

Guide

Read the questions first. Try to solve as many as you can. Don't get stuck on a question.

Refer to the session notes and practice code

Use the Python documentation

Don't search for solutions of the problems online (CHEATING)

Writing functions in any problem gives a bonus!

Use ideone.com 

Choose language "Python 3"

<https://www.ideone.com/> (<https://www.ideone.com/>)

Or Colab on Google Drive

This tutorial shows how to add Colab to your drive and access files stored on your drive e.g., data or text files.

Ignore the part about "change runtime to GPU"

<https://www.mlfairy.com/blog/2020/01/15/google-colab-getting-started/> (<https://www.mlfairy.com/blog/2020/01/15/google-colab-getting-started/>)

Q1.1 Write a program that checks if a number is positive, or negative, or zero.

Input: x=1

Output: positive

Input: x=-4

Output: negative

Input: x=0

Output: zero

Q1.2 Write a program that checks if a number is even or odd.

Input: x=1

Output: odd

Input: x=-4

Output: even

Input: x=0

Output: even

Q1.3 Write a program that checks if a number is positive, or negative, or zero. Also, if the number is even or odd.

Hint: define separate functions to check even/odd and positive/negative/zero

Input: x=1

Output: positive odd

Input: x=-4

Output: negative even

Input: x=0

Output: zero even

Q2.1 Write a program that finds the largest number of 3 given numbers.

Input: x=1; y=2; z=3

Output: 3

Input: x=5; y=10; z=2

Output: 10

Q2.2 Write a program that finds the smallest number of 3 given numbers.

Input: x=1; y=2; z=3

Output: 1

Input: x=5; y=10; z=2

Output: 2

Q2.3: Write a program that finds the largest and smallest number of 3 given numbers

Hint: define two separate variables: one for the largest and one for the smallest

Input: x=1; y=2; z=3

Output: largest 3, smallest 1

Input: x=5; y=10; z=2

Output: largest 10, smallest 2

Q3 Write a program that calculates the sum of squares (power 2) of numbers in a given range of numbers

For example: start=1; end=3 then $1^2 + 2^2 + 3^2 = 1 + 4 + 9 = 14$

Hint: remember to define a total sum variable

Bonus: search for "list comprehension" and use it to solve this problem with "range" and "sum" functions

Input: start=1; end=3

Output 14

Input: start=5; end=10

Output: 355

Q4.1 Write a program that generates 10 random numbers between 1 and 100

Hint: use "random.choice" and a loop

Output: [65, 38, 57, 20, 19, 24, 13, 41, 17, 15]

Q4.2 Write a program to generate 10 random *even* numbers between 1 and 100

Hint: use "random.choice"

Bonus: search how to use "random.sample" instead

Output: [44, 4, 70, 8, 88, 18, 30, 12, 60, 68]

Q5.1 Write a program to check if a list of numbers is in increasing order

Input: [1,2,3]

Output: yes

Input: [1,2,0,3]

Output: no

Q5.2 Write a program to check if a list of numbers is in decreasing order

Input: [3,2,1]

Output: yes

Input: [3,2,0,1]

Output: no

Q5.3 Write a program to check if a list of numbers is increasing, or decreasing, or neither.

Input: [1,2,3]

Output: increasing

Input: [3,2,1]

Output: decreasing

Input: [1,0,2]

Output: neither

Q6 Write a program to check a list is empty or not

Hint: use "len" function

Input: []

Output: yes

Input: [1,2]

Output: no

Q7.1 Write a program that checks if an element is in a list

Hint: use "in" operator to check if element in list

Input: x=[1,2,3]; y=1

Output: yes

Input: x=[1,2,3]; y=4

Output: no

Q7.2 Write a program that checks if two lists have at least one common element

Hint: use "in" operator and loop

Input: x=[1,2,3]; y=[4,5,6]

Output: no

Input: x=[1,2,3]; y=[3,4,5]

Output: yes

Q8.1 Write a program that takes a list of numbers and an integer, then outputs how many times the integer appears in the list

Hint: use "list.count" function

Input: x=[10,20,20,30,30,30]; y=20

Output: 2 times

Input: x=[10,20,20,30,30,30]; y=40

Output: 0 times

Q8.2 Write a program that takes a list of numbers and outputs the unique elements in the list

Hint: use "in" operator to check if element in list

Hint: define a separate list to output the unique elements

Input: [1,2,2,3,3,3]

Output: [1,2,3]

Input: [4,5,6]

Output: [4,5,6]

Q8.3 Write a program that takes a list of numbers and outputs how many times each number appears

Hint: use "list.count" function, but print only once for each unique number

Input:

[10,20,20,30,30,30]

Output:

10 appears 1 times

20 appears 2 times

30 appears 3 times

Q9 Write a program that takes a string and prints it in reverse and in uppercase

Input: "abc"

Output: "CBA"

Input: "hello world"

Output: "DLROW OLLEH"

Q10 Write a program that takes a string and outputs how many times each vowel appears, where vowels are "a", "e", "i", "o", "u"

Hint: use "string.count" function

Input:

"hello world"

Output:

a appears 0 times

e appears 1 times

i appears 0 times

o appears 2 times

u appears 0 times

Q11.1 Write a program to find the how many times a given character appears in a given string.

Hint: use "string.count"

Input: x="abbccc"; y="a"

Output: 2 times

Input: x="hello"; y="a"

Output: 0 times

Q11.2 Write a program to find the most common character in a given string. If more that one character appear the same number of times print any of them

Hint: use "string.count" and define a variable to store the most common character *so far*

Input: "hello"

Output: "l"

Input: "banana"

Output: "a"

Q12 Write a *function* that raises a power to an exponent e.g., pow(2,3) => 23 = 8**

Input: x=2; y=3

Output: 8

Input: x=3; y=2

Output: 9

Q13 Write a *function* to multiply all the numbers in a list.

Input: [3]

Output: 3

Input: [5,6]

Output: 30

Input: [10,40,5]

Output: 2000

Bonus

Input: []

Output: 0

Q13 Write a *function* to check whether a number falls in a given range.

Input: start=0; end=10; x=5

Output: yes

Input: start=0; end=10; x=10

Output: yes

Input: start=0; end=10; x=11

Output: no

Q14 Write a function that counts how many words are in a string

Hint: count spaces " "

Input: "hello world"

Output: 2

Input: "hello"

Output: 1