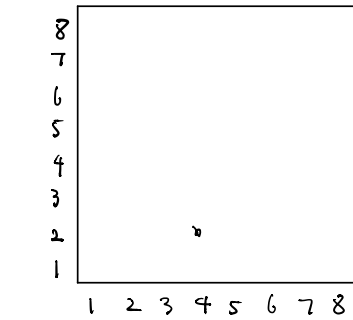


BFS breadth first search - Queue

$$\Delta x \begin{matrix} \uparrow \\ \pm 1, \pm 2 \\ \downarrow \end{matrix}$$

$$\Delta y \begin{matrix} \pm 2, \pm 1 \end{matrix}$$

$$(7,5) \rightarrow (4,2) \rightarrow (4+\Delta x, 2+\Delta y)$$



step=1

$\begin{pmatrix} +1, +2 \\ (5, 4) \end{pmatrix}$	$\begin{pmatrix} -1, +2 \\ (3, 4) \end{pmatrix}$	$\begin{pmatrix} +1, -2 \\ (5, 0) \end{pmatrix}$	$\begin{pmatrix} -1, -2 \\ (3, 0) \end{pmatrix}$...
--	--	--	--	-----

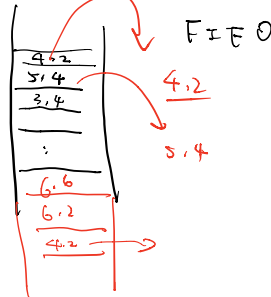
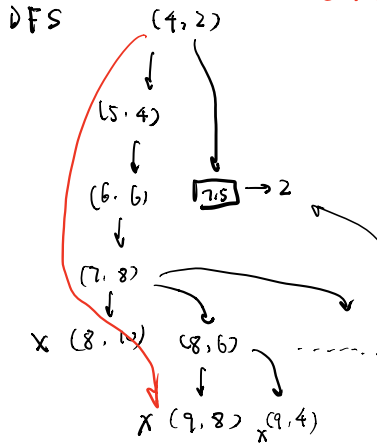
step=2

$\begin{pmatrix} +1, +2 \\ (6, 6) \end{pmatrix}$	$\begin{pmatrix} +1, -2 \\ (6, 2) \end{pmatrix}$	$\begin{pmatrix} -1, -2 \\ (4, 2) \end{pmatrix}$
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8-Q

DFS Depth First



$$\frac{(7,5)}{13}$$

dp[i][j]

val = [10, 15, 40]
weight = [1, 2, 3]
W = 7

state machine.

	0	1	2	3	4	5	6	7	→
0	0	0	0	0	0	0	0	0	
1	0	10	10	10	10	10	10	10	
2	0	10	10	10	10	10	10	10	
3	0								

dp[i][j]

i → item
j capacity → max value

weight[i] > j
weight[i] ≤ j

$$dp[i][j] = dp[i-1][j]$$

$$dp[i][j] = \max(val[i] + dp[i-1][j - val[i]], dp[i-1][j])$$