Dictionary vs Set

This lesson will discuss the key difference between Dictionary and Set in python.

We'll cover the following

Introduction#

Before solving any challenges regarding Hash Tables, it is necessary to look at the implementations of `dict`, and `set` and see how they are different. Both are implemented in Python. It is also a common misconception that these two structures are the same, but they are very different from each other.

🔍 `dict`#

`dict` or dictionary is a **Mapping Type** object which maps hashable values to arbitrary objects. It stores an element in the form of `key-value` pairs.

It provides the basic functionality of hashing along with some helper functions that help in the process of insertion, deletion, and search.

Some of the key features of `dict` are given below:

- An `dict` stores `key-value` pairs (examples given below [illegible] a [illegible] ey to the value:

$$abc -> 123$$

$$xyz -> 456$$

- `dict` cannot contain duplicate keys. It can, however, have duplicate values.
- `dict` does not store elements in any order either by the `key` or the `value`.

> **Note**: The insert order is maintained from **Python 3.7** and above.

- `dict` uses a hash table for its implementation. It takes the key and then maps it into the range of hash table using the hash function.
- On average, the complexity of the basic operation is $O(1)$. It will go up to $O(n)$ in the worst-case.

🔍 `set`#

`set` is a container in Python which has no duplicates. It consists of elements in no specific order. It is also built in the same way as `dict`, i.e., using the Hash Table, but it is still quite different from the `dict`.

Some of the key features of `set` are listed below:

- `set` is a container that implements the `Set` interface, and this interface only stores values, not a `key-value` pair. The `value` of an element will be its `key` at the same time.

$$1 -> 1$$

$$abc- > abc$$

- `set` does not allow storing duplicate elements as a **set** can only contain unique elements.
- On average, the complexity of the basic operation is $O(1)$. It will go up to $O(n)$ in the worst-case.

Member Functions#

Some of the commonly used member functions of `set` are given below:

Function	Definition
`set1` **`.add`** `(element)`	Adds `element` to the set `set1`
`set1` **`.remove`** `(element)`	Removes the `element` from the set `set1`. If the element is not found then it throws an error.
`set1` **`-`** `set2`	Returns difference between `set1` and `set2`
`set1` **`|`** `set2`	Returns union of `set1` and `set2`
`set1` **`&`** `set2`	Returns intersection of `set1` and `set2`
`key` **`in`** `container`	Search element with the given value `key`. If the element is present, it will return True.

Some of the commonly used member functions of `dict` are g b

Function	Definition
`dict1 [key] = value`	Adds `value` to the dictionary `dict` mapped to `key`
`del dict1[key]`	Removes the corresponding key-value pair from `dict1` with the key `key`.
`key in dict1`	Search element with the given key. If the element is present, it will return True.

In the following lessons, we will use the in-built Python hash table to solve popular interview questions.

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