Hi! I am Python

Python Programming Language

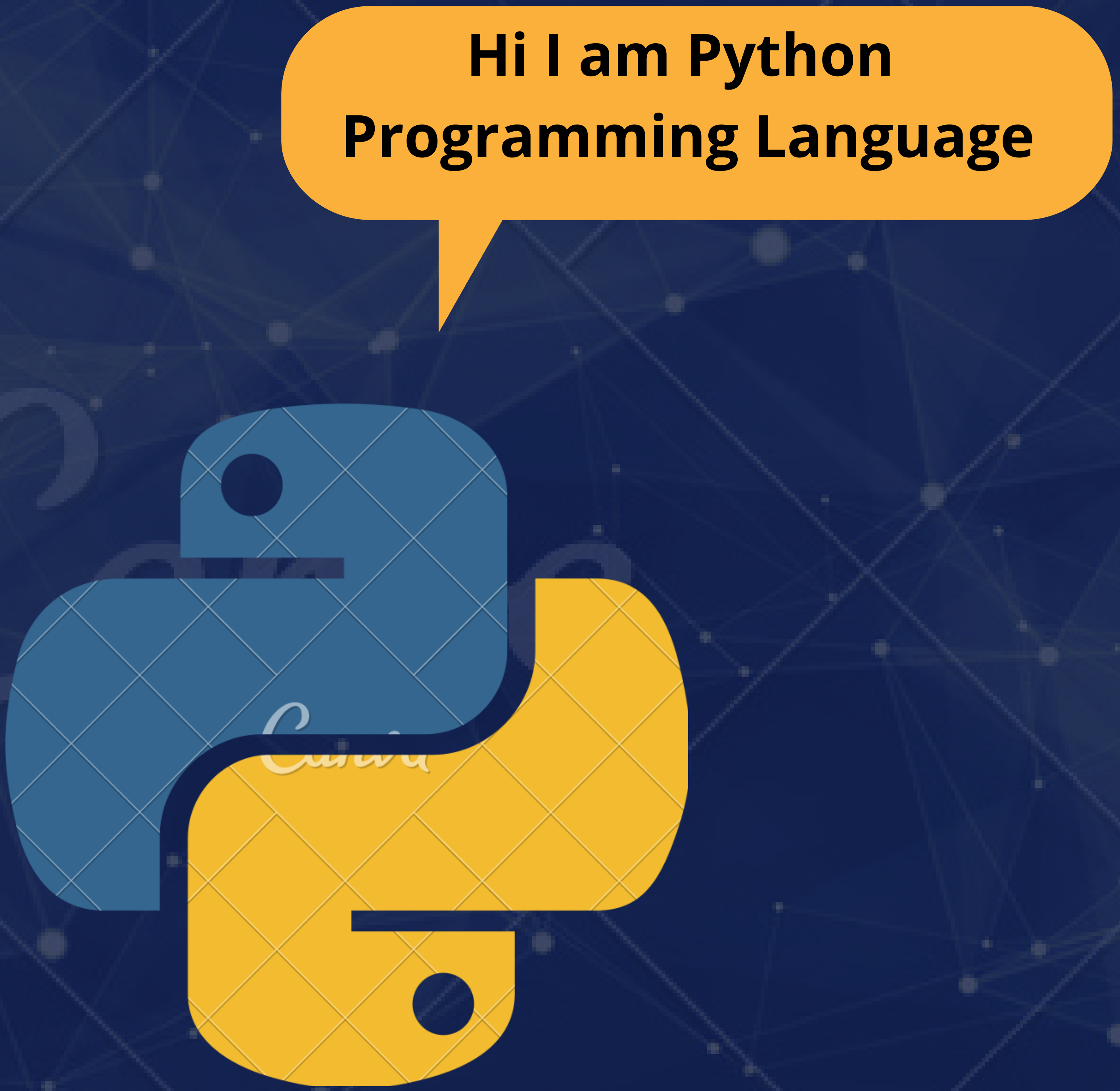


Table Of Contents

Variables in Memory

a = 10
memory for 10 is 12345

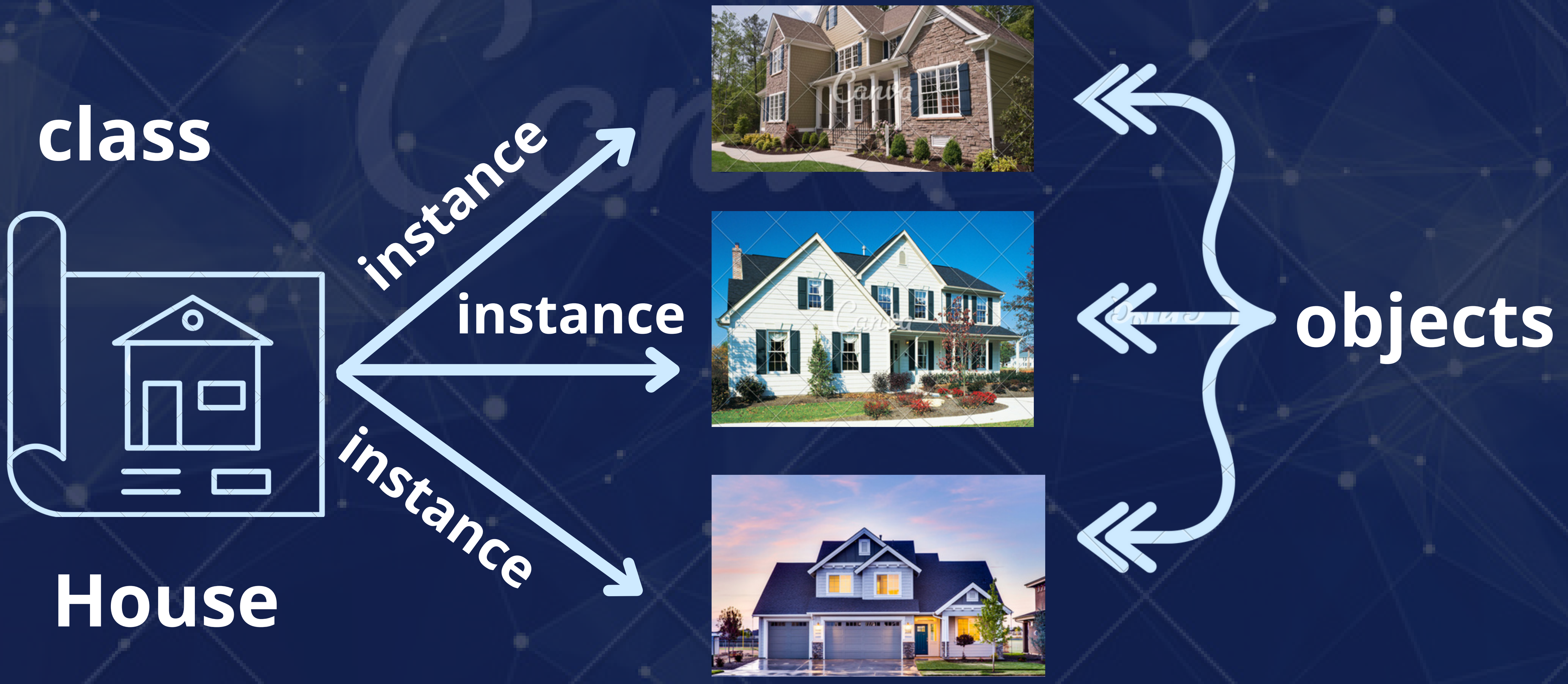
b = 10
memory for 10 is 12345

a = 12
memory for 12 is 12347

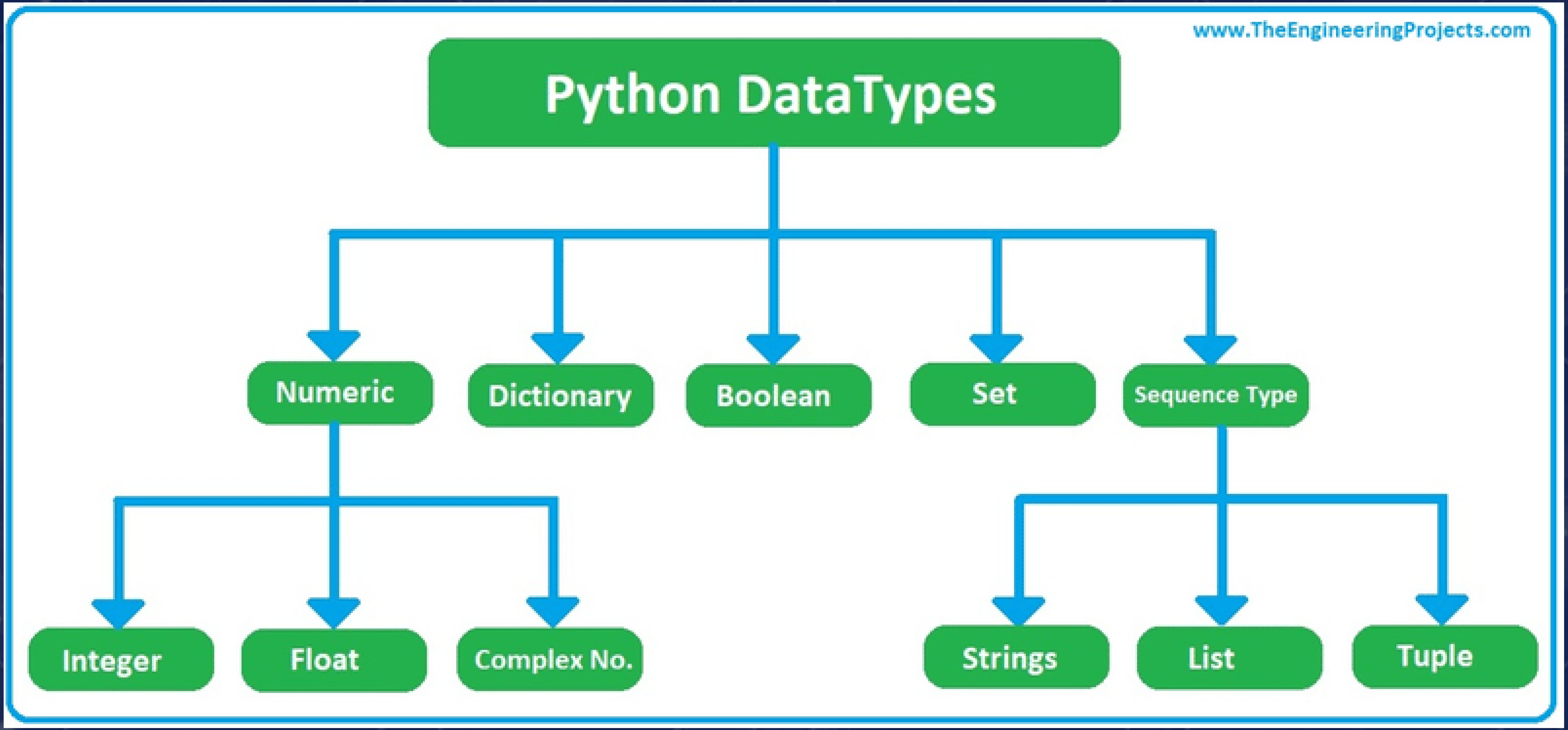
b = 11
memory for 11 is 12346

Data Types

Data types are the classification or categorization of data items. It represents the kind of value that tells what operations