Machine Learning and Statistics (Weekly Test-19-07-2024)- Haritha P V

5. Differences between Descriptive and Inferential Statistics

1. **Purpose**:
    - Descriptive: To summarize and describe the features of a dataset.
    - Inferential: To make inferences and predictions about a population based on a sample.
2. **Data Type**:
    - Descriptive: Deals with known, visible data.
    - Inferential: Deals with predictions and probabilities.
3. **Methods**:
    - Descriptive: Measures of central tendency (mean, median, mode), measures of variability (range, variance, standard deviation).
    - Inferential: Hypothesis testing, confidence intervals, regression analysis.
4. **Scope**:
    - Descriptive: Limited to the data at hand.
    - Inferential: Extends beyond the data to make generalizations about a larger population.
5. **Tools**:
    - Descriptive: Charts, graphs, tables, summary statistics.
    - Inferential: Statistical tests, p-values, confidence intervals.
6. **Population vs Sample**:
    - Descriptive: Typically involves the entire population or a complete dataset.
    - Inferential: Typically involves a sample of the population.
7. **Hypothesis**:
    - Descriptive: Does not test hypotheses.
    - Inferential: Involves hypothesis testing.
8. **Uncertainty**:
    - Descriptive: No uncertainty; data is fully known.

    - Inferential: Includes uncertainty; based on sample data, there is a margin of error.
9. **Examples**:
    - Descriptive: Average age of students in a class.
    - Inferential: Predicting the average age of students in all schools based on a sample.
10. **Goal**:
    - Descriptive: To present data in a meaningful way.
    - Inferential: To draw conclusions and make decisions based on data analysis.