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left

ALL



3

3. Choose a Flask

A robotic chemical delivery system for a college chemistry laboratory has been configured to work using only one type of glass flask per day. For each chemical ordered, it will be filled to a mark that is at least equal to the volume ordered. There are multiple flasks available, each with markings at various levels. Given a list of order requirements and a list of flasks with their measurements, determine the single type of flask that will result in minimal waste. Waste is the sum of *marking - requirement* for each order. Return the zero-based index of the flask type chosen. If there are multiple answers, return the minimum index. If no flask will satisfy the constraints, return -1.

Example

$n = 4$ (number of orders)

requirements = [4, 6, 6, 7]

flaskTypes = 3

markings = [[0, 3], [0, 5], [0, 7],
[1, 6], [1, 8], [1, 9],
[2, 3], [2, 5], [2, 6]]

The *markings* array is a 2D array where the first element is the flask number and the second an available marking. In this case, the first type has markings at 3, 5 and 7. The second type has them at 6, 8 and 9, and the third type has markings at 3, 5 and 6.

Using the first flask type, the losses are: $5 - 4 = 1$, $7 - 6 = 1$, $7 - 6 = 1$, $7 - 7 = 0$. $1 + 1 + 1 + 0 = 3$ units wasted.

Using the second flask type, losses are: $6 - 4 = 2$, $6 - 6 = 0$, $6 - 6 = 0$, $8 - 7 = 1$. $2 + 0 + 0 + 1 = 3$ units wasted.

The third flask type cannot be used because its maximum capacity is 6 and there is an order for 7.

Two types of flasks can be used and 3 units will be lost. The lower index flask is at index 0.

NOTE: The markings 2D array will be given in order of the flasks, *i.e.*, the markings for the 0-index flask will be followed by markings of 1-index flask and so on. For each flask, the given markings will also be sorted in ascending order.

Function Description

Complete the function *chooseFlask* in the editor below.

chooseFlask has the following parameter(s):

int requirements[n]: the requirements for the orders