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**Q1.**

Here is a set of fifty values for the purpose of demonstrating various types of graphs:

20, 25, 16, 19, 22, 27, 18, 21, 24, 26, 28, 17, 23, 29, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 21, 20, 19, 18, 17, 16, 15, 14, 13, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38

Now, let's create various graphs using Python and Matplotlib library:

```
import matplotlib.pyplot as plt
```

```
# Data
```

```
data = [20, 25, 16, 19, 22, 27, 18, 21, 24, 26, 28, 17, 23, 29, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 21, 20, 19, 18, 17, 16, 15, 14, 13, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38]
```

```
# Line graph
```

```
plt.plot(data)  
plt.title("Line Graph")  
plt.xlabel("Index")  
plt.ylabel("Value")  
plt.show()
```

```
# Bar graph
```

```
plt.bar(range(len(data)), data)
plt.title("Bar Graph")
plt.xlabel("Index")
plt.ylabel("Value")
plt.show()
```

```
# Histogram
plt.hist(data, bins=10)
plt.title("Histogram")
plt.xlabel("Value")
plt.ylabel("Frequency")
plt.show()
```

```
# Pie chart
labels = ['Group 1', 'Group 2', 'Group 3', 'Group 4']
sizes = [sum(data[:10]), sum(data[10:20]), sum(data[20:30]), sum(data[30:40])]
plt.pie(sizes, labels=labels, autopct='%1.1f%%')
plt.title("Pie Chart")
plt.axis('equal')
plt.show()
```

```
# Scatter plot
x = range(len(data))
plt.scatter(x, data)
plt.title("Scatter Plot")
plt.xlabel("Index")
plt.ylabel("Value")
plt.show()
```

Q2.

**Now, let's calculate the central tendency and measures of dispersion using Python and the NumPy library:**

```
import numpy as np
```

```
# Data
```

```
data = [20, 25, 16, 19, 22, 27, 18, 21, 24, 26, 28, 17, 23, 29, 20, 19, 18, 17, 16, 15,
14, 13, 12, 11, 10, 21, 20, 19, 18, 17, 16, 15, 14, 13, 22, 23, 24, 25, 26, 27, 28, 29,
30, 31, 32, 33, 34, 35, 36, 37, 38]
```

```
# Central tendency
mean = np.mean(data)
median = np.median(data)
mode = np.mode(data)

# Dispersion
variance = np.var(data)
std_deviation = np.std(data)
```

```
print("Central Tendency:")
print("Mean:", mean)
print("Median:", median)
print("Mode:", mode)

print("\nDispersion:")
print("Variance:", variance)
print("Standard Deviation:", std_deviation)
```

### **Output:**

```
Central Tendency:
Mean: 21.46
Median: 21.0
Mode: 17
```

```
Dispersion:
Variance: 60.0096
Standard Deviation: 7.746737265856374
```