Day 2 Session 2

Arrays (Lists, Sets, Dictionaries, Tuples)

Arrays

An array is a collection of items stored at contiguous memory locations. The idea is to store multiple items of the same type together. This makes it easier to calculate the position of each element by simply adding an offset to a base value, i.e., the memory location of the first element of the array (generally denoted by the name of the array).

Creating a Array
Array in Python can be created by importing array module. **array(*data_type*, *value_list*)** is used to create an array with data type and value list specified in its arguments.

Code:

```
import array as arr
a = arr.array('i', [1, 2, 3])
print("The new created array is : " , end=" ")
for i in range(0, 3):
    print(a[i], end=" ")
print()
```

Adding And Removing Elements to a Array

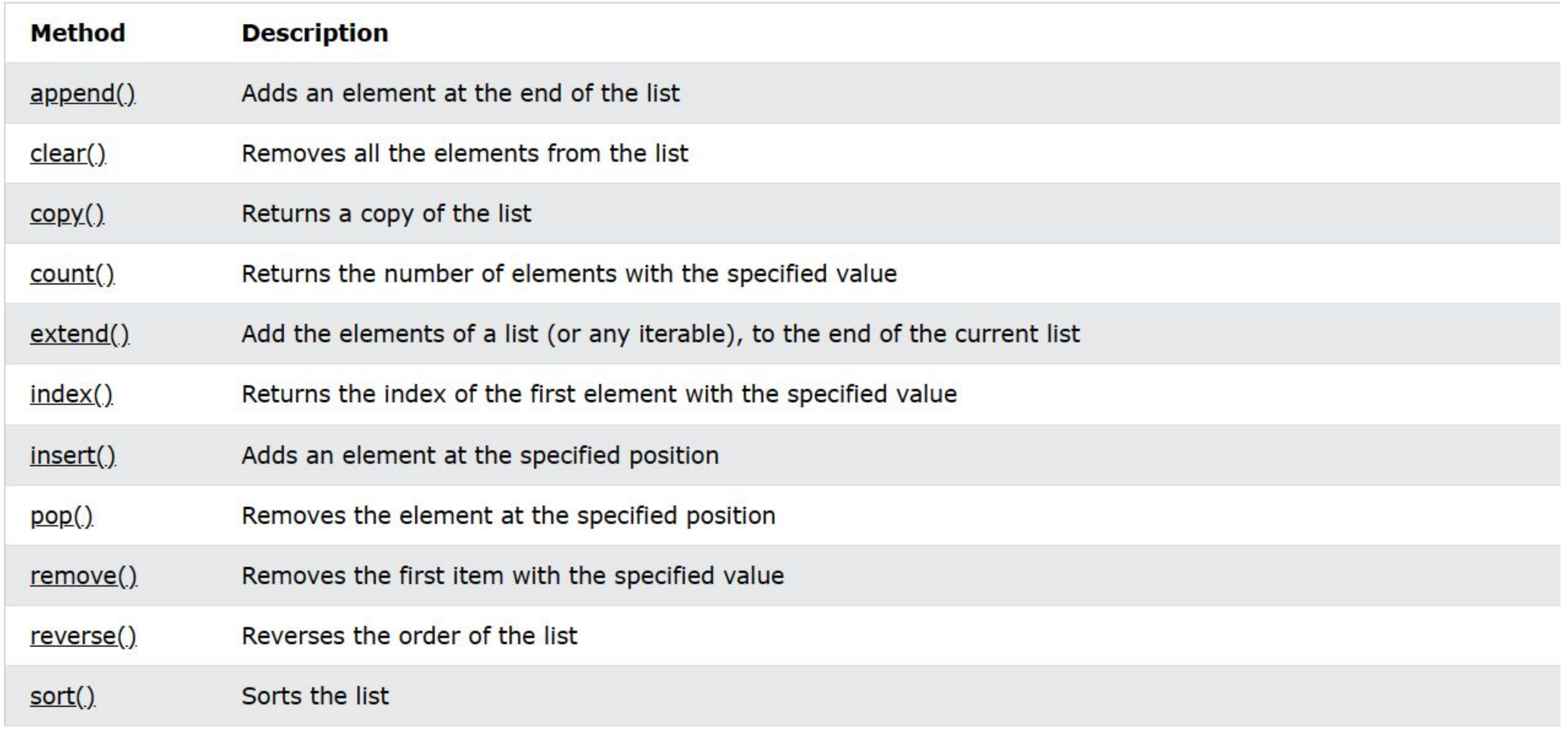
Adding Elements from the Array

Elements can be added to the Array by using built-in insert() function. Insert is used to insert one or more data elements into an array. Based on the requirement, a new element can be added at the beginning, end, or any given index of array. append() is also used to add the value mentioned in its arguments at the end of the array.

Removing Elements from the Array

Elements can be removed from the array by using built-in remove() function but an Error arises if element doesn't exist in the set. Remove() method only removes one element at a time, to remove range of elements, iterator is used. pop() function can also be used to remove and return an element from the array, but by default it removes only the last element of the array, to remove element from a specific position of the array, index of the element is passed as an argument to the pop() method.

