

Tuesday, October 13, 2020 | **Class #3**

Lists, object types, and logical operations

OCEAN 215 | Autumn 2020

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Warmup activity

Group Activity:

1) Without running this code, go through the mathematical operations for x, y, and z in lines 7-13.

- What do the print statements in lines 16-18 output?

2) Compare the numbers you just calculated using the logical operations in lines 22-25.

- What do the print statements in lines 28-33 output?

```
1 # Here are our numbers
2 x = 2
3 y = 8
4 z = 3
5
6 # Here we do some math with them!
7 x **= 4
8 y = 3*y
9 z += x+y
10 x *= 2
11 z = x+y
12 y /= x
13 x = (x+4)**1/2
14
15 # What do these print out?
16 print('x =', x)
17 print('y =', y)
18 print('z =', z)
19
20
21 # Now we compare our final results.
22 a = (x >= y and x >= z)
23 b = (x >= y or x >= z)
24 c = (y > 0 and y < 1)
25 d = (int(y) > 0 and z < 10)
26
27 # What do these print out?
28 print(a)
29 print(b)
30 print(c)
31 print(d)
32
33 print(type(a), type(b), type(c), type(d))
34
```

List activity

We are learning Python. Python programming today is a wizard at math. Python is now a language that is used everywhere. It is really powerful and fun.

1. Write code to find the number of sentences in this string.
2. Create a list with every third word from the string as an item.
3. Slice the 7 words at the center of this list and put them into a new list, with each word as a list item. Delete the 7 center words from the original list.
4. Reverse the order of the new list.
5. Insert your first name as an item at the beginning of this (now reversed) list.
6. Make your list into a single string and print it. How many characters are in this string?

Argo batteries activity

Argo floats rely on batteries to take samples remotely. Each oceanographer that deploys floats, uses a slightly different format to note their battery type in the data files. You are given a list of battery types from different Argo floats.

(This is an actual problem in the Argo data folders!)

```
0 'lithium'  
1 'Alkaline'  
2 'Alkaline'  
3 'Lithium'  
4 '    lithium    '  
5 'ALKALINE      '  
6 'Alkaline and lithium'  
7 '          alkaline'  
8 'alkaline/lithium'  
9 'ALKALINE AND LITHIUM'  
10 'LITHIUM'  
11 'alkaline/lithium'  
12 '    alkaline and lithium'  
13 'lithium      '  
14 'alkaline'  
15 '          Lithium    '  
16 'LITHIUM'  
17 'ALKALINE/LITHIUM'  
18 'alkaline, lithium'
```

Using string functions, change each battery string into the same format (spaces before/after, capitalization, use of separations [/ and ,]). Then, answer the following: how many of the float batteries are only lithium?