can be performed on a particular data.Since everything is an object in Python programming, **data types are actually classes and variables are instance (object) of these classes.**



Built in Data Types(cont.)



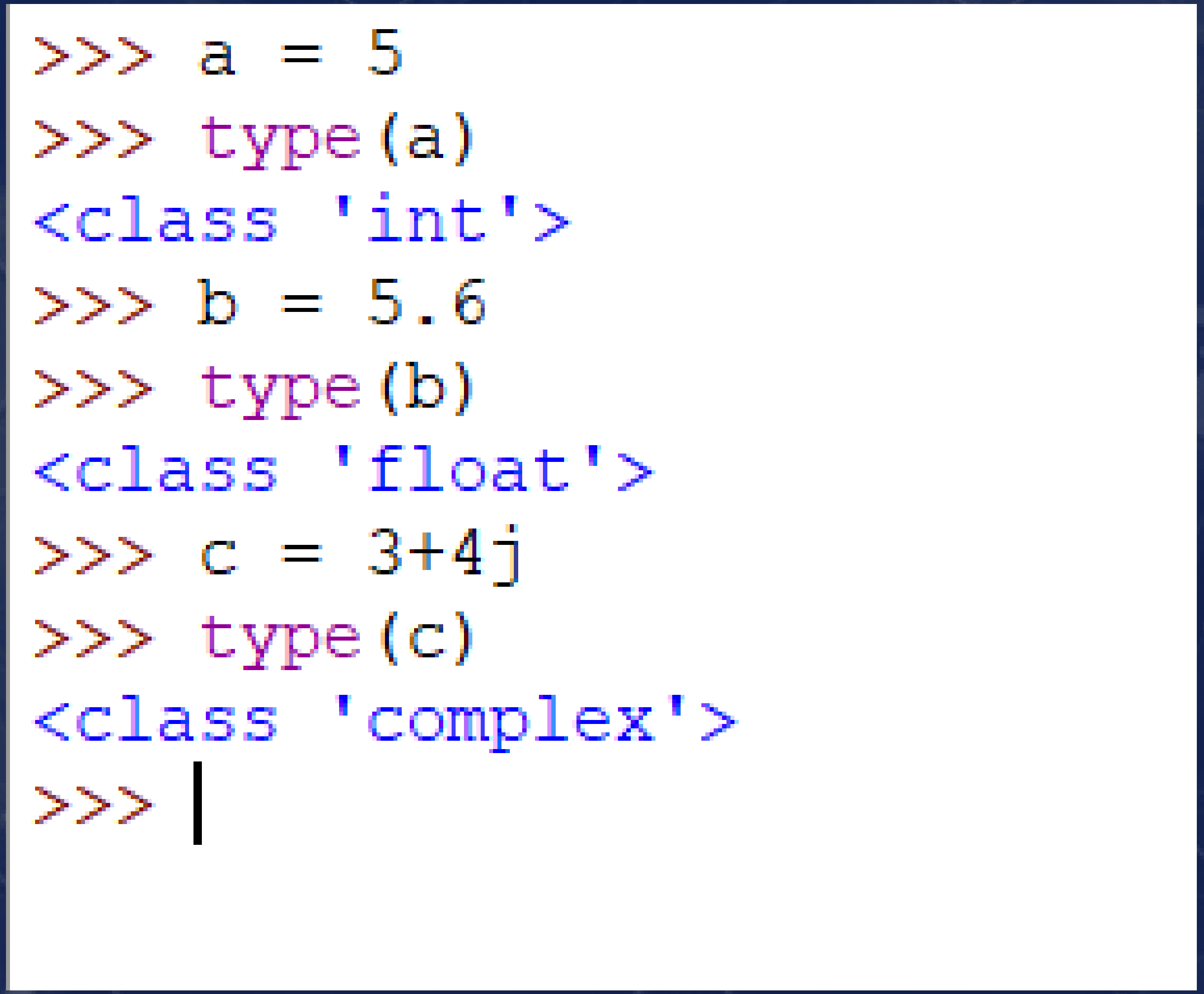
Numeric Data

numeric data type represent the data which has numeric value. Numeric value can be integer, floating number or even complex numbers. These values are defined as int, float and complex class in Python.

