

Lab_05: Lists.

1. Find an index of the element '7' in the following list: `numbers = [0, 2, 5, 7, 3, 1, 6, 8, 9]`
2. How many times does the article 'the' occurs in the following list? `articles = ['the', 'a', 'the', 'an', 'the', 'the', '', 'a', '']`
3. Initialize a python list consisting of 10 integer elements using different methods.
4. Create a list containing natural numbers as list elements and figure out its length, smallest, largest value elements and compute its total. The given task shall be executed in 2 ways:
1) using loop 2) using list methods.
5. Create an empty list. Add elements in your list using methods of the list. The given task shall be executed in 3 ways: 1) add an element at the end of the list 2) add an element into a specific place indicating its index number 3) add a sequence of values to the end of the list
6. Given the following list `fathers = ['James Gosling', 'Rasmus Lerdorf', 'Matthias Felleisen', 'Guido van Rossum', 'Larry Wall', 'Bjarne Stroustrup', 'Yukihiro Matsumoto']`, remove the elements using methods of the list. The given task shall be executed in 4 ways: 1) remove an element from the end of the list 2) remove a particular element from the list using its index number 3) remove a particular element using its value name 4) remove the remaining elements of the list to make it empty
7. There are several ways of copying the elements of the list. Given the following list `cities = ['Almaty', 'Kostanay', 'Aktau', 'Shymkent', 'Semey', 'Karagandy', 'Nur-Sultan']`, copy it using at least 3 different ways.
8. Given the list `coffee = ['americano', 'latte', 'frappuccino', 'cappuccino', 'espresso', 'mocha']`, print it out in a list in an opposite direction, so that the last element of the list turns the first element of a new list and the first element of the list becomes the last element of a new list. Your results must be `['mocha', 'espresso', 'cappuccino', 'frappuccino', 'latte', 'americano']`. Use the list slicing and a 'for loop' to complete the task.
9. How would you use 'for' and 'while' loops to traverse the element of the following list `fruits = ['orange', 'melon', 'apple', 'banana', 'watermelon', 'pineapple']`? Elements of the list must be printed out in one line separated with commas. Your result must be: `orange, melon, apple, banana, watermelon, pineapple`,
10. Given the list `numbers = [3, 4, 7, 1, 2, 8, 9, 5, 6]`, 1) sort the list without modifying the original list 2) sort the list in an ascending order, while original list to be modified 3) sort the list in a descending order while the original list to be modified.
11. Given the list `words = ['Australia', 'Eurasia', 'Africa', 'continent', 'land', 'North America', 'population', 'South America', 'race', 'language']`, sort it based on case-sensitive and case-insensitive methods. Use 'key=' parameter to complete this task.

12. Reverse the following list `animals = ['tiger', 'bear', 'lion', 'wolf', 'fox', 'zebra', 'eagle', 'penguin', 'dog', 'cat']` using slicing and a 'reverse' method of the list. Your result must be `['cat', 'dog', 'penguin', 'eagle', 'zebra', 'fox', 'wolf', 'lion', 'bear', 'tiger']`.
13. Extract the odd numbers from the following list `numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9]` using list comprehension.
14. Given the string `pl = 'Python'`, create a list of the ASCII integer codes of the letters of the string. Use a 'for' loop or list comprehension to complete this task.
15. Given the following `words = ['d@ll', 'b@ll', 'go@l', 'f@ll', '@mb@ss@dor', 'c@pit@l']`, create a new list with replaced '@' to 'a'. Complete the task in 3 ways: 1) using 'for/while' loop 2) using 'map' function of the list 3) using list comprehension
16. Given the following list `numbers = [-5, 4, 0, -3, 5, -2, 8, 2, -1]`, create a new list extracting positive integers. Complete the task in 3 ways: 1) using 'for/while' loop 2) using 'filter' function of the list 3) using list comprehension
17. Playing FizzBuzz game out of given list of numbers `numbers = [7, 10, 15, 56, 40, 32, 5, 12, 17, 24, 22, 53, 31]`. If the number is both divided into 4 and 5 without a remainder, your code must print 'FizzBuzz', if the number is divided into 4 without a remainder, your code must print 'Fizz', if the number is divided into 5 without a remainder, your code must print 'Buzz', if the number is neither divided into 4 nor 5, your code must print 'the number is neither Fizz nor Buzz'. Use a 'for' loop to complete the task.
18. Create a list consisting of any 8 integer elements. Then iterating through the elements of the list, use a greedy approach to extract these elements. Your first element must be extracted with your last element, your second element must be extracted with the preceding element to the last and so on. Example: given an array of elements [2, 3, 4, 5, 25, 16, 9, 4], the output looks like:
- 2 4
3 9
4 16
5 25
19. Form an ascending list of even numbers (number of elements 50) starting from 0.
20. Form a list consisting of 100 integers. Ask a user to input any number. If number is in the list, print "Number found", if it is not in the list, print "Number not found". If user enters a number in a word form, ask user to input it as digit. If user enters 'x', your program must stop.