A Collector's Paradise

A string in Python is a collection of characters. Today, we'll work with two other types of collections in Python: lists and tuples.

Part (a): Most of the string operators we have studied are collection operators—they work on any iterable object. Because lists and tuples are iterable, these operators apply also to lists and tuples.

As a warm-up, work with a partner to fill in answers for what will be printed. Assume the following assignments and consult the cheat sheets on lists and tuples for explanations of any operations that you don’t recognize.

```python
a_list = [2, 3.14, 'hi', 63]
a_tuple = ('J', 'P', 'Morgan')
a_list_of_tuples = [('Jan', 1), ('Dec', 25), ('Jul', 4)]

print(a_list[0])
print(a_list_of_tuples[1])
print(a_list_of_tuples[1][-1])
print(a_list[1:-1])
print(a_list[len(a_list):])
print(max(a_tuple))
print(min(a_list_of_tuples))
print(a_tuple[0] < a_tuple[1])
print(3.14 in a_list)
print('Dec' in a_list_of_tuples[1])
print('Dec' in a_list_of_tuples)
print(len(a_tuple))
print(len(a_tuple[-1]))
print("0, 1, 2, 3, 4, 5".split( ',')
print("0, 1, 2, 3, 4, 5".split( ', '))
```
print("0, 1, 2, 3, 4, 5".split( ' , ' )) ________________

print( '. '.join(a_tuple[: -1])) ________________

Walk through the visualization at the **Visualization 1** link on our website to check your work. Discuss with your partner how Python knows what to print at each step.

**Part (b):** Lists are our first example of a **mutable** type. A list can be changed by indexed assignment or by calling a **mutator method**. Most mutator methods do not return values (more precisely, they return **None**). They are called for their side-effect on the list, which is modified *in place*.

With your partner, decide what each print statement will print when the program below is executed.

```
s_lst = ['do', 're']
n_lst = [6, -3, 5]
n_lst[-1] = 13

print(n_lst)                             #Line 1
n_lst.extend(s_lst)                      _____________________________
print(n_lst)                             _____________________________
n_lst.remove('do')                       _____________________________
print(n_lst)                             _____________________________
s_lst.append(n_lst)                     #Line 2
print(s_lst)                             _____________________________

del n_lst[-1]
print(n_lst)                             _____________________________

print(n_lst.sort())
print(n_lst)                             _____________________________

print(s_lst)                             _____________________________
print(s_lst.pop())
print(s_lst)                             _____________________________

print(s_lst)                             _____________________________
```

Step through the execution in the **Visualization 2** link to check your understanding. **Question:** In going from the line labeled **Line 1** to the one labeled **Line 2**, the value of `s_lst` changes even though none of the instructions between these two lines references `s_lst`. Be sure you can explain why this apparent anomaly occurs.