Assignment - 1

Python Methods

① enumerate () :

— enumerate () method adds a Counter to an iterable and returns it in the form of an enumerating object. This enumerated object can then be used directly for loops or Converted into a list of tuples using the list () function.

Syntax : enumerate (iterable, start=0)

Parameters : iterable : any object that supports iteration
start : the index value from which the Counter is to be started, by default it is 0

Returns an iterator with index, and element Pairs from the original iterable

Example for enumerate () with both list and a string :

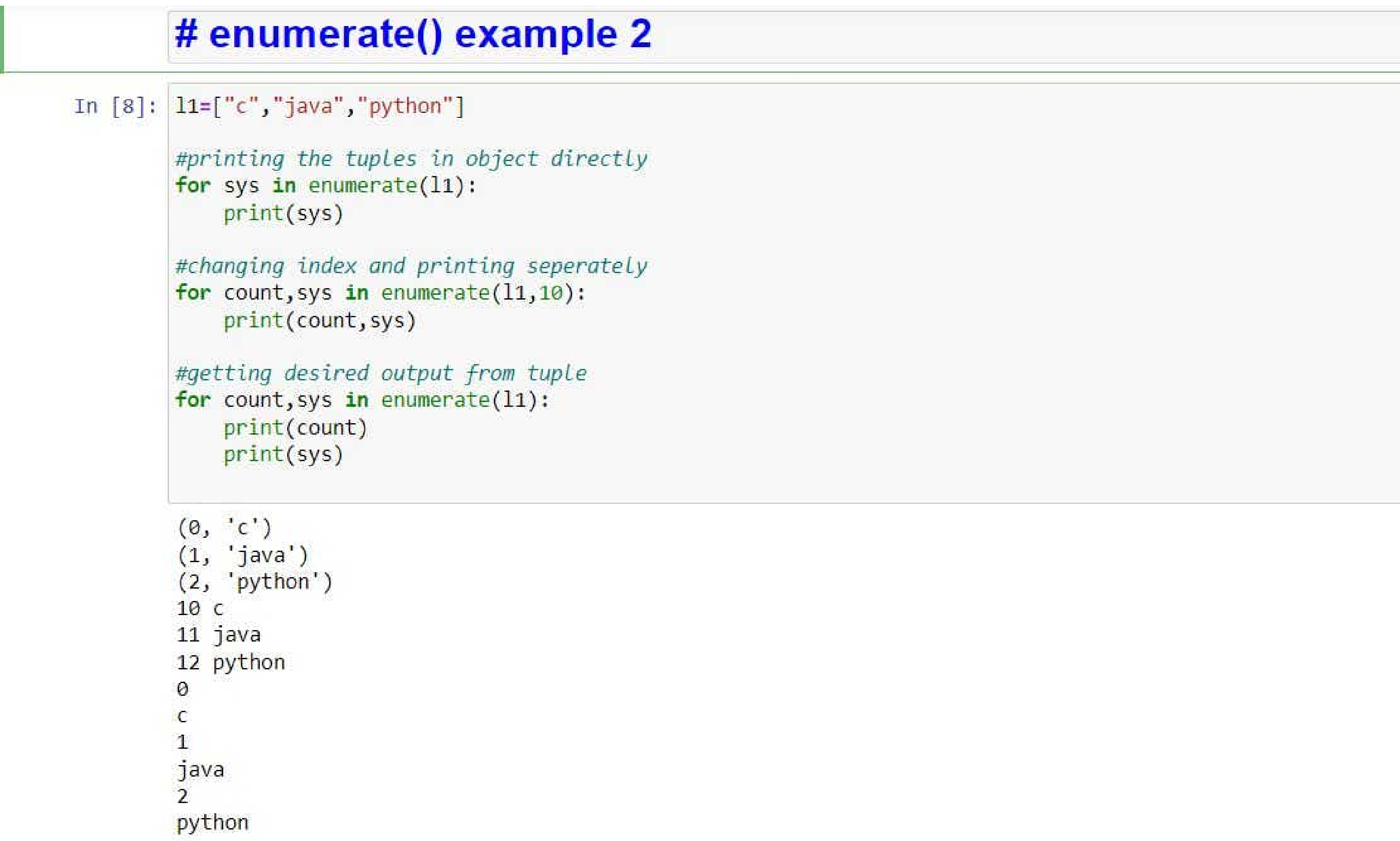
```
L1= ["c", "java", "Python"]
S1 = "System"
# Creating enumerate objects
obj1 = enumerate (L1)
obj2 = enumerate (S1)
print ("return type:", type (obj1))
print (list (enumerate (L1)))
print ("return type:", type (S1))
# changing the start index to 1 from 0
print (list (enumerate (S1,1)))
```