- **Integers** – This value is represented by int class. **In Python there is no limit to how long an integer value can be**. **-3,-2,-1,0,1,2,3 . int()**
- **Float** – This value is represented by float class. It is a real number with floating point representation. **9.34,9.00,3.45 . float()**
- **Complex Numbers** – Complex number is represented by complex class. It is specified as (real part) + (imaginary part)j. For example – **2+3j . complex()**

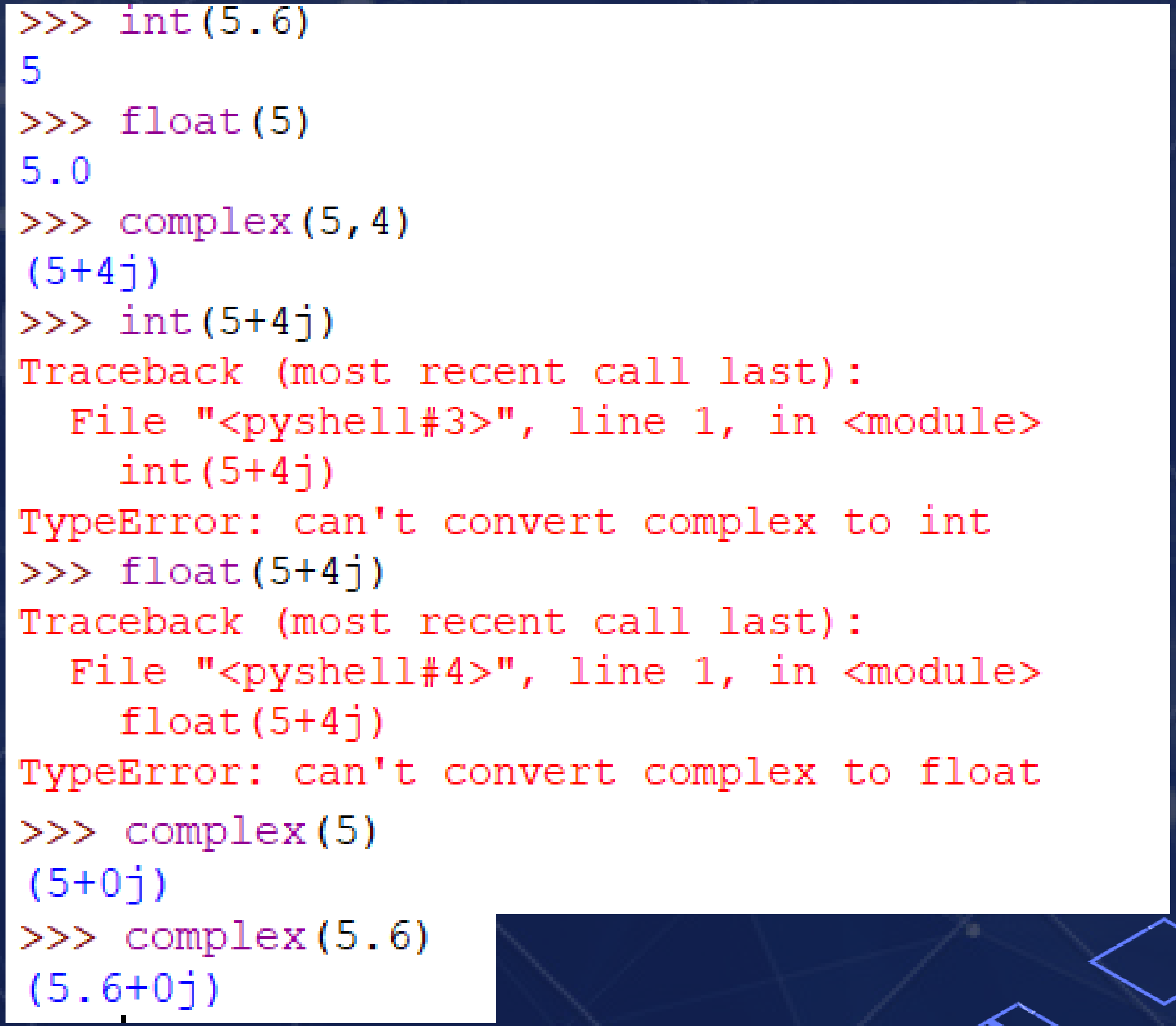
Numeric Data type example using type() function :

type checking :



```
>>> a = 5
>>> type(a)
<class 'int'>
>>> b = 5.6
>>> type(b)
<class 'float'>
>>> c = 3+4j
>>> type(c)
<class 'complex'>
>>> |
```

type conversion :



```
>>> int(5.6)
5
>>> float(5)
5.0
>>> complex(5,4)
(5+4j)
>>> int(5+4j)
Traceback (most recent call last):
  File "<pyshell#3>", line 1, in <module>
    int(5+4j)
TypeError: can't convert complex to int
>>> float(5+4j)
Traceback (most recent call last):
  File "<pyshell#4>", line 1, in <module>
    float(5+4j)
TypeError: can't convert complex to float
>>> complex(5)
(5+0j)
>>> complex(5.6)
(5.6+0j)
```

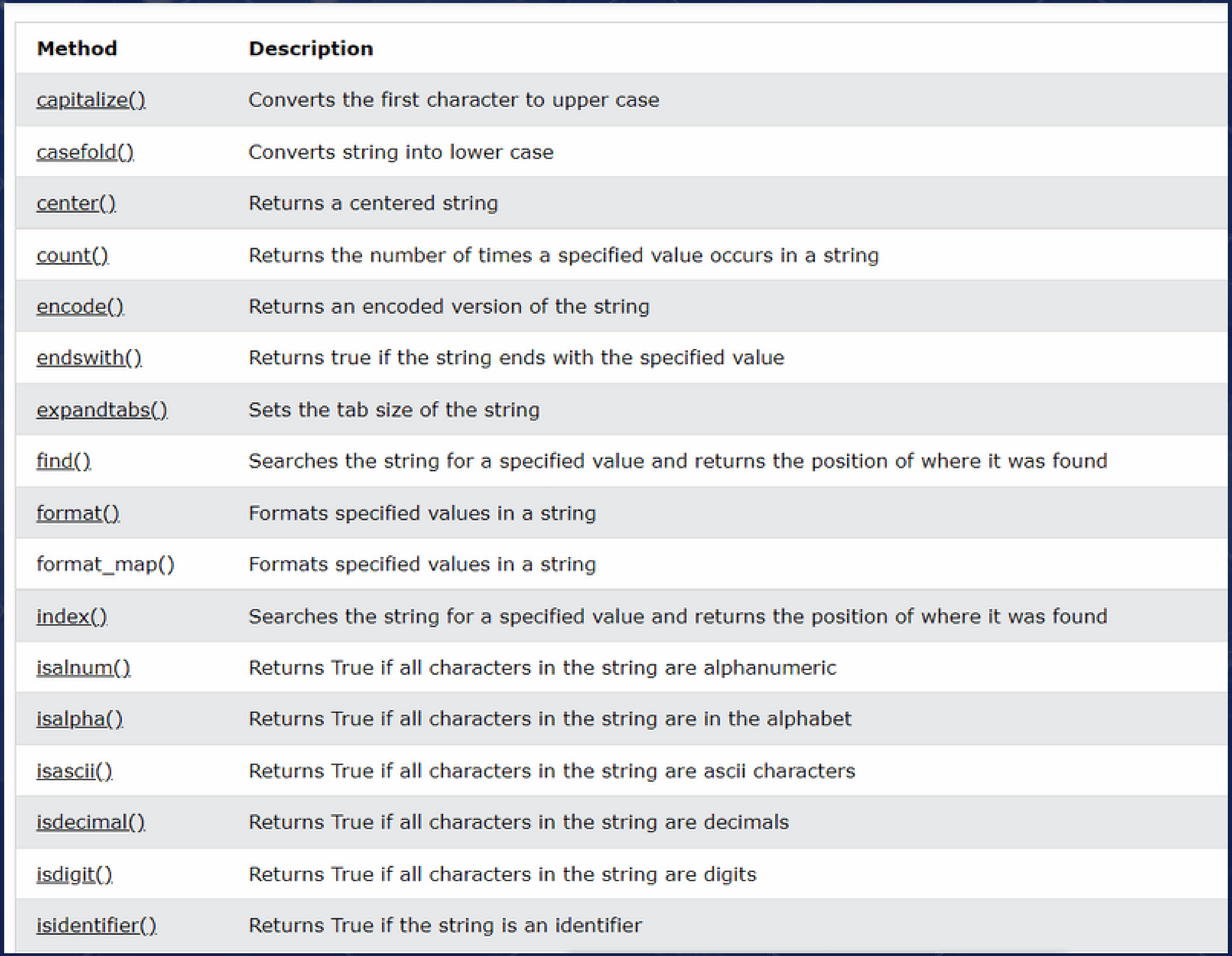
Sequence Type

In Python, sequence is the **ordered collection of similar or different data types**.

