PYTHON FOR COMPUTATIONAL PROBLEM SOLVING

The function: Zip

Prof. Sindhu R Pai
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Department of Computer Science and Engineering

Zip() function

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- Python zip() method takes iterable containers and returns a single iterator object, having mapped values from all the containers.
- It is used to map the similar index of multiple containers so that they can be used just using a single entity.
- The function zip is used to associate the corresponding elements of two or more iterables into a single lazy iterable of tuples.
- It does not have any callback function.

Syntax : zip(*iterators)

Zip() function

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Working

- The zip() function is used to combine two or more lists (or any other iterables) into a single iterable.
- Elements from corresponding positions are paired together.
- The resulting iterable contains tuples, where the first element from each list is paired together, the second element from each list is paired together, and so on.

Examples

Example 1: Consider the code below which pairs the two lists:

```
m=[1,2,3]
n=[4,5,6]
l_new=[]
for i in range(len(m)):
        l_new.append((m[i],n[i]))
print(l_new)
```

The above can be done very easily and with less code using zip. We can observe the same output.

```
print(list(zip(m,n)))
```

Output

```
[(1, 4), (2, 5), (3, 6)]
[(1, 4), (2, 5), (3, 6)]
```

Examples

Example 2: Combining two iterables (tuples) into a single iterable

```
name = [ "Sudha", "Suma", "Sara", "Asha" ]
roll_no = [ 404, 112, 393, 223 ]

# using zip() to map values
mapped = zip(name, roll_no)

print(set(mapped))
```

Output:

```
{('Sudha', 404), ('Suma', 112), ('Sara', 393), ('Asha', 223)}
```

Examples

Example 3: Combining two iterables (lists) into a single list

```
a = [1, 2, 3, 4, 5]

b = list(map(lambda x : x * x * x, a))

print(a)

print(b)

print(list(zip(a, b)))
```

Output:

```
[1, 2, 3, 4, 5]
[1, 8, 27, 64, 125]
[(1, 1), (2, 8), (3, 27), (4, 64), (5, 125)]
```

Examples

Example 4: Zipping list and tuple with unequal size

```
#Define lists for 'persons',and a tuple for 'ages'
persons = ["Baskar", "Monica", "Riya", "Madhav", "John",
"Prashanth"]
ages = (35, 26, 28, 14)

#lists along with the 'ages' tuple
zipped_result = zip(persons,ages)

print("Zipped result as a list:")
for i in list(zipped_result):
  print(i)
```

Examples

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Example 5: Zipping list with unequal size.(Two ways)

```
lis1 = [1,2,3]
lis2 = [4,5,6,7]
print(list(zip(lis1,lis2)))
```

The same can be acheived using the directory comprehension as:

```
print({k:v for k,v in (zip(lis1,lis2))})
```

Output

```
[(1, 4), (2, 5), (3, 6)]
{1: 4, 2: 5, 3: 6}
```

Practice programs

1.Given list of circle areas all in five decimal places, round each element in the list up to its position decimal places, meaning round up the first element in the list to one decimal place, the second element to two decimal places, the third element to three decimal places and so on.

2.Given
list= [1,2,3,4,5]
Chars= [‘a’, ’b’, ’c’, ’d’, ’e’]
Output the following.

('a', 1), ('b', 2), ('c', 3), ('d', 4), ('e', 5)]

3.The following are the scores of chemistry exam . Filter out those who passed with scores >75. Use an appropriate function

Practice programs

4.You are given a list of fruits names. Using lambda and map function print the list of fruit names starting with 'A'
Lst=['Orange', 'Apple' , ' Mango', ' Apricot']
Output=['Apple', 'Apricot']

5.Using reduce function find the sum of the digits of the digits of the given number

For ex: n = '1729'
output= summation of 1,7,2,9=19

6. Using the min and reduce function find the smallest number in a given list of 10 numbers.

THANK YOU

Department of Computer Science and Engineering

Dr. Shylaja S S, Director, CDSAML & CCBD, PESU
Prof. Sindhu R Pai – sindhurpai@pes.edu
Prof. C N Rajeswari