***Set and dictionary***

*Set*

*A set is a collection of unique items. Think of it like a bag where you can throw items in, but duplicates are not allowed.*

*Key Features of a Set:*

*No Duplicates:*

*Each item in a set is unique. If you try to add the same item again, it won’t appear twice.*

*Unordered:*

*Sets do not keep items in a specific order.*

*Mutable:*

*You can add or remove items from a set.*

*No Indexing:*

*You cannot access items in a set using an index (like set[0]).*

*Syntax:*

*Sets are written with curly braces {} or by using the set() function.*

*Example of a Set:*

*# Creating a set*

*fruits = {"apple", "banana", "cherry", "apple"} # "apple" is added only once*

*print(fruits) # Output: {'apple', 'banana', 'cherry'}*

*# Adding an item*

*fruits.add("orange")*

*print(fruits) # Output: {'apple', 'banana', 'cherry', 'orange'}*

*# Removing an item*

*fruits.remove("banana")*

*print(fruits) # Output: {'apple', 'cherry', 'orange'}*

*When to Use:*

* *Use a set when you need to store unique items and don’t care about the order.*

*Dictionary*

*A dictionary is a collection of key-value pairs. Think of it like a real dictionary where each word (key) has a definition (value).*

*Key-Value Pairs:*

*Each item in a dictionary has a key and a corresponding value.*

*Keys Are Unique:*

*Keys must be unique. You cannot have duplicate keys, but values can be duplicated.*

*Ordered (Python 3.7+):*

*Dictionaries maintain the order of items as they were added.*

*Mutable:*

*You can add, remove, or update key-value pairs.*

*Syntax:*

*Dictionaries are written with curly braces {}, with keys and values separated by a colon :.*

*Example of a Dictionary:*

*# Creating a dictionary*

*student = {"name": "Alice", "age": 25, "course": "Data Science"}*

*# Accessing a value*

*print(student["name"]) # Output: Alice*

*# Adding a new key-value pair*

*student["grade"] = "A"*

*print(student) # Output: {'name': 'Alice', 'age': 25, 'course': 'Data Science', 'grade': 'A'}*

*# Updating a value*

*student["age"] = 26*

*print(student) # Output: {'name': 'Alice', 'age': 26, 'course': 'Data Science', 'grade': 'A'}*

*# Removing a key-value pair*

*del student["course"]*

*print(student) # Output: {'name': 'Alice', 'age': 26, 'grade': 'A'}*

*When to Use:*

* *Use a dictionary when you need to pair related information (e.g., a name and a phone number).*

*DIFFERENCES:*

| *Feature* | *Set* | *Dictionary* |
| --- | --- | --- |
| *Purpose* | *Stores unique items.* | *Stores key-value pairs.* |
| *Duplicates* | *Not allowed.* | *Keys are unique, values can repeat.* |
| *Access* | *No indexing or keys (unordered).* | *Access values using keys.* |
| *Syntax* | *{item1, item2, ...}* | *{key1: value1, key2: value2, ...}* |
| *Example* | *{"apple", "banana", "cherry"}* | *{"name": "Alice", "age": 25}* |

*# LIST:*list\_names = ["Ammu", "bunny", "Madhu"]  
print(", ".join(list\_names))  
  
*# Duplicates:*list\_a = ["Amulya", "Rachana", "Madhu", "Archana"]  
print(list\_a)  
  
*# List Length:*names = ["Ammu", "Rachana", "bunny"]  
print(f"The number of names in the list is: {len(names)}")  
  
*# List Items - Data Types:  
# List of strings*list1 = ["Ammu", "Rachana", "bunny"]  
  
*# List of integers*list2 = [1, 5, 7, 9, 3]  
  
*# List of booleans*list3 = [True, False, False]  
  
*# Printing the lists*print("List of Strings:", list1)  
print("List of Integers:", list2)  
print("List of Booleans:", list3)  
  
*# Access Items:  
# List of fruits*thislist = ["apple", "banana", "cherry"]  
*# Print the second item of the list*print(thislist[1]) *# Output: banana  
  
# DICTIONARY:*a = {'a': 123456, 1: 'abc'}  
print(a)  
*# Output: {'a': 123456, 1: 'abc'}  
  
# get()*my = {'a': 1, 'b': 2, 'c': 3}  
print(my.get('b')) *# Output: 2*print(my.get('d')) *# Output: None  
  
# update()*k = {'a': 1, 'b': 2}  
k.update({'b': 10, 'c': 3})  
print(k)  
*# Output: {'a': 1, 'b': 10, 'c': 3}  
  
# pop()*amulya = {'a': 1, 'b': 2, 'c': 3}  
value = amulya.pop('b')  
print(value) *# Output: 2*print(amulya) *# Output: {'a': 1, 'c': 3}  
  
# popitem()*h = {'a': 1, 'b': 2, 'c': 3}  
key\_value\_amulya = h.popitem()  
print(key\_value\_amulya) *# Output: ('c', 3)*print(h) *# Output: {'a': 1, 'b': 2}  
  
# values()*my\_dict = {'a': 1, 'b': 2, 'c': 3}  
values = my\_dict.values()  
print(list(values)) *# Output: [1, 2, 3]  
  
# keys()*keys = my\_dict.keys()  
print(list(keys)) *# Output: ['a', 'b', 'c']  
  
# items()*items = my\_dict.items()  
print(list(items)) *# Output: [('a', 1), ('b', 2), ('c', 3)]  
  
# SET:  
# Set example*amulya = {1, 2, 8, 4, 2}  
k = set(amulya)  
print(k) *# Output: {1, 2, 8, 4}  
  
# Add()*my = {1, 2, 3}  
my.add(4)  
print(my) *# Output: {1, 2, 3, 4}  
  
# Clear()*my1 = {1, 2, 3}  
my1.clear()  
print(my1) *# Output: set()  
  
# Copy()*a = {1, 2, 3}  
new = a.copy()  
print(new) *# Output: {1, 2, 3}  
  
# Difference*set1 = {1, 2, 3}  
set2 = {3, 1, 5}  
print(set1.difference(set2)) *# Output: {2}  
  
# Discard()*my1 = {1, 2, 3}  
my1.discard(2)  
my1.discard(4)  
print(my1) *# Output: {1, 3}  
  
# Intersection()*set1 = {1, 2, 3}  
set2 = {2, 3, 4}  
print(set1.intersection(set2)) *# Output: {2, 3}  
  
# isdisjoint()*set1 = {1, 2, 3}  
set2 = {4, 5, 6}  
print(set1.isdisjoint(set2)) *# Output: True  
  
# pop()*lucky = {1, 2, 3}  
element = lucky.pop()  
print(element)  
print(lucky) *# Remaining set after pop  
  
# Remove()*my\_set = {1, 2, 3}  
my\_set.remove(2)  
print(my\_set) *# Output: {1, 3}  
  
# Symmetric difference()*set1 = {1, 2, 3}  
set2 = {3, 4, 5}  
print(set1.symmetric\_difference(set2)) *# Output: {1, 2, 4, 5}  
  
# Union*print(set1.union(set2)) *# Output: {1, 2, 3, 4, 5}  
  
# Update()*set1.update(set2)  
print(set1) *# Output: {1, 2, 3, 4, 5}  
  
# Length*b = {1, 2, 3, 4}  
print(len(b)) *# Output: 4  
  
# Max()*amulya = {10, 20, 5, 7}  
print(max(amulya)) *# Output: 20  
  
# Sorted()*j = {3, 1, 4, 2}  
print(sorted(j)) *# Output: [1, 2, 3, 4]*