O/P :
```
return type: <class 'enumerate'>
[(0, 'c') , (1, 'java') , (2, 'Python')]
return type: <class 'str'>
[(1, 's'), (2, 'y'), (3, 's'), (4, 't'), (5, 'e'), (6, 'm')]
```

Example using enumerate object in loops

```
L1= ["c", "java", "Python"]
# printing the tuples in object directly
for Sys in enumerate (L1):
    print (Sys)
# changing index and printing seperately
for Count, Sys in enumerate (L1, 10):
    print (Count, Sys)
# getting desired output from tuple
for Count, Sys in enumerate (L1):
    Print (Count)
    print (Sys)
```

O/P :
```
(0, 'c')
(1, 'java')
(2, 'Python')
10, c
11 java
12 Python
0
c
1
java
2
Python
```



enumerate() example 2

In [8]:
```python
l1=["c","java","python"]

#printing the tuples in object directly
for sys in enumerate(l1):
    print(sys)

#changing index and printing seperately
for count,sys in enumerate(l1,10):
    print(count,sys)

#getting desired output from tuple
for count,sys in enumerate(l1):
    print(count)
    print(sys)
```

```
(0, 'c')
(1, 'java')
(2, 'python')
10 c
11 java
12 python
0
c
1
java
2
python
```

② reduce() :

— It is a built-in function that applies a particular function to the elements of an iterable, reducing them to a single value.

<u>Working</u> :

i) At first step, first 2 elements of sequence are picked and the result is obtained

ii) Next step is to apply the same function to the previously attained result and the number just succeding the 2nd element and the result is again stored

iii) This process continues till no more elements are left and the final returned result is returned.

reduce function is defined in "functools" module

Syntax : functools.reduce (function, iterable [, initiali

parameters :

— function argument is a function that takes 2 arguments where 1st argument is accumulated value an the second argument is current value from iterable

