Data Bootcamp Problem Set 1 Spring 2020

NYU STERN

Instructions:

- **After completing the assignment, please submit your .ipnyb file to NYU Classes with the following naming convention: Lastname_Firstname_NetID_ProblemSet# (ex. Smith_John_js123_ProblemSet2)**
- Submit your answers in a Jupyter notebook with **proper markdown to indicate problem numbers and to write your answers**.
- In-line comments are helpful but not mandatory.
- Explanations are expected to be brief, between 1 and 3 sentences. Please write your explanations in a markdown cell.
- For problem numbers 2 to 10, the statements should be run as a block of code and explained after running in entirety.
- For problem numbers 15 to 17, all solutions must be programmatic. For example: when asked to count characters please apply a Python method to do so.

Problems:

1. Describe what each of these expressions produces in basic Python. Explain the difference between very similar expressions, if any.

    a) 2+5
    b) 2 + 5
    c) 2*5
    d) 2/5
    e) 2**5

2. What is the value of x after running these statements in order? Why?

    - x = 7
    - x = x + 3

3. What is the value of y after running these statements in order? Of x? Why?

    - x = 3
    - y = x
    - x = 10

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

    - x = 3
    - x = x/2
    - y = 'abc'
    - z = y + y
    - print(x, z)

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

    - x = 3
    - x = x/2
    - y = 'abc'

- z = x + y
- print(x, z)

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

   - x = 3
   - y = 24
   - z = y/x
   - print(x, y, z, sep=' | ')

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

   - x = 3
   - y = '24'
   - z = y/x
   - print(x, z)

8. Does this code run without error? If so, what does it produce? If not, explain why.
   - x = "I am a #string" # Whoa, a string!
9. Does this code run without error? If so, what does it produce? If not, explain why.
   - x = [1, 2, 3]
   - y = [42, 43]
   - z= x + y
   - print(z)
10. Does this code run without error? If so, what does it produce? If not, explain why.
    - x = [1, 2, 3]
    - y = 42
    - z = x + y
11. What data types are the following? Use type() method.

    a) x1 = 12
    b) x2 = 12.0
    c) x3 = '12.0'
    d) x4 = [12]
    e) x5 = [12, 12.0, '12.0']

12. Explain the result of each line:

    a) type(42)
    b) type(42.0)
    c) type('42.0')
    d) type("42.0")
    e) type("""42.0""")
    f) type([1, 2])
    g) type([1] + [2])
    h) type(1 + 2)
    i) type(print)
    j) type(float(str(int('1234'))))
    k) type(int(float('12.34')))
    l) len([1234])

m) len("1234")
n) len(1234)
o) type(2>1)
p) type('Itamar' > 'Chase')

13. What is the type and length of x=[]?
14. Consider the integer x = 1234.

    a) Convert x to a floating-point number
    b) Convert x to a string
    c) Convert x to the list ['1', '2', '3', '4']

15. Consider x= 'luke, i am your father'. How would you capitalize first letter of each word in x?
    - Hint: Use tab completion to find an appropriate method.
16. Consider the string x = 'How many characters and words are in this string?'

    a) How many characters does x contain?
    b) Convert x to a list of individual characters. Hint : use an appropriate converting function.
    c) Convert x to a list of individual words. Hint: use tab completion to find a method that splits x into pieces.
    d) How many words does x contain?

17. Does this block of code run without error? If so, what does it produce? If not, explain why.

    a) x = [1, 2, 3]
    b) y = 'bootcamp'
    c) z = x + y