Lecture 30

CSE 331

Couple more definitions

$p(j)$ = largest $i < j$ s.t. i does not conflict with j

= 0 if no such i exists

$p(j) < j$

$OPT(j)$ = optimal value on instance $1,..,j$

Property of OPT

j in OPT(j)

j not in OPT(j)

$$OPT(j) = \max \{ v_j + OPT(p(j)), OPT(j-1) \}$$

Given OPT(1),…., OPT(j-1),
how can one figure out if j
in optimal solution or not?

A recursive algorithm

Compute-Opt(j)

Correct for j=0

Proof of correctness by induction on j

If j = 0 then return 0

return max { v_j + Compute-Opt(p(j)), Compute-Opt(j-1) }

= OPT(p(j))

= OPT(j-1)

$$OPT(j) = \max \{ v_j + OPT(p(j)), OPT(j-1) \}$$

Exponential Running Time