Array/List Methods



Method	Description
append()	Adds an element at the end of the list
clear()	Removes all the elements from the list
copy()	Returns a copy of the list
count()	Returns the number of elements with the specified value
extend()	Add the elements of a list (or any iterable), to the end of the current list
index()	Returns the index of the first element with the specified value
insert()	Adds an element at the specified position
pop()	Removes the element at the specified position
remove()	Removes the first item with the specified value
reverse()	Reverses the order of the list
sort()	Sorts the list

Lists

Lists are used to store multiple items in a single variable.

Lists are one of 4 built-in data types in Python used to store collections of data, the other 3 are Tuple, Set, and Dictionary, all with different qualities and usage.

Lists are created using square brackets:

Code:

```
thislist = ["apple", "banana", "cherry"]

print(thislist)
```

Output:

```
  ['apple', 'banana', 'cherry']
```

Sets

A Set in Python programming is an unordered collection data type that is iterable, mutable and has no duplicate elements.

Set are represented by { } (values enclosed in curly braces)

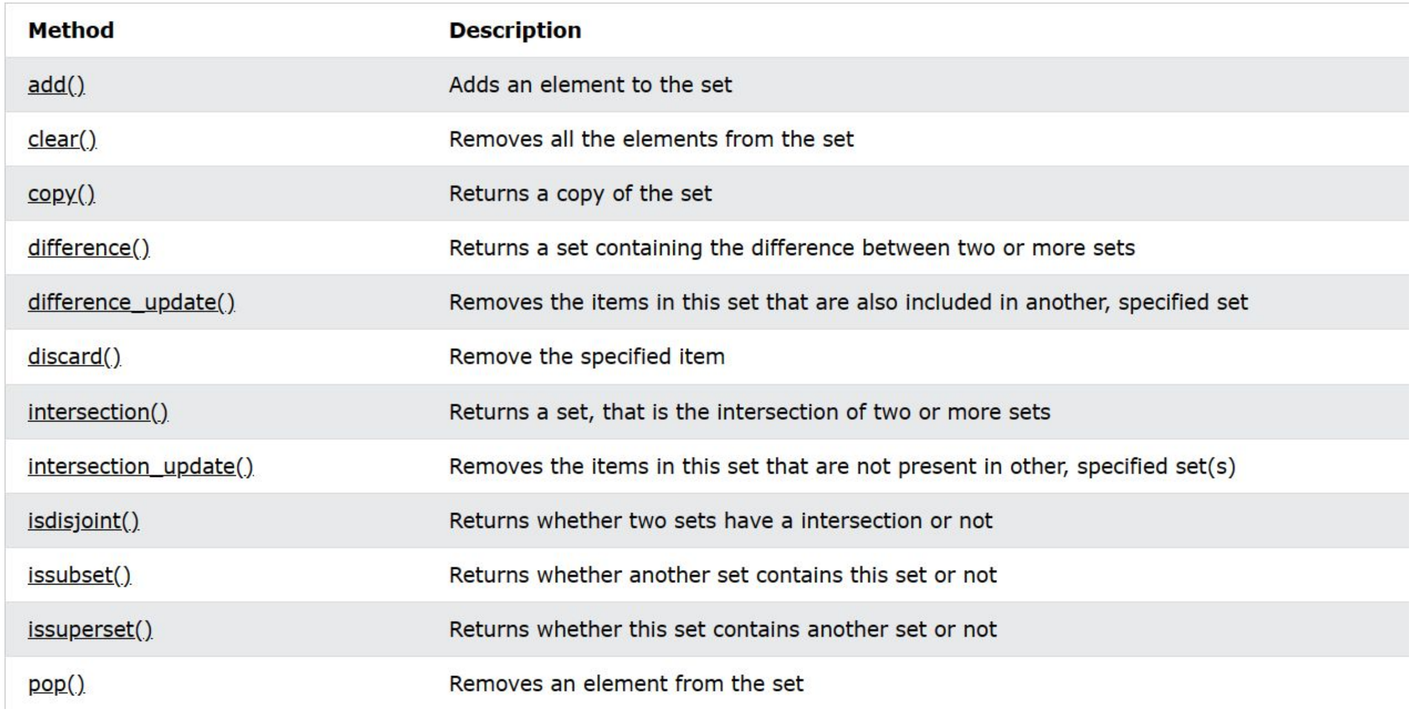
Code:

```
var = {"Geeks", "for", "Geeks"}
type(var)
```

