**SETS**

A **set** in Python is a collection of **unique, unordered, and unindexed** items. It is similar to a mathematical set and can be used for operations like union, intersection, and difference. Unlike lists or tuples, sets **cannot contain duplicate elements**.

**What is a Set?**

* **Unordered**: The elements in a set have no specific order.
* **Unique**: No duplicate elements are allowed.
* **Mutable**: You can add or remove elements from a set.
* **Heterogeneous**: A set can contain elements of different data types (e.g., integers, strings, floats).
* **Unindexed**: Sets do not support indexing or slicing.

### ****Set Methods and Operations****

| **Method** | **Description** | **Example** |
| --- | --- | --- |
| add(x) | Adds an element x to the set | my\_set.add(10) |
| remove(x) | Removes x from the set (raises error if not found) | my\_set.remove(10) |
| discard(x) | Removes x from the set (no error if not found) | my\_set.discard(10) |
| pop() | Removes and returns a random element | my\_set.pop() |
| clear() | Removes all elements from the set | my\_set.clear() |
| copy() | Returns a shallow copy of the set | new\_set = my\_set.copy() |
| union(set2) | Returns a new set with elements from both sets | set1.union(set2) |
| intersection(set2) | Returns elements common to both sets | set1.intersection(set2) |
| difference(set2) | Returns elements in set1 but not in set2 | set1.difference(set2) |
| symmetric\_difference(set2) | Returns elements in either set, but not both | set1.symmetric\_difference(set2) |

#### ✅ **Union (**|**)**

Combines elements from two sets (removes duplicates).

#### ✅ **Intersection (**&**)**

Returns common elements between two sets

#### ✅ **Difference (**-**)**

Returns elements in the first set but not in the second.

#### ✅ **Symmetric Difference (**^**)**

Returns elements in either set but not both.

### ****Summary****

* **Set**: Unordered collection of unique elements.
* **Mutable**: You can add or remove elements.
* **Used for**: Membership testing, removing duplicates, and mathematical set operations.
* **Frozen Set**: Immutable version of a set.