Python Basics: List

- List
  - Ordered: have a defined order, and that order will not change
  - Changeable: we can change, add, and remove items in a list
  - Allow Duplicates: lists can have items with the same value

```
list1 = ["apple", "banana", "cherry"]
list2 = [1, 5, 7, 9, 3]
list3 = [True, False, False]
```

```
['apple', 'banana', 'cherry']
[1, 5, 7, 9, 3]
[True, False, False]
```

Python Basics: List

- Access items

```
thislist = ["apple", "banana", "cherry"]
print(thislist[0])
print(thislist[-1])
print(thislist[-2])
```

```
apple
cherry
banana
```

```
thislist = ["apple", "banana", "cherry", "orange", "kiwi", "melon", "mango"]
print(thislist[2:5])
print(thislist[2:-2])
```

```
['cherry', 'orange', 'kiwi']
['cherry', 'orange', 'kiwi']
```

Python Basics: List

- Append: add an item to the end of the list

```
thislist = ["apple", "banana", "cherry"]
thislist.append("orange")
print(thislist)
```

```
['apple', 'banana', 'cherry', 'orange']
```

- Insert: insert a list item at a specified index

```
thislist = ["apple", "banana", "cherry"]
thislist.insert(1, "orange")
print(thislist)
```

```
['apple', 'orange', 'banana', 'cherry']
```

- Extend: append elements from *another list* to the current list

```
thislist = ["apple", "banana", "cherry"]
tropical = ["mango", "pineapple", "papaya"]
thislist.extend(tropical)
print(thislist)
```

```
['apple', 'banana', 'cherry', 'mango', 'pineapple', 'papaya']
```

Python Basics: List

- Remove: remove the specified item

```
thislist = ["apple", "banana", "cherry"]
thislist.remove("banana")
print(thislist)
```

```
['apple', 'cherry']
```

- Loop through a list

```
thislist = ["apple", "banana", "cherry"]
for x in thislist:
  print(x)
```

```
apple
banana
cherry
```

```
thislist = ["apple", "banana", "cherry"]
for i in range(len(thislist)):
  print(thislist[i])
```

Python Basics: Tuple

- Tuple: store multiple items in a single variable
  - Ordered: the items have a defined order, and that order will not change.
  - Unchangeable: cannot change, add or remove items after the tuple has been created.

```
thistuple = ("apple", "banana", "cherry", "apple", "cherry")
print(thistuple)
```

```
('apple', 'banana', 'cherry', 'apple', 'cherry')
```

Python Basics: Tuple

- Access:

```
thistuple = ("apple", "banana", "cherry", "orange", "kiwi", "melon", "mango")
print(thistuple[1])
print(thistuple[-1])
print(thistuple[2:5])
```

```
banana
mango
('cherry', 'orange', 'kiwi')
```

- Unpack: extract the values back into variables

```
fruits = ("apple", "banana", "cherry")

(green, yellow, red) = fruits

print(green)
print(yellow)
print(red)
```

```
apple
banana
cherry
```

Python Basics: Tuple

- Loop through a tuple

```
thistuple = ("apple", "banana", "cherry")
for x in thistuple:
  print(x)
```

```
thistuple = ("apple", "banana", "cherry")
for i in range(len(thistuple)):
  print(thistuple[i])
```

```
apple
banana
cherry
```

Python Basics: Dictionary

- Dictionary: store data values in key:value pairs
  - items are unordered, changeable, and does not allow duplicates
  - items can be referred to by using the key name.

```
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
print(thisdict)
print(thisdict["brand"])
```

```
{'brand': 'Ford', 'model': 'Mustang', 'year': 1964}
Ford
```

Python Basics: Dictionary

- Access

```
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}

x = thisdict.keys()
print(x)

y = thisdict.values()
print(y)

z = thisdict.items()
print(z)
```

```
dict_keys(['brand', 'model', 'year'])
dict_values(['Ford', 'Mustang', 1964])
dict_items([('brand', 'Ford'), ('model', 'Mustang'), ('year', 1964)])
```

Python Basics: Dictionary

- Add items:

```
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
thisdict["color"] = "red"
print(thisdict)
```

```
{'brand': 'Ford', 'model': 'Mustang', 'year': 1964, 'color': 'red'}
```

Python Basics: Dictionary

- Update items:
  - update the dictionary with the items from a given argument. If the item does not exist, the item will be added.

```
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
thisdict.update({"year": 2021})
print(thisdict)

thisdict.update({"color": "red"})
print(thisdict)
```

```
{'brand': 'Ford', 'model': 'Mustang', 'year': 2021}
{'brand': 'Ford', 'model': 'Mustang', 'year': 2021, 'color': 'red'}
```

Python Basics: Dictionary

- Remove

```
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
thisdict.pop("model")
print(thisdict)
```

```
{'brand': 'Ford', 'year': 1964}
```

Python Basics: Dictionary

- Loop

```
thisdict =  {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}

print("===keys===")
for x in thisdict.keys():
  print(x)

print("===values===")
for x in thisdict.values():
  print(x)

print("===items===")
for x, y in thisdict.items():
  print(x, y)
```

```
===keys===
brand
model
year
===values===
Ford
Mustang
1964
===items===
brand Ford
model Mustang
year 1964
```