

Higher Order Functions continued, random module

February 4, 2023

1 map(func, iterable)

```
[1]: lst = ['berlin', 'tokyo', 'palermo']  
print(list(map(len, lst)))
```

[6, 5, 7]

2 filter()

- filter(func, iterable)
- It will filter the element if the return value is True, when
- sent to the function

```
[6]: def fun1(n):  
      return 30 <= n < 50  
ages = [12, 14, 76, 35, 45, 31, 4, 92, 7]  
# adults = >=30 <50  
adults = list(filter(fun1, ages))  
print(adults)
```

[35, 45, 31]

```
[4]: 30 <= 95 < 50
```

[4]: False

```
[7]: ages = [12, 14, 76, 35, 45, 31, 4, 92, 7]  
# adults = >=30 <50  
adults = list(filter(lambda n: 30 <= n < 50, ages))  
print(adults)
```

[35, 45, 31]

```
[11]: def two_vowels(s):  
       return len([i for i in s if i in 'aeiouAEIOU']) == 2  
names = ['sachin', 'kohli', 'abd', 'dhoni', 'sangakkara',  
         'ponting', 'dravid']  
# Filter the names that are having exactly 2 vowels in them
```

```
filtered_names = list(filter(two_vowels, names))
print(filtered_names)
```

```
['sachin', 'kohli', 'dhoni', 'ponting', 'dravid']
```

```
[9]: def two_vowels(s):
      return len([i for i in s if i in 'aeiouAEIOU'])

      two_vowels('sachin')
```

```
[9]: 2
```

```
[12]: def two_vowels(s):
      return len([i for i in s if i in 'aeiouAEIOU']) == 2
      names = ['sachin', 'kohli', 'abd', 'dhoni', 'sangakkara',
               'ponting', 'dravid']
      # Filter the names that are having exactly 2 vowels in them
      filtered_names = list(filter(lambda s: len([i for i in s if i in 'aeiouAEIOU'])
                                   == 2, names))
      print(filtered_names)
```

```
['sachin', 'kohli', 'dhoni', 'ponting', 'dravid']
```

3 list.sort()

```
[13]: lst = [10, -1, 14, -14, 16]
      lst.sort() #in-place sort
      print(lst)
```

```
[-14, -1, 10, 14, 16]
```

```
[14]: lst = [10, -1, 14, -14, 16]
      lst.sort(reverse = True) #in-place sort
      print(lst)
```

```
[16, 14, 10, -1, -14]
```

```
[15]: names = ['sachin', 'kohli', 'abd', 'dhoni', 'sangakkara',
               'ponting', 'dravid']
      names.sort()
      print(names)
```

```
['abd', 'dhoni', 'dravid', 'kohli', 'ponting', 'sachin', 'sangakkara']
```

```
[16]: names = ['sachin', 'kohli', 'abd', 'dhoni', 'sangakkara',
               'ponting', 'dravid']
      names.sort(key=len)
      print(names)
```

```
['abd', 'kohli', 'dhoni', 'sachin', 'dravid', 'ponting', 'sangakkara']
```

```
[24]: def fun(s):
        return ord(min(s)) + ord(max(s))
names = ['sachin', 'kohli', 'abd', 'dhoni', 'sangakkara',
        'ponting', 'dravid']
names.sort(key=fun)
print(names)
```

['abd', 'dhoni', 'sachin', 'sangakkara', 'kohli', 'dravid', 'ponting']

```
[31]: def fun(s):
        return ord(min(s)) + ord(max(s))
print(fun('ponting')) # min = 'a', max = 'd'
```

219

```
[32]: names = ['sachin', 'kohli', 'abd', 'dhoni', 'sangakkara',
        'ponting', 'dravid']
names.sort(key=lambda s: ord(max(s)) + ord(min(s)))
print(names)
```

