Agenda

1. Tuples
    1. What is a tuple?
    2. Motivation behind tuples
    3. How to define a tuple?
    4. Important properties of tuples
2. Sets
    1. Set methods
    2. Set operations

Aditya → ISRO Aditya's Planet

[Mercury, ~~Venus~~, Earth ...]

Tuple → Its like immutable list,

i.e. we cannot change value of elements.

- We can do **positive & negative indexing** on tuples. ✓
- We can even **slice** tuples. ✓

Properties of Tuples

1) `t = ( )`

`t = (1, 2, 3)`

`t = (2)`

`t = (2,)`

`t = 2,`

2) **Type casting tuples -**

Code:

```
a = [1, 2, 3, 4, 5]
b = tuple(a)
print(a) # List
print(b) # Tuple
```

Output:

```
[1, 2, 3, 4, 5]
(1, 2, 3, 4, 5)
```

3) Packing & Unpacking in Tuples →

```
a = (1, 2, 3)

# We are allowed to do the following -
x, y, z = a
```

Python uses tuples in its internal implementation -

Code:

```
def foo():
    return 200, 300, 400

bar = foo()
print(bar) # Tuple
```

Output:

```
(200, 300, 400)
```

Iterating over a list of tuples

Swapping values of 2 variables

```
a = 5
b = 10

# First method
temp = a
a = b
b = temp
print(a)
print(b)
```

```
a = 5
b = 10

# Second method
b = a + b  # 15
a = b - a  # 10
b = b - a  # 5
print(a)
print(b)
```

```
a = 5
b = 10

# Third method
a, b = b, a
print(a)
print(b)
```

Sets

- A Set is a collection of unique elements.
- A Set is represented using curly braces `{ }`.

Set Methods

1) .add() → Add an element in the set.

2) .remove() → Remove an element from the set.

3) .pop() → Remove the first element from the set.

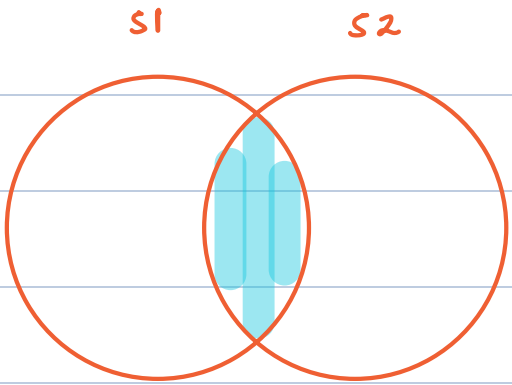
4) .update() → Update the elements in the set using a list / tuple of elements.

Set Operations

1) Intersection →

$s1 = \{2, 3, 4, 5\}$

$s2 = \{1, 3, 4, 6, 8\}$



$s1 \cap s2 = \{3, 4\}$

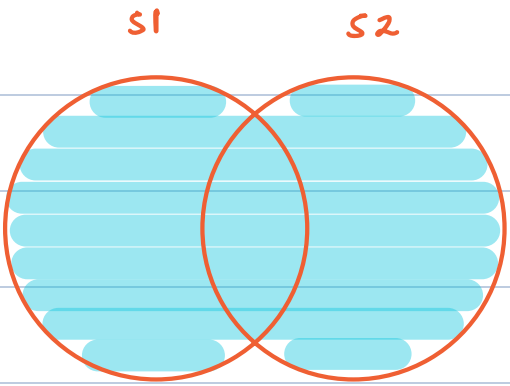
```
s1.intersection(s2)
s1 & s2
```

2) Union →

$s1 = \{2, 3, 4, 5\}$

$s2 = \{1, 3, 4, 6, 8\}$

$s1 \cup s2 = \{1, 2, 3, 4, 5, 6, 8\}$

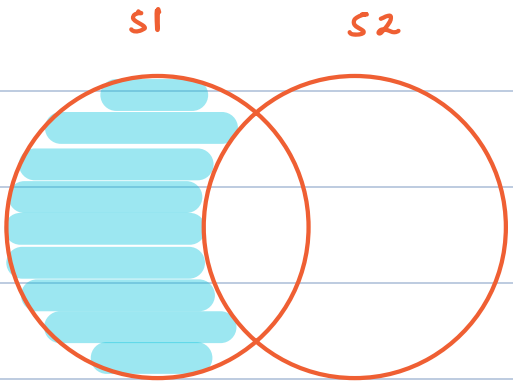



```
s1.union(s2)
s1 | s2
```

3) Difference →

s1 = { 2 , 3 , 4 , 5 }

s2 = { 1 , 3 , 4 , 6 , 8 }



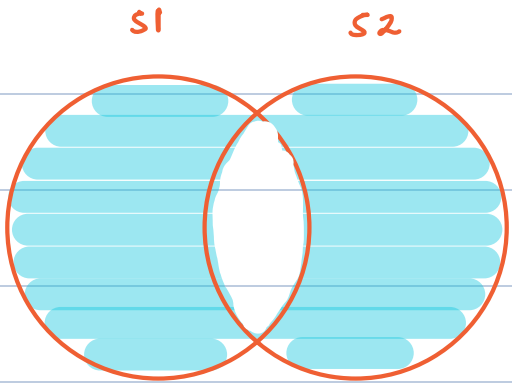
s1 − s2 = { 2, 5 }

```
s1.difference(s2)
s1 - s2
```

4) Symmetric Difference →

s1 = { 2 , 3 , 4 , 5 }

s2 = { 1 , 3 , 4 , 6 , 8 }

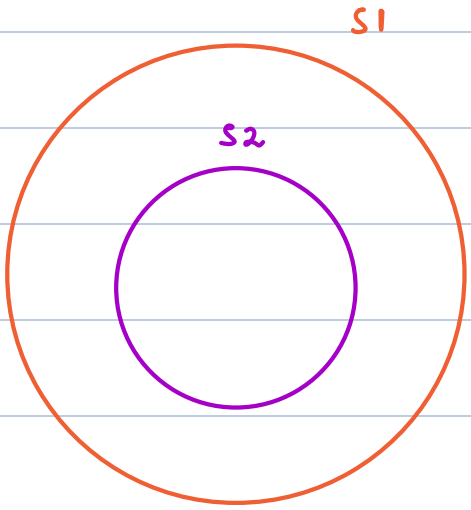


s1^s2 = { 1, 2, 5, 6, 8 }

```
s1.symmetric_difference(s2)
s1 ^ s2
```

Question-3

- You are given a string as input.
- Ascertain whether that string contains a binary number or not.



$S_2 < S_1$