Python. [HW1] Personal minor at MIPT.

Below u can find very useful references! Please, look them through, it'll be pretty helpful.
Don't mind, if you couldn't make some tasks -- it's just OK.
But try to do your best.

Remember: Python (and all other programming languages) -- is just an instrument, not a target.

You can be a good Data Scientist without deep knowledge of Python/C++/etc.. You can always use Google, one of mill tutorials, guides and so on.

BUT if you can learn Python at the good level it will always help you to improve your efficiency and can change your way of thinking to the more technical side. Thus, you should take care of it.

Links:

Python Getting Started
Learn Python - Free Interactive Python Tutorial
Online IDE, Editor, and Compiler - Fast, Powerful, Free

Requirements:
Do your HW in Jupyter Notebook! Run every task in a new cell
DEADLINE: 08.03.2020 16:00 (Sunday)! Please, respect it.

Lists

1. Write a Python program to sum all the items in a list.

2. Write a Python program to multiplies all the items in a list.

3. Write a Python program to get the largest number from a list.

4. Write a Python program to get the smallest number from a list.

5. Write a Python program to count the number of strings where the string length is 2 or more and the first and last character are same from a given list of strings.

Sample List : ['abc', 'xyz', 'aba', '1221']

Expected Result : 2

6. Write a Python program to get a list, sorted in increasing order by the last element in each tuple from a given list of non-empty tuples.

Sample List : [(2, 5), (1, 2), (4, 4), (2, 3), (2, 1)]

Expected Result : [(2, 1), (1, 2), (2, 3), (4, 4), (2, 5)]

7. Write a Python program to remove duplicates from a list.

8. Write a Python program to check a list is empty or not.

9. Write a Python program to clone or copy a list.

10. Write a Python program to find the list of words that are longer than n from a given list of words.

11. Write a Python function that takes two lists and returns True if they have at least one common member.

12. Write a Python program to print a specified list after removing the 0th, 4th and 5th elements.

Sample List : ['Red', 'Green', 'White', 'Black', 'Pink', 'Yellow']

Expected Output : ['Green', 'White', 'Black']

13. Write a Python program to generate a 3*4*6 3D array whose each element is *.

14. Write a Python program to print the numbers of a specified list after removing even numbers from it.

15. Write a Python program to shuffle and print a specified list.

16. Write a Python program to generate and print a list of first and last 5 elements where the values are square of numbers between 1 and 30 (both included).

17. Write a Python program to generate and print a list except for the first 5 elements, where the values are square of numbers between 1 and 30 (both included).

19. Write a Python program to get the difference between the two lists.

20. Write a Python program access the index of a list.

21. Write a Python program to convert a list of characters into a string.

22. Write a Python program to find the index of an item in a specified list.

Strings

1. Write a Python program to calculate the length of a string.

2. Write a Python program to count the number of characters (character frequency) in a string.

Sample String : google.com'

Expected Result : {'o': 3, 'g': 2, '.': 1, 'e': 1, 'l': 1, 'm': 1, 'c': 1}

3. Write a Python program to get a string made of the first 2 and the last 2 chars from a given a string. If the string length is less than 2, return instead of the empty string.

Sample String : 'w3resource'

Expected Result : 'w3ce'

Sample String : 'w3'

Expected Result : 'w3w3'

Sample String : ' w'

Expected Result : Empty String

4. Write a Python program to get a string from a given string where all occurrences of its first char have been changed to '$', except the first char itself.

Sample String : 'restart'

Expected Result : 'resta$t'

5. Write a Python program to get a single string from two given strings, separated by a space and swap the first two characters of each string.

Sample String : 'abc', 'xyz'

Expected Result : 'xyc abz'

6. Write a Python program to add 'ing' at the end of a given string (length should be at least 3). If the given string already ends with 'ing' then add 'ly' instead. If the string length of the given string is less than 3, leave it unchanged.

Sample String : 'abc'

Expected Result : 'abcing'

Sample String : 'string'

Expected Result : 'stringly'

7. Write a Python program to find the first appearance of the substring 'not' and 'poor' from a given string, if 'not' follows the 'poor', replace the whole 'not'...'poor' substring with 'good'. Return the resulting string.

Sample String : 'The lyrics is not that poor!'

'The lyrics is poor!'

Expected Result : 'The lyrics is good!'

'The lyrics is poor!'

8. Write a Python function that takes a list of words and returns the length of the longest one.

9. Write a Python program to remove the n^{th} index character from a nonempty string.

10. Write a Python program to change a given string to a new string where the first and last chars have been exchanged.

11. Write a Python program to remove the characters which have odd index values of a given string.

12. Write a Python program to count the occurrences of each word in a given sentence.

13. Write a Python script that takes input from the user and displays that input back in upper and lower cases.

14. Write a Python program that accepts a comma separated sequence of words as input and prints the unique words in sorted form (alphanumerically).

Sample Words : red, white, black, red, green, black

Expected Result : black, green, red, white,red

15. Write a Python function to create the HTML string with tags around the word(s).

Sample function and result :

add_tags('i', 'Python') -> 'Python'

add_tags('b', 'Python Tutorial') -> 'Python Tutorial '

16. Write a Python function to insert a string in the middle of a string.

Sample function and result :

insert_sting_middle('[[]]<<>>', 'Python') -> [[Python]]

insert_sting_middle('{{}}', 'PHP') -> {{PHP}}

17. Write a Python function to get a string made of 4 copies of the last two characters of a specified string (length must be at least 2).

Sample function and result :

insert_end('Python') -> ononononon

insert_end('Exercises') -> eseseses

18. Write a Python function to get a string made of its first three characters of a specified string. If the length of the string is less than 3 then return the original string.

Sample function and result :

first_three('ipy') -> ipy

first_three('python') -> pyt

19. Write a Python program to get the last part of a string before a specified character.

20. Write a Python function to reverses a string if it's length is a multiple of 4.

21. Write a Python function to convert a given string to all uppercase if it contains at least 2 uppercase characters in the first 4 characters.

22.Write a Python program to sort a string lexicographically (in alphabet order).

23. Write a Python program to remove a newline in Python.

24. Write a Python program to check whether a string starts with specified characters.

25. Write a Python program to create a Caesar encryption (if u dunno what is it, you can google it :)).

Extra

Take two lists, say for example these two:

a = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89]

b = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13]

and write a program that returns a list that contains only the elements that are common between the lists (without duplicates). Make sure your program works on two lists of different sizes.

Extras:

1. **Randomly generate two lists to test this**
2. **Write this in one line of Python (don't worry if you can't figure this out at this point - we'll get to it soon)**

List properties

In other words, "things you can do with lists."

One of the interesting things you can do with lists in Python is figure out whether something is inside the list or not. For example:

```
>>> a = [5, 10, 15, 20]
>>> 10 in a
True
>>> 3 in a
False
```

You can of course use this in loops, conditionals, and any other programming constructs.

```
list_of_students = ["Michele", "Sara", "Cassie"]

name = input("Type name to check: ")

if name in list_of_students:

   print("This student is enrolled.")
```

Happy coding!