Swift Sets

In this tutorial, we will learn Set and its various operations in Swift with the help of examples.

A set is a collection of unique data. That is, elements of a set cannot be duplicate. For example,

Suppose we want to store information about **student IDs**. Since **student IDs** cannot be duplicate, we can use a set.

Set of Student ID

Elements of a Set

Create a Set in Swift

Here's how we can create a set in Swift.

Output

```
Student ID: [112, 114, 115, 118, 116]
```

In the above example, notice the statement,

```
var studentID : Set = [112, 114, 115, 118, 116]
```

Here, the `Set` keyword specifies that `studentID` is a set. Since all the elements of the set are integers, `studentID` is a set of `Int` type.

However, we can also specify the type of set as

```
var studentID : Set<Int> = [112, 114, 115, 116, 118]
```

> **Note:** When you run this code, you might get output in a different order. This is because the set has no particular order.

Add Elements to a Set

We use the `insert()` method to add the specified element to a set. For example,

```
var employeeID: Set = [21, 34, 54, 12]

print("Initial Set: \(employeeID)")

// using insert method
numbers.insert(32)

print("Updated Set: \(numbers)")
```

In the above example, we have created a set named `employeeID`. Notice the line,

```
numbers.insert(32)
```

Here, `insert()` adds **32** to our set.

Remove an Element from a Set

We use the `remove()` method to remove the specified element from a set. For example,

```
var languages: Set = ["Swift", "Java", "Python"]

print("Initial Set: \(languages)")

// remove Java from a set
let removedValue = languages.remove("Java")

print("Set after remove(): \(languages)")
```

Output

```
Initial Set: ["Python", "Java", "Swift"]
Set after remove(): ["Python", "Swift"]
```

Similarly, we can also use

- `removeFirst()` - to remove the first element of a set
- `removeAll()` - to remove all elements of a set

`forEach()`	performs the specified actions on each element
`contains()`	searches the specified element in a set
`randomElement()`	returns a random element from the set
`firstIndex()`	returns the index of the given element

Iterate Over a Set

We can use the [for loop (/swift-programming/for-in-loop)](/swift-programming/for-in-loop) to iterate over the elements of a set. For example,

```
let fruits: Set = ["Apple", "Peach", "Mango"]

print("Fruits:")

// for loop to access each fruits
for fruit in fruits {
  print(fruit)
}
```

Output

```
Fruits:
Peach
Mango
Apple
```

Find Number of Set Elements

```
print("Set: \(evenNumbers)")

// find number of elements
print("Total Elements: \(evenNumbers.count)")
```

Output

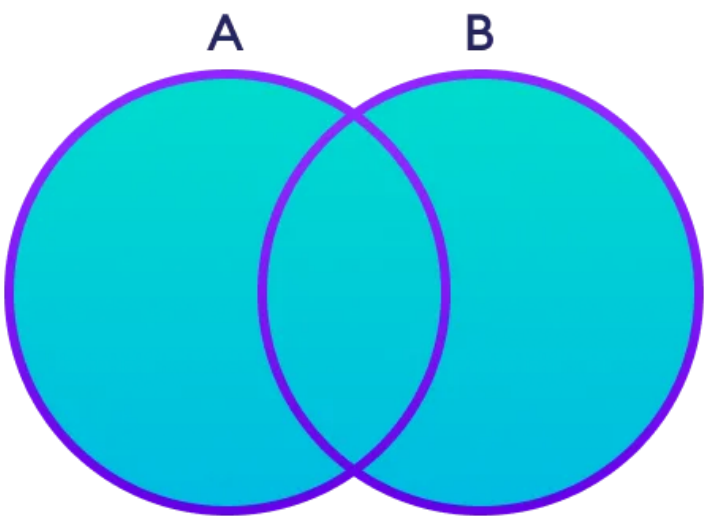
```
Set: [2, 6, 8, 4]
Total Elements: 4
```

Swift Set Operations

Swift Set provides different built-in methods to perform mathematical set operations like union, intersection, subtraction, and symmetric difference.

1. Union of Two Sets

The union of two sets **A** and **B** include all the elements of set **A** and **B**.



