Exercise 1 Consider the following problem: You have to fill the luggage of two cars with n suitcases, each of which with a given weight, that minimizes the absolute difference of total weight between the two cars.

Consider a greedy algorithm for this problem, which consists of the following steps:

- Sort the n suitcases by non-increasing ordering of their weights

- For each suitcase, choose the least filled luggage.

Show that this greedy algorithm is not correct (it does not find the optimal solution) by providing an input that makes it to fail.

Exercise 2 Consider the following problem: You have to place the minimum number of guards in a long hall of a museum that contains n valuable objects. Each guard can only take care of a range of m meters from his/her location. Sketch the pseudo-code of a greedy algorithm to solve this problem. Justify its correctness and discuss its time complexity.

Exercise 3 Read the problem *Guards in a gallery* in EA2025_PL in Mooshak and solve it using the techniques discussed above.