

Instructions:

- After completing the assignment, please submit your .ipynb 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 markdowns to indicate problem numbers and 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 4 and 5, use proper indentation when entering the block of code in your notebook.
- For problems 7 to 10, do not use Python's inbuilt slice() function but use index slicing the way it was taught in class.

Problems:

1. For the x and y below: what function tells us what type they are? What function tells us how many elements they contain?

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

2. What value does each of these comparisons have?

- a) `1 >= 0`
- b) `1 >= 1`
- c) `1 > 1`
- d) `1 == 1`
- e) `1 == 1.0`
- f) `'Spencer' == 'Spencer'`
- g) `2**3 > 3**2`
- h) `1 >= 0 or 1 <= 2`
- i) `1 >= 0 and 1 <= 2`

3. Does this code run without error? If so, what does it produce? If no, how would you correct it?

```
if 2 > 1:

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

4. What is the result of running this code?

```
cond = True

if cond:

    x = 'Chase'

else:
```

```
x = 'Dave'
```

```
print(x)
```

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

```
if <insert expression> :
```

```
    print('x has more')
```

```
else:
```

```
    print('y has at least as many')
```

6. Explain in words what slicing does.
7. 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]`
8. Use slicing to extract each word from the below. Suggestion: Number every character in the sentence by hand.
- `sentence = 'This is a sentence; please slice it.'`
9. Consider the list `x = [1, 2, "a", 'b', "fast", 'slow', 3, "Raghu", 'Liuren', 10]`. How would you slice out (select) the first item? The last item? How would you slice out the items from 'b' to 3 inclusive?
- Using the same list `x`, write a code that prints every element on a new line
 - Using the same list `x`, write a loop that prints every element of type `str`
10. 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) and display the output. Report the value with a dollar sign.
11. `first = 'Wilhelmina'`
`last = 'Grubbly-Plank'`
Take the 'first' and 'last' variables defined in the cell above and do the following with them:
- Extract the first letter of 'last'
 - Split 'last' into two components at the hyphen using an appropriate method
 - Define a new string variable named 'combo' which must be 'first' (the first name), a space, the first letter of 'last', and a period, in this order
 - Define a function that takes as inputs first and last names (both strings) and returns 'combo' (also a string, consisting of the first name plus the first letter of the last name and a period). Test it with your own name and also the variables 'first' and 'last'.
12. Write a loop that sums the integers from zero to thirty that are multiples of three: 3, 6, etc.
13. Refer to the list of strings below called "paren":
`paren = ['When we went to town on Monday (it was so early!) everyone was falling asleep', 'It is obvious (so obvious) that I am going to get a good grade on this exam', 'As she sang her famous line (the one they wrote that article about) the crowd went wild']`

- a) Loop through each item of the list and, for each item, replace the parentheses with a dash ("-") so that there is a space on either side of each dash. Print the new items.
- b) For each item in the list, print the index of each of the parentheses. Hint: try running: `str.find?`
- c) Create a function that removes all parenthesized content including the parentheses. This function should return a new string that has all the content in the old string except the parenthesized content.
- d) Using function created in Part C above, create a new list that contains all the elements of the old list without parenthesized content (including parentheses).