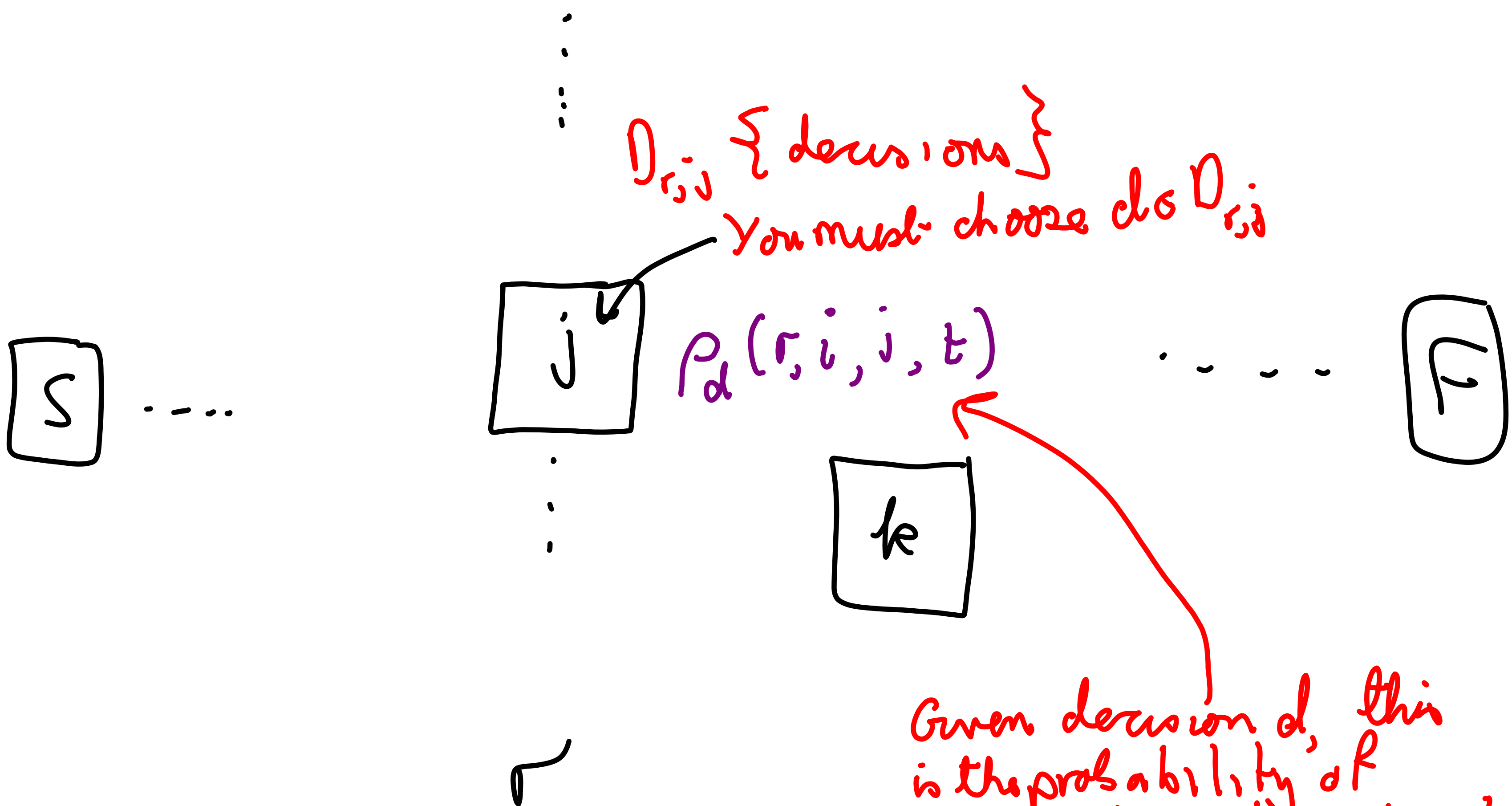
9/12/11

Probabilistic Shortest Path:



$D_{r,j}$ {decisions}

You must choose $d \in D_{r,j}$

$P_d(r, i, j, t)$

Given decision d, this is the probability of arriving at $(r+1, j)$ in time t.

① Aim is minimise expected time to get from $S \longrightarrow F$.

$f_r(j)$ = minimum expected time to get from $(r, i) \longrightarrow F$

$$= \min_{d} \left(\sum_{k,t} p_d(r, i, k, t) \left(t + f_{r+1}(k) \right) \right)$$

(ii) Maximise probability of reaching F within time T.

$g_r(i, \tau)$ = maximum probability of getting to F within time T starting from (r, i) at time τ.

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

$$g_{N+1}(F, t) = \begin{cases} 1 : & t \le T \\ 0 : & t > T \end{cases}$$

Production problem with random demands.

$\xi^+ = \max\{0, \xi\}$

Same as before except

$P_{n,d} = P_r($ demand in period n is d $)$.

cost $c(x)$ of producing x. Max. inventory H.

Penalty cost for not meeting demand.

$$f_n(h) = \min_x \left(c(x) + \sum_{d \geq 0} P_{n,d} \left(\pi (d-(x+h))^+ + f_{n+1}(\min(x+h-d, H)) \right) \right)$$

minimum expected cost of continuing

Decide on production level before know demand in period n