**What Is a Distribution?**

A **distribution** is a way to describe how values in a dataset are spread or arranged. It tells us how frequently different values or ranges of values occur. Distributions are commonly used in statistics, data science, and probability to analyze patterns and make predictions.

### **Types of Distributions**

1. **Probability Distribution** – Shows how probabilities are assigned to different outcomes.  
   * Example: A coin flip has a 50% probability of landing on heads or tails.
2. **Statistical Distribution** – Represents the spread of data in a dataset.  
   * Example: Heights of people in a population usually follow a **normal distribution** (bell-shaped curve).
3. **Continuous vs. Discrete Distributions**
   * **Continuous Distribution**: Deals with data that can take any value within a range (e.g., height, weight, temperature).
   * **Discrete Distribution**: Deals with countable values (e.g., number of customers in a shop).

### **Common Types of Distributions**

* **Normal Distribution (Gaussian)** – Symmetrical, bell-shaped (e.g., human height, IQ scores).
* **Binomial Distribution** – Used for binary outcomes (e.g., success/failure).
* **Poisson Distribution** – Models count data over time (e.g., number of calls received per hour).
* **Uniform Distribution** – All outcomes have equal probability (e.g., rolling a fair die).
* **Exponential Distribution** – Used for time between events in a Poisson process (e.g., time until the next earthquake).

