PW SKILLS

Introduction to Statistics

Defn: Statistics is the science of collecting, organizing and analyzing data

⇓

Decision MAKing Process

Data: "facts or pieces of information"

Eg: Height of students in classroom

{175cm, 18 cm, 190cm, 160cm ...}

IQ

{100, 90, 95, 80 ...}

② Types of Statistics

① Descriptive Statistics

Defn: It consists of organizing and summarizing data

① Measure of Central Tendency [Mean, Median, Mode]

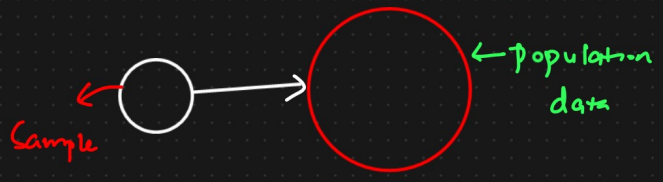
② Measure of Dispersion [Variance, Std]

③ Different type of Distribution of data.

Eg: Histogram, pdf, pmf

② Inferential Statistics

Defn: It consists of using data you have measured to form conclusion



① Z-test
② t-test
③ CHI SQUARE

} Hypothesis Testing Ho, H, p value, Significance value

Eg: Lets say there are 20 statistics classes at your college. and you have collected the heights of students in the class.

Heights are recorded [175cm, 180cm, 140, 140, 135, 160, 135, 190cm]

$$\frac{175+180+140+140+135+160+135+190}{8} = \text{Avg Height}$$

Descriptive Question

"What is the average height of the entire classroom"

Inferential Question

Sample

"Are the height of the students in classroom similar to what you expect in the entire college"

