Chapter 05 Dictionaries and Sets

Python Notes by Wahab

Dictionaries

A **dictionary** is a mutable, unordered collection of key-value pairs where each key must be unique, and values can be of any data type.

Properties

- **Unordered**: The order of elements is not guaranteed.

- **Mutable**: Can be modified after creation.

- **Key-Value Pairs**: Each item consists of a unique key and its associated value.

- **Keys are Unique**: No duplicate keys are allowed.

- **Keys are Immutable**: Keys must be of an immutable data type like strings, numbers, or tuples.

Syntax

```
my_dict = {
    "key1": "value1",
    "key2": "value2",
}
```

you can access value like this :

```
value = my_dict["key1"] # Access value using key
```

Dictionary Methods

1. **dict.get(key, default=None)**

   - Returns the value for the specified key if it exists, otherwise returns `default`.

2. **dict.keys()**

   - Returns a view object with a list of all keys in the dictionary.

3. **dict.values()**

   - Returns a view object with a list of all values in the dictionary.

4. **dict.items()**

   - Returns a view object containing a list of key-value tuple pairs.

5. **dict.pop(key, default=None)**

   - Removes the specified key and returns its value; if key is not found, returns `default`.

6. **dict.update([other])**

   - Updates the dictionary with key-value pairs from another dictionary or an iterable of pairs.

7. **dict.clear()**

   - Removes all key-value pairs from the dictionary.

8. **dict.copy()**

   - Returns a shallow copy of the dictionary.

9. **len(dict)**

   - Returns the number of key-value pairs in the dictionary.

Sets

Definition

A **set** is an unordered collection of unique, immutable elements. It is useful for storing elements without duplicates and performing set operations like union, intersection, etc.

Set Properties

- **Unordered**: Elements have no specific order.
- **Mutable**: You can add or remove elements after creation.
- **Unique Elements**: A set cannot have duplicate elements.
- **Immutable Elements**: The elements inside a set must be of immutable types (e.g., strings, numbers, tuples).

Syntax

There are two way to crete a set .

```python
# first way
my_set = set() # create an empty set.
# adding value to set
my_set.add(8)  #add 8 to my_set

# second way
my_set_02 = {"apple", "banana", "cherry"}
```

Note: if you wan to create an empty set use first way beacuse if you use "{}" this to create an empty set it will consider as dictionary not a set. you must have to use set() to create an empty set

Methods and Operations

1. **set.add(elem)**

   - Adds an element to the set if it is not already present.

2. **set.remove(elem)**

   - Removes the specified element from the set, raising an error if the element is not found.

3. **set.union(others)**

   - Returns a new set containing all unique elements from the set and the others (set1 | set2).

4. **set.intersection(others)**

   - Returns a new set with elements common to the set and others (set1 & set2).