ALGORITHM EXAM 03

Date: 20-12-2021

Time 2h

EXERCISE 01 (25pt)

Check if an array of integers contains **at least one** number **greater than 10 and smaller or equal than 20 and not 15** display **TRUE**. Otherwise, display **FALSE**

- INPUT
  - An array of integers
- OUTPUT
  - Boolean (TRUE OR FALSE)

Example:

INPUT	OUTPUT
[1, 5, 9, 17, 21]	TRUE Because 17 > 10 and 17 ≤ 20 and 17 ≠ 15
[5, 21, 9, 15, 1]	FALSE
[1, 5, 9, 15, 17, 21]	TRUE Because 17 > 10 and 17 ≤ 20 and 17 ≠ 15
[1, 23, 8, 16, 18, 5]	TRUE Because 16 > 10 and 16 ≤ 20 and 16 ≠ 15
[ ]	FALSE

EXERCISE 02 (25pt)

Check if an array of numbers is ascending

- INPUT
  - Array of Integers
- OUTPUT
  - ASCENDING (If array is ascending)
  - ERROR (If array is not ascending)

TIP: ascending means every number in the array is greater or equal than the previous number.

Example:

INPUT	OUTPUT
[1, 5, 9, 17, 21]	ASCENDING Because 1 ≤ 5 ≤ 9 ≤ 17 ≤ 21
[1, 15, 9, 17, 21]	ERROR Because 1 ≤ 15 ≥ 9 ≤ 17 ≤ 21
[7, 7]	ASCENDING Because 7 ≤ 7
[1]	ASCENDING
[1, 2, 1]	ERROR
[1, 1, 2, 2]	ASCENDING

EXERCISE 03 (25pt)

A list of books is represented as an array of dictionaries. Each book is a dictionary with 2 keys: “name” and “status”. The name of the book is a string and the status is a Boolean.

If the status of a book is *True*, it means it is available.

Count the number of available books.

Book name	Status (Availability)
Jack ma	True
Elon mask	False
Tom Teav	True

- INPUT
  - Array of dictionaries
- OUTPUT
  - Integer (Number of available books)

Example:

INPUT	OUTPUT
[{'name’: "Jackma", 'status’: True}, {'name’: "Kolap baelen", 'status': False}, {'name’: "Tom Teav", 'status': True}, {'name’: "Elon mask", 'status': False}, {'name’ :"Leadership", 'status’ : True}]	3 Because 3 books have status *True*
[{'name’ : "Jackma", 'status’ : False}, {'name’: "Kolap baelen", 'status’: False}, {'name': "Tom Teav", 'status': True}, {'name': "Elon mask", 'status': False}, {'name’ : "Leadership", 'status’ : False}]	1 Because only one book has status *True*

[{'name': "Jackma", 'status': True}, {'name': "Kolap baelen", 'status': False}, {'name': "Tom Teav", 'status': False}, {'name': "Elon mask", 'status': False}, {'name' :"Leadership", 'status' : True}]	2 Because 2 books have status *True*

EXERCISE 04 (25pt)

You have two dictionaries, the first one represents the ingredients and quantity to make a recipe, and the second one represents the ingredients you have in your kitchen and in what quantities.

- INPUT
  - Two arrays of dictionaries
    - Array dictionary of ingredients that we need
    - Array dictionary of ingredients that we have in the kitchen
- OUTPUT
  - Boolean
    - **TRUE** if you have enough ingredients in your kitchen, **FALSE** if not

Example:

INPUT	OUTPUT
[{“ingredient” : "rice","quantity” : 100}, {“ingredient” : ”beef”, “quantity” : 50}] [{“ingredient” : “banana”, “quantity” : 100}, {“ingredient” : “beef”, “quantity” : 200}, {“ingredient” : “rice”, “quantity” : 300}]	**True** Because you need 100 rice and 50 beef, and you have in your kitchen 300 rice (300 ≥ 100) and 200 beef (200 ≥ 50)

[{“ingredient” : "noodle","quantity” : 200}, {“ingredient” : ”beef”, “quantity” : 50}] [{“ingredient” : “banana”, “quantity” : 100}, {“ingredient” : “beef”, “quantity” : 200}, {“ingredient” : “noodle”, “quantity” : 50}, {“ingredient” : “apple”, “quantity” : 500}]	**False** Because you need 200 noodle and 50 beef, and you have in your kitchen only 50 noodle (50<200) so you can’t make the recipe.
[{“ingredient” : "noodle","quantity” : 200}, {“ingredient” : ”beef”, “quantity” : 50}, {“ingredient” : ”bread”, “quantity” : 10}] [{“ingredient” : “banana”, “quantity” : 100}, {“ingredient” : “beef”, “quantity” : 200}, {“ingredient” : “noodle”, “quantity” : 50}, {“ingredient” : “apple”, “quantity” : 500}]	**False** Because you need 200 noodle, 50 beef and 10 bread and you do not have bread in your kitchen