

In [1]: *#Create and Manipulate Lists*

```
# Creating a List of fruits
fruits = ['apple', 'banana', 'cherry', 'date']

# Manipulating the list
print("Original List:", fruits)

# Adding an element
fruits.append('elderberry')
print("After Adding an Element:", fruits)

# Removing an element
fruits.remove('banana')
print("After Removing an Element:", fruits)

# Indexing and Slicing
print("First Fruit:", fruits[0]) # Indexing
print("Last Two Fruits:", fruits[-2:]) # Slicing
```

Original List: ['apple', 'banana', 'cherry', 'date']

After Adding an Element: ['apple', 'banana', 'cherry', 'date', 'elderberry']

After Removing an Element: ['apple', 'cherry', 'date', 'elderberry']

First Fruit: apple

Last Two Fruits: ['date', 'elderberry']

In [2]: *#Understand the Differences Between Lists and Tuples*

```
# Creating a tuple of fruits
fruits_tuple = ('apple', 'banana', 'cherry', 'date')

# Tuples are immutable
print("\nOriginal Tuple:", fruits_tuple)

# Trying to modify the tuple (this will raise an error)
try:
    fruits_tuple[1] = 'blueberry' # Attempting to change an element
except TypeError as e:
    print("Error:", e)

# However, you can access elements and slice like a list
print("First Fruit in Tuple:", fruits_tuple[0]) # Indexing
print("Last Fruit in Tuple:", fruits_tuple[-1]) # Indexing
```

Original Tuple: ('apple', 'banana', 'cherry', 'date')

Error: 'tuple' object does not support item assignment

First Fruit in Tuple: apple

Last Fruit in Tuple: date

In [3]: *#Create and Manipulate Sets*

```
# Creating a set of fruits
fruits_set = {'apple', 'banana', 'cherry', 'date'}

print("\nOriginal Set:", fruits_set)
```

```

# Adding an element
fruits_set.add('elderberry')
print("After Adding an Element:", fruits_set)

# Removing an element
fruits_set.remove('banana')
print("After Removing an Element:", fruits_set)

# Demonstrating that sets do not allow duplicates
fruits_set.add('apple') # Trying to add a duplicate
print("After Trying to Add Duplicate:", fruits_set)

```

Original Set: {'cherry', 'banana', 'date', 'apple'}
 After Adding an Element: {'date', 'banana', 'apple', 'elderberry', 'cherry'}
 After Removing an Element: {'date', 'apple', 'elderberry', 'cherry'}
 After Trying to Add Duplicate: {'date', 'apple', 'elderberry', 'cherry'}

In [4]: *# Create and Manipulate Dictionaries*

```

# Creating a dictionary of fruits with their colors
fruits_dict = {
    'apple': 'red',
    'banana': 'yellow',
    'cherry': 'red',
    'date': 'brown'
}

print("\nOriginal Dictionary:", fruits_dict)

# Adding an element
fruits_dict['elderberry'] = 'purple'
print("After Adding an Element:", fruits_dict)

# Removing an element
del fruits_dict['banana']
print("After Removing an Element:", fruits_dict)

# Accessing values by keys
print("Color of Cherry:", fruits_dict['cherry']) # Accessing value by key

```

Original Dictionary: {'apple': 'red', 'banana': 'yellow', 'cherry': 'red', 'date': 'brown'}
 After Adding an Element: {'apple': 'red', 'banana': 'yellow', 'cherry': 'red', 'date': 'brown', 'elderberry': 'purple'}
 After Removing an Element: {'apple': 'red', 'cherry': 'red', 'date': 'brown', 'elderberry': 'purple'}
 Color of Cherry: red

In [5]: *#Explore Built-in Methods for Each Data Structure*

```

# Built-in methods for Lists
numbers = [1, 2, 3, 4, 5]
print("\nList Methods:")
numbers.append(6) # Append
print("Append 6:", numbers)
numbers.sort() # Sort

```

```

print("Sorted List:", numbers)

# Built-in methods for tuples (only example of available methods)
print("\nTuple Methods:")
print("Count of 3 in Tuple:", (1, 2, 3, 3, 3).count(3)) # Count occurrences
print("Index of 2 in Tuple:", (1, 2, 3).index(2)) # Index of an element

# Built-in methods for sets
fruits_set = {'apple', 'banana', 'cherry'}
print("\nSet Methods:")
fruits_set.add('date') # Add
print("After Adding 'date':", fruits_set)
fruits_set.discard('banana') # Remove
print("After Discarding 'banana':", fruits_set)

# Built-in methods for dictionaries
print("\nDictionary Methods:")
print("Keys:", fruits_dict.keys()) # Get all keys
print("Values:", fruits_dict.values()) # Get all values
print("Items:", fruits_dict.items()) # Get all key-value pairs

```

List Methods:

Append 6: [1, 2, 3, 4, 5, 6]

Sorted List: [1, 2, 3, 4, 5, 6]

Tuple Methods:

Count of 3 in Tuple: 3

Index of 2 in Tuple: 1

Set Methods:

After Adding 'date': {'cherry', 'banana', 'date', 'apple'}

After Discarding 'banana': {'cherry', 'date', 'apple'}

Dictionary Methods:

Keys: dict_keys(['apple', 'cherry', 'date', 'elderberry'])

Values: dict_values(['red', 'red', 'brown', 'purple'])

Items: dict_items([('apple', 'red'), ('cherry', 'red'), ('date', 'brown'), ('elderberry', 'purple')])

In []: