Python Methods: String, List, Dictionary, Set, Tuple

 **String Methods**:

* Examples: .upper(), .lower(), .replace(), .split(), .join()

 **List Methods**:

* Examples: .append(), .remove(), .pop(), .extend(), .sort()

 **Dictionary Methods**:

* Examples: .get(), .keys(), .values(), .items(), .update()

 **Set Methods**:

* Examples: .add(), .remove(), .union(), .intersection(), .difference()

 **Tuple**:

* Explanation: Tuples are immutable, no modification methods.

 **Key Differences**:

* Key differences between methods of string, list, dictionary, and set.
* Immutable vs mutable data types.

# String Methods

String methods perform operations on strings. Strings are immutable, meaning these methods do not modify the original string but return a new one.

Examples of String Methods:

s = " Hello, World! "  
  
# Lowercase  
print(s.lower()) # Output: " hello, world! "  
  
# Uppercase  
print(s.upper()) # Output: " HELLO, WORLD! "  
  
# Strip  
print(s.strip()) # Output: "Hello, World!"  
  
# Replace  
print(s.replace("Hello", "Hi")) # Output: " Hi, World! "  
  
# Split  
print(s.split(",")) # Output: [' Hello', ' World! ']  
  
# Join  
words = ["Python", "is", "awesome"]  
print(" ".join(words)) # Output: "Python is awesome"  
  
# Find  
print(s.find("World")) # Output: 10  
  
# Startswith  
print(s.startswith(" He")) # Output: True  
  
# Endswith  
print(s.endswith("! ")) # Output: True

# List Methods

List methods allow modification of a list. Lists are mutable, meaning they can be modified directly.

Examples of List Methods:

lst = [1, 2, 3]  
  
# Append  
lst.append(4)  
print(lst) # Output: [1, 2, 3, 4]  
  
# Extend  
lst.extend([5, 6])  
print(lst) # Output: [1, 2, 3, 4, 5, 6]  
  
# Insert  
lst.insert(2, 99)  
print(lst) # Output: [1, 2, 99, 3, 4, 5, 6]  
  
# Remove  
lst.remove(99)  
print(lst) # Output: [1, 2, 3, 4, 5, 6]  
  
# Pop  
popped = lst.pop(2)  
print(popped) # Output: 3  
print(lst) # Output: [1, 2, 4, 5, 6]  
  
# Sort  
lst.sort()  
print(lst) # Output: [1, 2, 4, 5, 6]  
  
# Reverse  
lst.reverse()  
print(lst) # Output: [6, 5, 4, 2, 1]

# Dictionary Methods

Dictionary methods are used for operations related to key-value pairs. Dictionaries are mutable.

Examples of Dictionary Methods:

d = {"a": 1, "b": 2, "c": 3}  
  
# Keys  
print(d.keys()) # Output: dict\_keys(['a', 'b', 'c'])  
  
# Values  
print(d.values()) # Output: dict\_values([1, 2, 3])  
  
# Items  
print(d.items()) # Output: dict\_items([('a', 1), ('b', 2), ('c', 3)])  
  
# Get  
print(d.get("b")) # Output: 2  
  
# Update  
d.update({"d": 4})  
print(d) # Output: {'a': 1, 'b': 2, 'c': 3, 'd': 4}  
  
# Pop  
popped = d.pop("c")  
print(popped) # Output: 3  
print(d) # Output: {'a': 1, 'b': 2, 'd': 4}

# Set Methods

Set methods are for working with unordered collections of unique elements. Sets are mutable.

Examples of Set Methods:

s = {1, 2, 3}  
  
# Add  
s.add(4)  
print(s) # Output: {1, 2, 3, 4}  
  
# Remove  
s.remove(2)  
print(s) # Output: {1, 3, 4}  
  
# Discard (no error if element doesn't exist)  
s.discard(5)  
print(s) # Output: {1, 3, 4}  
  
# Union  
s2 = {3, 4, 5}  
print(s.union(s2)) # Output: {1, 3, 4, 5}  
  
# Intersection  
print(s.intersection(s2)) # Output: {3, 4}  
  
# Difference  
print(s.difference(s2)) # Output: {1}

# Tuple Methods

Tuple methods are limited since tuples are immutable. However, they allow counting occurrences and finding indices.

Examples of Tuple Methods:

t = (1, 2, 2, 3)  
  
# Count  
print(t.count(2)) # Output: 2  
  
# Index  
print(t.index(3)) # Output: 3