Shreya Nair-24BIT196

AIM: To understand and apply functional programming concepts like map(), filter(), lambda, and storing functions as first-class objects in Python.

HARDWARE & SOFTWARE REQUIREMENTS: Hardware:16GB RAM, Intel Processor(i9), Software: Python (Version 3.x), Google Colab (Cloud-based)

SYSTEM CONFIGURATION: Operating System: Windows 11, IDE: Google Colab

THEORY: Functional programming treats computation as the evaluation of mathematical functions and avoids changing state or mutable data. In Python: Functions are first-class objects, meaning they can be passed, stored, and returned. -lambda functions are small anonymous functions used for simple operations. -map() applies a function to all items in an iterable. -filter() selects elements from a sequence based on a condition. -These tools allow concise and clean code for data transformation and processing.

REFERENCES:Geeks for Geeks, Python Documentation: https://docs.python.org/3/

1) Define three functions fun(), disp(), and msg(). Store them in a list and call them one by one using a loop.

```
def fun():
    print("This is function fun()")
def disp():
    print("This is function disp()")
def msg():
    print("This is function msg()")

func_list = [fun, disp, msg]

for f in func_list:
    f()
```

```
This is function fun()
This is function disp()
This is function msg()
```

2) Suppose there are two lists, one containing numbers from 1 to 6, and other containing numbers from 6 to 1. Write a program to obtain a list that contains elements obtained by adding corresponding elements of the two lists. (hint: use map and lambda functions)

```
lst1 = [1, 2, 3, 4, 5, 6]
lst2 = [6, 5, 4, 3, 2, 1]
result = list(map(lambda x, y: x + y, lst1, lst2))
print("Resultant list:", result)
```

```
Resultant list: [7, 7, 7, 7, 7, 7]
```

3) Generate the list of 10 different random numbers between -15 and 15. Create a new list by obtaining square of all numbers in a list.

```
import random
random_num = [random.randint(-15, 15) for _ in range(10)]
squared_num = list(map(lambda x: x**2, random_num))

print("Random numbers:", random_num)
print("Squared numbers:", squared_num)
```

```
Random numbers: [9, -13, 3, 15, -15, -2, -2, 0, -14, 0]
Squared numbers: [81, 169, 9, 225, 225, 4, 4, 0, 196, 0]
```

4) Consider the following list: lst = ['madam','Python',"malayalam",12321] Write a program to print those strings which are palindromes

```
lst = ['hello', 'Python', 'bob', 12321]
print("Palindromes:")
for item in lst:
    s = str(item)
    if s == s[::-1]:
```

```
    print(s)
```

```
Palindromes:
bob
12321
```

5) A list contains names of Faculty Members. Write a program to filter out those names whose length is more than 8 characters.

```
names = ["Prof.Chintan","Prof.Santosh","Dr.Milan",]

long_names = list(filter(lambda name: len(name) > 8, names))
print("Names longer than 8 characters:", long_names)
```

```
Names longer than 8 characters: ['Prof.Chintan', 'Prof.Santosh']
```