COMP1002 – Advanced Python

Lab9

Assignment-1: Matplotlib

Plot the following two sets of data on the same graph with different colors and line styles:

- `x1: [0, 1, 2, 3, 4, 5]`
- `y1: [0, 1, 4, 9, 16, 25]`
- `x2: [0, 1, 2, 3,  4, 5]`
- `y2: [0, 1, 8, 27, 64, 125]`

Customize the plot with:

- A title: "Multi Line Plots"
- X-axis label: "X-axis"
- Y-axis label: "Y-axis"
- A legend to differentiate the two lines
- Different line styles and markers for each line

Assignment-2: Iterators and Generators

Task-1: Iterators

Complete the following custom iterator class called **`FilterIterator`** that takes list and a function. The **`FilterIterator`** should iterate over the elements of the given iterator and yield only those elements for which the provided function returns **`True`**.

```
class FilterIterator:
    def __init__(self, iterable, func):
        self.iterable = iterable
        self.func = func
        self.index = 0

    def __iter__(self):
        # student code

    def __next__(self):
        while self.index < len(self.iterable):
            # student code
        raise StopIteration

def is_positive(x):
    return x > 0
numbers = [6, 5, -2, 8, -9, -3, 7]
filtered_iterator = FilterIterator(numbers, is_positive)
for num in filtered_iterator:
    print(num)
```

Task-2: Generators

Write a program using generator to print the numbers which can be divisible by 5 and 7 between `0` and n in comma separated form while n is input by console.

Example:

If the following n is given as input to the program: `100`
Then, the output of the program should be: `0,35,70`