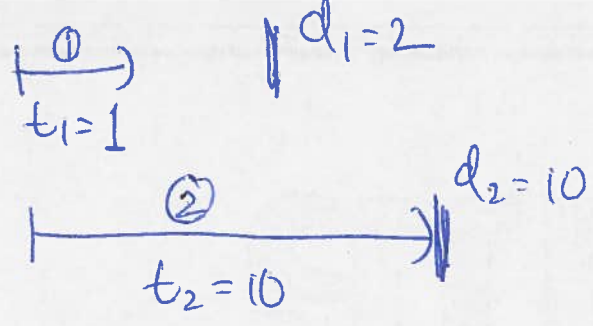


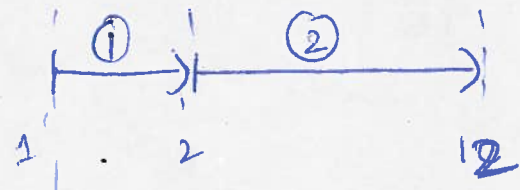


Ex 2:



counter example for shortest slack first

Schedule 1:



$l_1 = 0$      $l_2 = 1$   
 $L = 1$  ✓

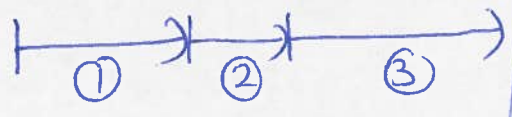


$l_1 = 9$ ,  $l_2 = 0$   
 $L = 9$

Class of greedy algos:

Order tasks & schedule them right one after the other.

①, ②, ③



- (a) shortest duration first
- (b) shortest slack first     $slack_i = d_i - t_i$
- (c) Earliest ~~dead~~ deadline first

Greedy Algo

1. Sort intervals/jobs in incr. order of deadline

(notational simplification)  $\Rightarrow (d_1 \leq d_2 \leq \dots \leq d_n) \leftarrow O(n \log n)$

2.  $f \leftarrow 1$      $O(1)$

3. for  $i = 1 \dots n$

$O(1)$   $\left\{ \begin{array}{l} s(i) \leftarrow f \\ f(i) \leftarrow s(i) + t_i \\ f \leftarrow f(i) \end{array} \right. \quad O(n)$

$O(n \log n)$   
 $+ O(n)$   
 $= O(n \log n)$

4. Return ~~the~~ the schedule:  $i \rightarrow [s(i), f(i)]$

$\uparrow O(n)$



Obs: A has 0 inversions

Lemma: If 2 schedules have 0 idle time  
& 0 # inversions  $\Rightarrow$  has same L

THM:  $\exists$   $\mathcal{O}$  with 0 idle time & 0 # inversion.