1) String : (immutable)
A string is a collection of one or more characters put in a single quote, double-quote or triple quote. In python there is no character data type, a character is a string of length one. It is represented by **str** class. example : **'hello', "hello", """hello""". str()**

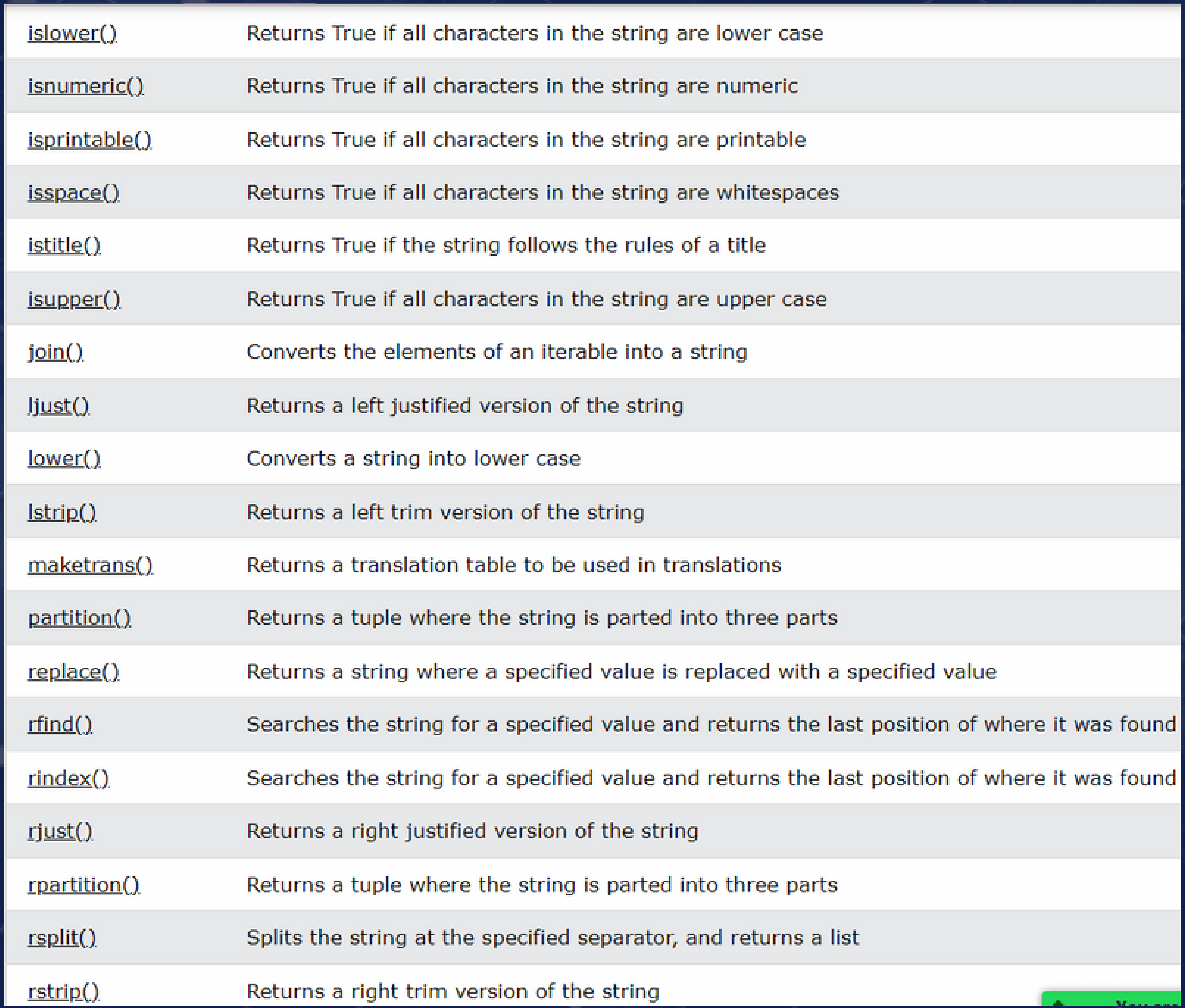
2) List : (mutable)
Lists are just like the arrays, declared in other languages which is an ordered collection of data. It is very flexible as the items in a list do not need to be of the same type . **example : data = [1,2,3,4,5,'food','fruits', 4,5,'food']. list()**

String



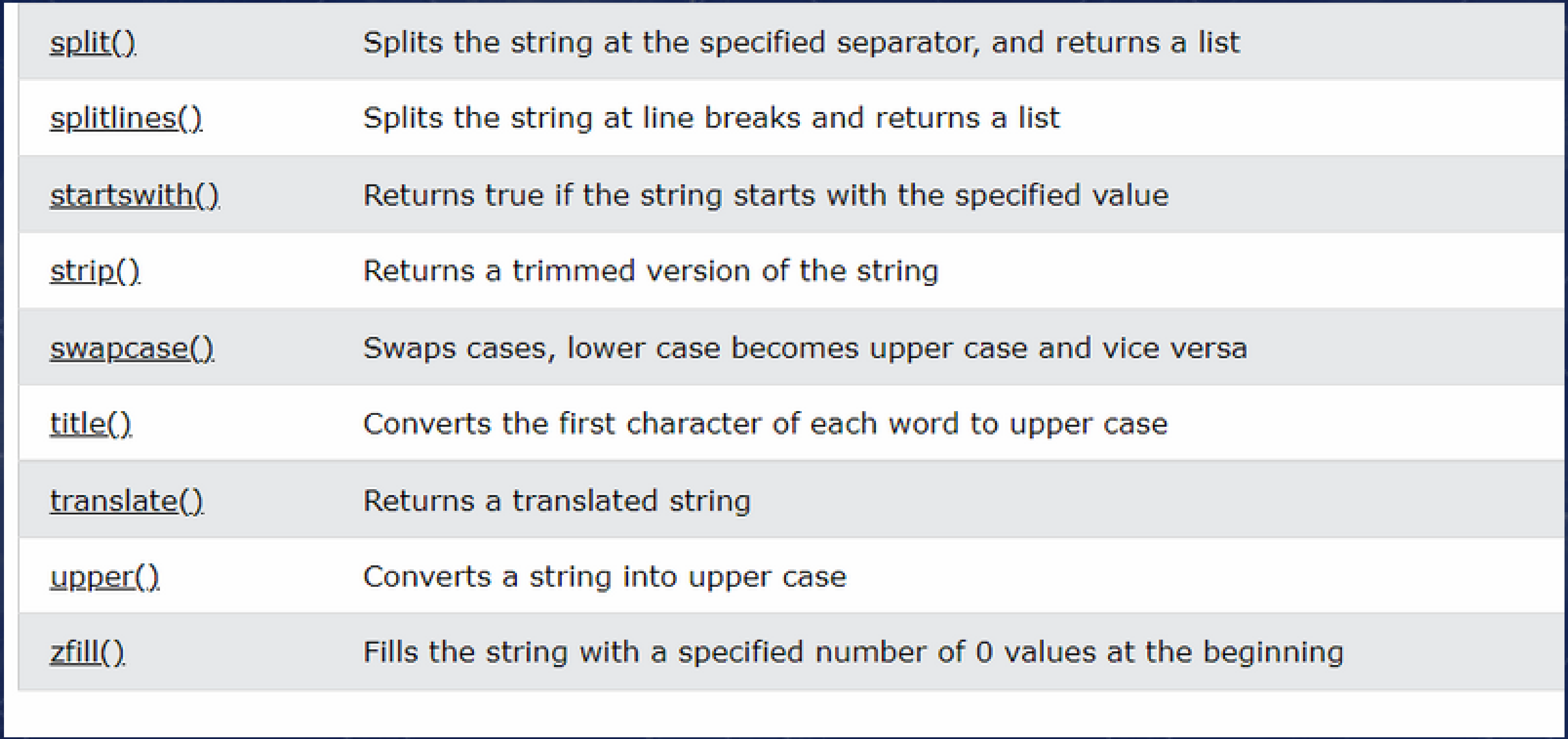
Method	Description
capitalize()	Converts the first character to upper case
casefold()	Converts string into lower case
center()	Returns a centered string
count()	Returns the number of times a specified value occurs in a string
encode()	Returns an encoded version of the string
endswith()	Returns true if the string ends with the specified value
expandtabs()	Sets the tab size of the string
find()	Searches the string for a specified value and returns the position of where it was found
format()	Formats specified values in a string
format_map()	Formats specified values in a string
index()	Searches the string for a specified value and returns the position of where it was found
isalnum()	Returns True if all characters in the string are alphanumeric
isalpha()	Returns True if all characters in the string are in the alphabet
isascii()	Returns True if all characters in the string are ascii characters
isdecimal()	Returns True if all characters in the string are decimals
isdigit()	Returns True if all characters in the string are digits
isidentifier()	Returns True if the string is an identifier

