**Lab 04**

**Task 1:**

* Generate random data (sample size=100). Hint: [random.normal(loc=10,\_\_=1,100)]
* Calculate the mean of the data.
* Plot the data distribution using a histogram or boxplot, and mark the mean on the plot. Plt.bar(data,

**Task 2:**

* Use the same dataset
* Calculate the median.
* Use a histogram to visualize the data and mark the median on the plot.

**Task 3:**

* Use the same dataset
* Calculate the mode(s).
* Use a histogram to visualize the data, highlighting the mode(s).

**Task 4:**

* Calculate the minimum and maximum values to find the range.
* Visualize using a boxplot, marking min and max values.

**Task 5:**

* Calculate variance.
* Plot the data distribution and display variance as text.

**Task 6:**

* Calculate standard deviation.
* Visualize data distribution using histogram and annotate ±1, ±2 standard deviations and also show the %age of data lies in each std.

**Task 7:**

* Compute Q1, Q3, and IQR.
* Plot a boxplot showing quartiles and IQR range.

**Task 8:**

* Generate a skewed dataset (for both (a) left and (b)right skewed data)
* Calculate mean and median.
* Plot histogram, marking mean,mode and median.

**Task 9:**

* Calculate Z-scores.
* Plot histogram of Z-scores, showing standard normal distribution as reference.

**Task 10:**

* Calculate Q1, Q3, and IQR, then identify outliers.
* Plot data with outliers marked, using a scatter plot or boxplot.