Friday, January 26, 2018 2:24 PM

Into Schuh —

Thm: Greedy is Optimal.

pf (Greedy is always ahead).

Say $i_1\ i_2\ \cdots\ i_k$ greedy output

Say $j_1\ \cdots\ j_m$ OPT.

To show $k \geq m$.

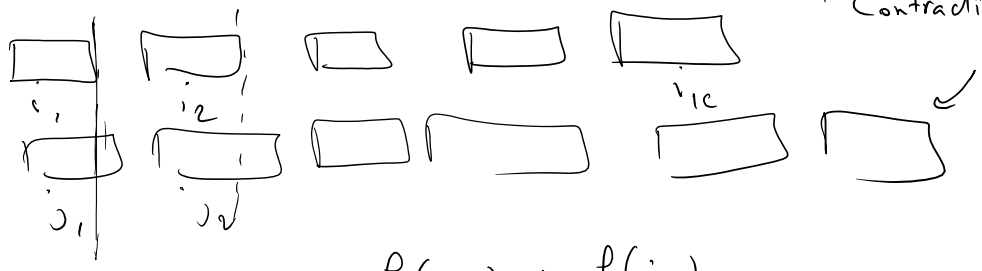
If $k < m$, then

we know $f(j_k) \geq f(i_k)$

$f(j_k) \leq s(j_{k+1})$

So j_{k+1} is compatible for greedy but it didn't schedule

Contradiction!



Claim For all r, $f(i_r) \leq f(j_r)$.

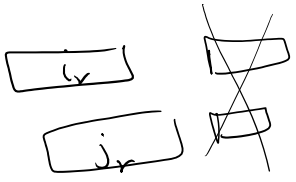
By induction

Base Case $f(i_1) \leq f(j_1)$ First job has smallest finish time.

IH: For some r, $f(i_r) \leq f(j_r)$.

IS: Goal: $f(i_{r+1}) \leq f(j_{r+1})$.

$s(j_{r+1}) \geq f(j_r) \geq f(i_r)$ by IH



So j_{r+1} was an option for greedy

But it took $i_{r+1} \Rightarrow f(j_{r+1}) \geq f(i_{r+1})$ □

Int Partition —

Thm: Greedy is OPT.

Supp Greedy use d classrooms

Goal depth $\geq d$