Statistics: Definition, Application

Data: Qualitative and Quantitative, Summarization, Scale of measurement, Central tendency, Dispersion, Shape characteristics,

Probability: Definitions, Addition & Multiplication law, Basic computation of probability - math coin toss, die throw, card/ball draw

Random variable: probability function, probability density function, expectation of RV.

Distributions: Binomial, Poisson, Normal, Exponential, Gamma, Beta (Mean, Variance, MGF)

Distribution of a Random Variable: Concept of Parameter & Statistics/Estimator,

Sampling distribution: Distribution of sample mean, Sample variance; Exact sampling distributions: Chi-Square, t, F distributions

Correlation and Cross-tabulation Analysis: Concept of Qualitative and Quantitative Data; Application tools for analysis, Interpretation;

Simple and Multiple Regression: Model specification, Estimation of parameters and Interpretation, Test of hypothesis; Concept of Multiple and Partial Correlation

Sampling and Sample size Determination: Concept of population, sample, Probability sampling and non-probability sampling, Drawing sample under different sampling techniques: Simple Random Sampling, Stratified Random Sampling, Systematic Sampling and Cluster Sampling.

A random variable is a variable that takes different value with associated probabilities; with the condition that summation of the probabilities will be one.

Discrete random variable: x takes countable numbers; e.g., x=0,1,2,...

Continuous random variable: x takes values within a range; e.g., 0<x<1.

Probability function [p(x)]: Mathematical formulation of a discrete random variable. For example, Binomial distribution, Poisson distribution...

Probability density function [f(x)]: Mathematical formulation of a continous random variable. For example, Normal distribution, Exponentail, Gamma, Beta....etc.

Joint probability function [p(x,y)]<=> Marginal distribution, Conditional distribution

Joint probabilty density function [f(x,y)] <=> Marginal distribution, Conditional distribution

Random Sample: Each Individual have an Equal Chance of Being Chosen

Each element/item/individual (5 out of 23) of Random Sample is independent.

23 <=> 5 23c5=33649

L=f(x1,x2,...xn)=f(x1).f(x2). ... .f(xn)

Random Variable (X<=> x1, x2,....xn

Distribution:

Probability Distribution (Binomial/Poisson/Geometric etc.)or

Probability Density Function (Normal/Exponentail/Gamma etc.)

Binomial: Number of trials is fixed (Possible outcomes two); x=0,1,2,...,n

Poisson: Number of trials is infinite in nature (Possible outcomes two); x=0,1,2,...