

Data Bootcamp: Code Practice #2

Revised: January 29, 2016

Answer each of the questions below. Answers should include any code you write. They can be handwritten, but they must be readable and look professional.

1. *Review.* Does this code run without error? If so, what does it produce? If not, explain why.

```
x = [1, 2, 3]
y = 'bootcamp'
z = x + y
```

2. *Review.* For the same `x` and `y` as the previous question: What function tells us what type they are? What function tells us how many elements they contain?
3. What type is each expression? How can you tell?

```
2
'2'
2.0
"2.0"
2>1
'Itamar' > 'Chase'
[1, 2]
(1, 2)
{1: one, 2: two}
```

4. What value does each of these comparisons have?

```
1>=0
1 >= 1
1 > 1
1==1
1 == 1.0
'Spencer' == "Spencer"
2**3 > 3**2
1 >= 0 or 1 <= 2
1 >= 0 and 1 <= 2
```

5. Does this code run without error? If so, what does it produce? If not, how would you fix it?

```
if 2>1
    print('Yes, 2 is still greater than 1')
```

6. What is the result of running this code? Why?

```
if True:
    print('on the one hand')
else:
    print('but on the other hand')
```

What happens if we replace `True` with `False` in the first line? What happens if we insert the word `not` after `if` in the first line?

7. What is the result of running this code?

```
cond = True
if cond:
    x = "Chase"
else:
    x = "Dave"
print(x)
```

8. Suppose we have two lists, `x = [1, 2, 3, 4]` and `y = ['x', 'y', 'z']`. Adapt the code below to determine which has more elements:

```
if <insert expression>:
    print('x has more')
else:
    print('y has more')
```

9. Explain in words what slicing does.
10. How would you extract (“slice”) the first element (the integer 1) from the list `x` below? The last element? All but the last element?

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

11. Use slicing to extract each word from

```
sentence = 'This is a sentence; please slice it.'
```

Suggestion: Number every character in `sentence` by hand.

12. Consider the list

```
x = [1, 2, "a", 'b', "fast", 'slow', 3, "Raghu", 'Liuren', 10]
```

- (a) How would you slice out the first item? The last item?
- (b) How would you slice out the items from `'b'` to 3 inclusive?

13. Using the same list `x`, write a loop that prints every element on a new line.

14. *Challenging.* Using the same list `x`, write a loop that prints every element of type `str`.
15. Use Spyder's help to find out what the range function does. How would you describe `range(3,12,2)`? Verify by converting to a list with `list(range(3,12,2))`.
16. *Challenging.* Write a loop that sums the integers from zero to thirty that are multiples of three: 3, 6, etc.
17. Define a function `pocket_change()` that takes four integers as inputs (numbers of pennies, nickels, dimes, and quarters in your pocket) and returns a floating point number (their dollar value). Run your program with the input (1, 2, 3, 4).
18. *Challenging.* Write a function `notsix()` that takes a list of integers and returns a (shorter) list of only those that do not begin with a 6. Test it on the list [1234, 6783, 6, 4321, 9876]. *Hints:* You can create a blank list with `x = []`. You can append `item` to it with `x.append(item)`.
19. Consider the Python object

```
z = {1: 'one', 2: 'two', 3: 'three'}
```

- (a) What kind of object is `z`? What is its length?
 - (b) Which components are keys? Which are values?
 - (c) How would I get the value associated with the key 2?
 - (d) Use Spyder's help facilities to figure out what `z.keys()` does. Ditto `z.values()`. Try them to verify.
 - (e) What does `list(z.keys())` do?
 - (f) What does `list(z.values())` do?
 - (g) What does `list(z)` do?
20. Take the dictionary connecting state names and abbreviations:

```
states = {'AK': 'Alaska', 'IA': 'Iowa', 'NY': 'New York', 'VT': 'Vermont'}
```

Write a function that takes a string as input (the abbreviation) and returns another string (the full name of the state). Test your function on two test cases.

21. *Challenging.* Explain what this code does:

```
old_list = [1234, 6783, 6, 4321, 9876]
new_list = [x for x in old_list if str(x)[0] != "6"]
```