Python Programming
Tuples and zip

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Zip Function

```python
# When you have multiple sequences and want to iterate
# such that in each iteration you have a single item
# from each sequence ==> you need zip

numbers = [1, 2, 3]
letters = ['a', 'b', 'c']

# zip class constructor: def __init__(self, *iterables)
# it takes a group of iterables
# it then returns iterator that we can use to iterate

zipped = zip(numbers, letters)

print(list(zipped))
# [(1, 'a'), (2, 'b'), (3, 'c')]

words = ["mostafa", 'saad', 'ibrahim']
print(list(zip(numbers, letters, words)))
# [(1, 'a', 'mostafa'), (2, 'b', 'saad'), (3, 'c', 'ibrahim')]

# note: zip() in Python 3 is different than Python 2
```

zip

```python
numbers = [1, 2, 3]
letters = ['a', 'b', 'c']
words = ["mostafa", 'saad', 'ibrahim']

for tuple_item in zip(numbers, words, letters):
    print(tuple_item)
"""
(1, 'mostafa', 'a')
(2, 'saad', 'b')
(3, 'ibrahim', 'c')
"""

for number, word, letter in zip(numbers, words, letters):
    print(number, word, letter)
"""
1 mostafa a
2 saad b
3 ibrahim c
"""
```

Zip and deep unpacking

```python
numbers = [1, 2, 3]
letters = ['a', 'b', 'c']
words = ["mostafa", 'saad', 'ibrahim']

for idx, tuple_item in enumerate(zip(numbers, words, letters)):
    print(idx, tuple_item)

"""
0 (1, 'mostafa', 'a')
1 (2, 'saad', 'b')
2 (3, 'ibrahim', 'c')
"""

for idx, (number, word, letter) in enumerate(zip(numbers, words, letters)):
    print(idx, number, word, letter)
"""
0 1 mostafa a
1 2 saad b
2 3 ibrahim c
"""
```

Different length?

```
 2
 3    # what if sequences are of different length?
 4    # It stops at the shortest length
 5
 6    items = list(zip(range(10, 15), range(100)))
 7    print(items)
 8    # [(10, 0), (11, 1), (12, 2), (13, 3), (14, 4)]
 9    # observe stopped only after 5 elements!
10
11    # unzip
12    seq1, seq2 = zip(*items)
13    print(seq1)      # (10, 11, 12, 13, 14)
14    print(seq2)      # (0, 1, 2, 3, 4)
15
16
```

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."