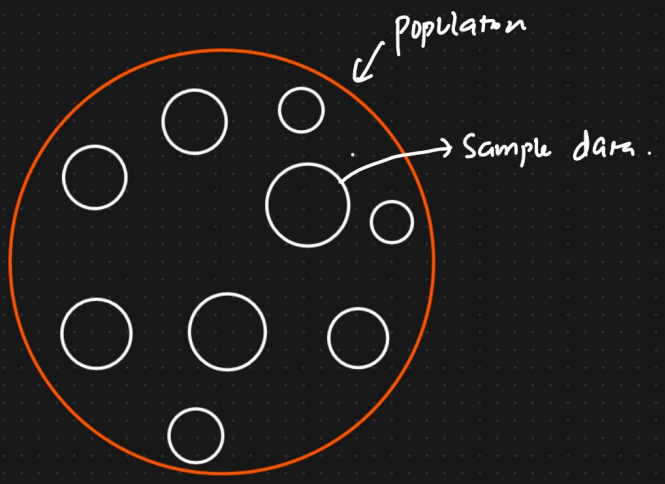
↳ population data

Population And Sample Data

Population: The group you are interested in studying

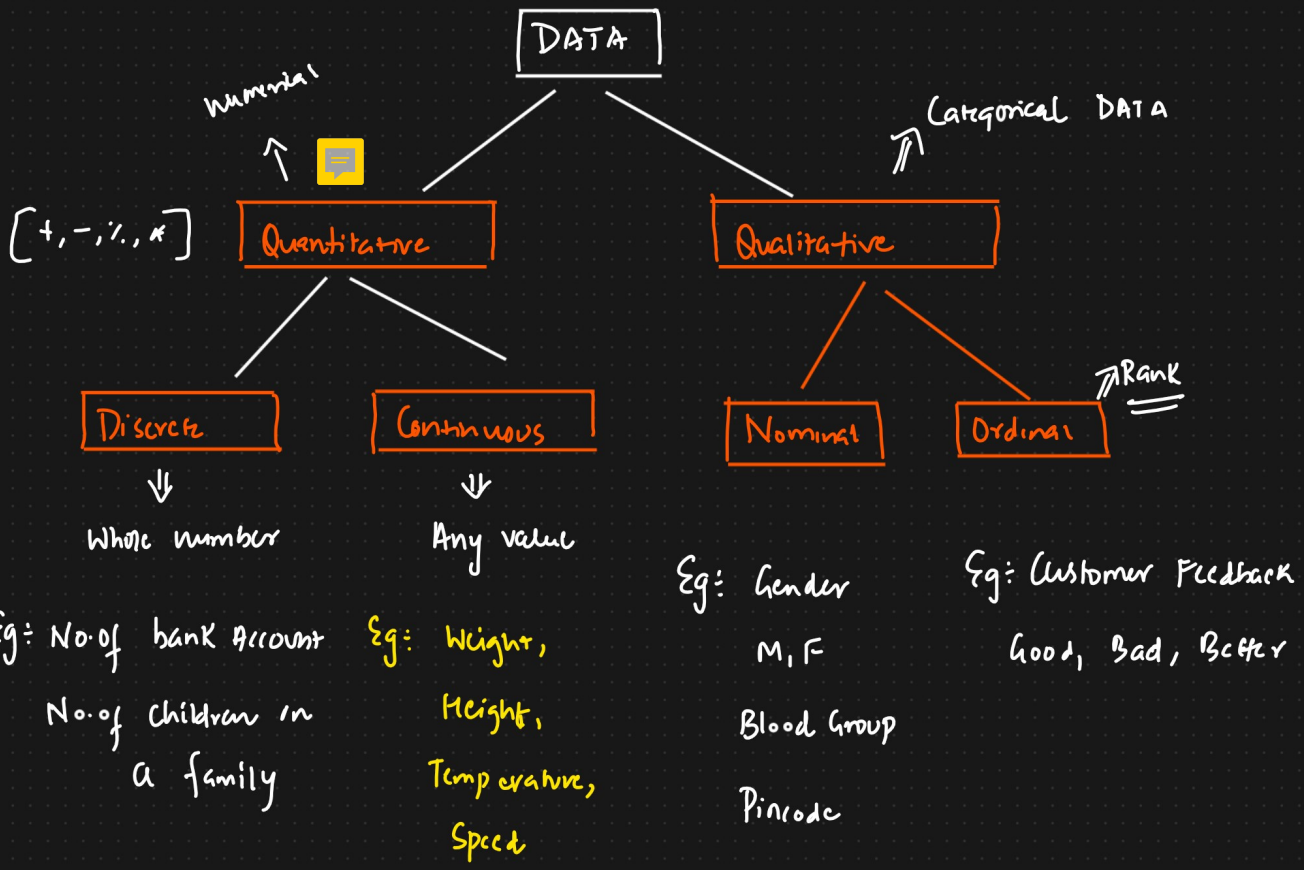
Sample : a subset of population

Eg: Exit Poll



③ Types of Data

DMC	DC	ISI	BUI	FWI	Classes	Region
3.4	7.6	1.3	3.4	0.5	not fire	0
4.1	7.6	1	3.9	0.4	not fire	0
2.5	7.1	0.3	2.7	0.1	not fire	0
1.3	6.9	0	1.7	0	not fire	0
3	14.2	1.2	3.9	0.5	not fire	0
5.8	22.2	3.1	7	2.5	fire	0
9.9	30.5	6.4	10.9	7.2	fire	0
12.1	38.3	5.6	13.5	7.1	fire	0



④ Scale of Measurement

1. Nominal Scale Data
2. Ordinal Scale Data
3. Interval Scale Data
4. Ratio. Scale Data.

① Nominal Scale Data

1. Qualitative / Categorical
2. Eg: Gender, Colors, Fabrics
3. Order does not matter

Eg: Favorite Color

Red → 5 → 50%

Blue → 3 → 30%

Orange → 2 → 20%

10

Gender

M

F

② Ordinal Scale Data

1. Ranking is important
2. Order matter
3. Difference cannot be measured

Eg:

1 → Best

2 → Good

3 → Bad

Working Professional

M

T

W

Th

← F

Race:

1st

2nd

3rd

4:20

5:30

6:00

OF

③ Interval Scale Data

① The order matter

② Difference can be measured

③ Ratio cannot be measured ✓

④ No "0" Starting Point

Eg: Temperature variable.

-30° F

-15° F

30 F

60 F

90 F

120 F

60:30 = 2:1 →

90 - 60 = 30 F

120 - 90 = 30 F

④ Ratio Scale Data

① The order matter ✓

② Differences are measurable (including ratio)

③ Contains a "0" Starting point.

Eg: Students marks in a class

0, 90, 60, 30, 75, 40, 50

Asc = 30, 40, 50, 60, 75, 90

40 - 30 = 10

50 - 30 = 20

Ratio = $\frac{90}{30}$ = 3 : 1

Example

① Length of Different Rivers In the World ?

② Favorite food Based on Gender ?

③ Marital Status ?

④ IQ measurement ?