

Weighted Interval Scheduling (WIS)

Sort tasks based on the ending time $O(n \log n)$

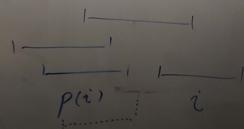
Compute $P(i)$ for each i $O(n^2 \log n)$

$V(1) = W(0)$

for $i = 2 \dots n$ do

$$V(i) = \max \begin{cases} V(P(i)) + w(i) \\ V(i-1) \end{cases}$$

End for
return $V(n)$

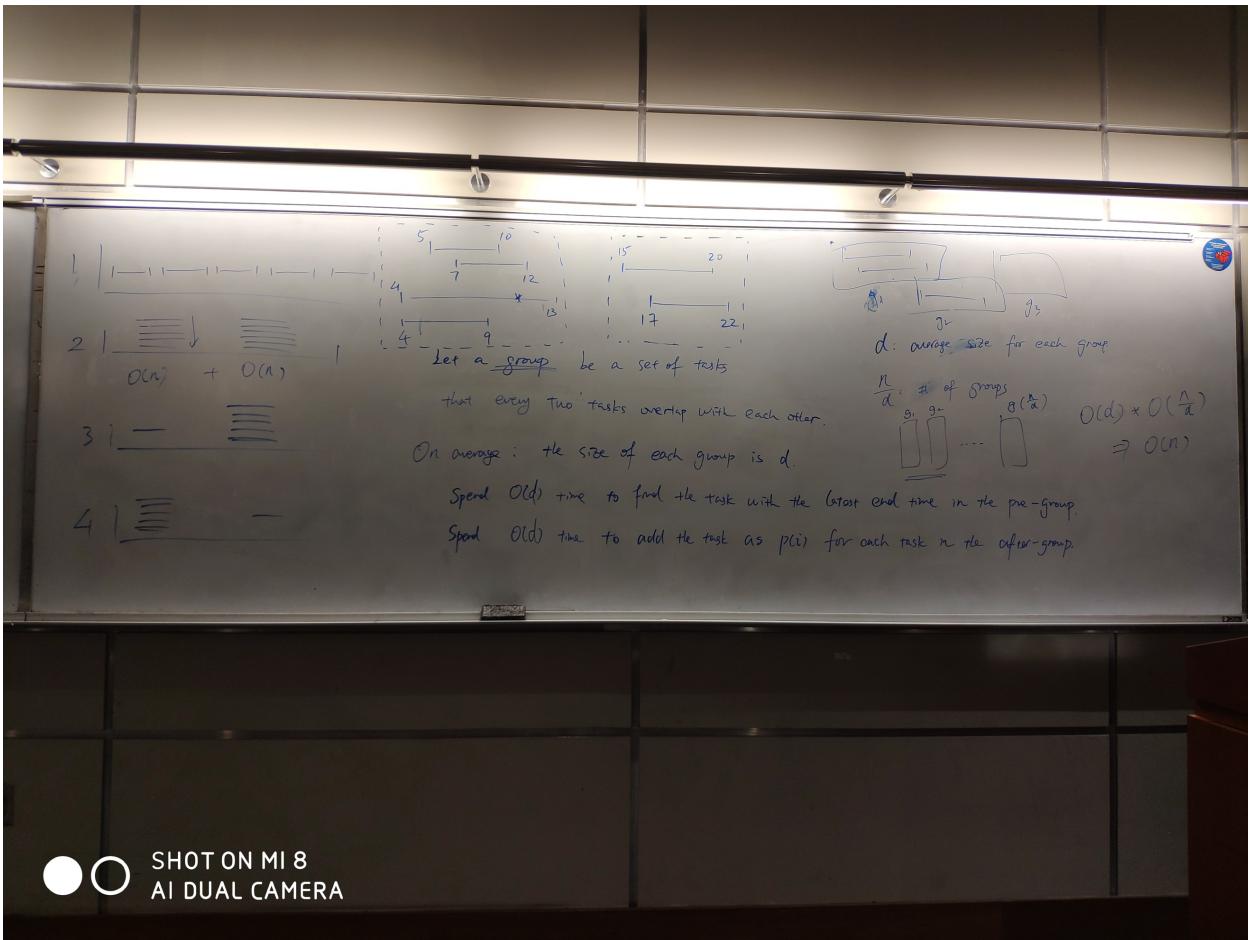


$O(\log n)$: binary search.

