

Python Programming Exercise

Question 1: Write a program which will find all such numbers which are divisible by 7 but are not a multiple of 5, between 2000 and 3200 (both included). The numbers obtained should be printed in a comma-separated sequence on a single line.

Question 2: Write a program which can compute the factorial of a given numbers. The results should be printed in a comma-separated sequence on a single line. Suppose the following input is supplied to the program: 8
Then, the output should be: 40320

Hints: In case of input data being supplied to the question, it should be assumed to be a console input.

Question 3: With a given integral number n, write a program to generate a dictionary that contains (i, i*i) such that i is an integral number between 1 and n (both included). and then the program should print the dictionary.

Suppose the following input is supplied to the program: 8

Then, the output should be: {1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64}

Hints: In case of input data being supplied to the question, it should be assumed to be a console input. Consider use dict()

Question 4: Write a program which accepts a sequence of comma-separated numbers from console and generate a list and a tuple which contains every number.

Suppose the following input is supplied to the program: 34,67,55,33,12,98

Then, the output should be:

['34', '67', '55', '33', '12', '98']

('34', '67', '55', '33', '12', '98')

Hints: In case of input data being supplied to the question, it should be assumed to be a console input.

Question 5: Define a class which has at least two methods:

getString: to get a string from console input

printString: to print the string in upper case.

Question 6: Write a program that calculates and prints the value according to the given formula:

$Q = \text{Square root of } [(2 * C * D)/H]$

Following are the fixed values of C and H: C is 50. H is 30.

D is the variable whose values should be input to your program in a comma-separated sequence.

Example : Let us assume the following comma separated input sequence is given to the program: 100,150,180

The output of the program should be: 18,22,24

Hints: If the output received is in decimal form, it should be rounded off to its nearest value (for example, if the output received is 26.0, it should be printed as 26)

In case of input data being supplied to the question, it should be assumed to be a console input.

Question 7: Write a program which takes 2 digits, X,Y as input and generates a 2-dimensional array. The element value in the i-th row and j-th column of the array should be $i*j$.

Example

Suppose the following inputs are given to the program: 3,5

Then, the output of the program should be: [[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]]

Hints: Note: In case of input data being supplied to the question, it should be assumed to be a console input in a comma-separated form.

Question 8: Write a program that accepts a comma separated sequence of words as input and prints the words in a comma-separated sequence after sorting them alphabetically.

Suppose the following input is supplied to the program: without,hello,bag,world

Then, the output should be: bag,hello,without,world

Hints: In case of input data being supplied to the question, it should be assumed to be a console input.

Question 9: Write a program that accepts sequence of lines as input and prints the lines after making all characters in the sentence capitalized.

Suppose the following input is supplied to the program:

Hello world

Practice makes perfect

Then, the output should be:

HELLO WORLD

PRACTICE MAKES PERFECT

Hints: In case of input data being supplied to the question, it should be assumed to be a console input.

Question 10: Write a program that accepts a sequence of whitespace separated words as input and prints the words after removing all duplicate words and sorting them alphanumerically.

Suppose the following input is supplied to the program: hello world and practice makes perfect and hello world again

Then, the output should be: again and hello makes perfect practice world

Hints: In case of input data being supplied to the question, it should be assumed to be a console input.

We use set container to remove duplicated data automatically and then use sorted() to sort the data.

Question 11: Write a program which accepts a sequence of comma separated 4 digit binary numbers as its input and then check whether they are divisible by 5 or not. The numbers that are divisible by 5 are to be printed in a comma separated sequence.

Example: 0100,0011,1010,1001

Then the output should be: 1010

Notes: Assume the data is input by console.

Hints: In case of input data being supplied to the question, it should be assumed to be a console input.

Question 12: Write a program, which will find all such numbers between 1000 and 3000 (both included) such that each digit of the number is an even number. The numbers obtained should be printed in a comma-separated sequence on a single line.

Hints: In case of input data being supplied to the question, it should be assumed to be a console input.

Question 13: Write a program that accepts a sentence and calculate the number of letters and digits. Suppose the following input is supplied to the program: hello world! 123
Then, the output should be:
LETTERS 10
DIGITS 3

Hints: In case of input data being supplied to the question, it should be assumed to be a console input.

