

Practice Exercise #16: Set Containment

http://www.comp.nus.edu.sg/~cs1020/4_misc/practice.html

Objectives:

1. Using **ArrayList** class.
2. Creating your own class.

Task statement:

Write a program **Set.java** to define a class **Set** that includes the attribute

- private `ArrayList<Integer>` members

which is an array of integers. This class should include a **toString()** method and **isSubset()** method which are used by clients. The **isSubset()** method has the following header and purpose:

- public boolean **isSubset**(Set set)
To return true if 'this' is a subset of 'set', or false otherwise.

Set *A* is a subset of set *B* if for every element in *A*, it is also present in *B*. For example, { 5, 3 } is a subset of { 7, 3, 8, 5 }, but { 4, 2, 1 } is not a subset of { 1, 4, 3 }, and { 12, 10 } is also not a subset of { 10, 20, 30 }.

Write a client program **TestSet.java** to test your **Set** class. The program reads in data for two sets and creates two **Set** objects, and then compares them to see if the first set is a subset of the second.

It also compares to see if they are the same set. However, for this you are not to create an **equals()** method in the **Set** class; you are to use the **isSubset()** method.

You may assume that the values read into a set have no duplicates (which is what a set should be).

Sample run #1:

```
Enter number of elements in set A: 3
Enter elements for set A: 25 10 16
Enter number of elements in set A: 5
Enter elements for set A: 7 16 10 32 25
Set A: [25, 10, 16]
Set B: [7, 16, 10, 32, 25]
Set A is a subset of set B.
Set A is not equal to set B.
```

Sample run #2:

```
Enter number of elements in set A: 4
Enter elements for set A: 2 6 1 3
Enter number of elements in set A: 3
Enter elements for set A: 1 6 2
Set A: [2, 6, 1, 3]
Set B: [1, 6, 2]
Set A is not a subset of set B.
Set A is not equal to set B.
```

Sample run #3:

```
Enter number of elements in set A: 4
Enter elements for set A: 2 6 1 3
Enter number of elements in set A: 4
Enter elements for set A: 1 3 6 2
Set A: [2, 6, 1, 3]
Set B: [1, 3, 6, 2]
Set A is a subset of set B.
Set A is equal to set B.
```