

## Chapter 5 : Dictionary & Sets

Dictionary is a collection of key-value pairs

Syntax :

<sup>keys</sup>                      <sup>values</sup>  
 $a = \{ \text{"key"} : \text{"value"},$   
 $\text{"harry"} : \text{"code"},$   
 $\text{"marks"} : \text{"100"},$   
 $\text{"list"} : [1, 2, 9] \}$

$a[\text{"key"}] \Rightarrow$  Prints "value"

$a[\text{"list"}] \Rightarrow$  Prints [1, 2, 9]

Properties of a Python Dictionaries

- 1> It is unordered
- 2> It is mutable
- 3> It is indexed
- 4> Cannot contain duplicate keys

Dictionary Methodes

Consider the following dictionary

$a = \{ \text{"name"} : \text{"Harry"},$   
 $\text{"from"} : \text{"India"},$   
 $\text{"marks"} : [92, 98, 96] \}$

- 1>  $a.items()$  : returns a list of (key, value) tuples
- 2>  $a.keys()$  : returns a list containing dictionary's keys
- 3>  $a.update(\{ \text{"friend"} : \text{"Sam"} \})$  : updates the dictionary with supplied key-value pairs

4. `a.get("name")`: returns the value of the specified keys (and value is returned eg. "Harry" is returned here)

More methods are available on [docs.python.org](https://docs.python.org).

### Sets in Python

Set is a collection of non repetitive elements

`S = Set()`

⇒ No repetition allowed!

`S.add(1)`

`S.add(2)`

⇒ or `Set = {1, 2}`

If you are a programming beginner without much knowledge of mathematical operations on sets, you can simply look at sets in python as data types containing unique values.

### Properties of Sets

1. Sets are unordered ⇒ Element's order doesn't matter
2. Sets are unindexed ⇒ Can't access elements by index
3. There is no way to change items in sets.
4. Sets cannot contain duplicate values

### Operations on Sets

Consider the following Set:

`S = {1, 8, 2, 3}`

1. `len(S)`: Returns 4, the length of the set
2. `S.remove(8)`: Updates the set `S` and removes 8 from `S`.

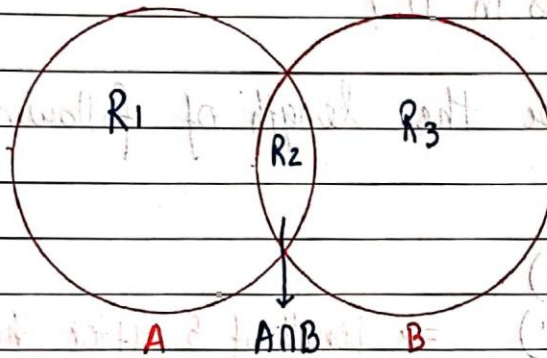


3.  $S.pop()$ : Removes an arbitrary element from the set and returns the element removed

4.  $S.clear()$ : Empties the set  $S$

5.  $S.union(\{8, 11\})$ : Returns a new set with all items from both sets.  $\Rightarrow \{1, 8, 2, 3, 11\}$

6.  $S.intersection(\{8, 11\})$ : Returns a set which contains only items in both sets.  $\Rightarrow \{8\}$



$$R_2 \Rightarrow A \cap B$$

$$R_1 + R_2 + R_3 \Rightarrow A \cup B$$

$$R_1 + R_3 \Rightarrow A \Delta B$$

$$R_1 \Rightarrow A - B$$

$$R_3 \Rightarrow B - A$$

## Chapter 5: Practice Set

1 Write a program to create a dictionary of Hindi words with values as their english translation. Provide user with an option to look it up!

2 Write a program to input eight numbers from the user and display all the unique numbers (once).

3 Can we have a set with 18(int) and "18"(str) as a values in it?

4 What will be the length of following set S:

S = Set()

S.add(20)

S.add(20.0)

S.add("20")  $\Rightarrow$  length of S after these operations?

5 S = { }

what is the type of S?

6 Create an empty dictionary. Allow 4 friends to enter their favourite language as values and use keys as their names. Assume that the names are unique

7 If names of 2 friends are same; what will to the program in Problem 6?

8 If languages of two friends are same; what will happen to the program in Problem 6?



9 Can you change the values inside a list which is contained in Set S

$$S = \{8, 7, 12, \text{"Harry"}, [1, 2]\}$$