Question 14: Write a program that accepts a sentence and calculate the number of upper case letters and lower case letters. Suppose the following input is supplied to the program: Hello world!
Then, the output should be:
UPPER CASE 1
LOWER CASE 9

Hints:
In case of input data being supplied to the question, it should be assumed to be a console input.

Question 15: Write a program that computes the value of $a+aa+aaa+aaaa$ with a given digit as the value of a . Suppose the following input is supplied to the program: 9
Then, the output should be: 11106

Hints:
In case of input data being supplied to the question, it should be assumed to be a console input.

Question 16: Use a list comprehension to square each odd number in a list. The list is input by a sequence of comma-separated numbers. Suppose the following input is supplied to the program: 1,2,3,4,5,6,7,8,9
Then, the output should be: 1,3,5,7,9

Hints:
In case of input data being supplied to the question, it should be assumed to be a console input.

Question 17: Write a program that computes the net amount of a bank account based a transaction log from console input. The transaction log format is shown as following:
D 100
W 200

D means deposit while W means withdrawal.

Suppose the following input is supplied to the program:

D 300

D 300

W 200

D 100

Then, the output should be:

500

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

Question 18: A website requires the users to input username and password to register. Write a program to check the validity of password input by users.

Following are the criteria for checking the password:

1. At least 1 letter between [a-z]

2. At least 1 number between [0-9]

1. At least 1 letter between [A-Z]

3. At least 1 character from [\$#@]

4. Minimum length of transaction password: 6

5. Maximum length of transaction password: 12

Your program should accept a sequence of comma separated passwords and will check them according to the above criteria. Passwords that match the criteria are to be printed, each separated by a comma.

Example

If the following passwords are given as input to the program:

ABd1234@1,a F1#,2w3E*,2We3345

Then, the output of the program should be:

ABd1234@1

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

Question 19: You are required to write a program to sort the (name, age, height) tuples by ascending order where name is string, age and height are numbers. The tuples are input by console.

The sort criteria is:

1: Sort based on name;

2: Then sort based on age;

3: Then sort by score.

The priority is that name > age > score.

If the following tuples are given as input to the program:

Tom,19,80

John,20,90

Jony,17,91

Jony,17,93

Json,21,85

Then, the output of the program should be:

[('John', '20', '90'), ('Jony', '17', '91'), ('Jony', '17', '93'), ('Json', '21', '85'), ('Tom', '19', '80')]

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

We use itemgetter to enable multiple sort keys.

Question 20:

Define a class with a generator which can iterate the numbers, which are divisible by 7, between a given range 0 and n.

Question 21 : A robot moves in a plane starting from the original point (0,0). The robot can move toward UP, DOWN, LEFT and RIGHT with a given steps. The trace of robot movement is shown as the following:

UP 5

DOWN 3

LEFT 3

RIGHT 2

The numbers after the direction are steps. Please write a program to compute the distance from current position after a sequence of movement and original point. If the distance is a float, then just print the nearest integer.

Example:

If the following tuples are given as input to the program:

UP 5

DOWN 3

LEFT 3

RIGHT 2

Then, the output of the program should be:

2

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

Question 22: Write a program to compute the frequency of the words from the input. The output should output after sorting the key alphanumerically.

Suppose the following input is supplied to the program:

New to Python or choosing between Python 2 and Python 3? Read Python 2 or Python 3.

Then, the output should be:

2:2

3.:1

3?:1

New:1

Python:5

Read:1

and:1

between:1

choosing:1

or:2

to:1

Hints

In case of input data being supplied to the question, it should be assumed to be a console input.

Question 23:

Write a method which can calculate square value of number.

Question 24:

Python has many built-in functions, and if you do not know how to use it, you can read document online or find some books. But Python has a built-in document function for every built-in functions.

Please write a program to print some Python built-in functions documents, such as `abs()`, `int()`, `raw_input()`

And add document for your own function

Hints:

The built-in document method is `__doc__`

Question 25:

Define a class, which have a class parameter and have a same instance parameter.

Hints:

Define a instance parameter, need add it in `__init__` method

You can init a object with construct parameter or set the value later

Question 26:

Define a function which can compute the sum of two numbers.

Hints:

Define a function with two numbers as arguments. You can compute the sum in the function and return the value.

Question 27:

Define a function that can convert a integer into a string and print it in console.

Question 28:

Define a function that can convert a integer into a string and print it in console.

Question 29:

Define a function that can receive two integral numbers in string form and compute their sum and then print it in console.

