

items	weight(i)	value(i)	d ①
0	6	6	1
1	10	2	0.2
2	3	1	0.33
3	5	8	1.60
4	1	3	3
5	3	4	1.33

$$d = \frac{v}{w}$$

② صاب كثافة

③ ترتيب العناصر تنازلياً حسب الكثافة

items	w	v	d
4	1	3	3
3	5	8	1.6
5	3	4	1.33
0	6	6	1
2	3	1	0.33
1	10	2	0.2

capacity = 16 , Total weight = 0 , Total benefit = 0 ④

if (weight(4) + total weight <= capacity)

$$(1 + 0) <= 16 \quad \text{yes}$$

$$\text{total weight} = \text{total weight} + \text{weight}(4) \\ = 0 + 1 = 1$$

$$\text{benefit weight} = \text{benefit weight} + \text{value}(4) \\ = 0 + 3 = 3$$

$$F(\text{weight}(3) + \text{total weight} \leq \text{capacity})$$

$$5 + 1 \leq 16 \quad \text{Yes}$$

$$\text{total weight} = \text{total weight} + \text{weight}(3)$$

$$= 1 + 5 = 6$$

$$\text{benefit weight} = \text{benefit weight} + \text{value}$$

$$= 3 + 8 = 11$$

$$F(\text{weight}(5) + \text{total weight} \leq \text{capacity})$$

$$3 + 6 \leq 16$$

$$9 \leq 16 \quad \checkmark$$

$$\text{total weight} = \text{total weight} + \text{weight}$$

$$= 6 + 3 = 9$$

$$\text{total benefit} = 11 + 4 = 15$$

$$F(\text{weight}(0) + \text{total weight} \leq \text{capacity})$$

$$6 + 9 \leq 16$$

$$15 \leq 16 \quad \text{Yes}$$

$$\text{total weight} = \text{total weight} + \text{weight}(0)$$

$$= 9 + 6 = 15$$

$$\text{benefit} = 15 + 6 = 21$$

$$F(\text{weight}(2) + \text{total weight} \leq \text{capacity})$$

$$3 + 15 \leq 16 \quad \text{No}$$

$$wt = \text{capacity} - \text{total weight}$$

$$= 16 - 15 = 1$$

$$\text{Value} = wt * \frac{\text{value}(2)}{w(2)} = 1 * \frac{1}{3} = 0.33$$

$$\text{total weight} = \text{total weight} + wt$$

$$= 15 + 0.33 = 15.33 \approx 15$$

$$\text{benefit} = \text{benefit} + \text{value}$$

$$= 21 + 0.33 = 21.33$$