Sets Basics

What is a Set?

- A **set** is a collection of unique items in Python.
- **Unordered** → elements don't have a fixed position.
- **Unindexed** → cannot access elements using index.
- Written with **curly braces** {}.

Example:

```
my_set = {1, 2, 3, 4}
print(my_set)   # Output: {1, 2, 3, 4}
```

Characteristics of Sets:

1. **No Duplicates** → automatically removes duplicates.
2. **Unordered** → order of elements is not guaranteed.
3. **Unindexed** → cannot access by index like lists/tuples.
4. **Mutable** → you can add/remove items (but elements must be immutable like numbers, strings, tuples).

Creating Sets:

```
fruits = {"apple", "banana", "cherry"}
print(fruits)
# Empty set
empty_set = set()   # correct way
```

Common Set Methods

- add(item) → adds item.
- remove(item) → removes item (error if not found).
- discard(item) → removes item (no error if not found).
- clear() → removes all items.
- union(set2) → combines two sets.
- intersection(set2) → returns common items.
- difference(set2) → returns items not in set

Importance of Sets:

- Used to store **unique values only**.
- Best for **mathematical operations** (union, intersection).
- Useful when order doesn't matter but uniqueness does.