Exercise 1 Fill the dynamic programming table for the knapsack problem with the following four objects:

Object	value	weight
1	3	2
2	4	3
3	5	4
4	6	5

Assume that the knapsack has capacity 5. Then, reconstruct the solution from the dynamic programming table.

Exercise 2 Zé Manel found a part-time job in a new take-away pizzeria close to the University. His job seems to be very easy: Collect the orders, put the pizzas in the ovens and, once cooked, give them to the clients. However, clients are starting to complain because of the amount of time that they have to wait for the pizza. Since the owner does not have enough money to buy a new oven, he asked Zé Manel to find a way of improving the usage of the two existing ovens.

Since Zé Manel likes challenges, he went back home and thought about it. In the next day, Zé Manel went to the owner and explained that he could improve the satisfaction of the clients in general if the workload of the two ovens is as balanced as possible for a given set of orders. One way of balancing the workload is to assign pizzas to the two ovens such that the absolute difference between their total cooking time is as small as possible.

a) Assume that the cooking time of each pizza is given as an integer value. Sketch the pseudo-code of a bottom-up dynamic programming approach to solve the problem.

b) Fill the dynamic programming table to solve the problem for the following input data:

Pizza	minutes
Napoletana	1
Marinara	2
Margherita	1
Romana	3

c) Could you use the same approach if real values were used for the cooking times?

Exercise 3 Read the problem *Zé Manel is making pizzas* in EA2024_PL in Mooshak and solve it using the techniques discussed above.