APr21 → Have access to $P(1), \ldots, P(n)$.

→ Assumed $f(1) \le f(2) \le \cdots \le f(n)$.

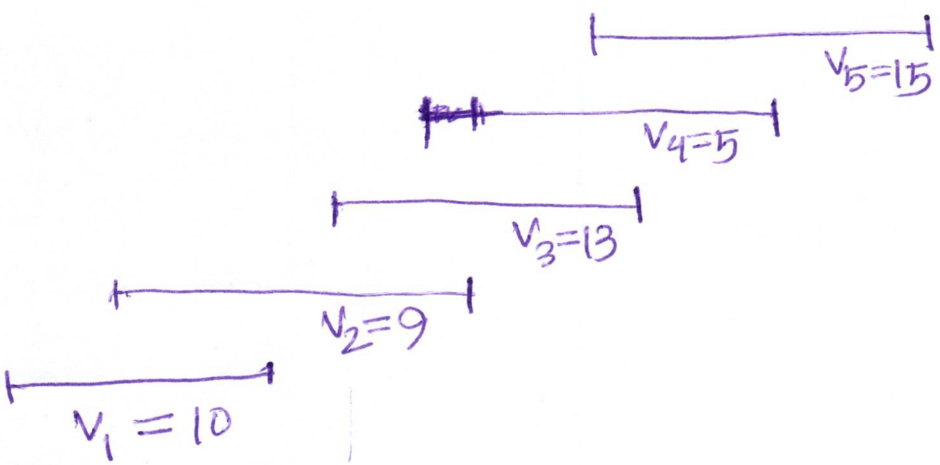
→ $M[0..n]$

(•) $M[0] \leftarrow 0$

(•) for $j = 1 \ldots n$

$M[j] = \max\{v_j + M[P(j)],\ M[j-1]\}$

(•) return $M[n]$



$P(5) = 2$

$P(4) = 1$

$P(3) = 1$

$P(2) = 0$

$P(1) = 0$

	0	1	2	3	4	5
$j=0$	0					
$j=1$	0	10				
$j=2$	0	10	10			
$j=3$	0	10	10	23		

$M[0] \leftarrow 0$

$M[1] = \max\{v_1 + M[0],\ M[0]\} = \max\{10+0,\ 0\}$
$= 10$

$M[2] = \max\{v_2 + M[\underbrace{P(2)}_{=0}],\ M[1]\} = \max\{9+0,\ 10\}$
$= 10$

$M[3] = \max\{v_3 + M[1],\ M[2]\}$
$= \max\{13+10,\ 10\} = 23$

$j = 4$

0	1	2	3	4	5
0	10	10	23	23	

$M[4] = \max\{v_4 + M[1], M[3]\}$
$= \max\{5+10, 23\} = \underline{23}$

$j = 5$

0	1	2	3	4	5
0	10	10	23	23	25

$M[5] = \max\{v_5 + M[2], M[4]\}$
$= \max\{15+10, 23\} = 25$

$OPT(5) = 25$

$\Rightarrow$ what is O_5?

Recall: $j \in O_j$ if $v_j + OPT(P(j)) > OPT(j-1)$.

↳ compute O_5.

$\Rightarrow$ $5 \in O_5$? $\underline{15+10} > 23$ ✓

$\Rightarrow 5 \in O_5$

$P(5) = 2$ considering $O_5 \setminus \{5\} = O_2$ for $[2]$

$2 \in O_2$? $9 + 0 > 10$ ✗

$\Rightarrow 2 \notin O_2$

$\Rightarrow$ considering $O_2 = O_1$ for $[1]$ | $1 \in O_1$? $10 + 0 > 0$ ✓ $\Rightarrow 1 \in O_1$

$\Rightarrow \{1, 5\}$ is an optimal solution

```
MSchedule (n; M, P)
  if n = 0, return ∅
  if vn + M[P(n)] > M[n-1]
     return {n} U MSchedule(P(n), M, P)
  else return MSchedule(n-1, M, P).
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