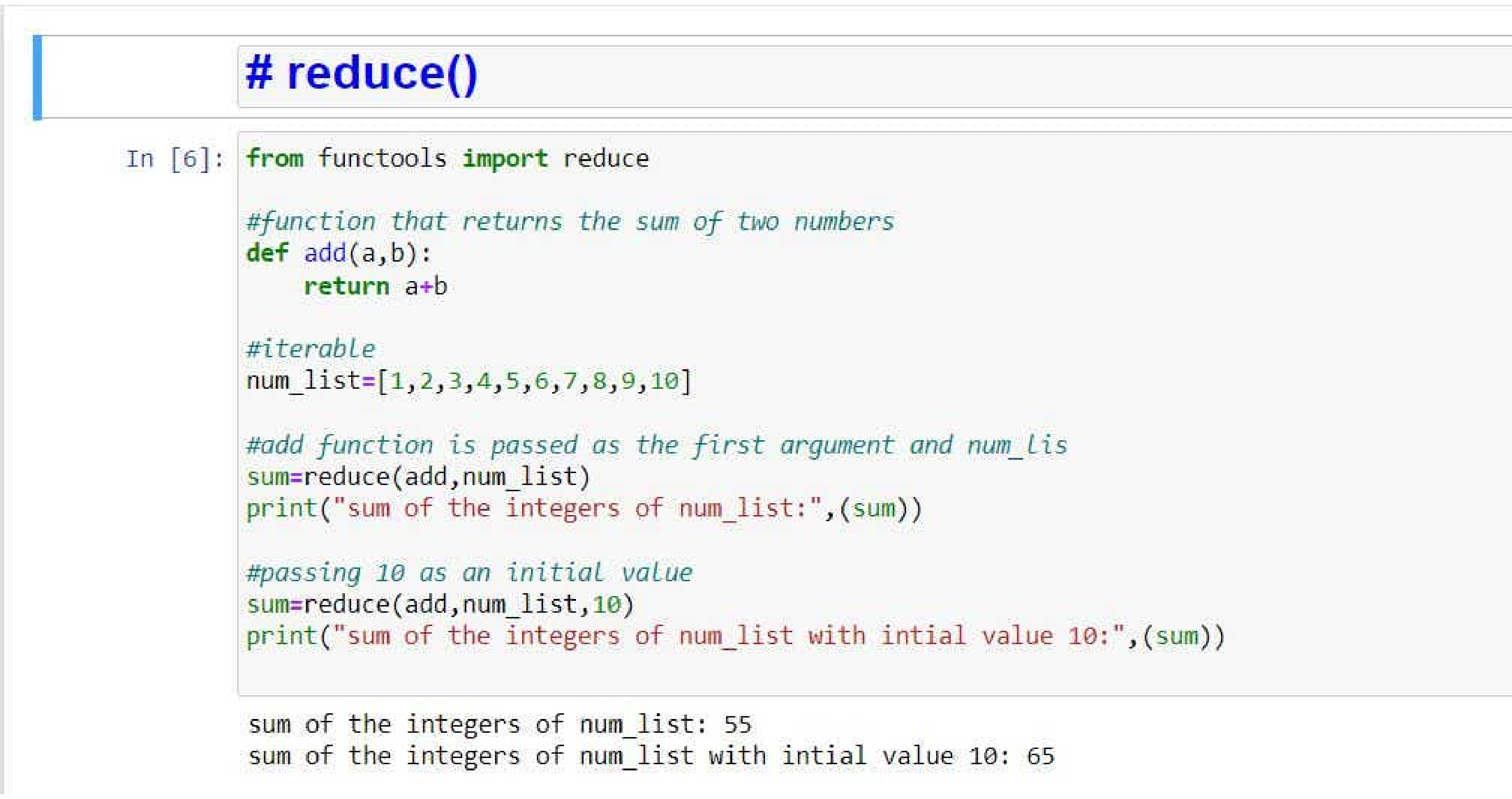
— iterable argument is sequence of values to be redu

— intialiser is optional

Example for reduce ( ) :

```
from functools import reduce

#function that returns the sum of 2 numbers
def add (a,b) :
        return a+b

# iterable
num_list = [1,2,3]

# add function is passed as the 1st argument
and num_list

sum = reduce (add, num_list)
print ("sum of integers of num_list :", (sum))
# passing 10 as initial value
sum = reduce (add, num_list, 10)
print ("sum of integers of num_list with initial
value 10:", (sum)
```

O/P : sum of integers of num_list : 6
sum of integers of num_list with initial value 10 : 16



reduce()

```
In [6]: from functools import reduce

        #function that returns the sum of two numbers
        def add(a,b):
            return a+b

        #iterable
        num_list=[1,2,3,4,5,6,7,8,9,10]

        #add function is passed as the first argument and num_lis
        sum=reduce(add,num_list)
        print("sum of the integers of num_list:",(sum))

        #passing 10 as an initial value
        sum=reduce(add,num_list,10)
        print("sum of the integers of num_list with intial value 10:",(sum))
```

```
sum of the integers of num_list: 55
sum of the integers of num_list with intial value 10: 65
```

③ map ( ):

map () function returns a map object (which is an iterator) of results after applying the given function to each item of a given iterable (list, tuple etc..)

