Chapter 5 : Dictionary & Sets

Dictionary is a collection of key-value pairs

Syntax :

```
          keys                 values
    a =  { "key" : "value",
           "harry" : "Code",
           "marks" : "100",
           "list" : [1,2,9] }
```

a ["key"]   ⟹ Prints "value"
a ["list"] ⟹ 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 Methods
Consider the following dictionary

```
    a =  { "name" : "Harry",
           "from" : "India",
           "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({"friend" : "Sam"}) : updates the dictionary with supplied key-value pairs

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

More methods are available on docs.python.org.

Sets in Python
Set is a collection of non repetitive elements

```
S = Set ()
S. add (1)
S. add (2)
```

⇒ No repetition allowed!

⇒ 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   ⇒ Cannot access elements by index
3. There is no way to change items in sets.
4. Sets cannot contain duplicate values

Operations on Sets
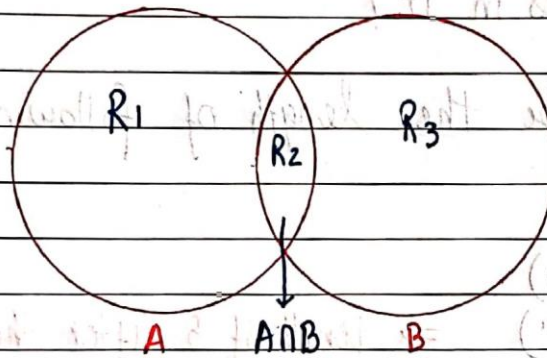Consider the following Set :
$$S = \{1, 8, 2, 3\}$$

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. $\Rightarrow \{8\}$

$R_2 \Rightarrow A \cap B$

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

$R_1 + R_3 \Rightarrow A \Delta B$

$R_1 \Rightarrow A - B$

$R_3 \Rightarrow B - A$

A $A \cap B$ B