

Types of Quantitative Data:

- **Discrete:** Countable numbers
Example: Number of children, cars, students
- **Continuous:** Measurable values
Example: Height, weight, time, temperature

Examples:

Variable	Type
Age (in years)	Continuous
Number of books	Discrete
Income (in ₹)	Continuous

Comparison Summary

Feature	Categorical Data	Quantitative Data
Nature	Descriptive	Numerical
Can do math?	No	Yes
Subtypes	Nominal, Ordinal	Discrete, Continuous
Examples	Gender, Color, Rank	Age, Income, Distance
Visualized by	Bar chart, Pie chart	Histogram, Box plot

Define Binomial distribution and Poisson distribution.

1. Binomial Distribution

Definition:

A **Binomial Distribution** models the number of **successes** in a **fixed number of independent trials**, where each trial has only **two possible outcomes**: success or failure.

Key Conditions:

- Fixed number of trials: n
 - Two possible outcomes: **Success or Failure**
 - Constant probability of success: p
 - Trials are **independent**
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Probability Formula:

$$P(X = r) = nCr \cdot p^r \cdot (1 - p)^{n-r}$$

Where:

- $P(X = r)$: Probability of getting exactly r successes
 - nCr : Number of combinations (ways to choose r successes from n trials)
 - p : Probability of success
 - $1 - p$: Probability of failure
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Mean and Variance:

- Mean $m = n \cdot p$
- Variance $\sigma^2 = n \cdot p \cdot (1 - p)$

Variance is also given as “n.p.q”

2. Poisson Distribution

Definition:

The **Poisson Distribution** models the number of **events** that occur in a **fixed interval of time or space**, given the events occur **independently** and at a **constant average rate**.

Key Conditions:

- Events occur **randomly and independently**
 - Average rate (mean) of events in an interval is **known and constant**
 - Used when number of trials n is large and probability p is small
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