



Fractional Knapsack

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3/3 points earned (100%)

Quiz passed!



1 / 1
points

1.

You have a knapsack of capacity 10kg and three items. First item has weight 20kg and value 20, second item has weight 5kg and value 10. Third item has weight 4 kg and value 20. You want to maximize the total value of the fractions of items that fit into your knapsack. What is the safe move?



Take 10 kg of the first item.



Take the whole third item.

Correct

Third item has value 5 per 1kg of weight, while first item has value 1 per 1 kg of weight and second item has value 2 per 1 kg of weight. So, safe move is to take the item with the largest value per 1 kg of weight - the third item. You can take the whole third item, because it fits into the knapsack.



Take 2kg of third item and 8 kg of first item.



Take the whole second item.



Take the whole first item.



1 / 1
points

2.

What is the next safe move in the previous problem?

- ☐ Take 10 kg of the first item.
- ☐ Take 6 kg of the first item.
- ☐ Take the whole first item.
- ☒ Take the whole second item.

Correct

The third item is already in the knapsack. The second item has value 2 per 1 kg of weight, and the first item has value 1 per 1 kg of weight, so it is safe to take the second item, because it has higher value per 1 kg of weight. The knapsack capacity is 10 kg, you've already put 4 kg of the third item in the knapsack, and the second item is only 5 kg, so the whole second item still fits in the knapsack.

- ☐ Take the whole third item.



1 / 1
points

3.

What is the last move?

- ☐ Take the whole second item.
- ☐ Take 10 kg of the first item.
- ☐ Take the whole third item.
- ☐ Take 1 kg of the second item.
- ☒ Take 1 kg of the first item.

Correct

You've already took the whole first item and the whole second item, their total weight is 9 kg, and the knapsack capacity is 10 kg. You have 1 kg left to use, and you take 1 kg of the first item.

