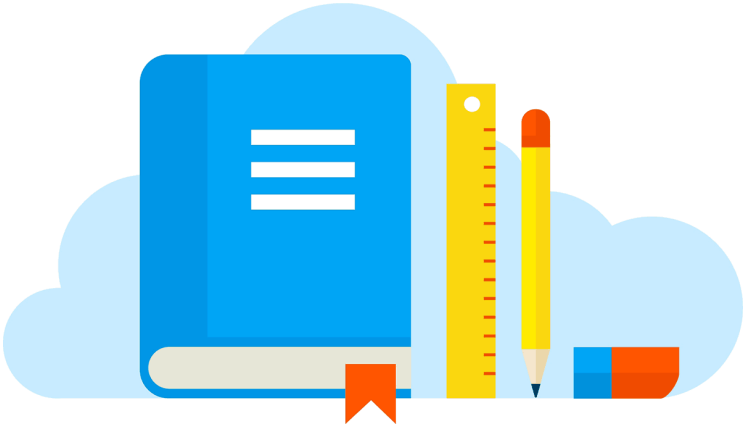


Data Science Notes by Sarowar Ahmed

📊 Chapter: Probability Theory

📊 Topic: Bernoulli Distribution

🔎 Hey there, GitHub family! Today, let's unravel the mystery of the Bernoulli Distribution, a cornerstone of probability theory that's as simple as flipping a coin. I'll guide you through this concept in a way that's clear and engaging for everyone, no matter your background or age!

🌟 What is the Bernoulli Distribution?

▪ Imagine a light switch. It can only be in one of two states: ON or OFF. Similarly, the Bernoulli Distribution deals with events that have

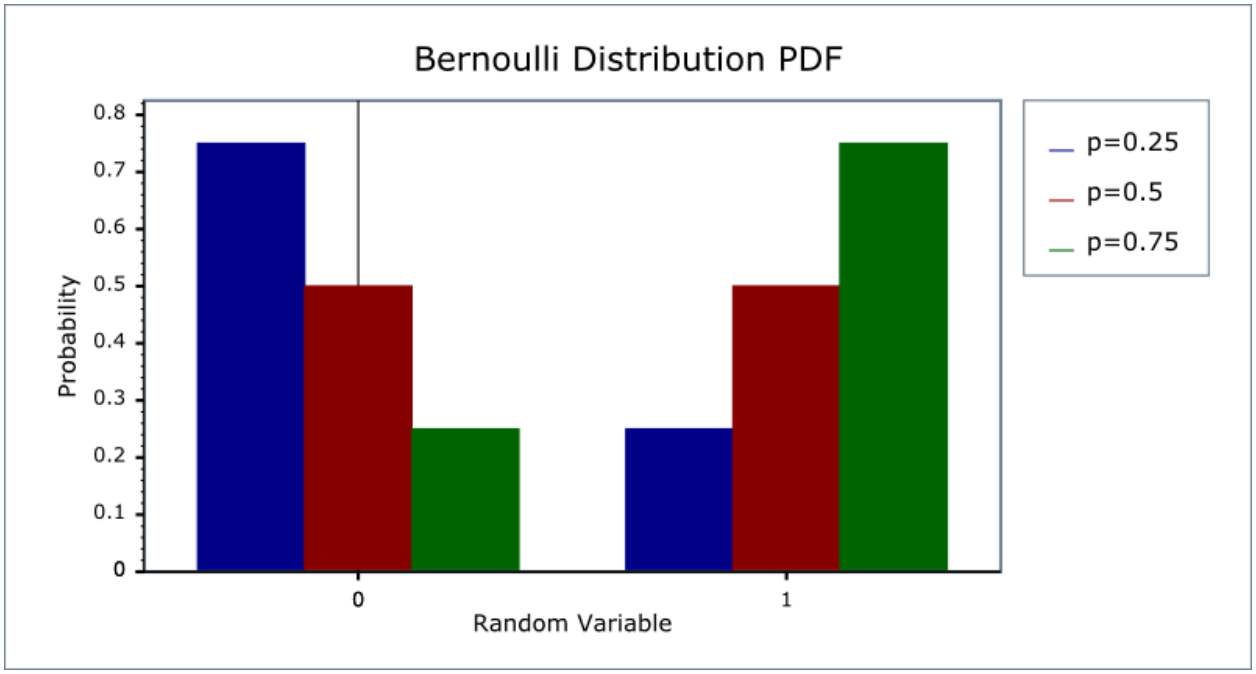
only two possible outcomes: a success or a failure, true or false, 1 or 0. It's the foundation for understanding more complex probabilities.

📐 Formula for Bernoulli Distribution:

▪ The probability mass function (PMF) of a Bernoulli distributed random variable X is given by:

P(X=x)=p^x*(1−p)^(1−x)
Where:
▪ x can only be 1 or 0,
▪ p is the probability of success (X=1),
▪ (1−p) is the probability of failure (X=0).

🖼️ Visualizing the Bernoulli Distribution:



🎲 Examples of the Bernoulli Distribution:

Flipping a Coin:
▪ If you flip a fair coin, there are two possible outcomes: heads (success) or tails (failure). If heads is considered a success (p=0.5), then the probability of flipping tails (1–p) is also 0.5.

Checking for Defects:
▪ In a factory, a machine inspects items and classifies them as defective (success, p) or non-defective (failure, 1–p). If 2% of items are typically defective, then p=0.02.

🚀 Why Does This Matter?

▪ The Bernoulli Distribution is a fundamental concept in probability theory and statistics, underpinning more complex distributions and models. It's crucial for decision making, risk assessment, and in any scenario where outcomes are binary.

Got any questions about Bernoulli Distribution!? Feel free to ask me via Linkedin! Let's keep learning together.

My LinkedIn Date: 11/04/2024