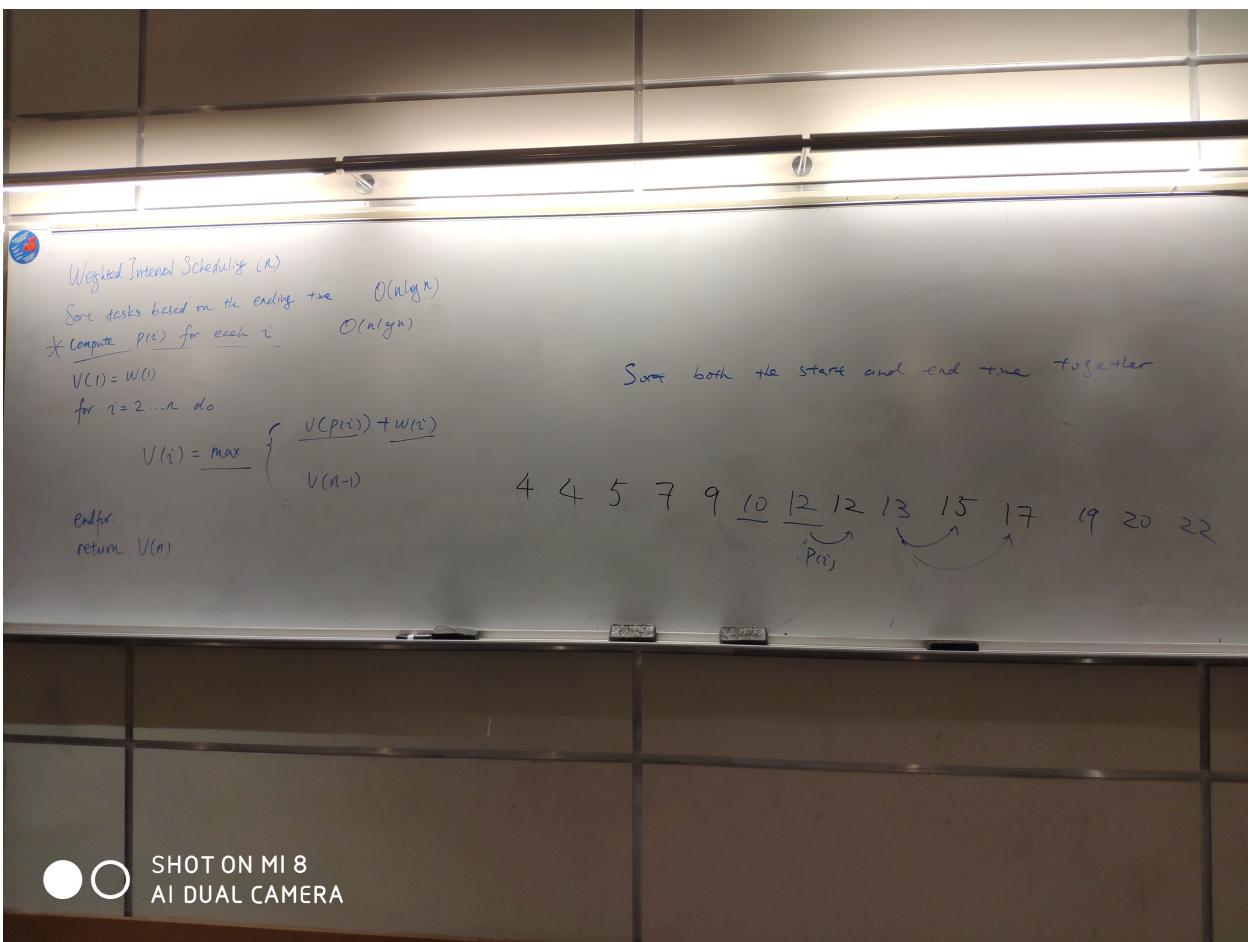
$\alpha(n)$: for each i



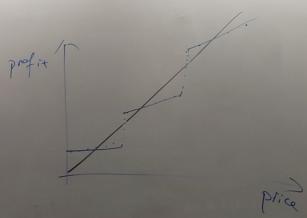
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Segmented linear regression.



of lines.

$$\text{Min } R = \sum r^2$$

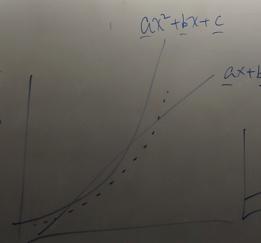
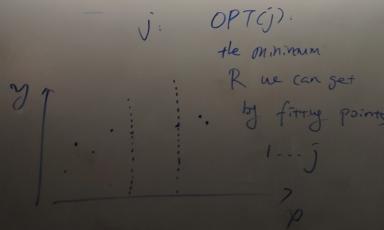
$$a = \frac{n \sum x_i y_i - (\sum x_i)(\sum y_i)}{n \sum x_i^2 - (\sum x_i)^2}$$

$$b = O(n)$$



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- penalty for adding another line : C (regularization).



$OPT(j_s) + C + R(j_s - j)$
 $OPT(j)$

$$= \min_{j_s \in J} \{OPT(j_s) + C + R(j_s - j)\}$$
$$= O(n^2) * O(n) \\ = O(n^3)$$



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