

# ALGORITHM FINAL EXAM

Date: 14-10-2022

Time **2h30**

## EXERCISE 01 (15pt)

### Objective:

Filter the names containing exactly 2 characters 'a'

*As example:*

INPUT	OUTPUT
[ "Meta", "Dara" ]	[ "Dara" ]

### Input / outputs types

- INPUT
  - o An array of strings
- OUTPUT
  - o An array of strings

### Examples

INPUT	OUTPUT
[ ]	[ ] Because no name with 2 "a"
[ "AAb", "aabb", "abab" ]	[ "aabb", "abab" ]
[ "Champa", "Kanha", "Chompei", "Meta", "Dara" ]	[ 'Champa', 'Kanha', 'Dara' ]
[ "Lexi", "Bopha", "Chann", "Mori", "Botra", "Elle" ]	[ ] Because no name with 2 "a"

## EXERCISE 02 (25pt)

### Objective:

You need to **reverse** both:

- The list of words
- But also, each word letters

*As example:*

INPUT	OUTPUT
['apple', 'banana']	['ananab', 'elppa']

### Input / outputs types

- INPUT
  - o Array of String
- OUTPUT
  - o Array of String

### Functions

You need to **define and call the following function** in your code

Function name	<b>reverseText</b>
Parameter	(string) text
Return	(string) The reversed text
Example	reverseText("abc") → "cba"

### Examples:

INPUT	OUTPUT
["abc", "123", "456"]	["654", "321", "cba"]
[]	[]
["banana", "coconut"]	["tunococ", "ananab"]
['ronan', 'him', 'mengheang', 'rady']	['ydar', 'gnaehgnem', 'mih', 'nanor']

## EXERCISE 03 (30 pts.)

We represent student **scores** with an array of dictionaries.

If the **student score is < 50**, the student failed the subject.

*Each student score is represented as follows:*

Name	The name of the student
Subject	The subject
Score	The student score

### Objective:

You need to display the **numbers of students** who failed **algorithm** and their **name**

*Example:*

If only 3 students failed:

**3** students failed algorithm: **Nit Dyna Khid**

If only 1 student failed:

**1** student failed algorithm: **Nit**

If 0 student failed:

**0** student failed algorithm

### Input / outputs types

- INPUT
  - o Array of dictionaries
- OUTPUT
  - o String

### Examples

INPUT	OUTPUT
<pre>[   {'name': 'Nit', 'subject': 'Algorithm', 'score': 10},   {'name': 'Visal', 'subject': 'PL', 'score': 80},   {'name': 'Dyna', 'subject': 'Algorithm', 'score': 49},   {'name': 'Virak', 'subject': 'English', 'score': 50},   {'name': 'Sreymom', 'subject': 'Algorithm', 'score': 50},   {'name': 'Khid', 'subject': 'Algorithm', 'score': 40}, ]</pre>	<p>3 students failed algorithm: Nit Dyna Khid</p>
<pre>[   {'name': 'Sreyka', 'subject': 'Algorithm', 'score': 100},   {'name': 'Chetra', 'subject': 'English', 'score': 49},   {'name': 'Thana', 'subject': 'Algorithm', 'score': 40}, ]</pre>	<p>1 student failed algorithm: Thana</p>

## EXERCISE 04 (30 pts.)

You have two arrays as input

The first one represents **the list of subjects** per class and assigned teacher:

```
[
  {"subject": "html", "class": "WEP-B", "teacher-id", 45},
  {"subject": "html", "class": "WEP-A", "teacher-id", 36},
  {"subject": "algorithm", "class": "WEP-B", "teacher-id", 36},
]
```

The second one represents **the list of teacher**:

```
[
  {"teacher-id": "36", "first-name": "rady", "last-name": "Y"},
  {"teacher-id": "45", "first-name": "ronan", "last-name": "the best"},
]
```

As you can see the teacher is represented by an ID (a number) and we can get the teacher information (first name, last name) by using the second array.

### Objective:

You need to print the last **name** of teachers who teach algorithm subject

If no teacher is teaching algorithm you need to display:

```
No teacher in algorithm subject
```

### Input / outputs types

- INPUT
  - o Array of dictionary (subjects)
  - o Array of dictionary (teachers)
  - o
- OUTPUT
  - o String

### Example:

INPUT	OUTPUT
<pre>[   {"subject": "html", "class": "WEP-B", "teacher-id", 45},   {"subject": "html", "class": "WEP-A", "teacher-id", 36},   {"subject": "algorithm", "class": "WEP-B", "teacher-id", 36}, ]  [   {"teacher-id": "36", "first-name": "rady", "last-name": "Y"},   {"teacher-id": "45", "first-name": "ronan", "last-name": "the best"}, ]</pre>	<pre>Y  teacher-id 36 last name is "Y" he s teaching algorithm</pre>

<pre>[   {"subject": "html", "class": "WEP-B", "teacher-id", 45},   {"subject": " algorithm ", "class": "WEP-A", "teacher-id", 68},   {"subject": "algorithm", "class": "WEP-B", "teacher-id", 39}, ]  [   {"teacher-id": "39", "first-name": "Mengheang", "last-name": "Pho"},   {"teacher-id": "45", "first-name": "ronan", "last-name": "the best"},   {"teacher-id": "68", "first-name": "him", "last-name": "Hey"}, ]</pre>	Pho Hey
<pre>[   {"subject": "html", "class": "WEP-B", "teacher-id", 45},   {"subject": "PL", "class": "WEP-A", "teacher-id", 68},   {"subject": "Algorithm", "class": "WEP-B", "teacher-id", 39}, ]  [   {"teacher-id": "38", "first-name": "Mengheang", "last-name": "Pho"},   {"teacher-id": "45", "first-name": "ronan", "last-name": "the best"},   {"teacher-id": "68", "first-name": "him", "last-name": "Hey"}, ]</pre>	No teacher in algorithm subject