

We can express this relationship in the following formula: Define $c[i, w]$ to be the value of the solution for items $1, \dots, i$ and maximum weight w . Then

$$c[i, w] = \begin{cases} 0 & \text{if } i = 0 \text{ or } w = 0, \\ c[i - 1, w] & \text{if } w_i > w, \\ \max(v_i + c[i - 1, w - w_i], c[i - 1, w]) & \text{if } i > 0 \text{ and } w \geq w_i. \end{cases}$$