String



islower()	Returns True if all characters in the string are lower case
isnumeric()	Returns True if all characters in the string are numeric
isprintable()	Returns True if all characters in the string are printable
isspace()	Returns True if all characters in the string are whitespaces
istitle()	Returns True if the string follows the rules of a title
isupper()	Returns True if all characters in the string are upper case
join()	Converts the elements of an iterable into a string
ljust()	Returns a left justified version of the string
lower()	Converts a string into lower case
lstrip()	Returns a left trim version of the string
maketrans()	Returns a translation table to be used in translations
partition()	Returns a tuple where the string is parted into three parts
replace()	Returns a string where a specified value is replaced with a specified value
rfind()	Searches the string for a specified value and returns the last position of where it was found
rindex()	Searches the string for a specified value and returns the last position of where it was found
rjust()	Returns a right justified version of the string
rpartition()	Returns a tuple where the string is parted into three parts
rsplit()	Splits the string at the specified separator, and returns a list
rstrip()	Returns a right trim version of the string

String



split()	Splits the string at the specified separator, and returns a list
splitlines()	Splits the string at line breaks and returns a list
startswith()	Returns true if the string starts with the specified value
strip()	Returns a trimmed version of the string
swapcase()	Swaps cases, lower case becomes upper case and vice versa
title()	Converts the first character of each word to upper case
translate()	Returns a translated string
upper()	Converts a string into upper case
zfill()	Fills the string with a specified number of 0 values at the beginning

Creating List

# Creating a List

```
List = []
```

#creating list using list() method/function:

```
List = list('hello')          →          ['h', 'e', 'l', 'l', 'o']
```

# Creating a List with the use of a String

```
List = ['workingwithlist']
```

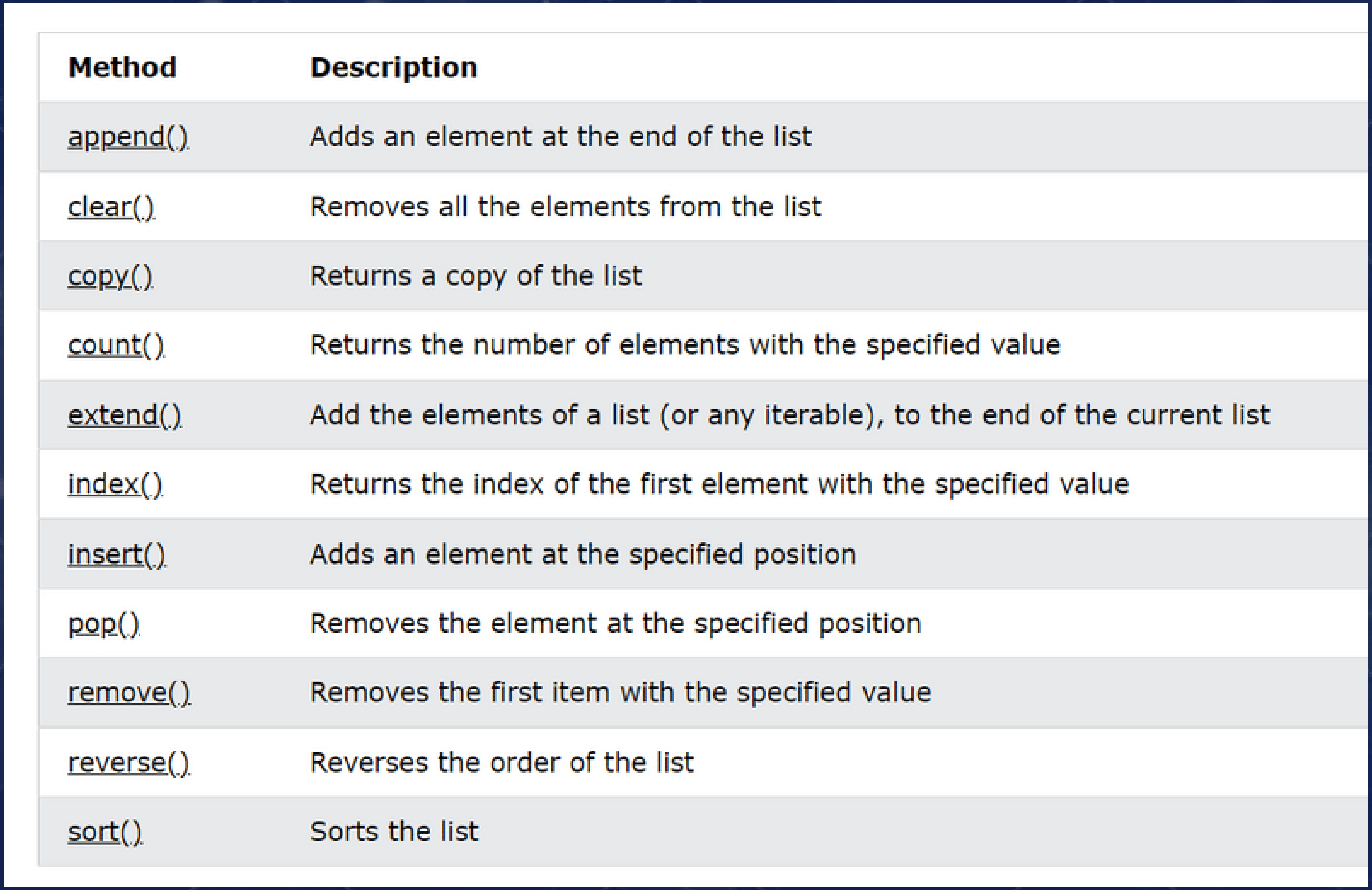
# Creating a List with the use of multiple values

```
List = ["working", "with", "list"]
```

