Python List

Creating a List:

```
my_list = []                    # Empty list
my_list = [1, 2, 3]             # List with elements
my_list = list(range(1, 5))     # List using range
```

Accessing Elements:

```
my_list = ['apple', 'banana', 'cherry']
print(my_list[0])               # Accessing the first element ('apple')
print(my_list[-1])              # Accessing the last element ('cherry')
```

Modifying Elements:

```
my_list[0] = 'orange'               # Modifying the first element
my_list.append('mango')             # Appending an element at the end
my_list.extend(['grapes', 'kiwi'])  # Extending the list with multiple elements
```

Slicing a List:

```
my_list = [1, 2, 3, 4, 5]
print(my_list[1:3])                 # Slicing from index 1 to 2 ([2, 3])
print(my_list[:3])                  # Slicing from the beginning to index 2 ([1, 2, 3])
print(my_list[2:])                  # Slicing from index 2 to the end ([3, 4, 5])
```

Removing Elements:

```
my_list.remove('banana')        # Removing a specific element
del my_list[0]                  # Removing element at index 0
my_list.pop()                   # Removing the last element and returning it
```

List Concatenation:

```
list1 = [1, 2, 3]
list2 = [4, 5, 6]
concatenated_list = list1 + list2
```

List Length:

```
my_list = [1, 2, 3, 4, 5]
length = len(my_list)
```

Checking if an Element is in a List:

```
my_list = ['apple', 'banana', 'cherry']
if 'apple' in my_list:
    print("Found!")
```

Clearing a List:

```
my_list = [1, 2, 3, 4, 5]
my_list.clear()                    # Clears all elements in the list
```

Counting Occurrences:

```
my_list = [1, 2, 2, 3, 4, 2]
count = my_list.count(2)          # Counting occurrences of element 2
print(count)                      # Output: 3
```

Finding Index:

```
my_list = ['apple', 'banana', 'cherry']
index = my_list.index('banana')          # Finding the index of 'banana'
print(index)                             # Output: 1
```

Sorting a List:

```
my_list = [4, 2, 1, 3, 5]
my_list.sort()                    # Sorting the list in ascending order
print(my_list)                    # Output: [1, 2, 3, 4, 5]
```

Reversing a List:

```
my_list = [1, 2, 3, 4, 5]
my_list.reverse()                 # Reversing the order of elements
print(my_list)                    # Output: [5, 4, 3, 2, 1]
```

Copying a List:

```
my_list = [1, 2, 3]
new_list = my_list.copy()              # Creating a shallow copy of the list
```

List Comprehensions: List comprehensions provide a concise way to create new lists based on existing lists.

```
my_list = [1, 2, 3, 4, 5]
squares = [x**2 for x in my_list]        # Creating a new list with squares of elements
```

Nested Lists: Lists can contain other lists, allowing for multi-dimensional data structures.

```
nested_list = [[1, 2, 3], [4, 5, 6], [7, 8, 9]]
print(nested_list[0][1])                 # Accessing element at row 0, column 1 (output: 2)
```

Checking Equality:

```
list1 = [1, 2, 3]
list2 = [1, 2, 3]
equal = list1 == list2                   # Checking if the two lists are equal
print(equal)                             # Output: True
```

List Membership Testing:

```
my_list = [1, 2, 3, 4, 5]
exists = 2 in my_list                    # Checking if element 2 exists in the list
print(exists)                            # Output: True
```

List Repeating:

```
my_list = [1, 2, 3]
repeated_list = my_list * 3              # Repeating the list three times
print(repeated_list)                     # Output: [1, 2, 3, 1, 2, 3, 1, 2, 3]
```

List Concatenation with Other Iterables:

```
my_list = [1, 2, 3]
my_tuple = (4, 5, 6)
concatenated_list = my_list + list(my_tuple)    # Concatenating a list with a tuple
print(concatenated_list)                        # Output: [1, 2, 3, 4, 5, 6]
```

List Iteration:

```
my_list = ['apple', 'banana', 'cherry']
for item in my_list:
    print(item)                          # Iterating over each element in the list
```

List Comprehension with Conditional Filtering:

```
my_list = [1, 2, 3, 4, 5]
filtered_list = [x for x in my_list if x % 2 == 0]   # Creating a new list with even numbers
print(filtered_list)                                 # Output: [2, 4]
```

List Unpacking:

```
my_list = [1, 2, 3]
a, b, c = my_list                  # Unpacking the list into separate variables
print(a, b, c)                     # Output: 1 2 3
```

List Insertion:

```
my_list = [1, 2, 3, 4, 5]
my_list.insert(2, 10)                # Inserting the value 10 at index 2
print(my_list)
```

List Sum:

```
my_list = [1, 2, 3, 4, 5]
total = sum(my_list)                  # Calculating the sum of all elements in the list
print(total)
```

List Min and Max:

```
my_list = [4, 2, 1, 3, 5]
minimum = min(my_list) # Finding the minimum value in the list
maximum = max(my_list) # Finding the maximum value in the list
print(minimum, maximum)
```