1. Throughout this quiz consider a knapsack problem with three items

1 / 1 point

Item	Value	Weight
I_1	v_1	w_1
I_2	v_2	w_2
I_3	v_3	w_3

Once again we wish to maximize the total value of our steal while keeping weights under limit W. However, for each item we can steal arbitrarily many copies of that item. For instance, if we steal item I_2 5 times, we have a value of $5v_2$ and weight $5w_2$. There is no limit on the number of times an item can be stolen.

Assume $w_j > 0$ for each item: otherwise, we can take infinitely many copies of the items and the problem becomes undefined.

- (selected) This sort of situation can happen if I_j is a stock where we can invest in 0 or more units of the stock I_j.
- This sort of situation is purely imaginary and not based on any sort of reality.

Correct

Correct

2. Refer to the problem introduced in the previous question.

1 / 1 point

Let $maxValue(j, W)$ be the maximum value obtained for considering items $I_j, \ldots, I_3$ and weight limit W. Note that $1 \leq j \leq 4$. In particular for $j = 4$, we obtain the empty list of items.

Select all the correct facts from the choices below.

Notation $\lfloor \frac{a}{b} \rfloor$ is the value by computing $\frac{a}{b}$ and rounding it down when $a, b > 0$.

- [x] The minimum number of times we can choose item I_j is 0 and maximum number of times is $\lfloor \frac{W}{w_j} \rfloor$.

> **Correct**
> Correct.

- [x] $maxValue(4, W) = 0$ whenever $W \geq 0$.

> **Correct**
> Correct.

- [x] If the thief chose to steal item $I_j, k \geq 0$ times, the remaining weight budget is $W - kw_j$ and value obtained is kv_j

> **Correct**

- [ ] If $j < 4$ and $W \geq 0$ then

$$maxValue(j, W) = \max \begin{cases} 0 + maxValue(j+1, W) \\ 1 + maxValue(j+1, W - w_j) \\ 2 + 1 + maxValue(j+1, W - 2w_j) \\ \cdots \\ k + maxValue(j+1, W - kw_j) \end{cases} \text{ where } k = \lfloor \frac{W}{w_j} \rfloor$$