Syntax : map (function, iterable)

parameters :

function : To which map passes each element of given iterable

iterable : which is to be mapped

We Can pass 1 or more iterable to the map() function

Returns from map():

— Returns a list of results after applying the given function to each item of a given iterable (list, tuple)

— The returned value from map() (map object) then Can be passed to functions like list() (to Create list), Set() (to Create Set)

Example for map() :

1) # Return double of n

```
def addition(n):
        return n+n
# Double all numbers using map()
numbers = (1,2,3,4)
result = map(addition, numbers)
print (list (result))
```

O/P : [2,4,6,8]

2) # Double all the numbers using map and lamda

```
numbers = (1,2,3,4)
result = map (lambda x: x+x, numbers)
print (list (result))
```

O/P : [2,4,6,8]

3) # Add two lists using map and lamda

```
numbers1 = [1,2,3]
numbers2 = [4,5,6]
result = map (lambda x,y: x+y, numbers1, numbers2)
print (list (result))
```

O/P : [5,7,9]

map() example

```
In [1]: #return double of n

        def addition(n):
            return n+n

        #double all numbers using map()

        numbers=(1,2,3,4)
        result=map(addition,numbers)
        print(list(result))

        [2, 4, 6, 8]
```

map() example2

```
In [2]: #list of strings

        l=['sat','bat','mat']

        #map() can listify the list of strings individually

        test=list(map(list,l))
        print(test)

        [['s', 'a', 't'], ['b', 'a', 't'], ['m', 'a', 't']]
```

④ filter() :

— filter() method filters the given Sequence with the help of a function that tests each element in the Sequence to be true or not

Syntax : filter(function, sequence)

Parameters:

function : Tests if each element of a Sequence is true or not

Sequence : which needs to be filtered, it Can sets, lists, tuples (or) Containers of any iterators

Returns an iterator that is already filtered

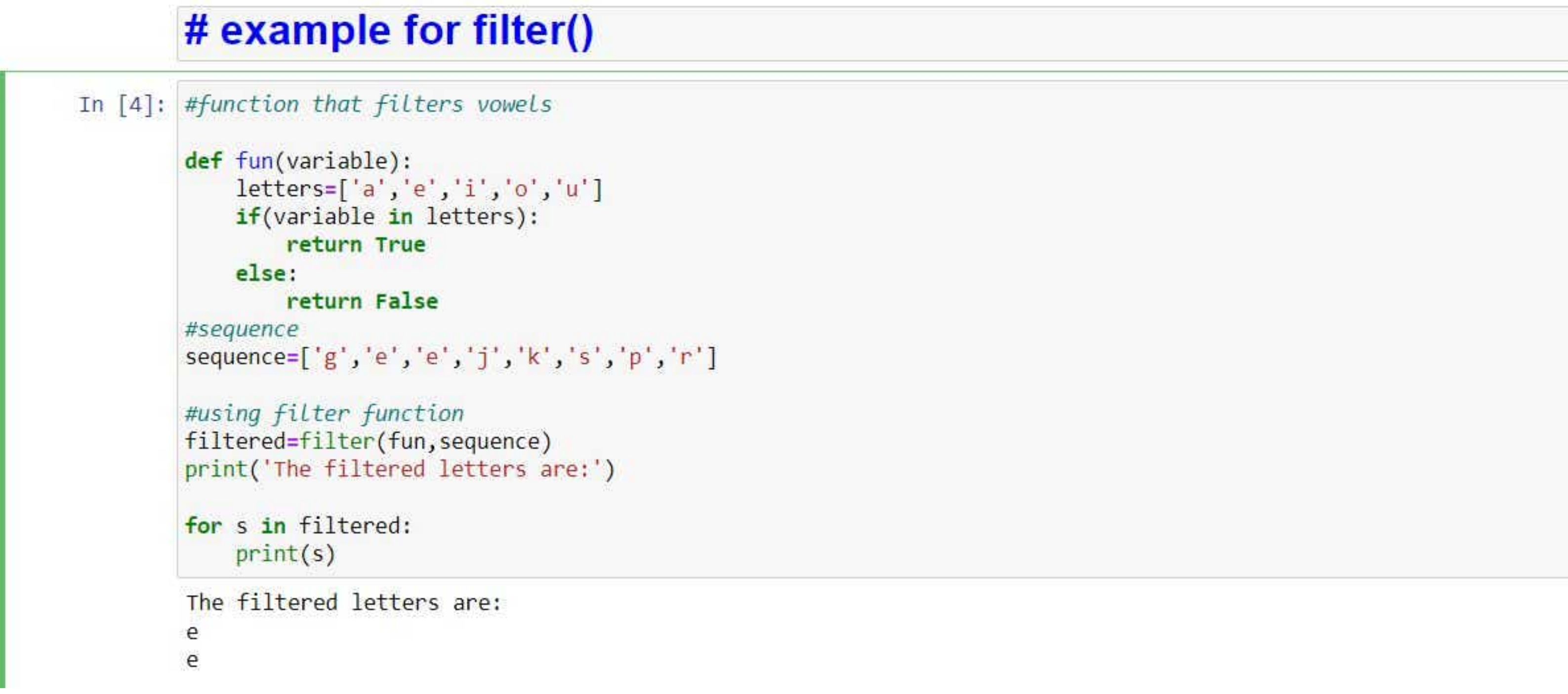
Example for filter() :

```
# function that filters Vowels
    def fun (Variable):
        letters = ['a', 'e', 'i', 'o', 'u']
```

```
if (variable in letters):
        return True
else:
        return False

# Sequence
Sequence = ['g','e','e','j','K','s','p','r']
# using filter function
filtered = filter(fun, sequence)
print ('The filtered Letters are:')
for s in filtered:
        print(s)
```