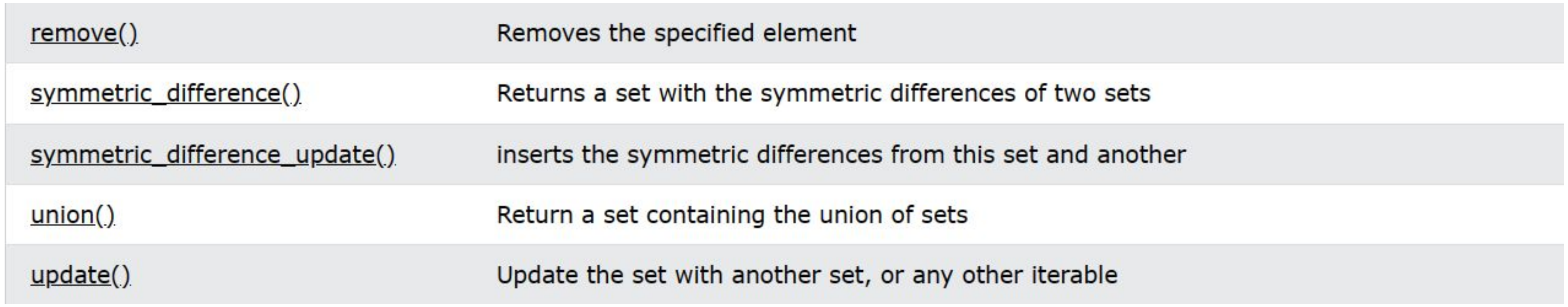
Output:

```
set
```

Set Methods



Method	Description
add()	Adds an element to the set
clear()	Removes all the elements from the set
copy()	Returns a copy of the set
difference()	Returns a set containing the difference between two or more sets
difference_update()	Removes the items in this set that are also included in another, specified set
discard()	Remove the specified item
intersection()	Returns a set, that is the intersection of two or more sets
intersection_update()	Removes the items in this set that are not present in other, specified set(s)
isdisjoint()	Returns whether two sets have a intersection or not
issubset()	Returns whether another set contains this set or not
issuperset()	Returns whether this set contains another set or not
pop()	Removes an element from the set



remove()	Removes the specified element
symmetric_difference()	Returns a set with the symmetric differences of two sets
symmetric_difference_update()	inserts the symmetric differences from this set and another
union()	Return a set containing the union of sets
update()	Update the set with another set, or any other iterable

