

## Job Sequencing with Deadlines

$n=5$

| Jobs      | $J_1$ | $J_2$ | $J_3$ | $J_4$ | $J_5$ |
|-----------|-------|-------|-------|-------|-------|
| profits   | 20    | 15    | 10    | 5     | 1     |
| deadlines | 2     | 2     | 1     | 3     | 3     |
|           | ✓     | ✓     | ×     |       |       |

0  $\overline{J_2}$  1  $\overline{J_1}$  2  $\overline{J_4}$  3  
 9 10 11 12

$\{ \overline{J_2}, \overline{J_1}, \overline{J_4} \}$

$\overline{J_1} \rightarrow \overline{J_2} \rightarrow \overline{J_4}$

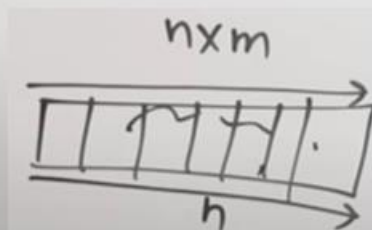
$\overline{J_3} \rightarrow \overline{J_1} \rightarrow \overline{J_4}$

### Algorithm:

Arrange All jobs in decreasing order of Profit. ( $n \log n$ )

For each job( $m_i$ ), do linear search to find particular slot in array of size ( $n$ ), where  $n = \text{maximum deadline}$   
 $m = \text{total jobs}$

$\frac{mn}{n^2} \quad \underline{O(n^2)}$



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| deadlines | 2     | 2     | 1     | 3     | 3     |

| Job considered | slot assign            | Solution        | profit        |
|----------------|------------------------|-----------------|---------------|
| —              | —                      | —               | 0             |
| $J_1$          | $[1, 2]$               | $J_1$           | 20            |
| $J_2$          | $[0, 1] [1, 2]$        | $J_1, J_2$      | $20 + 15$     |
| $J_3 \times$   | $[0, 1] [1, 2]$        | $J_1, J_2$      | $20 + 15$     |
| $J_4$          | $[0, 1] [1, 2] [2, 3]$ | $J_1, J_2, J_4$ | $20 + 15 + 5$ |
| $J_5 \times$   | "                      | "               | "             |

### Job Sequencing with Deadlines

$n=7$

|           |       |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|-------|
| Jobs      | $J_1$ | $J_2$ | $J_3$ | $J_4$ | $J_5$ | $J_6$ | $J_7$ |
| profits   | 35    | 30    | 25    | 20    | 15    | 12    | 5     |
| deadlines | 3     | 4     | 4     | 2     | 3     | 1     | 2     |

$$\begin{array}{ccccccccc}
 0 & \underline{J_4} & 1 & \underline{J_3} & 2 & \underline{J_1} & 3 & \underline{J_2} & 4 \\
 & 20 & & 25 & & 35 & & 30 & = 110
 \end{array}$$