1. Introduction to data modelling for Business

2. Fundamentals of Statistics

3. Inferential Statistics

4. Descriptive statistics with R.

Reference book:-

G. James, D. Witten, T. Hastie & R. Tibshirani - An introduction to statistical learning with applications in R, Springer.

Data → Analyse → Predict / conclude.

Birth-Death < population
1-5
6-18
18-40
40-60
60 >

How ?

Qu:- Any company manufactures TV

Warranty

X — lifetime of TV

Prob $(X > 1)$ = ?

$P(X > 3)$ = ? 0.7 How?

Exponential distn. → by a function depending on some parameter

TV →
Mobile →
PC →

Parameter

finding this parameter

Parameter estimation

Statistics

Descriptive

Inferential

① Measure of Central Tendency

↓

Mean, Median, Mode

Students marks

$a_1\ a_2\ a_3 \ldots a_{10}$

Parameter Estimation

Point estimation

Interval estimation

Hypothesis Testing

↓

statement

Null Hypothesis

Alternative Hypothesis.

Passing marks = $\frac{1}{2}$ Median.

② Measure of Dispersion :- Range

Variance, Standard deviation.

$$Var = \frac{1}{n}(x_i - \bar{x})^2$$

↓

square feet.

2 3 4 · 5 6 7 → feet

$\bar{x} = \frac{27}{6} = 4.5$ feet

(iii) Visualization: Histogram, Bar graph, Pie charts

Sampling:

Population → Destructive

Sample → subset of population

large

Sampling theory:

Population: Income of people in Patna

1, 2, ..., 1000

$X_1, X_2, \ldots, X_{1000}$ → random variable

Random Sample → independent & identically distributed random variables

$X_1, X_{20}, X_{300}, X_{80}, X_{150}, \ldots$

Statistic → Function of random sample

Population (we want to infer some property of this population)

↓

Sample (independent part of population)

↓

Statistic (Function of sample)

↓

Analyze this statistic to infer about population.