{EPITECH}
LEARN DIFFERENT*

PRE-POOL

DAY 05

PRE-POOL

OH MY GIT!
In addition to the tasks below, you must go as far as possible in this game.
Work on it as soon as you have a bit of time, or whenever you need a break in you day!

Lists creation and browsing

Task 01

Create a list that contains 5 numbers and print the first one.

Task 02

Display the last element of your list.

Your code must be functional whichever number of elements the list contains.

Task 03

Add a 6th element in your list.

Task 04

Display all the elements of your list.

Task 05

Delete the last element and display all the remaining elements.

Your code must be functional whichever number of elements the list contains.

Task 06

Add an element at the beginning of the list and display all its elements.

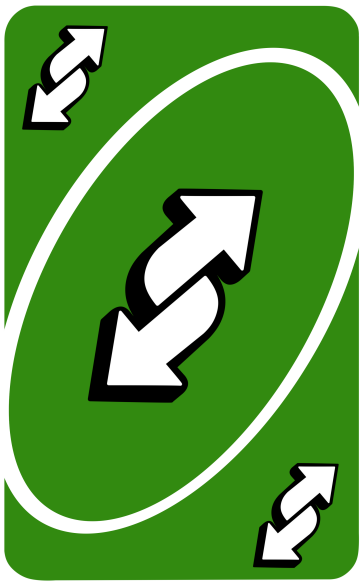
Task 07

Display the substring from the 2nd to the 5th elements.

Can you do it in one line?

Task 08

Reverse the list by creating a new list with the same elements, but starting from the end.
Display all the elements of this new list.



Task 09

Display one element out of two of the list.

Task 10

Add 17 elements at the end of your list.

Please, do not do it in 17 lines...

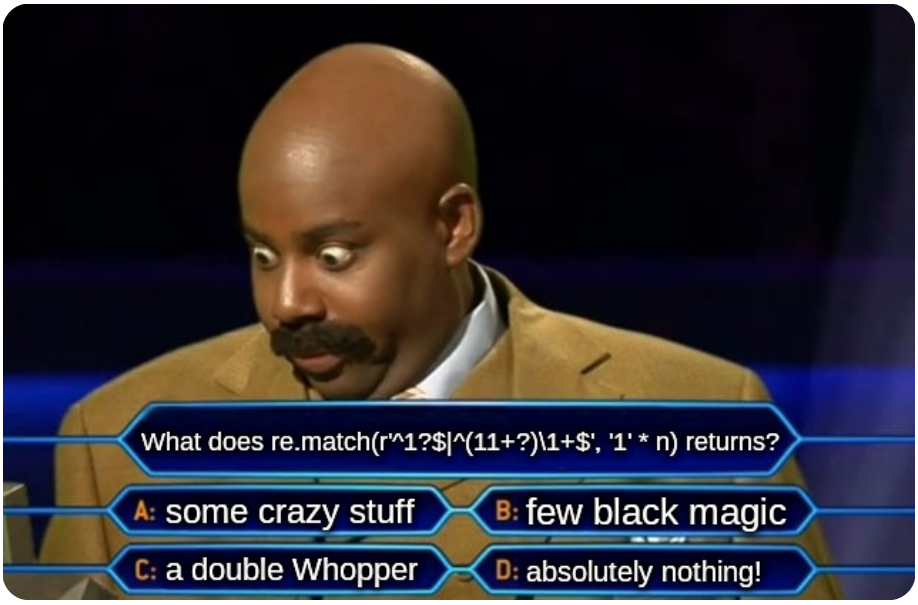
Task 11

What does the following code make?

```
my_first_list = [4, 5, 6]
my_second_list = [1, 2, 3]
my_first_list.extends(my_second_list)
```

Same with:

```
my_first_list = [7, 8, 9]
my_second_list = [4, 5, 6]
my_first_list = [*my_first_list, *my_second_list]
```



Operations on lists

Task 01

Create a list of 10 numbers.
Print the result of the multiplication of all elements of this list.

Task 02

Test this code and try to explain it: `[x + 10 for x in [3, 2, 6, 7, 1, 4]]`

Task 03

Test this code and try to explain it: `list(map(lambda x: x * x, [3, 2, 6, 7, 1, 4])`

Task 04

Browse the list and display both the smallest and the biggest elements.

Task 05

Display all the elements smaller than 7.

Task 06

Sort your list in descending order.

Task 07

Test this code and try to explain it `[x // 2 if x % 2 == 0 else x * 2 for x in [42, 3, 4, 18, 3, 10]]`

Task 08

Test this code and try to explain it: `list(filter(lambda x: x > 10, [42, 3, 4, 18, 3, 10]))`

Task 09

Test this code and try to explain it: `[*enumerate([42, 3, 4, 18, 3, 10])]`

Task 10

Test this code and try to explain it:

```
first_name = ["Jackie", "Bruce", "Arnold", "Sylvester"]
last_name = ["Stallone", "Schwarzenegger", "Willis", "Chan"]

magic = [*zip(first_name, last_name[::-1])]

print(magic[0])
print(magic[3])
print(magic[1][0])
print(magic[0][1])
print(magic[2])
```

