**Practical 1**

**Write a program to draw a line chart. Apply grids and special effects on line chart and display multiple lines with different shapes and colour.**

**Theory**

A line chart, also known as a line plot or line graph, is a type of chart used to represent data points as a series of markers connected by straight line segments. It is particularly useful for showing trends over time or illustrating the relationship between two variables.

# Characteristics of Line Charts:

1. **Sequential Data Visualization:** Line charts are ideal for visualizing data that has a natural sequence, such as time-series data. The x-axis typically represents the sequential data points (e.g., time, months, years), while the y-axis represents the corresponding values.
2. **Trend Analysis:** Line charts help in identifying trends, patterns, and fluctuations in data over time. Upward or downward trends, seasonality, and cyclical patterns can be easily observed.
3. **Comparison:** Line charts allow for easy comparison of multiple datasets or categories. You can plot multiple lines on the same chart to compare trends across different groups or variables.
4. **Interpolation:** Line charts often interpolate between data points, assuming a continuous relationship between adjacent points. This interpolation helps in visualizing the overall trend even if data points are sparse.

# Components of a Line Chart:

1. **Data Points:** These are the individual values being plotted. Each data point is represented by a marker on the chart.
2. **Line Segments:** Line segments connect consecutive data points, forming the lines that give the chart its name.
3. **X-axis and Y-axis:** The horizontal axis (X-axis) typically represents the independent variable, while the vertical axis (Y-axis) represents the dependent variable. For example, in a time series, time might be plotted on the X-axis, and the corresponding values are plotted on the Y-axis.
4. **Labels and Titles:** Line charts often include labels for the X and Y axes, as well as a title that describes the overall content of the chart.
5. **Legend:** If the chart displays multiple lines, a legend may be included to indicate the meaning of each line.

**Code:**

import matplotlib.pyplot as plt

print("Harshit Lakhera BCA 4 M\n")

print("02214202023\n")

years = [2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023]

X = [75, 65, 85, 95, 105, 60, 80, 90, 100, 150, 250, 40]

linkedin = [50, 75, 85, 105, 125, 110, 120, 145, 150, 180, 209, 258]

whatsapp = [8, 16, 24, 30, 55, 60, 75, 80, 10, 70, 450, 600]

plt.plot(years, X, marker="\*", linewidth=1, markersize=4, linestyle='dashed')

plt.plot(years, linkedin, marker='o', linewidth=1, markersize=4, linestyle=":")

plt.plot(years, whatsapp, marker='<', linewidth=1, markersize=4)

plt.xlabel('Years')

plt.ylabel('Visitor Count (in millions)')

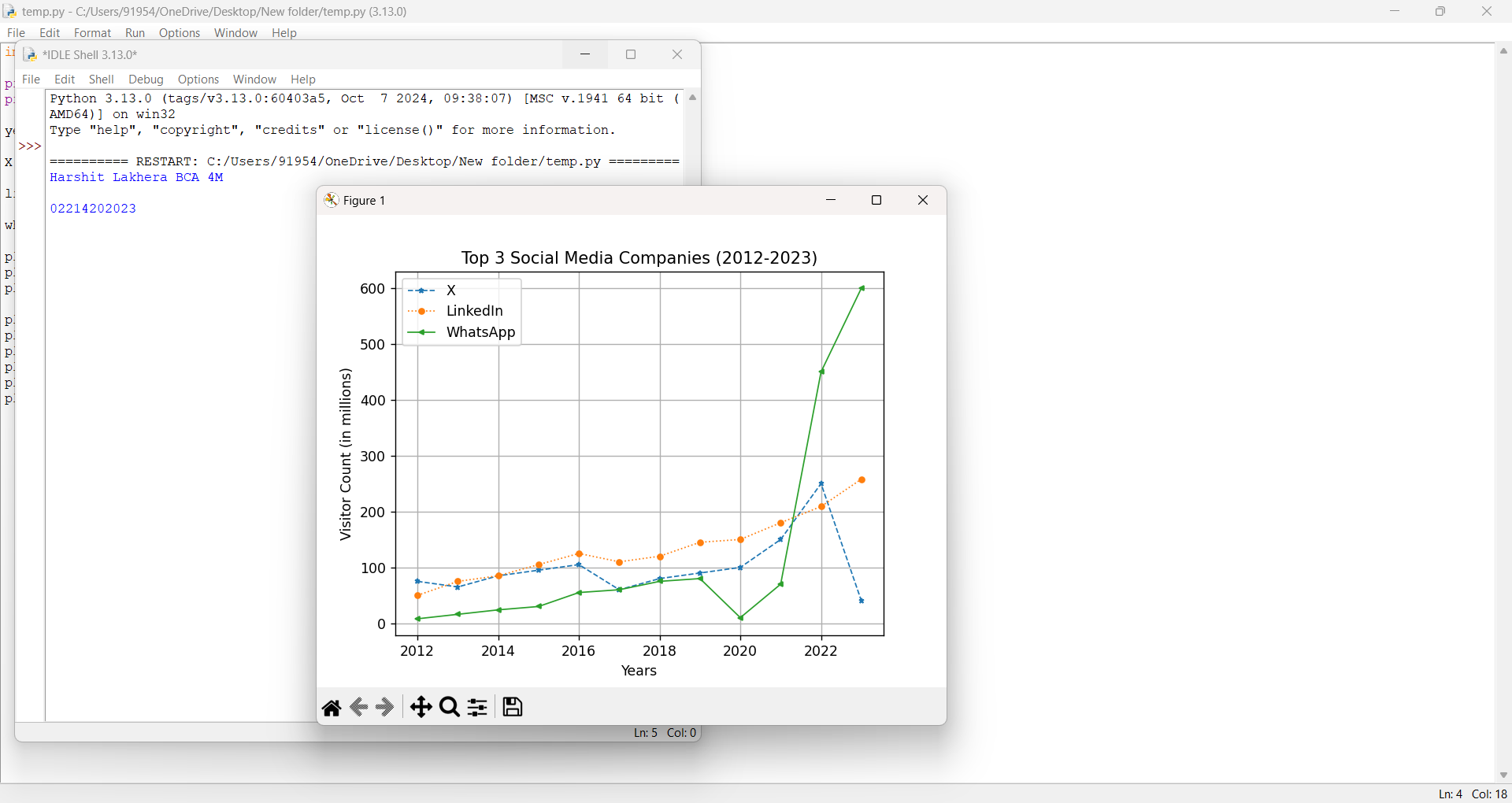
plt.title("Top 3 Social Media Companies (2012-2023)")

plt.legend(['X', 'LinkedIn', 'WhatsApp'], loc='upper left')

plt.grid()

plt.show()

**Output:**

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