O/p : The filtered Letters are:

```
e
e
```



example for filter()

```
In [4]: #function that filters vowels

        def fun(variable):
            letters=['a','e','i','o','u']
            if(variable in letters):
                return True
            else:
                return False
        #sequence
        sequence=['g','e','e','j','k','s','p','r']

        #using filter function
        filtered=filter(fun,sequence)
        print('The filtered letters are:')

        for s in filtered:
            print(s)
```

```
The filtered letters are:
e
e
```

⑤ zip():

It takes iterable containers and returns a single iterato
object, having mapped values from all the containers

— It is used to map the similar index of multiple containers so that they can be used just using a single entity.

Syntax : zip(iterator1, iterator2,...)

Parameters : iterator1 , iterator2 etc., Those are

iterables that want to Combine.
We Can provide multiple iterables as arguments and zip() will pair up elements at Corresponding positions
— Returns a Single iterator object

Example for zip() :

```
# Create two lists
name = ["Manjeet", "Nikhil", "shambavi", "Astha"]
rollno = [4, 1, 3, 2]
# using zip() to map the values
mapped = zip(name, rollno)
print (set (mapped))
```

O/P :
```
{('Nikhil',1), ('shambavi',3), ('Manjeeth',4),
 ('Astha',2)}
```

# example for zip()

In [8]:
```python
#create two lists

name=["Manjeeth","Nikhil","shambavi","Ashtha"]
rollno=[4,1,3,2]

#using zip()to map the values

mapped=zip(name,rollno)
print(set(mapped))
```

```
{('Nikhil', 1), ('Manjeeth', 4), ('shambavi', 3), ('Ashtha', 2)}
```

⑥ id() :

~~It~~ returns the unique identifier of an object
The identifier is an integer, which represents the memory address of the object.

— id() function is used to check if two Variables or objects refer to the Same memory location

Syntax: id (object)

Returns a unique integer for a given object

Example for id() :

```
x=42
y=x
z=42
print (id(x))
print (id(y))  # (same as x)
print (id(z))  # (same as x &y)
```

O/P :

```
10731304  140713214187592
10731304  140713214187592
10731304  140713214187592
```

In [9]:
```
#example for id()
```

In [13]:
```
x=42
y=x
z=42
print(id(x))
print(id(y))
print(id(z))
```

```
140713214187592
140713214187592
140713214187592
```