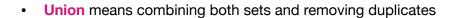# Set Operators

- The operators are given in the right hand side table
- Here we are taking the following sets and performing different set operators.
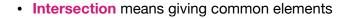
s = { 1,2,3,4,5,6,7,8,9,10 }

A = { 1,2,3,5,7 }   B = { 5,7,9,10,11 }

I
&
-
^
<
<=
>
>=
==
!=
in
not in

- **Union** means combining both sets and removing duplicates

    C = A **|** B   => A **|** B = { 1,2,3,5,7,9,10,11 }

    C -   Taking result of A , B in var C
    | -   pipe / union symbol

- **Intersection** means giving common elements

    C = A **&** B   => A **&** B = { 5,7 }

    C -   Taking result of A , B in var C
    & -   Intersection symbol

- **Difference** of A - B means take all elements of A except those common in B

    C = A **-** B   => A **-** B = { 1,2,3 }

- **Symmetric Difference** means take all elements of A and B except those common to both sets

    C = A **^** B   => A **^** B = { 1,2,3,9,10,11 }

    C -   Taking result of A , B in var C
    ^ -   Symmetric difference

```
>>>
>>> A={1,2,3,5,7}
>>> B={5,7,9,10,11}
>>> A|B                          #union
    {1, 2, 3, 5, 7, 9, 10, 11}
>>> A&B                          #intersection
    {5, 7}
>>> A−B                          #difference
    {1, 2, 3}
>>> A^B                          #symmetric difference
    {1, 2, 3, 9, 10, 11}
>>>
```

- Now let us check other operators.
- **< , >** are useful for checking proper subset (or) proper superset
- **<= ,>=** they consider equal sets as well while checking subset and superset
- **==** they check if two sets are equal or not
- **!=** they check if two sets are not equal

```
>>>
>>> S = {1,2,3,4,5,6,7,8,9,10}
>>> A={1,2,3,5,7}
>>> B={5,7,9,10,11}
>>>
>>> A<B
    False
>>> B<A
    False
>>> A<S
    True
>>> S>B                          #11 Is in B but not in S so that's why false
    False
>>> S==S
    True
>>> S!=A
    True
>>> S<=A
    False
>>> S>=B
    False
>>>
```

- **in , not in** are also know as membership operators
- They check if an element is present in a set or not and return boolean type as result.

```
>>>
>>> S = {1,2,3,4,5,6,7,8,9,10}
>>> A={1,2,3,5,7}
>>> B={5,7,9,10,11}
>>>
>>> 8 in S
    True
>>> 11 in S
    False
>>> 11 in B
    True
>>>
>>> 11 not in S
    True
```

Note :

- If you store the result of A | B in A, then the result will be go in A itself. So, You can write this as

A | B (same as A = A | B)
A & B (same as A = A & B)
A - B (same as A = A - B)