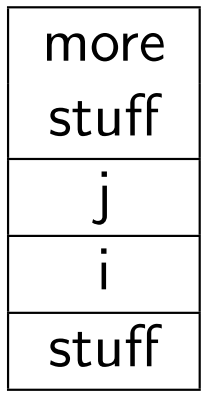
Greedy Algorithms

A Scheduling Application: Correctness Proof Part II

Algorithms: Design and Analysis, Part II

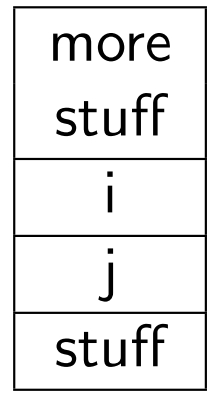
Cost-Benefit Analysis, Part I

$i > j$



σ^*

exchange $i, j \rightarrow$



new schedule

Question: What is the effect of this exchange on the completion time of (1) a job k other than i or j, (2) the job i, (3) the job j?

A) Not enough info/goes up/goes down

B) Not enough info/goes down/goes up

C) Unaffected/ goes up / goes down

D) Unaffected/goes down/goes up

by l_j

by l_i

Cost-Benefit Analysis, Part II

Upshot:

1. Cost of exchange $w_i l_j$. [C_i goes up by l_j]
2. Benefit of exchange is $w_j l_i$. [C_j goes down by l_i]

Note: $i > j \Rightarrow w_i/l_i < w_j/l_j \Rightarrow w_i l_j < w_j l_i \Rightarrow COST < BENEFIT$
$\Rightarrow$ Swap improves σ^*, contradicts optimality of σ^*.

QED!

a little confused. Why it contradicts???