# Creating a Multi-Dimensional List (By Nesting a list inside a List)

```
List = [['working', 'with'], ['list']]
```

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

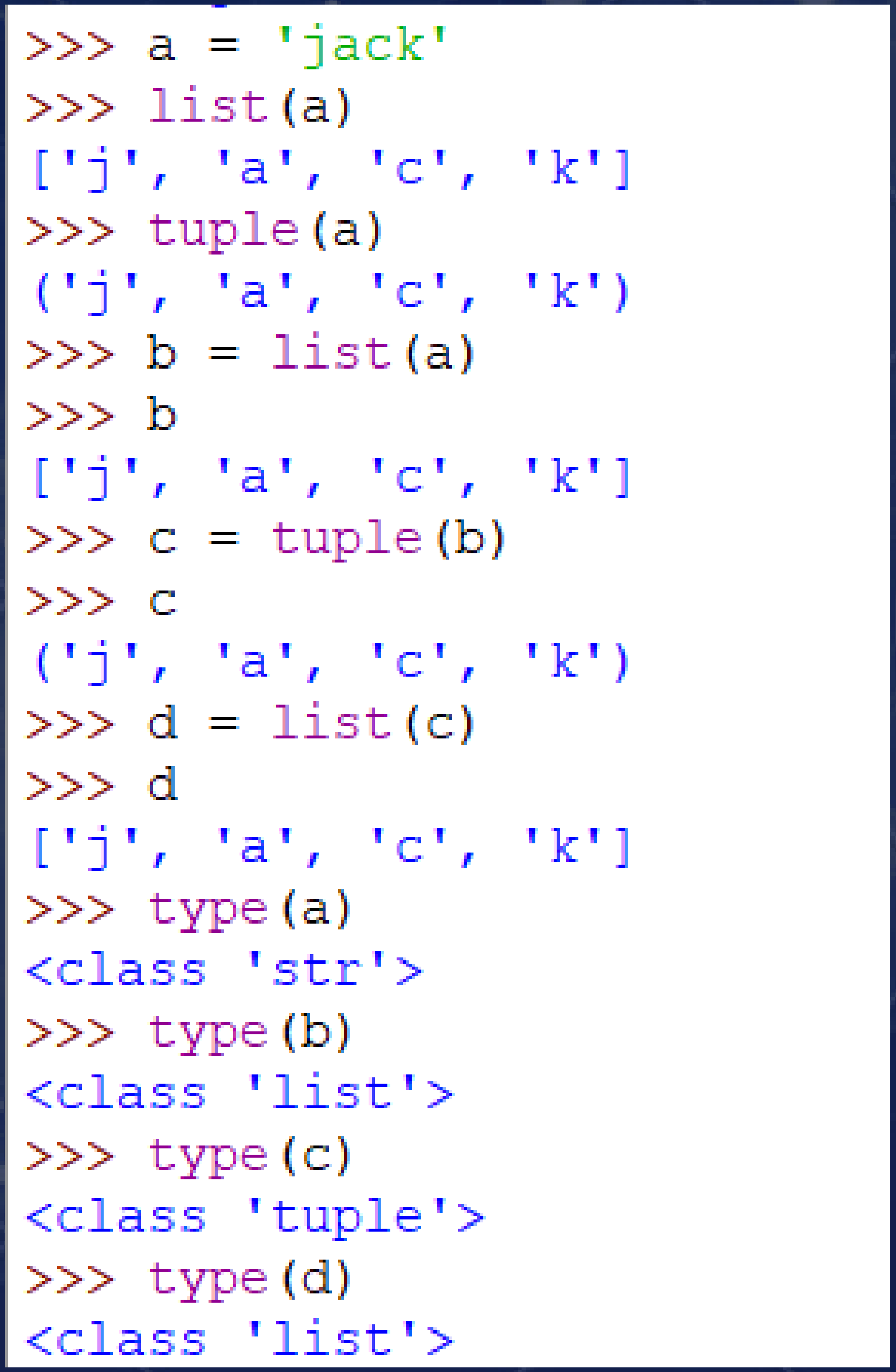
Creating Tuple

3) Tuple : (immutable)
Just like list, tuple is also an ordered collection of Python objects. The only difference between tuple and list is that tuples are **immutable** i.e. **tuples cannot be modified after it is created.** It is represented by tuple class. tuple()
example : (1,2,3,4,'food', 4,5)

Creating Tuple

```
# Creating an empty tuple
Tuple1 = ()

# Creating a Tuple with the use of Strings
Tuple1 = ('coding', 'For')

# Creating a Tuple with the use of list
list1 = [1, 2, 4, 5, 6]
tup = tuple([1,2,3,4,5,6])          →    (1, 2, 4, 5, 6)

# Creating a Tuple with the use of built-in function
Tuple1 = tuple('python')            →    ('p', 'y', 't', 'h', 'o', 'n')

# Creating a Tuple with nested tuples
Tuple1 = (0, 1, 2, 3)
Tuple2 = ('python', 'geek')
Tuple3 = (Tuple1, Tuple2)
```

