

Sets

A set is a collection of unique values. Any duplicate values are removed from a set when it is used. A set has some similarities with a list;

- it is mutable - we can change values in a set.
- it is iterable - we can loop through the data in a set

Sets are defined using curly brackets.

```
a = {1, 2, 3, 4}

print(a)
print(type(a))
```

In the first line we declare the set, then we print it. In the last line we are finding out the type of data a is.

A set does not allow duplicate items. Try this and see the result

```
b = {1, 2, 2, 3, 4, 4, 5, 5}
print(b)
```

In your output, all duplicate values should be removed leaving only unique values in the set.

Another way of creating sets is by casting a list to a set using the set method. Type this and click run.

```
a = ['a', 'b', 'c', 'b', 'e']  
b = set(a)  
print(b)
```

As you can see the set does not preserve the order of items as per our definition of a set above. The more you print it you will notice that items in the set b could be printed in any order.

Set methods

For these examples, I would like you to define these three sets and try the following methods

```
s1 = {1, 2, 3, 4, 5}
s2 = {'a', 'b', 'c', 'd', 'd'}
s3 = {3, 4, 5, 6, 7}
```

Add

add() - Adds an item to a set

```
s1.add(6)
print(s1)
```

Update

update() - Adds multiple items to a set.

```
s2.update(['e', 'f', 'g'])
print(s2)
```

In - Check if an item is present in a set. Try these two

```
print('a' in s2)
print('z' in s2)
```

Remove

remove() - Removes an item from the set

```
s1.remove(6)
print(s1)
```

`remove()` raises an error if the item does not exist in the set.

Try this and click run. You should get an error since 7 does not exist in s1

```
s1.remove(7)
```

Discard

`discard()` is just like `remove()` but it does not raise an error if the item does not exist in the set. This should not throw an error.

```
s1.discard(7)
```

Sets are also very useful for computing mathematical operations such as intersection, union, difference between two sets of data. Using the same sets defined previously try the following examples. Study the output to understand each set method.

Difference

difference() - Returns a set containing the difference between two sets.

```
x = s1.difference(s3)
print(x)

y = s3.difference(s1)
print(y)
```

Union

union() - returns a set containing all the numbers in two sets, duplicates excluded.

```
s4 = s1.union(s3)
print(s4)
```

Intersection

intersection() - returns a set containing elements that exist in both sets

```
s5 = s1.intersection(s3)
print(s5)
```

