

Data Bootcamp: Python Fundamentals 1 Practice

Revised: February 13, 2017

1. Construct a dictionary whose keys are the integers 1, 2 and 3 and whose values are the same numbers as words: one, two, three. How would you get the word associated with the key 2?
2. What does the built-in function `zip()` do? Start with the lists

```
l1 = [1, 2, 3]
l2 = ['one', 'two', 'three']
```

- Construct the list of tuples [(1, 'one'), (2, 'two'), (3, 'three')].
 - Construct a dictionary whose keys are the integers 1, 2 and 3 and whose values are the same numbers as words: one, two, three.
3. Take the variables `name1` and `name2`, both of them strings. Write a program using `if ... else` that prints the name that comes first in alphabetical order. Test your program with

```
name1 = 'Dave'
name2 = 'Glenn'
```

Could you write a function for this task?

4. Take the list `stuff = ['cat', 3.7, 5, 'dog']`.
 - Write a program that tells us the type of each elements of `stuff` (value and type)
 - Write a program that prints only the elements of `stuff` that are strings.
5. Write a program that given two integer values `a` and `b` returns `True` if either one is 6, or if their sum or difference is 6. *Hint:* you might want to use the built-in function `abs()`. Test your program with
 - `a=6, b=4` (should get `True`)
 - `a=4, b=5` (should get `False`)
 - `a=1, b=5` (should get `True`)

Could you write a function for this task?

6. Write a program that given two integers `a` and `b` returns their sum. However, sums in the range [10, 19] are forbidden, so in that case just return 20. Test your program with
 - `a=3, b=4` (should get 7)
 - `a=9, b=4` (should get 20)
 - `a=10, b=11` (should get 21)

Could you write a function for this task?

7. Take the list of bond yields $y = [.01, .02, .03]$ for maturities of one, two and three years. Write a program that multiplies all elements with 100, i.e. returns the list

```
y_perc = [1.0, 2.0, 3.0]
```

Can you do it with list comprehension? And with a function?

8. Using only core Python functionality define a list that contains

- all integers from 0 to n (test it with the example: $n=5$)
- all integers from $n1$ to $n2$ (test it with the example: $n1=4$ and $n2=8$)

Could you define a function that can do both? (*Hint*: use default values)

9. Suppose that you have two strings

```
s1 = "abc def ghi"
s2 = "def ghi abc"
```

- How would you check if the two strings contain the same characters? (irrespective of their order)
- How would you check if the two strings contain the same words?

10. Take the list $x = [1, 4, 5, 6, 4, 2, 7, 12, 4, 23, 4]$. Using only loops and/or conditionals create a list with all the indices i for which $x[i] == 4$.