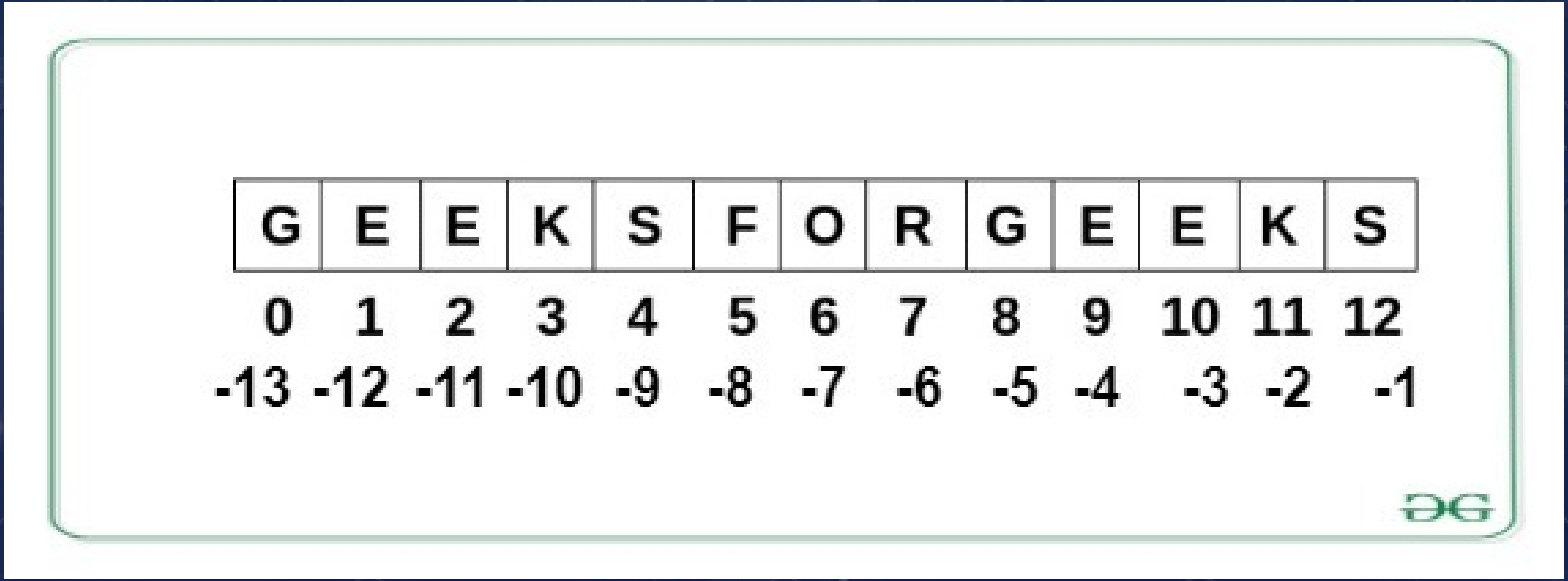
Type Conversion



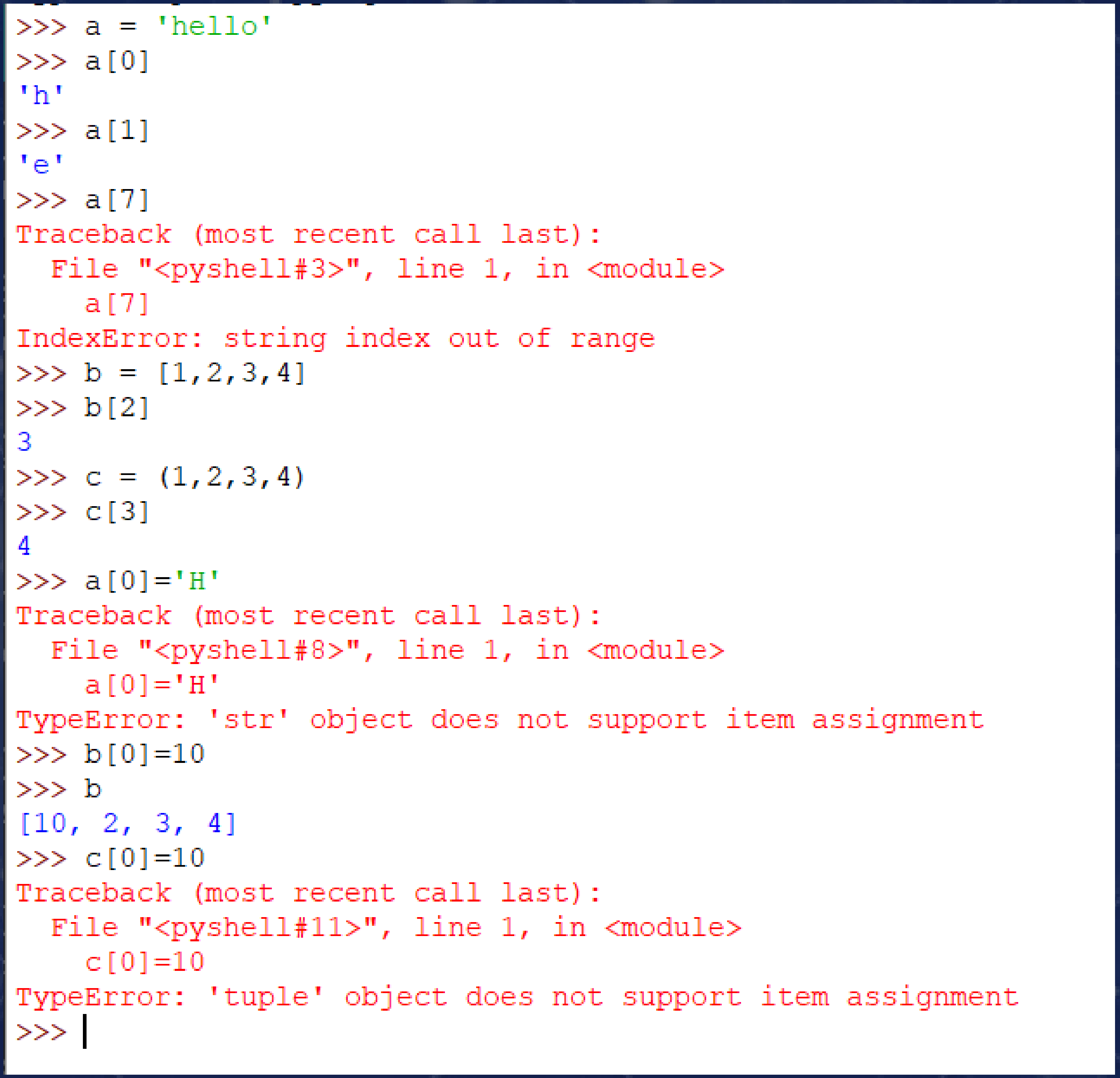
```
>>> a = 'jack'
>>> list(a)
['j', 'a', 'c', 'k']
>>> tuple(a)
('j', 'a', 'c', 'k')
>>> b = list(a)
>>> b
['j', 'a', 'c', 'k']
>>> c = tuple(b)
>>> c
('j', 'a', 'c', 'k')
>>> d = list(c)
>>> d
['j', 'a', 'c', 'k']
>>> type(a)
<class 'str'>
>>> type(b)
<class 'list'>
>>> type(c)
<class 'tuple'>
>>> type(d)
<class 'list'>
```

indexing

Indexing in Python is a way to refer the individual items within an iterable by its position. In other words, you can directly access your elements of choice within an iterable and do various operations depending on your needs.



indexing



```
>>> a = 'hello'
>>> a[0]
'h'
>>> a[1]
'e'
>>> a[7]
Traceback (most recent call last):
  File "<pyshell#3>", line 1, in <module>
    a[7]
IndexError: string index out of range
>>> b = [1,2,3,4]
>>> b[2]
3
>>> c = (1,2,3,4)
>>> c[3]
4
>>> a[0]='H'
Traceback (most recent call last):
  File "<pyshell#8>", line 1, in <module>
    a[0]='H'
TypeError: 'str' object does not support item assignment
>>> b[0]=10
>>> b
[10, 2, 3, 4]
>>> c[0]=10
Traceback (most recent call last):
  File "<pyshell#11>", line 1, in <module>
    c[0]=10
TypeError: 'tuple' object does not support item assignment
>>> 
```

Set

Set is an **unordered** and **unindexed** collection of items in Python. **iterable, mutable and has no duplicate elements**. Unordered means when we display the elements of a set, it will come out in a random order. Unindexed means, we cannot access the elements of a set using the indexes like we can do in list and tuples.

example : {1,2,3,4}

Set

# Creating a Set

```
set1 = set()
print("Initial blank Set: ", set1)
```

$\longrightarrow$

```
Initial blank Set: set()
```

# Creating a Set with the use of a String

```
set1 = set("phiiittrrrooonn")
```

$\longrightarrow$

```
{'p', 'h', 't', 'i', 'r', 'o', 'n'}
```

# Creating a Set with the use of a List

```
set1 = set(["learn", "and", "learn"])
```

$\longrightarrow$

```
{'learn', 'and'}
```

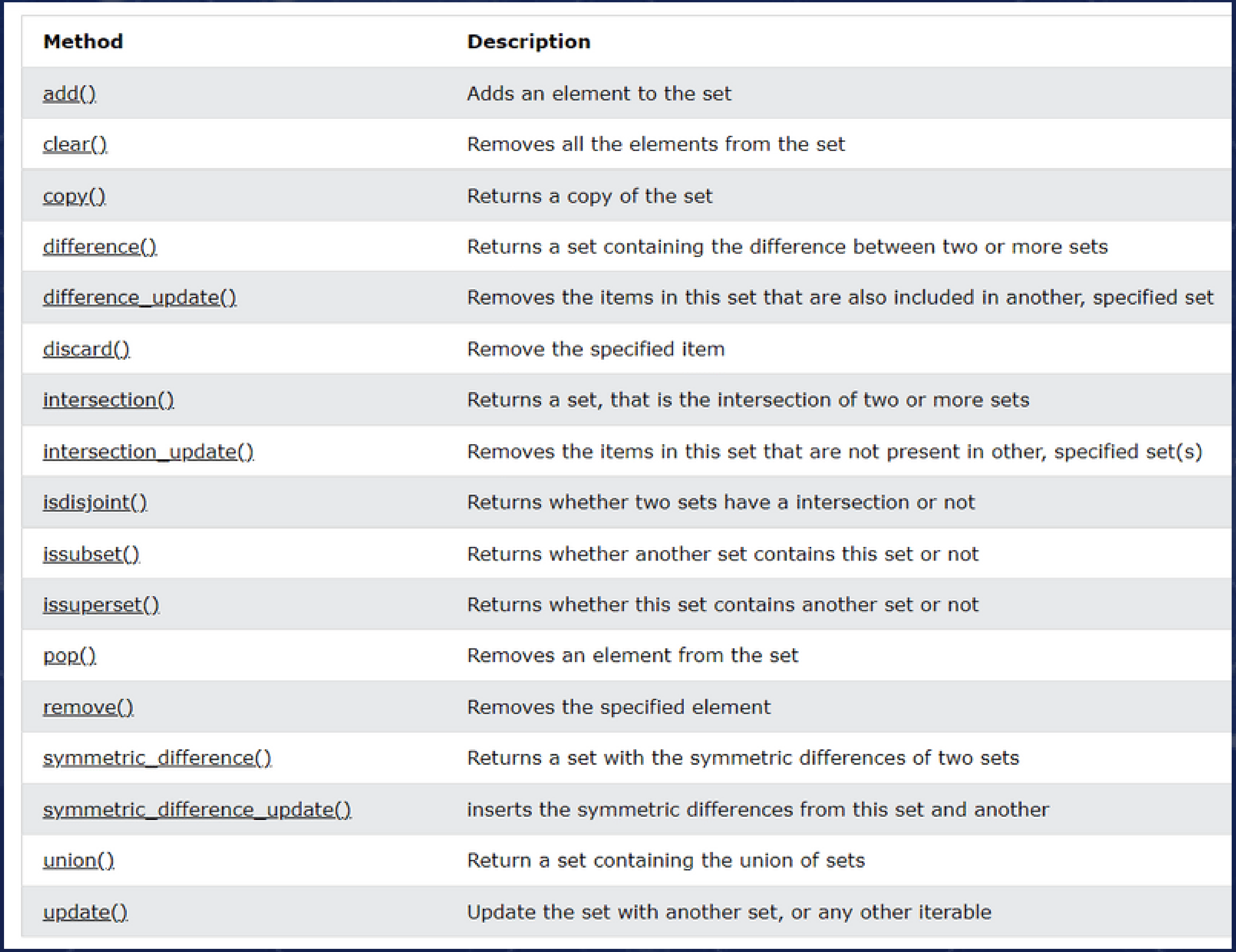
# Creating a Set with a mixed type of values (Having numbers and strings)

```
set1 = set([1, 2, 'hello', 4, 'world', 6, 'hello', 'Hello'])
```

$\longrightarrow$

```
{'hello', 1, 2, 4, 6, 'world', 'Hello'}
```

Set



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

Dictionary

Dictionary in Python is an **unordered collection** of data values, used to store data values like a map, which unlike other Data Types that hold only single value as an element, Dictionary holds key:value pair. Key-value is provided in the dictionary to make it more optimized. Each key-value pair in a Dictionary is separated by a colon :, whereas each key is separated by a ‘comma’.

