Python Programming

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SET DATA TYPE - 3

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Learning Mantra

If you really strong in the basics, then remaining things will become so easy.

Agenda:

1. Mathematical operations on the Set
2. Membership operators
3. Set Comprehension

4. Mathematical operations on the Set

1.union():

- **x.union(y)** ➔ We can use this function to return all elements present in both x and y sets.

We can perform union operation in two ways:

i. x.union(y) ➔ by calling through union() method.

ii. x|y ➔ by using '|' operator.

- This operation returns all elements present in both sets x and y (without duplicate elements).

Eg:

```
x={10,20,30,40}

y={30,40,50,60}

print(x.union(y))

print(x|y)
```

Output:

```
{40, 10, 50, 20, 60, 30}

{40, 10, 50, 20, 60, 30}
```

2. intersection():

- We can perform intersection operation in two ways:

  i. x.intersection(y) ➔ by calling through intersection() method.

  ii. x&y ➔ by using '&' operator.

- This operation returns common elements present in both sets x and y.

Eg:

```
x={10,20,30,40}

y={30,40,50,60}

print(x.intersection(y))        #{40, 30}

print(x&y)                      #{40, 30}
```

Output:

```
{40, 30}

{40, 30}
```

3. difference():

- We can perform difference operation in two ways:

  i. x.difference(y) ➔ by calling through difference() method.

  ii. x-y ➔ by using '-' operator.

- This operation returns the elements present in x but not in y.

Eg:

```
x={10,20,30,40}

y={30,40,50,60}

print(x.difference(y))          #{10, 20}

print(x-y)                      #{10, 20}

print(y-x)                      #{50, 60}
```

Output:

```
{10, 20}

{10, 20}

{50, 60}
```

4.symmetric_difference():

- We can perform symmetric difference operation in two ways:

  i. x.symmetric_difference(y) ➔by calling through symmetric_difference method.

  ii. x^y ➔ by using '^' operator.

- This operation returns elements present in either x or y but not in both.

Eg:

```
x={10,20,30,40}

y={30,40,50,60}

print(x.symmetric_difference(y))        #{10, 50, 20, 60}

print(x^y)                              #{10, 50, 20, 60}
```

Output:

```
{10, 50, 20, 60}

{10, 50, 20, 60}
```

5. Membership operators:

- Membership operators are used to check whether a particular object is available or not.
- For any sequence, we can apply membership operators.
- Following are the membership operators:

    1. in
    2. not in

Eg:

```
s=set("karthi")

print(s)

print('a' in s)

print('z' in s)
```

Output:

```
{'r', 'a', 'i', 't', 'k', 'h'}

True

False
```

6. Set Comprehension

- Set comprehension is possible.

Syntax:

s = {expression for x in sequence condition}

Eg:

```
s = {x*x for x in range(6)}

print(s)
```

Output:

{0, 1, 4, 9, 16, 25}

Eg:

```
s={2**x for x in range(2,10,2)}

print(s)
```

Output:

{16, 256, 64, 4}

Note :

- Set objects won't support indexing and slicing.

Eg:

```
s={10,20,30,40}
print(s[0])
print(s[1:3])
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-11-6f6a7552f39c> in <module>
      1 s={10,20,30,40}
----> 2 print(s[0])              #TypeError: 'set' object does not support in
dexing
      3 print(s[1:3])           #TypeError: 'set' object is not subscriptabl
e

TypeError: 'set' object is not subscriptable
```

Example Programs

Q 1. Write a program to eliminate duplicates present in the list.

Approach-1:

```
l=eval(input("Enter List of values: "))

s=set(l)

print(s)
```

Output:

```
Enter List of values: 10,20,30,10,20,40

{40, 10, 20, 30}
```

Approach-2:

```
l=eval(input("Enter List of values: "))
l1=[]
for x in l:
    if x not in l1:
        l1.append(x)
print(l1)
```

Output:

```
Enter List of values: 10,20,30,10,20,40
[10, 20, 30, 40]
```

Q 2. Write a program to print different vowels present in the given word.

```
w=input("Enter word to search for vowels: ")
s=set(w)
v={'a','e','i','o','u'}
d=s.intersection(v)
print("The different vowel present in",w,"are",d)
print('The number of different vowels : ',len(d))
```

Output:

```
Enter word to search for vowels: Learning python is very easy
The different vowel present in Learning python is very easy are {'o', 'a','i', 'e'}
The number of different vowels : 4
```

Any question?

If you try to practice programs yourself, then you will learn many things automatically

Spend few minutes and then enjoy the study

Thank You