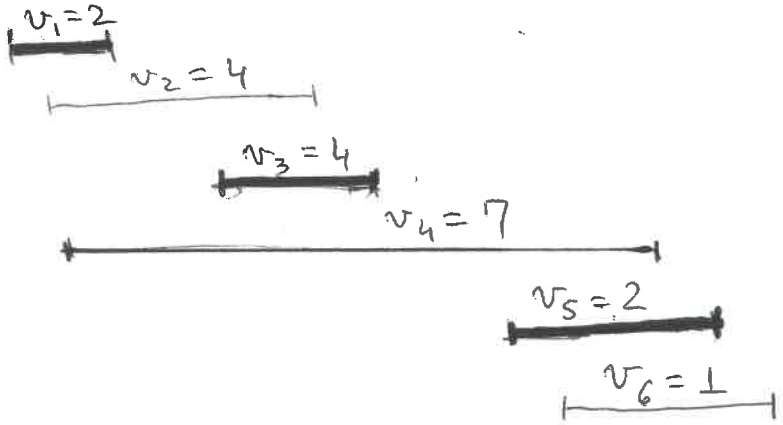
Dynamic Programming

3.29.2017

Weighted Interval Scheduling - Iterative approach

$n=6$



$p(1)=0$

$p(2)=0$

$p(3)=1$

$p(4)=0$

$p(5)=3$

$p(6)=3$

	0	1	2	3	4	5	6
M	0	2	4	6	7	8	8

$n=6$

$$M[j] = \max(v_j + M[p(j)], M[j-1])$$

$M[1] = \max(2 + M[p(1)], M[0]) = 2$

$M[2] = \max(4 + M[0], M[1]) = 4$

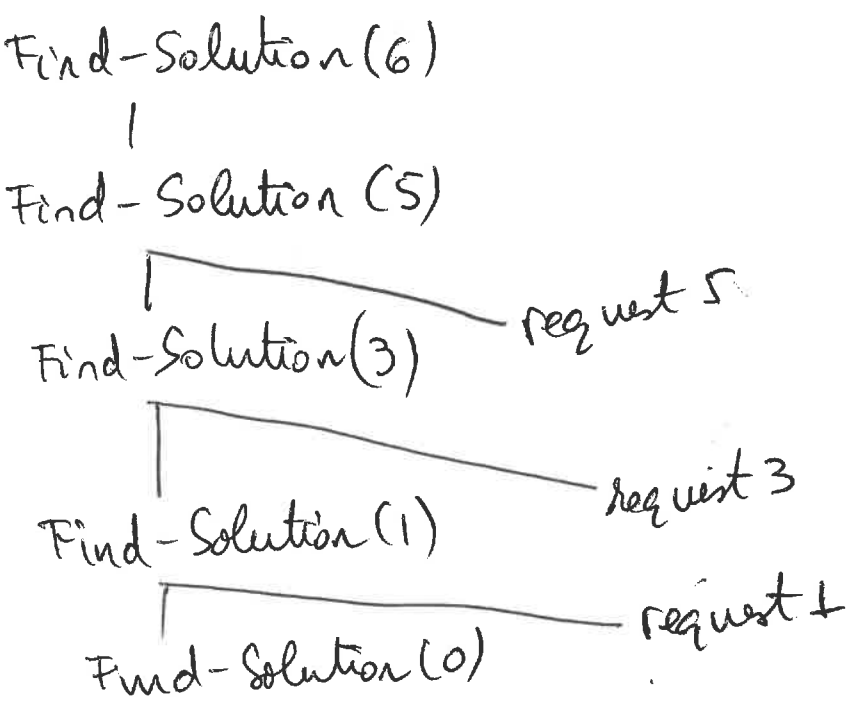
$M[3] = \max(4 + M[1], M[2]) = 6$ (M[2] = 4)

$M[4] = \max(7 + M[0], M[3]) = 7$ (M[3] = 6)

$M[5] = \max(2 + M[3], M[4]) = 8$ (M[3] = 6, M[4] = 7)

$M[6] = \max(1 + M[3], M[5]) = 8$ (M[3] = 6, M[5] = 8)

$M[n] = M[6] = 8 \Rightarrow$ total max value for opt sol. is 8



optimal solution is $O = \{$ request 1, request 3, request 5 $\}$

optimal solution value = $OPT = 8$