{1: 'Learn', 2: 'with', 3: 'encodemy'}

- **no duplicate key is allowed**
- **The values in the dictionary can be of any type, while the keys must be immutable like numbers, tuples, or strings.**
- **Dictionary keys are case sensitive- Same key name but with the different cases are treated as different keys in Python dictionaries.**

Creating Dictionary

# Creating an empty Dictionary
Dict = {}

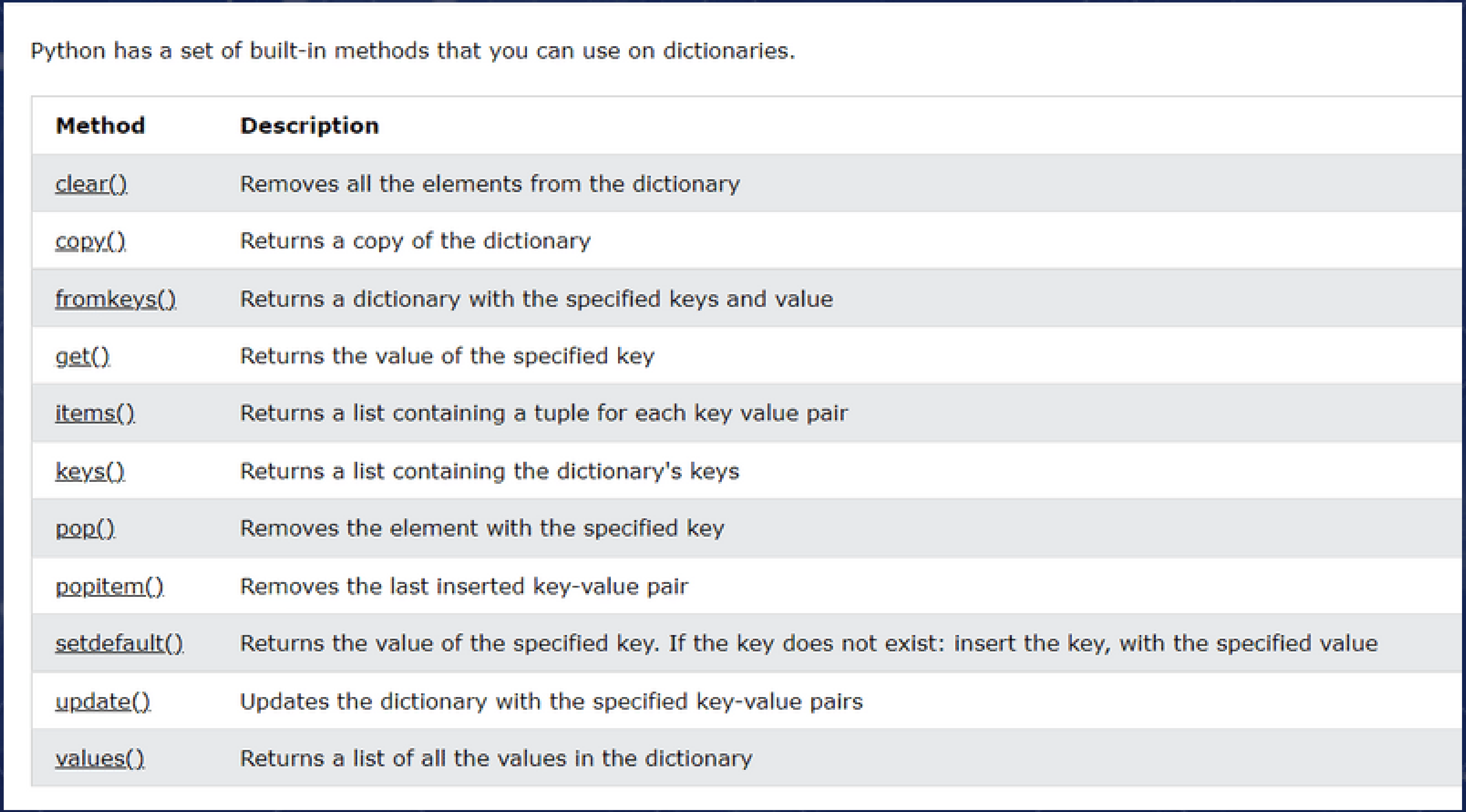
# Creating a Dictionary with Integer Keys
Dict = {1: 'Learn', 2: 'with', 3: 'phitron'}

# Creating a Dictionary with Mixed keys
Dict = {'Name': 'phitron', 1: [1, 2, 3, 4]}

# Creating a Dictionary with dict() method
Dict = dict({1: 'Learn', 2: 'with', 3:'phitron'})

# Creating a Dictionary with each item as a Pair
Dict = dict([(1, 'phitron'), (2, 'with')])
#keys must be unique
members = {1001: "John", 1002: "Jane", 1003: "Emily", 1001: "Max"}print(members)
{1001: 'Max', 1002: 'Jane', 1003: 'Emily'}

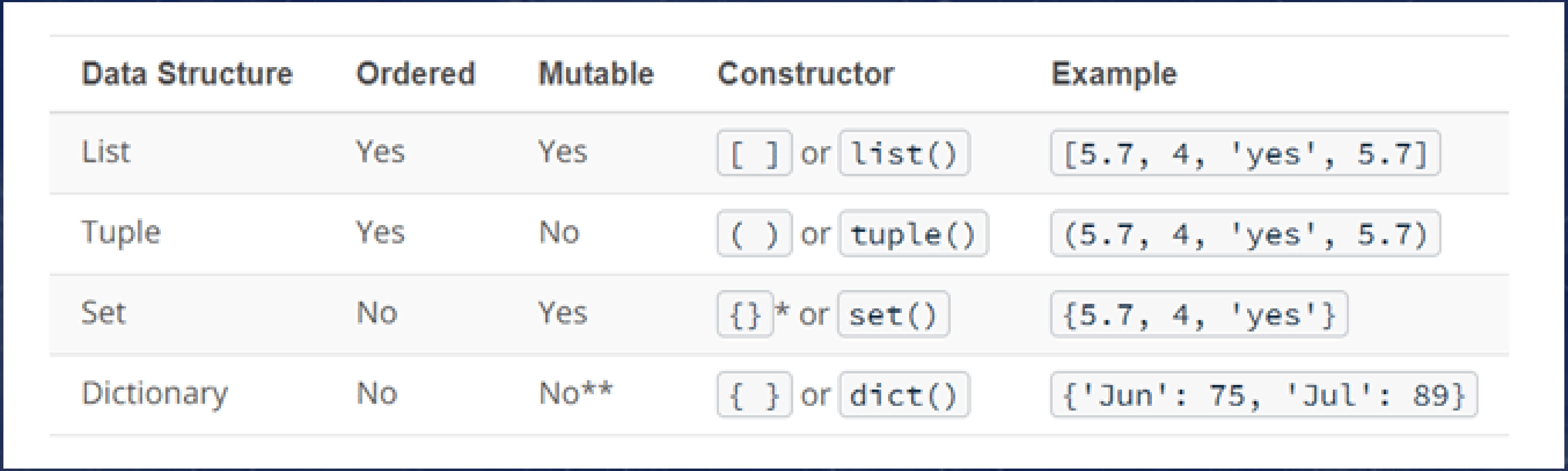
Dictionary Methods



Python has a set of built-in methods that you can use on dictionaries.

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

Summary



Data Structure	Ordered	Mutable	Constructor	Example
List	Yes	Yes	`[ ]` or `list()`	`[5.7, 4, 'yes', 5.7]`
Tuple	Yes	No	`( )` or `tuple()`	`(5.7, 4, 'yes', 5.7)`
Set	No	Yes	`{}`* or `set()`	`{5.7, 4, 'yes'}`
Dictionary	No	No**	`{ }` or `dict()`	`{'Jun': 75, 'Jul': 89}`

Thank You