11/Pg 22

⇒ We have access to $p(1), \ldots, p(n)$

⇒ $f_1 \leq f_2 \leq \cdots \leq f_n$ $\quad M[n] = OPT(n)$

Goal: $M[0 \ldots n]$

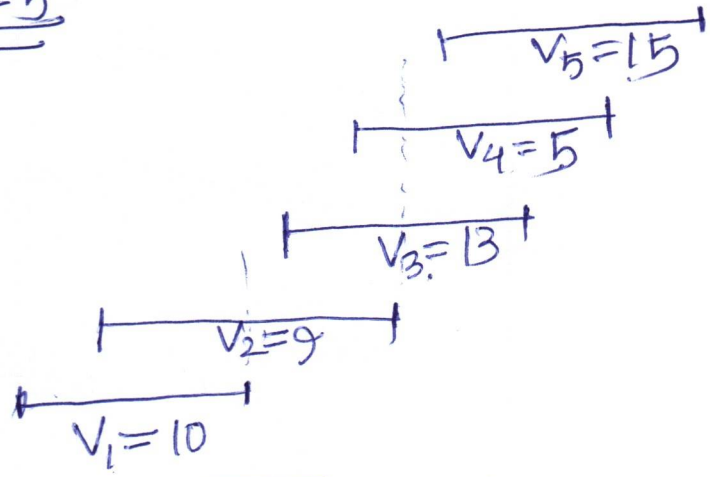
(1) $M[0] \leftarrow 0$

(2) for $j = 1 \ldots n$

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

(3) return $M[n]$

$n = 5$



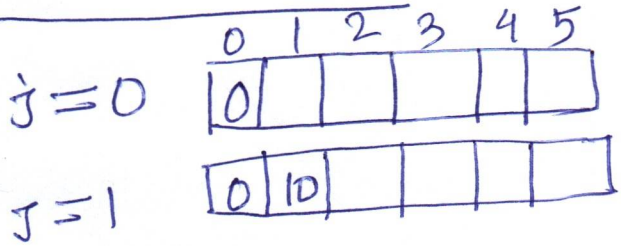
$p(5) = 2$

$p(4) = 1$

$p(3) = 1$

$p(2) = 0$

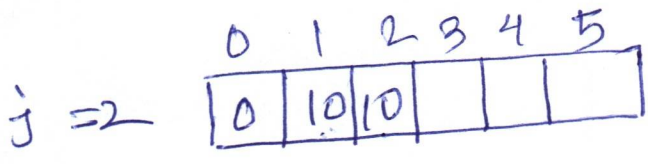
$p(1) = 0$



$M[0] \leftarrow 0$

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

$= \max\{10+0, 0\} = 10$



$M[2] \leftarrow \max\{9 + M[0], M[1]\}$

$= \max\{9+0, 10\} = 10$

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

$M[3] \leftarrow \max\{13 + M[1], M[3-1]\}$

$= \max\{13+10, 10\} = 23$

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

$M[4] \leftarrow \max\{5 + M[1], M[3]\}$

$= \max\{5+10, 23\} = 23$

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

$M[5] \leftarrow \max\{15 + M[2], M[4]\}$

$= \max\{15+10, 23\} = 25$

$M[5] = OPT(5) = 25$

Q! $O_5 = \{5, 1\}$

n=5

$\Rightarrow$ $j \in O_j$ $v_j + OPT(P(j)) > OPT(j-1)$

$\Rightarrow$ $5 \in O_5$? $v_5 + OPT(P(5)) > OPT(5-1)$

$15 + 10 > 23$ ✓

Consider $O_5 \setminus \{5\} = O_2$

$2 \in O_2$? ✗ $v_2 + OPT(P(2)) > OPT(2-1)$

$9 + 0 > 10$ ✗

Consider $O_2 = O_1$

$1 \in O_1$? ✓ $v_1 + OPT(P(1)) > OPT(1-1)$

$10 + 0 > 0$ ✓

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