

# Sets - Symmetric Difference

## Objective

Today, we're learning about a new data type: *sets*.

## Concept

If the inputs are given on one line separated by a space character, use *split()* to get the separate values in the form of a list:

```
>> a = raw_input()
5 4 3 2
>> lis = a.split()
>> print (lis)
['5', '4', '3', '2']
```

If the list values are all integer types, use the *map()* method to convert all the strings to integers.

```
>> newlis = list(map(int, lis))
>> print (newlis)
[5, 4, 3, 2]
```

Sets are an unordered bag of unique values. A single set contains values of any immutable data type.

## CREATING SETS

```
>> myset = {1, 2} # Directly assigning values to a set
>> myset = set() # Initializing a set
>> myset = set(['a', 'b']) # Creating a set from a list
>> myset
{'a', 'b'}
```

## MODIFYING SETS

Using the *add()* function:

```
>> myset.add('c')
>> myset
{'a', 'c', 'b'}
>> myset.add('a') # As 'a' already exists in the set, nothing happens
>> myset.add((5, 4))
>> myset
{'a', 'c', 'b', (5, 4)}
```

Using the *update()* function:

```
>> myset.update([1, 2, 3, 4]) # update() only works for iterable objects
>> myset
{'a', 1, 'c', 'b', 4, 2, (5, 4), 3}
>> myset.update({1, 7, 8})
>> myset
{'a', 1, 'c', 'b', 4, 7, 8, 2, (5, 4), 3}
>> myset.update({1, 6}, [5, 13])
```

```
>>> myset
{'a', 1, 'c', 'b', 4, 5, 6, 7, 8, 2, (5, 4), 13, 3}
```

## REMOVING ITEMS

Both the *discard()* and *remove()* functions take a single value as an argument and removes that value from the set. If that value is not present, *discard()* does nothing, but *remove()* will raise a `KeyError` exception.

```
>>> myset.discard(10)
>>> myset
{'a', 1, 'c', 'b', 4, 5, 7, 8, 2, 12, (5, 4), 13, 11, 3}
>>> myset.remove(13)
>>> myset
{'a', 1, 'c', 'b', 4, 5, 7, 8, 2, 12, (5, 4), 11, 3}
```

**COMMON SET OPERATIONS** Using *union()*, *intersection()* and *difference()* functions.

```
>>> a = {2, 4, 5, 9}
>>> b = {2, 4, 11, 12}
>>> a.union(b) # Values which exist in a or b
{2, 4, 5, 9, 11, 12}
>>> a.intersection(b) # Values which exist in a and b
{2, 4}
>>> a.difference(b) # Values which exist in a but not in b
{9, 5}
```

The *union()* and *intersection()* functions are symmetric methods:

```
>>> a.union(b) == b.union(a)
True
>>> a.intersection(b) == b.intersection(a)
True
>>> a.difference(b) == b.difference(a)
False
```

These [other built-in data structures in Python](#) are also useful.

## Task

Given **2** sets of integers,  $M$  and  $N$ , print their symmetric difference in ascending order. The term *symmetric difference* indicates those values that exist in either  $M$  or  $N$  but do not exist in both.

## Input Format

The first line of input contains an integer,  $M$ .

The second line contains  $M$  space-separated integers.

The third line contains an integer,  $N$ .

The fourth line contains  $N$  space-separated integers.

## Output Format

Output the symmetric difference integers in ascending order, one per line.

## Sample Input

```
4
2 4 5 9
```

```
4
2 4 11 12
```

## Sample Output

```
5
9
11
12
```