Wuu-Bernstein Algorithm for the Dictionary Problem

function hasRec(T_i, eR, k)

return T_i(k,eR.node) ≥ eR.time

Initially:

$V_i = \varnothing$

$PL_i = \varnothing$

$C_i = 0$

$T_i(j,k) = 0$ j=1…N, k=1…N

insert(x) :

$C_i = C_i+1$

$T_i(i,i) = C_i$

$PL_i = PL_i \cup \{$ (insert(x), C_i, i) $\}$

$V_i = V_i \cup \{x\}$

delete(x) :

$C_i = C_i+1$

$T_i(i,i) = C_i$

$PL_i = PL_i \cup \{$ (delete(x), C_i, i) $\}$

$V_i = V_i - \{x\}$

send(msg_{ij}) from site i to site j :

NP = { eR | eR ∈ PL_i and ¬hasRec(T_i, eR, j) }

Send msg_{ij}, T_i, NP to site j

receive(msg_{ki}, T_k, NP) at from site k at site i:

NE = { fR | fR ∈ NP and ¬hasRec(T_i, fR, i) }

V_i = { v | (v ∈ V_i or insert(v) ∈ NE) and (¬∃ dR ∈ NE such that dR.op = delete(v)) }

for r=1…N

  $T_i(i,r) = \max(T_i(i,r), T_k(k,r))$

for r=1…N, s = 1…N

  $T_i(r,s) = \max(T_i(r,s), T_k(r,s))$

PL_i = { eR | eR ∈ ($PL_i \cup$ NE) and ∃ s such that ¬ hasRec(T_i,eR,s) }