

STAT 2593

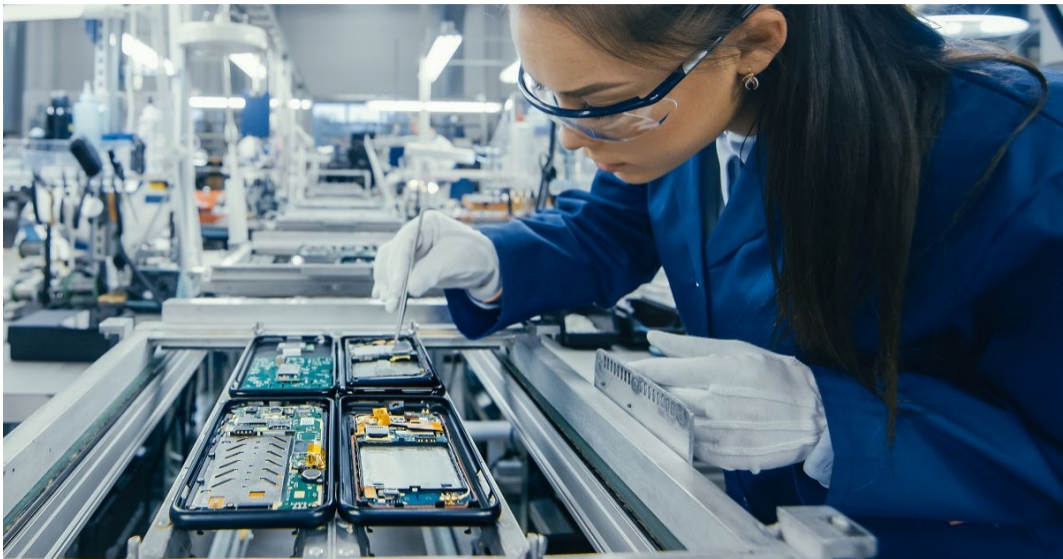
Lecture 013 - The Binomial Distribution

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The Binomial Distribution

Learning Objectives

1. Understand the binomial distribution, its use cases, and its properties.



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- ▶ The random variable X of the counts of successes then follows $X \sim \text{Bin}(n, p)$.
 - ▶ We have $E[X] = np$, $\text{var}(X) = np(1 - p)$, and

$$p(x) = \binom{n}{x} p^x (1 - p)^{n-x}.$$

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 - ▶ If the population is *very* large, then it will behave as an approximately binomial distribution.

Summary

- ▶ The binomial distribution characterizes the number of successes on repeated bernoulli trials.
- ▶ The binomial distribution relies on the assumptions of fixed number of trials, constant probability of success, and independence.
- ▶ There is a closed for PMF, expectation, and variance.