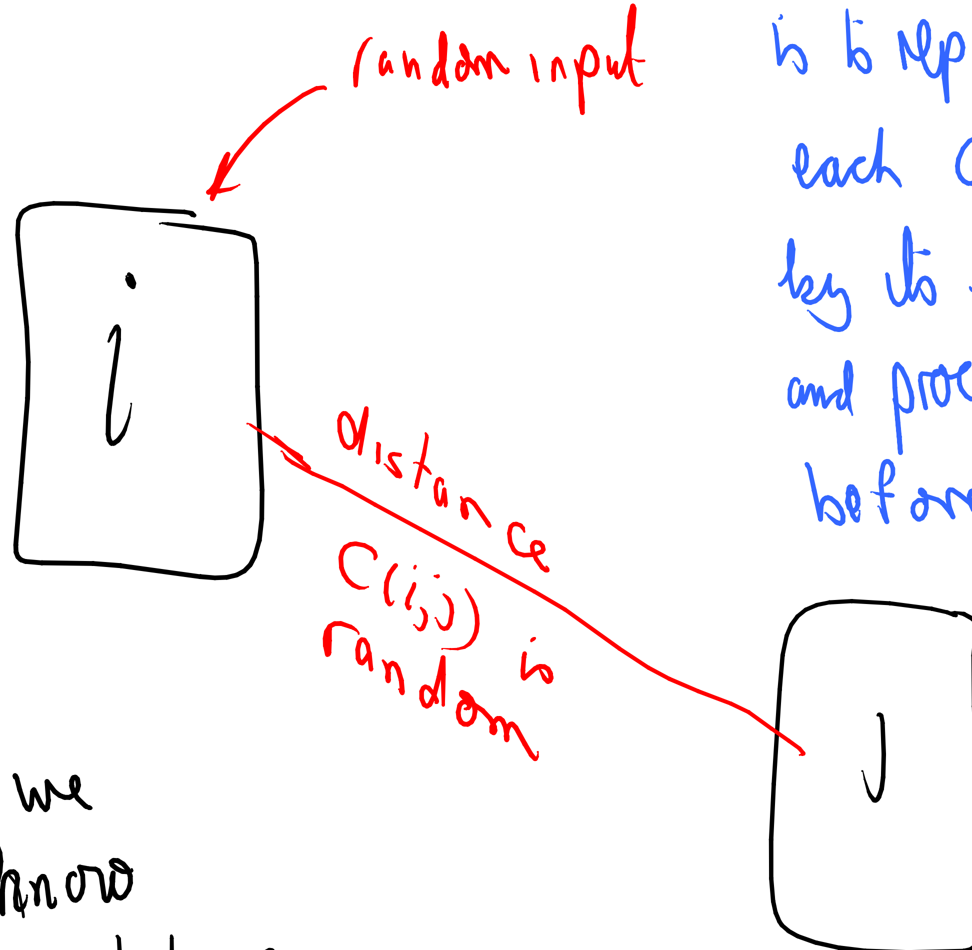
9/12/12

We add some randomness!

Simplest strategy is to replace each $C(i,j)$ by its expectation and proceed as before



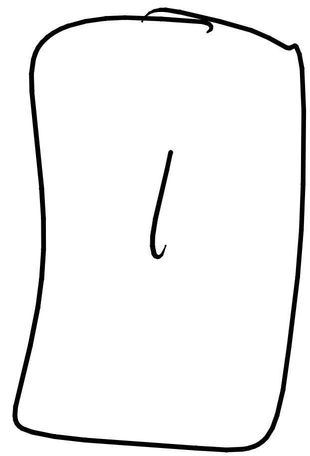
Assume we don't know $C(i,j)$ until we get to i, if at all

(i) Make a decision d

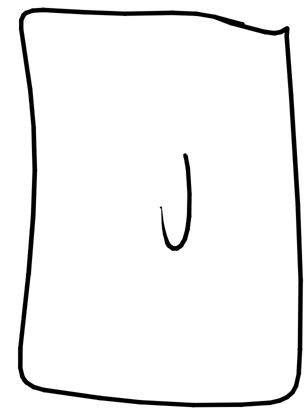
(ii) Randomness

$P_d(i, j)$: Probability of ending up at

$P_d(i, j)$: Expected cost of this move, if I make decision d, conditional on landing at j



Represents "state" of a process



Criterion: minimise expected time

$\boxed{i, r}$

$$f_r(i) = \min_{d} \left\{ \sum_{j} p_d(i,j) \left[\rho_d(i,j) + f_{r+1}(j) \right] \right\}$$

at ith pass in range r

$d \in D_r(i)$: possible decisions at this point.

Criterion: maximise probability of reaching F by time T.

$g_r(i,t)$ = max prob. of getting to F in time

$$= \max_d \left\{ \sum_{j,\tau} p_d(i,j,\tau)\, g_{r+1}(j, t+\tau) \right\}$$

decision

probability of reaching j in τ units of time

$$g(F,t) = \begin{cases} 0 : t > T \\ 1 : t \leq T \end{cases}$$

Production problem:

Minimize total expected cost

demand

$$\Pr(d_j = d) = p_{j,d}$$

probability demand in period j is d

$$f_r(i) = \min_{x} \left[c(x) + \sum_{d \geq 0} p_{r,d} \left[\pi \left(d - (i+x) \right)^+ + f_{r+1}\left(\min\{ (x+i-d)^+, H \} \right) \right] \right]$$

start of period r

stock level

production level