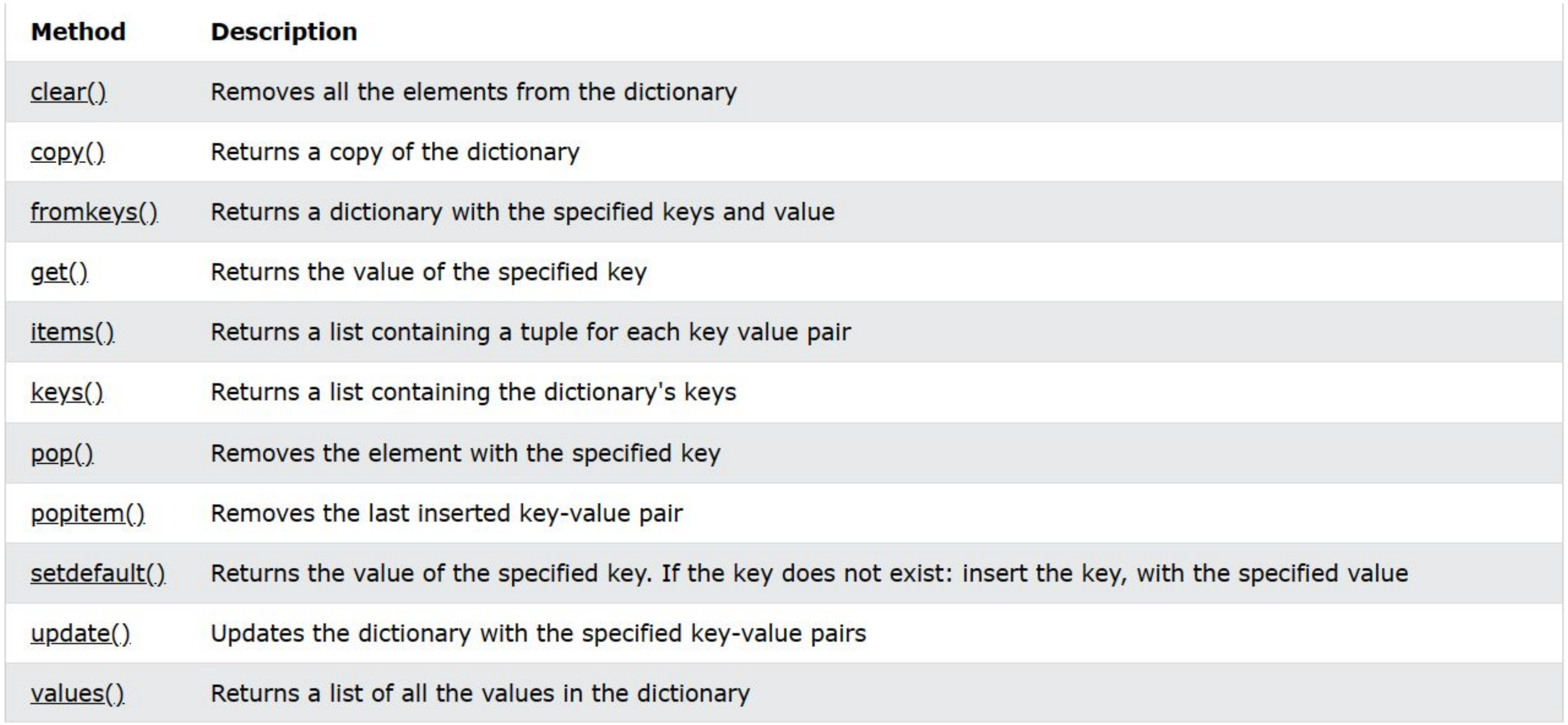
Dictionaries

Dictionary in Python is a collection of keys values, used to store data values like a map, which, unlike other data types which hold only a single value as an element.