Question 30:

Define a function that can accept two strings as input and concatenate them and then print it in console.

Question 31:

Define a function that can accept two strings as input and print the string with maximum length in console. If two strings have the same length, then the function should print all strings line by line.

Question 32:

Define a function that can accept an integer number as input and print the "It is an even number" if the number is even, otherwise print "It is an odd number".

Question 33:

Define a function which can print a dictionary where the keys are numbers between 1 and 3 (both included) and the values are square of keys.

Question 34:

Define a function which can print a dictionary where the keys are numbers between 1 and 20 (both included) and the values are square of keys.

Question 35:

Define a function which can generate a dictionary where the keys are numbers between 1 and 20 (both included) and the values are square of keys. The function should just print the values only.

Question 36:

Define a function which can generate a dictionary where the keys are numbers between 1 and 20 (both included) and the values are square of keys. The function should just print the keys only.

Question 37:

Define a function which can generate and print a list where the values are square of numbers between 1 and 20 (both included).

Question 38:

Define a function which can generate a list where the values are square of numbers between 1 and 20 (both included). Then the function needs to print the first 5 elements in the list.

Question 39:

Define a function which can generate a list where the values are square of numbers between 1 and 20 (both included). Then the function needs to print the last 5 elements in the list.

Question 40:

Define a function which can generate a list where the values are square of numbers between 1 and 20 (both included). Then the function needs to print all values except the first 5 elements in the list.

Question 41:

Define a function which can generate and print a tuple where the value are square of numbers between 1 and 20 (both included).

Question 42:

With a given tuple (1,2,3,4,5,6,7,8,9,10), write a program to print the first half values in one line and the last half values in one line.

Question 43:

Write a program to generate and print another tuple whose values are even numbers in the given tuple (1,2,3,4,5,6,7,8,9,10).

Question 44:

Write a program which accepts a string as input to print "Yes" if the string is "yes" or "YES" or "Yes", otherwise print "No".

Question 45:

Write a program which can filter even numbers in a list by using filter function. The list is: [1,2,3,4,5,6,7,8,9,10].

Question 46:

Write a program which can map() to make a list whose elements are square of elements in [1,2,3,4,5,6,7,8,9,10].

Question 47:

Write a program which can map() and filter() to make a list whose elements are square of even number in [1,2,3,4,5,6,7,8,9,10].

Question 48:

Write a program which can filter() to make a list whose elements are even number between 1 and 20 (both included).

Question 49:

Write a program which can map() to make a list whose elements are square of numbers between 1 and 20 (both included).

Question 50:

Define a class named American which has a static method called printNationality.

Question 51:

Define a class named American and its subclass NewYorker.

Question 52:

Define a class named Circle which can be constructed by a radius. The Circle class has a method which can compute the area.

Question 53:

Define a class named Rectangle which can be constructed by a length and width. The Rectangle class has a method which can compute the area.

Question 54: Define a class named Shape and its subclass Square. The Square class has an init function which takes a length as argument. Both classes have a area function which can print the area of the shape where Shape's area is 0 by default.

Question 55: Please write a program using generator to print the even numbers between 0 and n in comma separated form while n is input by console.

Example: If the following n is given as input to the program: 10
Then, the output of the program should be : 0,2,4,6,8,10

Question 56: Please write a program using generator to print the numbers which can be divisible by 5 and 7 between 0 and n in comma separated form while n is input by console.

Example: If the following n is given as input to the program: 100
Then, the output of the program should be: 0,35,70

Question 57:

With two given lists [1,3,6,78,35,55] and [12,24,35,24,88,120,155], write a program to make a list whose elements are intersection of the above given lists.

Question 58:

With a given list [12,24,35,24,88,120,155,88,120,155], write a program to print this list after removing all duplicate values with original order reserved.

Question 59:

Define a class Person and its two child classes: Male and Female. All classes have a method "getGender" which can print "Male" for Male class and "Female" for Female class.

Question 60:

Please write a program which accepts a string from console and print it in reverse order.

Question 61: Please write a program which accepts a string from console and print the characters that have even indexes.

Example:

If the following string is given as input to the program: H1e2l3l4o5w6o7r8l9d
Then, the output of the program should be: Helloworld

Question 62: Write a program to solve a classic ancient Chinese puzzle:

We count 35 heads and 94 legs among the chickens and rabbits in a farm. How many rabbits and how many chickens do we have?
