

Exercises_wk4 (including solutions)

Q1: Define a variable ('text') that contains the following text: 'According to the Fortune 1000, -Walmart, -Amazon and -ExxonMobil are the three largest companies in the United States by revenue.', and print it. Next, use the lower(), strip() and split() methods to define a new variable ('text_adj') that consists of a list of all the words from the text, and print it. Carefully examine what happens! Finally, use a for loop, the append() method and the strip() method to clean the resulting list of the words from the text (i.e., try to remove the - signs, commas and dots).

```
In [1]: text = 'According to the Fortune 1000, -Walmart, -Amazon and -ExxonMobil are the three largest
companies in the United \
States by revenue.'
print(text)
text_adj = text.lower().strip().split()
print(text_adj)
text_adj2 = []
for item in text_adj:
    text_adj2.append(item.strip('-', '.'))
print(text_adj2)
```

According to the Fortune 1000, -Walmart, -Amazon and -ExxonMobil are the three largest companies in the United States by revenue.
['according', 'to', 'the', 'fortune', '1000,', '-walmart,', '-amazon', 'and', '-exxonmobil', 'are', 'the', 'three', 'largest', 'companies', 'in', 'the', 'united', 'states', 'by', 'revenue.']
['according', 'to', 'the', 'fortune', '1000', 'walmart', 'amazon', 'and', 'exxonmobil', 'are', 'the', 'three', 'largest', 'companies', 'in', 'the', 'united', 'states', 'by', 'revenue']

NOTE: A dictionary is a collection of unordered data, which is stored in key-value pairs. Dictionaries are mutable.

Q2: Write a program that asks the user to input his/her name and age. Then create a dictionary with those key-value pairs, and print both the dictionary and its length.

```
In [2]: name = input('What is your name?: ')
age = input('What is your age?: ')

data = {'name': name, 'age': age}
print(data)
print(len(data))
```

What is your name?: Martijn
What is your age?: 50
{'name': 'Martijn', 'age': '50'}
2

Q3: Create a dictionary ('firms') with the following key-value pair: 'retailers': ['Walmart', 'Amazon', 'Costco']. Then print the retailer at index position 1 in the list within the 'retailers' key ('Amazon') in two different ways: (1) by first accessing the key and then the index, and (2) using the get() method. Also print the length of this dictionary.

```
In [3]: firms = {'retailers': ['Walmart', 'Amazon', 'Costco']}
print(firms['retailers'][1]) # By first accessing the key and then the index
print(firms.get('retailers')[1]) # Using the get() method
print(len(firms))
```

Amazon
Amazon
1

Q4: Create a dictionary ('firms') with the following key-value pair: 'retailers': ['Walmart', 'Amazon', 'Costco']. Then use a for loop to print all the retailers from the list within the 'retailers' key on a separate line.

```
In [4]: firms = {'retailers': ['Walmart', 'Amazon', 'Costco']}
for items in firms['retailers']:
    print(items)
```

Walmart
Amazon
Costco

Q5: Write a program that counts how many times each letter appears in the word 'accounting', and save the results as key-value pairs in a dictionary (i.e., the letters are the keys and the counts are the values: 'a': 1, 'c': 2, 'o': 1, etc.). (Hint: Use a for loop and conditionals).

```
In [5]: word = 'accounting'
dict = {}
for char in word:
    if char not in dict:
        dict[char] = 1
    else:
        dict[char] += 1
print(dict)
```

{'a': 1, 'c': 2, 'o': 1, 'u': 1, 'n': 2, 't': 1, 'i': 1, 'g': 1}

Q6: Rewrite the program of the previous exercise in such a way that it counts how many times each word (as opposed to each letter) appears in the following sentence: "Walmart, Amazon and ExxonMobil are the three largest companies in the United States by revenue". (Hint: You will need the split() method.)

```
In [6]: text = 'Walmart, Amazon and ExxonMobil are the three largest companies in the United States by
revenue'
text_adj = text.split() # Note that without this line the program counts the frequencies of the letters.
dict = {}
for word in text_adj:
    if word not in dict:
        dict[word] = 1
    else:
        dict[word] += 1
print(dict)
```

{'Walmart,': 1, 'Amazon': 1, 'and': 1, 'ExxonMobil': 1, 'are': 1, 'the': 2, 'three': 1, 'largest': 1, 'companies': 1, 'in': 1, 'United': 1, 'States': 1, 'by': 1, 'revenue': 1}

Q7: Write a program that first prints each key-value pair from the dictionary you created in the previous exercise on a separate line (Hint: Use a for loop, the items() method and the format() method), then prints an empty line (Hint: Use the '\n' escape character), and finally prints only the key-value pairs from the dictionary with a value above 1 (Hint: Use a for loop, the items() method and the format() method again, but add a conditional.)

```
In [7]: for key, value in dict.items():
        print('{}: {}'.format(key, value))
print('\n')
for key, value in dict.items():
    if dict[key] > 1:
        print('{}: {}'.format(key, value))
```

Walmart,: 1
Amazon: 1
and: 1
ExxonMobil: 1
are: 1
the: 2
three: 1
largest: 1
companies: 1
in: 1
United: 1
States: 1
by: 1
revenue: 1

the: 2

NOTE: A tuple is identical to a list, except it is immutable.

Q8: Create a tuple ('tuple1') that contains the following values: 'Amazon', [2019, 2020], 20.5, 798000, and print it. Then print the length of 'tuple1'.

```
In [8]: tuple1 = ('Amazon', [2019, 2020], 20.5, 798000) # Or: tuple1 = 'Amazon', [2019, 2020], 20.5, 798000
print(tuple1)
print(len(tuple1))
```

('Amazon', [2019, 2020], 20.5, 798000)
4

Q9: Use indexing and slicing to respectively extract: (1) the element at index position 0 of the tuple ('Amazon'), (2) the element at index position 1 of the tuple ('[2019, 2020]'), (3) the element at index position 1 of the nested list ('2020'), and (4) the slice from the element at index position 2 to the end of the tuple ('(20.5, 798000)'), and print these elements and slices. (Hint: Be aware that Python uses zero-based indexing.)

```
In [9]: print(tuple1[0])
print(tuple1[1])
print(tuple1[1][1])
print(tuple1[2:])
```

Amazon
[2019, 2020]
2020
(20.5, 798000)

Q10: Create a dictionary with the following key-value pairs: 'Walmart': 2200000, 'Amazon': 798000, 'ExxonMobil': 74900. Then create a list of tuples ('list1') where each tuple is (key, value), and print it (Hint: Use a for loop, the items() method and the append() method). Next, sort this list of tuples, and print it (Hint: Use the sort() method).

```
In [10]: dict1 = {'Walmart': 2200000, 'Amazon': 798000, 'ExxonMobil': 74900}

list1 = []
for key, value in dict1.items():
    list1.append((key, value))
print(list1)
list1.sort()
print(list1)

[('Walmart', 2200000), ('Amazon', 798000), ('ExxonMobil', 74900)]
[('Amazon', 798000), ('ExxonMobil', 74900), ('Walmart', 2200000)]
```