Knapsack with repetition example

K(*w*) = maximum value achievable with a knapsack of capacity *w*

$W = 10$ and

Item	Weight	Value
1	6	\$30
2	3	\$14
3	4	\$16
4	2	\$9

$K(0) = 0$
for $w = 1$ to W:
    $K(w) = \max\{K(w - w_i) + v_i : w_i \leq w\}$
return $K(W)$

	0	1	2	3	4	5	6	7	8	9	10
K	0	0	9	14	18	23	30				48

$K(1) = 0$

$K(2) = \max\{K(2-2)+9\} = 9$

$K(3) = \max\{K(3-2)+9, K(3-3)+14\} = 14$

$K(4) = \max\{K(4-2)+9, K(4-3)+14, K(4-4)+16\} = 18$

$K(5) = \max\{K(5-2)+9, K(5-3)+14, K(5-4)+16\} = 23$

$K(6) = \max\{K(6-2)+9, K(6-3)+14, K(6-4)+16, K(6-6)+30\}$

$K(10) = \max\{K(10-6)+30, \ldots\} = 48$