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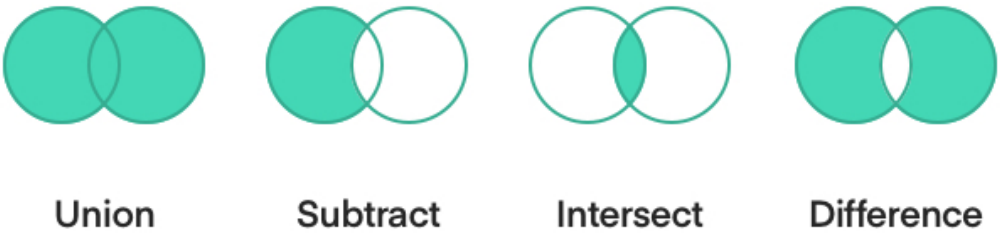
26. Mathmatical Set Operation

Set Operation 🔧

Sets can be used to carry out mathematical set operations following different operation on set can be performed

1. Union (|)
2. Intersection (&)
3. difference (-)
4. symmetric difference (^)



1.union() 💼

- Two sets can be **added** together.
- Union is performed using | operator same can be achived using built in function **union()**.

Syntax:

```
setA=set()
SetB=set()
#Using | Operator
result=SetA | SetB

#Using Built in Function .union()
result=SetA.union(SetB)
```

Example:

```
#Initialize Two Set
A={1,5,2}
```

```
B={6,7,8,9}

#using built in method .union()
result=A.union(B)
print(result)
#Result:{1, 2, 5, 6, 7, 8, 9}

#Using | operator
result1=A | B
print(result1)
#Result:{1, 2, 5, 6, 7, 8, 9}
```

2.Intersection ❌

- A new set can also be constructed by determining which members two sets have **in common**.
- Intersection is performed using **&** operator same can be achived using built in function **intersection()**.

Syntax:

```
setA=set()
SetB=set()

#Using & operator
result=SetA & SetB

#using intersection() method
result=SetA.intersection(SetB)
```

Example:

```
#Initialize Two Set
A={1,5,2}
B={3,2,1,6,8,7}

#using built in method .intersection()
result=A.intersection(B)
print(result)
#Result:{1, 2}

#Using & operator
result1=A & B
print(result1)
#Result:{1, 2}
```

3. Difference ⛔

- Two sets can also be **subtracted**.
- Difference can be performed using - operator or same thing can be achieved using **difference()**.
- Here **A-B** Result is Different result than **B-A**.

A-B:The elements included in A, but not included in B. **B-A**:The elements included in B, but not included in A.

Syntax:

```
setA=set()
SetB=set()

#using - Operator
result=SetA - SetB

#Using .difference()
result=SetA.difference(SetB)
```

Example:

```
A={1,2,3,5,4}
B={2,4,8,6,9}

#using built in method .difference()
result=A.difference(B)
print(result)
#Result:{1, 3, 5}

#Using - operator
result1=A - B
print(result1)
#Result:{1, 3, 5}
```

4. symmetric Difference 🚫

- The **symmetric_difference()** method returns a set that contains all items from both set, but not the items that are present in both sets.
- symmetric Difference can be performed using ^ operator or same thing can be achieved using **symmetric_difference()**.

Syntax:

```
setA=set()
SetB=set()

#Using ^ Operator
```

```
result=SetA ^ SetB

#Using symmetric_difference()
result=SetA.symmetric_difference(SetB)
```

Example:

```
#Initialize Two Diffrent Sets
A={1,2,3,5,4}
B={2,1,8,6,9}

#using built in method .symmetric_difference()
result=A.symmetric_difference(B)
print(result)
#Result:{3, 4, 5, 6, 8, 9}

#Using ^ operator
result1=A ^ B
print(result1)
#Result:{3, 4, 5, 6, 8, 9}
```