**Statistics: (cosai)**

Is Science of collecting,Organizing,summarization

,analyzing and making inferences from data.



**Variable :**

Measurable characteristic or attribute that differs.



Values are determined by chance are called **random variables.**

1. **Data :** arevalues of that variables describing an event
2. **Quantitative data :** data values are numeric

Eg: height of basketball players are quantitative data values .

1. **Discrete variables :** values can be counted.

Eg:number of days in your neighbourhood.

1. **Continuous Variables** : assume values between min and max values. Eg:Height of basket players.
2. **Qualitative data** : data values that can be placed into distinct categories according to some attribute.eg:Eye color of basketball players
3. **Population** :all elements being studied.

Eg : to get **mean** of 10th grade students in school , population of all 10th grade students gets considered.

1. **Parameters** : characteristic or fact about population.

Eg:Standard deviation,Mean of population

1. **Sample** : subset of population.

Eg:Randomly selected 10th grade student.

1. **Statistic** : characteristics or fact about sample.

Eg: Mean and SD

**Descriptive statistics :**

Frequency Distribution

Graphical display of data

Central tendency and variability

**Frequency distribution** :

1. Frequency
2. Relative frequency
3. Cumulative frequency
4. Cumulative relative frequency
5. Mean and standard deviation
6. Frequency : number of times data occurs in data set
7. Relative frequency : number of freq/total number of observation
8. Cumulative frequency : sum of freq for all values at or below given value.
9. Relative cumulative freq : sum of all relative freq
10. Mean and sd :

**Graphical display of data :**

1. **Dot plots** : multiple occurences of a particular value
2. **Bar charts** : horizontal and vertical bar to represent frequencies
3. **Histogram** : freq or relative freq that uses classes and vertical bars of various height
4. **Stem and leaf plots :**
5. **Pie charts** : divided into slices according to percentage of data values in each category.

**Central tendency and variability :**

1. Mean
2. Median
3. Mode
4. Variance : avg squared deviation from population mean
5. Standard deviation
6. Range
7. Coefficient of variation
8. IQR
9. Mean absolute deviation(MAD)

**Probability**

Basics of probability

Discrete Probability Distribution

Continuous Probability Distribution

**Discrete Probability Distribution :**

Expected value

Variance and standard deviation

Binomial Random distribution

Poisson distribution

**Continuous Probability Distribution :**

Normal distribution

Standard normal distribution

Students t-distribution

**Inferential Statistics :**

Single Sample Hypothesis testing and confidence intervals

Two Sample Hypothesis testing and confidence intervals

Using Chi-square Distribution

**Single Sample Hypothesis testing and confidence intervals :**

Confidence intervals

Hypothesis testing

**Two Sample Hypothesis testing and confidence intervals**

Bird eye’s view

Confidence intervals

Hypothesis testing

**Using Chi-square Distribution :**

Chi-square goodness of fit test

Chi-square test of homogeneity

Chi-square test of independence

Confidence intervals for variance and SD

**Applied Statistics :**

Linear correlation

Least Squares Linear Regression