OBJECTIVE

BINOMIAL DISTRIBUTION GOES TO POISSION DISTRIBUTION AS SAMPLE SIZE INCREASES.

CONCLUSION

As the sample size in a binomial distribution increases while maintaining a fixed probability of success, the shape of the distribution begins to resemble a Poisson distribution. This transition occurs when the sample size (n) is large, and the probability of success (p) is small, yet the product np remains moderate.

The key connection lies in the conditions where the binomial distribution becomes approximately Poisson:

1. *Low Probability of Success (p):* As p approaches zero, the binomial distribution becomes more skewed, resembling the shape of a Poisson distribution.

2. *Large Sample Size (n):* When the sample size is large, the discrete nature of the binomial distribution starts to approximate a continuous distribution, resembling the Poisson distribution.

The relationship is often expressed as $np \approx \lambda$, where λ is the average rate of success per unit (time, space, etc.) in the Poisson distribution

OBJECTIVE

BINOMIAL DISTRIBUTION GOES TO NORMAL DISTRIBUTION AS SAMPLE SIZE INCREASES.

CONCLUSION

The phenomena of binomial distribution approaches normal distribution is known as the Central Limit Theorem.

The central limit theorem states that if you take sufficiently large samples from a population, the samples' means will be normally distributed, even if the population isn't normally distributed.

CLT states that as the sample size of a random variable with a binomial distribution increases, the distribution of the sample mean approaches a normal (Gaussian) distribution, regardless of the shape of the original distribution.

In the case of a binomial distribution, which describes the number of successes in a fixed number of independent Bernoulli trials, as you take larger and larger samples and calculate their means, the distribution of those means becomes increasingly bell-shaped and approaches a normal distribution.

This transition to normality occurs due to the averaging effect of large sample sizes, smoothing out the irregularities in the original distribution