Creating a Dictionary

In Python, a dictionary can be created by placing a sequence of elements within curly **{}** braces, separated by ‘comma’. Dictionary holds pairs of values, one being the Key and the other corresponding pair element being its **Key:value**. Values in a dictionary can be of any data type and can be duplicated, whereas keys can’t be repeated and must be *immutable*.

Dictionary Methods



Method	Description
clear()	Removes all the elements from the dictionary
copy()	Returns a copy of the dictionary
fromkeys()	Returns a dictionary with the specified keys and value
get()	Returns the value of the specified key
items()	Returns a list containing a tuple for each key value pair
keys()	Returns a list containing the dictionary's keys
pop()	Removes the element with the specified key
popitem()	Removes the last inserted key-value pair
setdefault()	Returns the value of the specified key. If the key does not exist: insert the key, with the specified value
update()	Updates the dictionary with the specified key-value pairs
values()	Returns a list of all the values in the dictionary

TUPLES

Python Tuple is a collection of objects separated by commas. In some ways, a tuple is similar to a Python list in terms of indexing, nested objects, and repetition but the main difference between both is Python tuple is immutable, unlike the Python list which is mutable.

Create Tuples using Round Brackets ():

To create a tuple we will use () operators.

Code:

```
var = ("Geeks", "for", "Geeks")
print(var)
```

Output:

```
('Geeks', 'for', 'Geeks')
```

What is Immutable in Tuples?

Tuples in Python are similar to Python lists but not entirely. Tuples are immutable and ordered and allow duplicate values. Some Characteristics of Tuples in Python.

- We can find items in a tuple since finding any item does not make changes in the tuple.
- One cannot add items to a tuple once it is created.
- Tuples cannot be appended or extended.
- We cannot remove items from a tuple once it is created.

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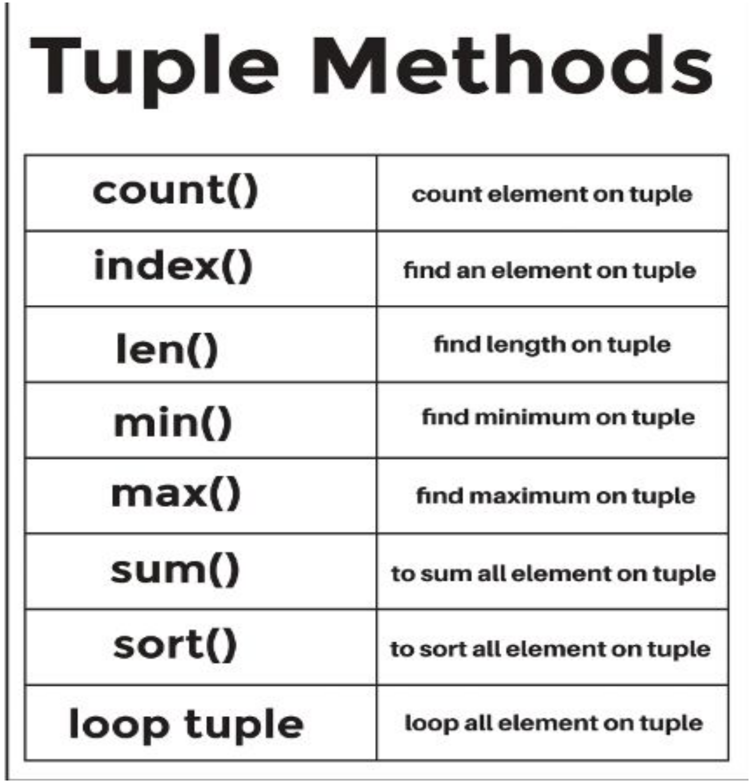

Tuple Methods

count()	count element on tuple
index()	find an element on tuple
len()	find length on tuple
min()	find minimum on tuple
max()	find maximum on tuple
sum()	to sum all element on tuple
sort()	to sort all element on tuple
loop tuple	loop all element on tuple