CHALLENGE

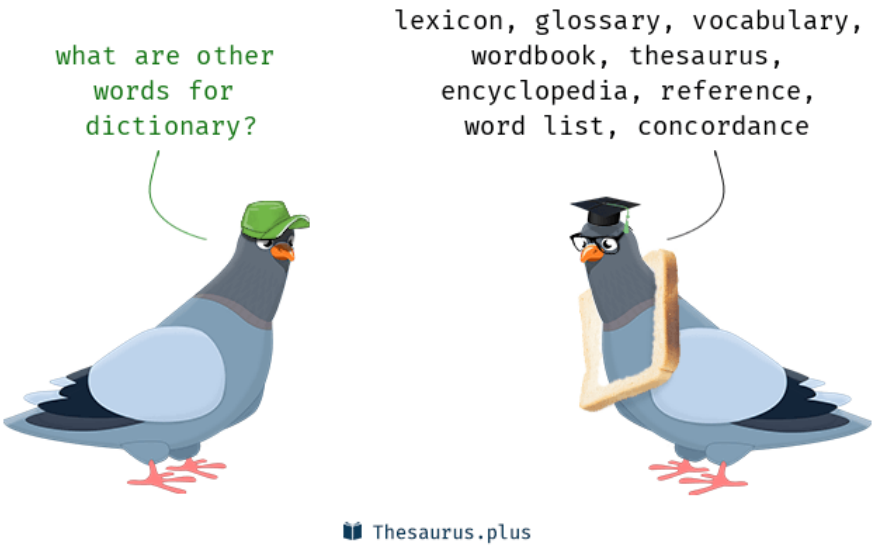
Create a list of 1 000 000 random integers and sort it as fast as possible.

If you want to know precisely how long the execution of your program lasted, you can put the code `startingTime = time.time()` at the beginning and `duration = time.time()- startingTime` at the end.

Dictionaries

Task 01

Create a dictionary stored in a `student` variable.
This dictionary must contain 2 key/value pairs.
The keys must be “name” and “academic_year”.
The associated values are up to you, but please keep them coherent!



Task 02

In your student dictionary, add a `units` key.
The value associated to `units` is an array of 3 elements.
Each element of this array is a dictionary of 3 keys: `name`, `credits`, `grade`:

The value associated with `name` can be one of:

- ✓ Web Development
- ✓ Network and System Administration
- ✓ Java

The value associated with `credits` is a strictly positive integer.
The value associated with `grade` is a letter ranging from A to E.

Task 03

Create a new directory named `grade_weight_mapping`.
This dictionary contains 5 keys (“A”, “B”, “C”, “D”, “E”) and their respective values (4, 3, 2, 1, 0).

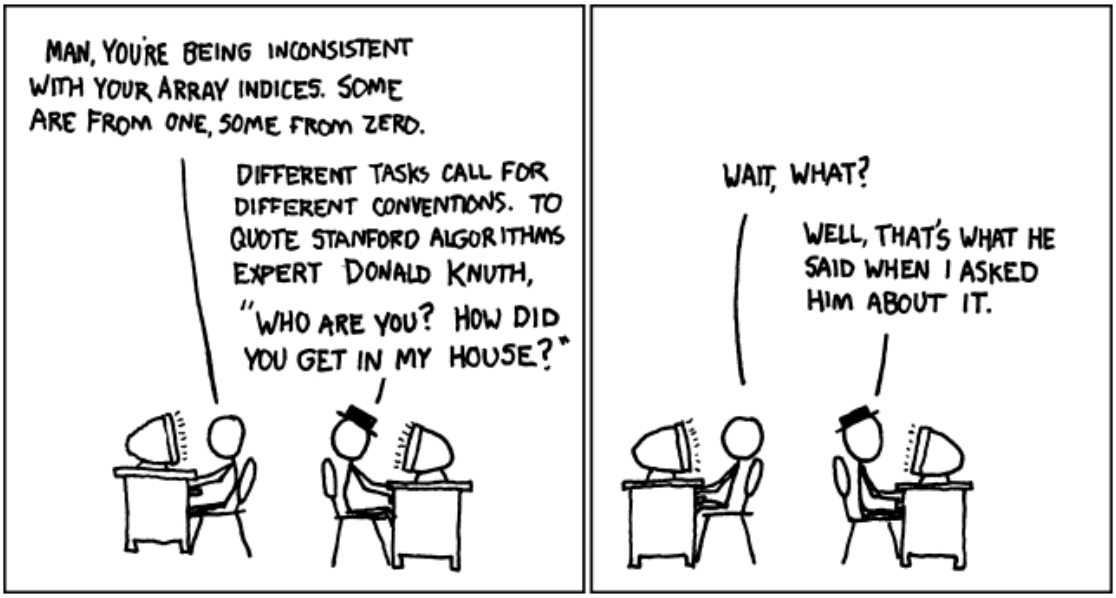
In your `student` dictionary, add a `total_credits` name. Give it the correct value according to the amount of credits you’ve given to each units in the previous task.
Also add a `GPA` key and give it the correct value.

GPA or Grade Point Average is a number between 0 and 4. It is the average grade obtained, weighted by the number of credits.

Task 04

Create an array and store at least 3 `students` (as defined in previous tasks) in it.
Write some code to:

- ✓ sort this array by student’s name in alphabetical order
- ✓ sort this array by GPA in both ascending and descending order



Lets' go further

Task 01

Let's consider a list of names (the ambassador's banquet guests).
Write a program that displays:

- ✓ "welcome in" if a given name belongs to this list ;
- ✓ and "get lost!" otherwise.

Task 02

Write a program that deletes all the duplicated elements in a list.

Task 03

Let consider a list of meetings. Each meeting is a list containing the day, the time of the meeting and the name of all the participants.
For instance `["Monday, "3:30 PM", "Joe", "Samantha"]`.
Write a program that, given a name, displays all the meetings in which this person is involved.

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