1. **Explain Key Statistical Concepts**

1. Population and Sample

* Population: The entire group you want to study or draw conclusions about.
* Sample: A subset of the population used to represent the whole.

2. Descriptive vs. Inferential Statistics

* Descriptive Statistics: Summarizes data using numbers like mean, median, mode, standard deviation, etc.
* Inferential Statistics: Makes predictions or generalizations about a population based on a sample (e.g., confidence intervals, hypothesis testing)

3. Measures of Central Tendency

* Mean: Average value.
* Median: Middle value when data is sorted.
* Mode: Most frequent value.

4. Measures of Dispersion

* Range: Difference between max and min values.
* Variance: Average squared deviation from the mean.
* Standard Deviation (SD): Square root of variance. Shows data spread.
* Interquartile Range (IQR): Spread of the middle 50% of values.

5. Probability

* Values range from 0 (impossible) to 1 (certain).
* Example: Probability of flipping a head in a fair coin = 0.5.

1. **Presentation: Importance of Probability in Machine Learning**

**Introduction:-**

* What is Probability?  
  The mathematical study of uncertainty and randomness.
* Why it matters in ML:  
  Machine Learning often involves predicting uncertain outcomes and modeling real-world randomness.

**Role of Probability in ML:-**

* Helps models learnfromdata.
* Enables predictionsanddecisions with confidence.
* Powers statisticallearning, Bayesianinference, and uncertaintyestimation.

**Uncertainty Estimation:-**

* Probability allows the model to expressuncertainty.
* Important in:

Medical diagnosis

Autonomous driving

Risk-sensitive applications