## Objective(s)

i) To learn basic Python syntax required for Computer Graphics.

**ii)** To understand variables, data types, operators, conditions, loops and lists.

**iii)** To write simple Python programs using input/output and control structures.

**iv)** To plot basic graphs using the matplotlib library.

## Software(s) Required

- Python 3.x
- Jupyter Notebook / VS Code / PyCharm
- Python libraries: matplotlib, numpy (for later labs)

## Theory Key concepts:

Python is a high-level, interpreted language with simple, readable syntax. In this course, Python is used as the main language to implement and visualise computer graphics algorithms.

**Qn1. Write a Python program to input five numbers and print the largest number.**

Code:

```
nums = []

for i in range(5):
    number = float(input(f"Enter number {i+1}: "))
    nums.append(number)

largest = max(nums)
print("The largest number is:", largest)
```

Output:

```
Enter number 1: 4
Enter number 2: 4
Enter number 3: 7
Enter number 4: 8
Enter number 5: 4
The largest number is: 8.0
```

**Qn2: Write a program to print the multiplication table of any number (from 1 to 10).**

Code:

```python
num = int(input("Enter a number to print its multiplication table: "))
print(f"Multiplication table of {num}:")

for i in range(1, 11):
    print(num, "x", i, "=", num * i)
```

Output:

```
Enter a number to print its multiplication table: 5
Multiplication table of 5:
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
```

**Qn3.** Create a list of 10 integers and print:

- all even numbers
- all odd numbers

Code:

```python
numbers = [12, 7, 9, 20, 33, 42, 15, 28, 5, 18]

print("Even numbers:")
for num in numbers:
    if num % 2 == 0:
        print(num)

print("\nOdd numbers:")
for num in numbers:
    if num % 2 != 0:
        print(num)
```

Output:

```
Even numbers:
12
20
42
28
18

Odd numbers:
7
9
33
15
5
```

1. **Qn4. Using matplotlib, plot:**

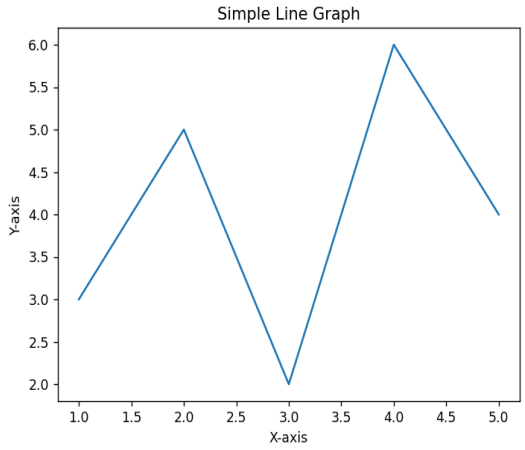
   - **a simple line graph of your choice**

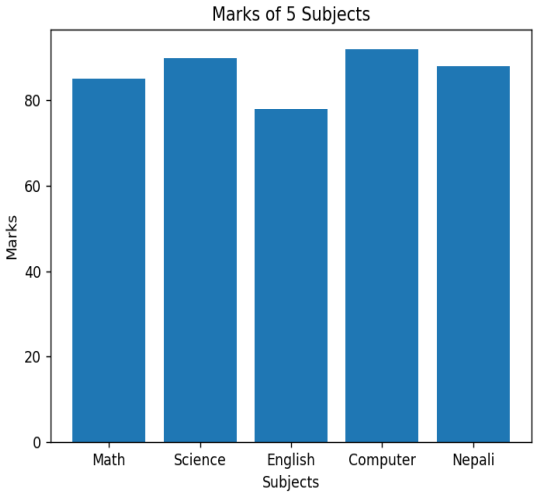
   - **a bar graph of marks of 5 subjects**

**Code:**

```python
import matplotlib.pyplot as plt

x = [1, 2, 3, 4, 5]
y = [3, 5, 2, 6, 4]

plt.figure()
plt.plot(x, y)
plt.title("Simple Line Graph")
plt.xlabel("X-axis")
plt.ylabel("Y-axis")
plt.show()

subjects = ["Math", "Science", "English", "Computer", "Nepali"]
marks = [85, 90, 78, 92, 88]

plt.figure()
plt.bar(subjects, marks)
plt.title("Marks of 5 Subjects")
plt.xlabel("Subjects")
plt.ylabel("Marks")
plt.show()
```

**Output:**




## Outcomes

- Students will understand core Python syntax needed for later graphics labs.
- Students will be able to use conditions, loops and lists in basic programs.

- Students will know how to create simple plots with matplotlib