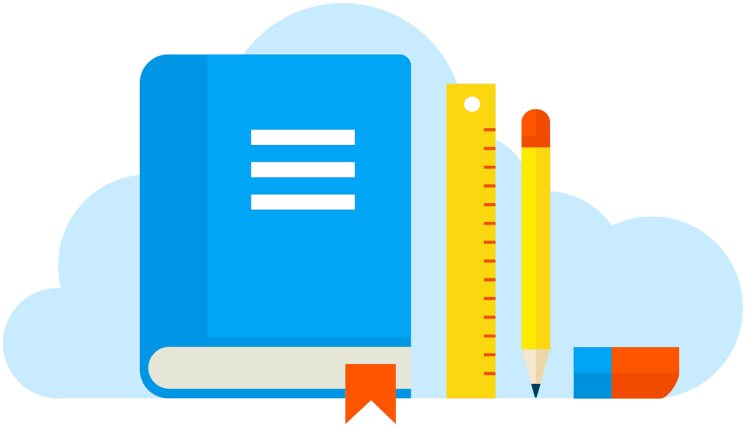


Data Science Notes by Sarowar Ahmed

📊 Chapter: Probability Theory

📊 Topic: Binomial Distribution

🔎 Hello, GitHub family! Today, we're diving into the Binomial Distribution, a fascinating concept in probability theory that expands on the simple idea of the Bernoulli distribution. Whether you're a student, a professional, or just a curious mind, I'll make sure this post is easy to understand for everyone!

🌟 What is the Binomial Distribution?

▪ Imagine you're playing a game of darts. Each throw is either a hit (success) or a miss (failure), and you play several rounds. The

Binomial Distribution helps you figure out the probability of scoring a certain number of hits across those rounds, given the probability of hitting the target in a single throw.

📐 Formula for Binomial Distribution:

The probability of getting exactly k successes in n trials is given by:
P(X=k) = C(n, k) * p^k * (1-p)^(n-k)

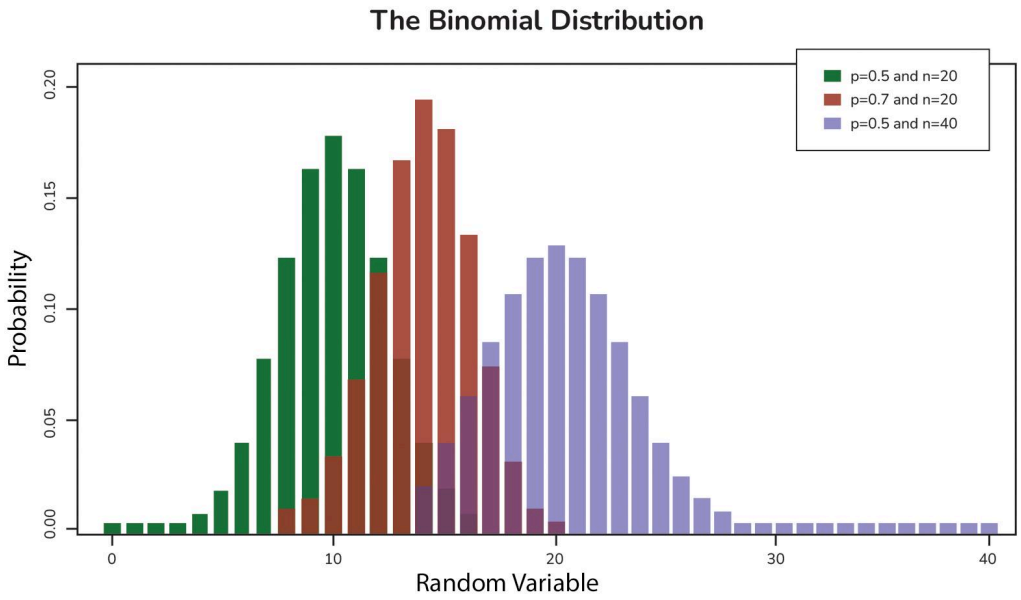
Where:
▪ C(n, k) is the binomial coefficient, representing the number of ways to choose k successes from n trials.
▪ p is the probability of success on a single trial.
▪ k is the number of successes.
▪ n is the total number of trials.

🎲 Examples of the Binomial Distribution:

Marketing Emails:
▪ Suppose a company sends out 100 emails, each with a 10% chance of receiving a response. Using the binomial distribution, we can calculate the probability of receiving exactly 10 responses.

Vaccine Efficacy:
▪ During testing, a vaccine shows 95% efficacy in preventing a disease. If 100 people are vaccinated, the binomial distribution can be used to find the probability that exactly 90 people will be protected.

🖼️ Visualizing the Binomial Distribution:



🚀 Why Does This Matter?

▪ The Binomial Distribution is vital for planning, decision making, and risk assessment in fields ranging from business and marketing to healthcare and public policy. It offers a quantitative way to understand the outcomes of repeated trials with two possible outcomes.

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

My LinkedIn Date: 13/04/2024