

V2e-Python CaseStudies

List,Dictionary,Tuples,Set

Exercise 1: (Dictionary)

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}

Exercise 2: (Tuples)

Write a program to sort the (name, age, height) list of tuples by ascending order where name is string, age and height are numbers. Get the tuples as input via 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')]
```

Exercise 3: (Tuples)

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

i-

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. Finally based on the final position, print the total covered distance for all the directions.

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:

1,2

Exercise 4: (Tuples)

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

1. Sort based on Gender 1: Sort based on name; 2: Then sort based on age; 3: Then sort by score. The priority is that Gender > name > age > score.

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

```
[(Reny,19,80,F),(John,20,90,M),( Jony, 17, 91,M),( Jony, 17, 93,M),(Reny,28,85,F)( Jason,21,85,F),( Angel,19,79,F )]
```

Then, the output of the program should be:

```
[(Angel,19,79,F),(Reny,19,80,F),(Reny,28,85,F),('John', '20', '90',M), ('Jony', '17', '91',M), ('Jony', '17', '93',M), ('Jason', '21', '85',M),
```

Exercise 5: (Dictionary)

Write a program to compute the frequency of the words from the input. The output should form in such a way that sorting the key with value 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
```

Exercise 6: (List)

Write a program to count unique values inside each list and multiply all the values =
[[27,9,2,8,8,9,27,8],[1,18,2,01,18,4,4,01],[1,5,07,5,8,7,4,5],[1,2,3,5,8,4,4,3]]

Exercise 7: (List)

Write a program to check if the list contains three consecutive numbers if yes print the list position from the list of list.

By using the result of position form another list

```
[[27,9,2,8,8,9,27,8],[1,18,18,18,19,4,4,01],[1,5,5,5,8,7,4,5],[1,2,3,5,8,4,4,3],[18,27,63,36,27,27,27,1,5],[3,5,8,4,4,4,2,15,15,151]]
```


Exercise 8: (List)

Write a program to compose secret messages from the given input statement. Remove all the spaces and form a rectangle with 9 rows and 8 columns

The coded message is obtained by reading down the columns going left to right. For example, the message above is coded as:

Input:

Helloall!!WelcometoV2etechnologies--Holatodas!!bienvenidoV2etechnologies.

Output:

Helloall
!!Wlcome
toV2etec
hnologie
s--Holat
odas!!bi
envenido
V2etechn
ologies.

Form a List Column wise like [H!thsoeVo][e!on-dn2l].... etc. After forming the list of lists, find the vowels count from each list and form a dictionary which Key as List position and value as total count of vowels from each list like {1:3,2:2.....}

Exercise 9: (Set)

Return a set of elements present in Set 1 or set 2 or Set 3 but not present 2 or more sets together

Output should form in ascending order.

Given Input:

set1 = {11,10, 20, 30, 40, 50}

set2 = {25,30, 40, 50, 60, 70}

set3 = {3,9, 20, 30, 40, 50,20}

Output:

{3,9,10,11, 25,60,70}

Exercise 10: (List & Dictionary)

Write a program to count unique values from the input list of lists and form dictionary where key as list position from the list of lists and value as "unique value" from the list. After forming the dictionary multiply all the keys and display the result. If same list contains more than one unique value then append some character with keys, please refer sample output below. Before multiply all the keys ignore all the characters.

Example: Input List: `[[27,9,2,8,8,9,27,8],[1,18,2,1,18,4,4,6,1],[1,5,7,5,8,7,4,5],[1,2,3,5,8,4,4,3]]`

Output: `{1:2,2:2,2a:6,3:1,3a:4,3b:8,4:1,4a:2,4b:5,4c:8}`

$1*2*2*3*3*3*4*4*4*4 = 27648$

Exercise 11: (Tuples & Dictionary)

write a program to sort the (name, age, weight, height, Gender) list by ascending order where name and Gender is string, age, weight, and height are numbers. The list are input by console.

First calculate the BMI for each list and sort the result based on the below criteria,

1. Sort based on Gender
2. Sort based on name;
3. Sort based on Age;
4. Then sort based on BMI;

The priority is that Gender > name > age > BMI

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

Reny, 19, 95, 80, F

John, 20, 105, 90, M

Jony, 17, 81, 91, M

Jony, 17, 70, 93, M

Json, 21, 65, 85, F

Angel, 19, 59, 79, F

Exercise 12 : Generate a Python list of all the even numbers between 12 to 45 and then arrange the results in the reverse order in another list

Exercise 13 :

Concatenate two lists index-wise

Write a program to add two lists index-wise. Create a new list that contains the 0th index item from both the list, then the 1st index item, and so on till the last element. any leftover items will get added at the end of the new list.

```
list1 = ["M", "comp","na", "i", "v2e"]
```

```
list2 = ["y", "any","me", "s", "Technologies"]
```

expected result:

```
['My',"Company" 'name', 'is', 'v2eTechnologies']
```

Finally arrange the results in the reverse order in another list using following criteria

Only last 2 indexes should be reverse order remaining should be followed by previous

Expected result:

```
["v2eTechnologies" "is","My","Company","name"]
```

Exercise 14 :

Concatenate two lists in the following order

```
list1 = ["Hello ", "take "]
```

```
list2 = ["Dear", "Coffee"]
```

Expected result:

```
['Hello Dear', 'take Dear', 'Hello Coffee', 'take Cofee']
```

Finally remove the 2nd occurrence of each word from the results and form another list,

```
['Hello Dear', 'take', 'Coffee']
```