['abd', 'dhoni', 'sachin', 'sangakkara', 'kohli', 'dravid', 'ponting']

```
[33]: x = lambda s: len(s)
x('hello')
```

[33]: 5

```
[36]: print(list(filter(lambda s: ord(s) > 115, 'python')))

['y', 't']
```

```
[37]: ord('y'), ord('t')
```

[37]: (121, 116)

4 random module

```
[50]: # randint
import random
print(random.randint(1, 10)) # a random number from 1 to 10 (both inclusive)
```

10

```
[76]: # generating a list of random integers from 1 to 100 (20)
random_nums = [random.randint(1, 100) for i in range(5)]
print(random_nums)
```

[18, 17, 48, 83, 52]

```
[90]: random_nums = []
      for i in range(5):
          x = random.randint(1, 100)
          random_nums.append(x)
      print(random_nums)
```

[48, 76, 77, 55, 24]

```
[114]: # generating a list of alphabets from a to z in random way
      random_chars = [chr(random.randint(97, 122)) for i in range(5)]
      print(random_chars)
```

['v', 'x', 'j', 'b', 'o']

```
[123]: # generating a list of alphabets from a to z in random way
      size = int(input())
      random_string = ''.join([chr(random.randint(97, 122)) for i in range(size)])
      print(random_string)
```

146

ofwctzqlyvtxrcbxdjxvurxykmltqosplmqpqlhypfwalgaxnsinwkvppytasbkaqgwyajlxaovfjay
yhhzbyxhlcmvdrdrdyxpzhdjulmgjwbhltsijaooxhvavtaimgsgjsqxtfamvdklna

```
[ ]: # randrange()
```

```
[131]: print(random.randrange(5, 100, 5))
```

65

```
[144]: # random.choice()
      # it helps get a random value from an iterable
      lst = [10, 20, 30, 40, 50, 60]
      ch = random.choice(lst)
      print(ch)
```

40

```
[162]: # random.choice()
      # it helps get a random value from an iterable
      string = 'python is simple'
      ch = random.choice(string)
      print(ch)
```

h

```
[169]: # random.choice()
      # it helps get a random value from an iterable
      r = range(100, 90, -1)
      ch = random.choice(r)
      print(ch)
```

100

```
[163]: r = range(100, 90, -1)
print(list(r))
```

[100, 99, 98, 97, 96, 95, 94, 93, 92, 91]

```
[191]: # sample
string = 'python is simple'
sample_list = random.sample(string, 5)
print(sample_list)
```

['y', 'p', 'h', 't', ' ']

```
[190]: # sample
lst = [10, 20, 30, 40]
sample_list = random.sample(lst, 4)
print(sample_list)
```

[30, 40, 20, 10]

```
[203]: # choices
string = 'python is simple'
sample_list = random.choices(string, k=100)
print(sample_list)
```

['l', 'i', 'y', 'h', ' ', 'p', ' ', 's', 's', 'i', 'o', 'e', 'n', 'h', 's', 'i',
'i', 'h', 'o', 'p', ' ', 'm', 'i', 'n', 'p', 'i', 'i', ' ', 's', ' ', 'i', 's',
's', 't', 'p', 'e', ' ', 'i', ' ', 's', 'n', 'y', 'p', 'i', 'n', 'y', 'n', 'i',
's', 's', 't', 'o', ' ', 'p', 'y', ' ', 'p', ' ', 'i', 'n', 'i', ' ', 's', 'o',
's', 'p', 's', 'p', 'i', 'm', ' ', 'e', 'i', ' ', 'y', ' ', 'l', 't', 'h', 's',
'l', 'i', ' ', 's', 'o', 's', 'p', 'l', 'i', 'e', 's', 'n', 'l', 'n', ' ', 'p',
' ', 't', 'y', 'e']

```
[204]: from random import *
print(randint(1, 100))
```

12

```
[205]: import random as rd # rd is alias for random

print(rd.randint(1, 100))
```

7