Syllabus for Statistics 1 recruitment test

IITM Online Degree Project

1. Introduction: Data Collection. Variables and cases. Classification of data as categorical and numerical and others. Creation, downloading, and manipulation of datasets. Framing questions that can be answered from data. Motivating questions about estimation, testing, correlation. Sample and Population.

2. Descriptive Statistics: Organising and visualising data. Misleading graphs. Computation and interpretation of numerical summaries - mean, standard deviation, median, Percentile, and Interquartile range. Five number summary. Histograms, box plots, frequency tables, and contingency tables. Association between two variables.

3. Permutations and combinations: Factorials, Permutations, Combinations, Binomial Coefficients.

4. Probability: Probabilities of events - unions, intersections, complement. Conditional probability. Dependent and Independent events. Relating probability to data sets.

5. Discrete Random Variables: Types of random variables - discrete and continuous. Probability mass function, graph, and examples. Cumulative distribution function, graphs, and examples. Expectation and variance of a random variable.

6. Binomial Distribution: Definition. Expectation and variance of binomial distribution

7. Normal Distribution: Concept of probability density function. The empirical rule of Normal distribution. Standard Normal distribution. Applications of Normal distributions.