Union of Two Sets

```
let setA: Set = [1, 3, 5]
print("Set A: ", setA)

// second set
let setB: Set = [0, 2, 4]
print("Set B: ", setB)

// perform union operation
print("Union: ", setA.union(setB))
```

Output

```
Set A:  [1, 5, 3]
Set B:  [0, 2, 4]
Union: [0, 5, 2, 4, 1, 3]
```

Note: `setA.union(setB)` is equivalent to `A ∪ B` set operation.

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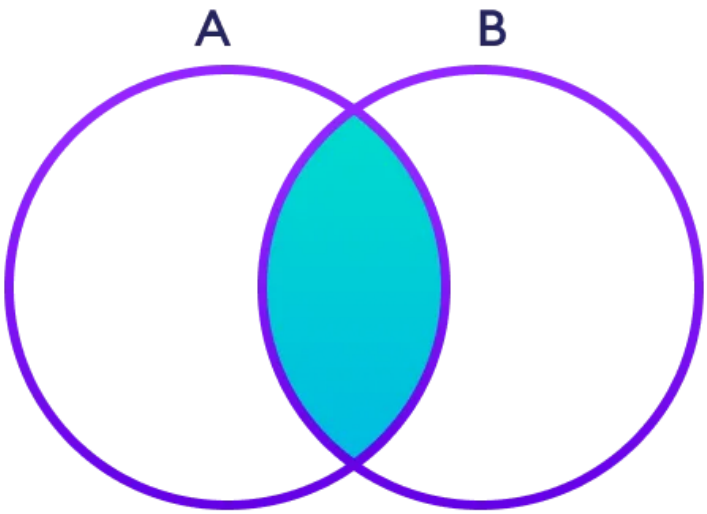
2. Intersection between Two Sets



Intersection of Two Sets

We use the `intersection()` method to perform the intersection between two sets. For example,

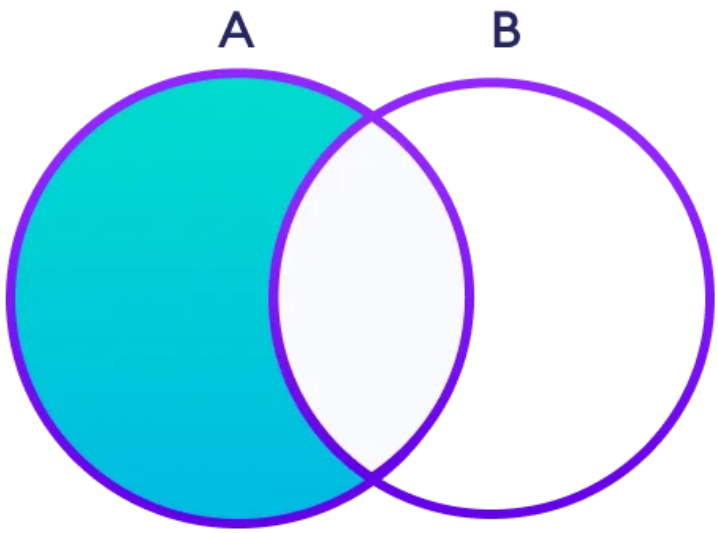
```
// first set
let setA: Set = [1, 3, 5]
print("Set A: ",  setA)

// second set
let setB: Set = [1, 2, 3]
print("Set B: ",  setB)

// perform intersection operation
print("Intersection: ", setA.intersection(setB))
```

Output

Note: `setA.intersection(setB)` is equivalent to `A ∩ B` set operation.

3. Difference between Two Sets

The difference between two sets **A** and **B** include elements of set **A** that are not present on set **B**.



Difference Between Two Sets

We use the `subtracting()` method to perform the difference between two sets. For example,

```
let setB: Set = [1, 2, 6]
print("Set B: ",  setB)

// perform subtraction operation
print("Subtraction: ", setA.subtracting(setB))
```

Output

```
Set A:  [3, 5, 2]
Set B:  [1, 6, 2]
Subtraction:  [3, 5]
```

> **Note:** `setA.substracting(setB)` is equivalent to `A - B` set operation.

