# IMPLEMENTING SETS – UNION, INTERSECTION, DIFF

**Lab Goal:** Instead of using the Java defined implementation of sets, we will design our own Set implementation for this project. To do this,

**Lab Description :** Read in 2 Sets of numbers. Then, you are to perform the set operations of union, intersection, difference, and symmetric difference on the 2 Sets.

```
1 2 3 4 5
4 5 6 7 8
```

**Files Needed ::**

**MathSet.java**
**MathSetRunner.java**
**mathsetdata.dat**

UNION – all of the items in both Sets - **1 2 3 4 5 6 7 8**
INTERSECTION – the items that occur in both Sets - **4 5**
DIFFERENCE A-B – the items that occur in A, but not in B **- 1 2 3**
DIFFERENCE B-A – the items that occur in B, but not in A **- 6 7 8**
SYMMMETRIC DIFFERENCE – the items that occur in either Set, but not in both **- 1 2 3 6 7 8**

## Sample Data :

```
1 2 3 4 5
4 5 6 7 8
10 11 12 13 14 15 16 17
11 13 15 17 19 21 23
4 5 5 6 76 7 7 8 8 8 8 8
23 3 4 3 5 3 53 5 46 46 4 6 5 3 4
```

## Sample Output :

```
Set one [1, 2, 3, 4, 5]
Set two [4, 5, 6, 7, 8]

union - [1, 2, 3, 4, 5, 6, 7, 8]
intersection - [4, 5]
difference A-B - [1, 2, 3]
difference B-A - [6, 7, 8]
symmetric difference [1, 2, 3, 6, 7, 8]


Set one [10, 11, 12, 13, 14, 15, 16, 17]
Set two [11, 13, 15, 17, 19, 21, 23]

union - [10, 11, 12, 13, 14, 15, 16, 17, 19, 21, 23]
intersection - [11, 13, 15, 17]
difference A-B - [10, 12, 14, 16]
difference B-A - [19, 21, 23]
symmetric difference [10, 12, 14, 16, 19, 21, 23]


Set one [4, 5, 6, 7, 8, 76]
Set two [3, 4, 5, 6, 23, 46, 53]

union - [3, 4, 5, 6, 7, 8, 23, 46, 53, 76]
```

***Useful Collection methods***

```
retainAll( )
addAll( )
removeAll( )
```

```
intersection - [4, 5, 6]
difference A-B - [7, 8, 76]
difference B-A - [3, 23, 46, 53]
symmetric difference [3, 7, 8, 23, 46, 53, 76]
```