Nov 19 Simplified problem: Instead of outputting an optimal schedule $\mathcal{O}$, just output $v(\mathcal{O})$

$OPT(j)$ = value of any optimal schedule for $[j] \leftarrow (s_1, f_1, v_1) \; j = 0, \ldots, n \; \ldots \; (s_j, f_j, v_j)$

(ASSUME: $f_1 \leq f_2 \leq \cdots \leq f_n$)

Goal: $OPT(n)$

Def: $\mathcal{O}_j$ be an optimal solution for $[j]$

$v(\mathcal{O}_j) = OPT(j)$

Case 1: $j \notin \mathcal{O}_j$ Claim 1: $\mathcal{O}_j$ is also an optimal solution for $[j-1]$

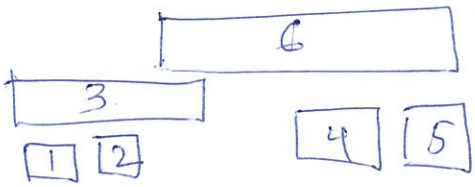
$\Rightarrow OPT(j) = OPT(j-1)$ ——— (1)

Case 2: $j \in \mathcal{O}_j$ Claim 2: $\mathcal{O}_j \setminus \{j\}$ is an optimal solution to $[p(j)]$

Def: $p(j)$ is the largest $i < j$ s.t i & j do not conflict

$= 0$ if no such $i \geq 1$ exists.

$\Rightarrow OPT(j) = v_6 + OPT(p(j))$ ——— (2)



$p(6) = 2$

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

$OPT(0) = 0$