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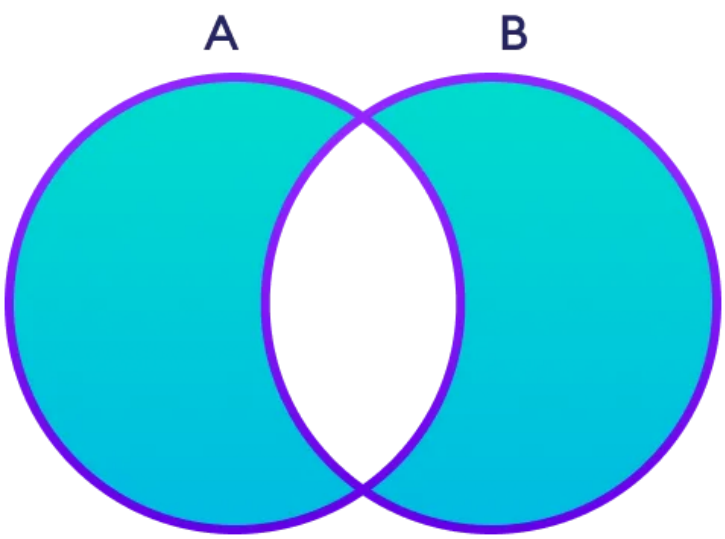
4. Symmetric Difference between Two Sets

The symmetric difference between two sets **A** and **B** includes all elements of **A** and **B** without the common elements.



```
// first set
let setA: Set = [2, 3, 5]
print("Set A: ",  setA)

// second set
let setB: Set = [1, 2, 6]
print("Set B: ",  setB)

// perform symmetric difference operation
print("Symmetric Difference: ", setA.symmetricDifference(setB))
```

Output

```
Set A:  [5, 2, 3]
Set B:  [2, 6, 1]
Symmetric Difference:  [1, 6, 3, 5]
```

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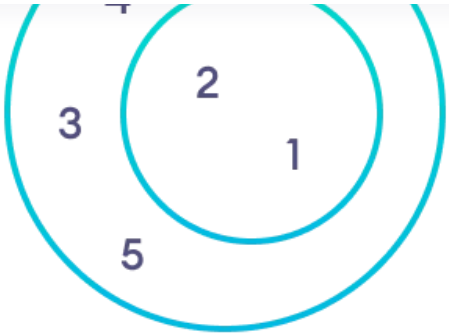
5. Check Subset of a Set

Set **B** is said to be the subset of set **A** if all elements of **B** are also present in **A**.



Subset of a Set

We use the `Subset()` method to check if one set is a subset of another or not. For example,

```
// first set
let setA: Set = [1, 2, 3, 5, 4]
print("Set A: ",  setA)

// second set
let setB: Set = [1, 2]
print("Set B: ",  setB)

// check if setB is subset of setA or not
print("Subset: ", setB.isSubset(of: setA))
```

Output

```
Set A:  [3, 1, 2, 5]
Set B:  [1, 2]
Subset:  true
```

Check if two sets are equal

```
let setB: Set = [3, 5, 1]

if setA == setB {
  print("Set A and Set B are equal")
}
else {
  print("Set A and Set B are different")
}
```

Output

```
Set A and Set B are equal
```

In the above example, `setA` and `setB` have the same elements, so the condition

```
if setA == setB
```

evaluates to `true`. Hence, the statement `print("Set A and Set B are same")` inside the `if` is executed.

Create an Empty Set

In Swift, we can also create an empty set. For example,

```
var emptySet = Set<Int>()
print("Set:", emptySet)
```

Output

```
Set: [ ]
```

Next Tutorial:
Swift Dictionary (/swift-programming/dictionary)

Previous Tutorial:
Swift Arrays (/swift-programming/arrays)

Swift Arrays

(/swift-programming/arrays)

Swift Tutorial

Swift Dictionary

(/swift-programming/dictionary)

Swift Tutorial

Swift Tuple

(/swift-programming/tuples)

Swift Tutorial

Swift Ranges

(/swift-programming/ranges)