

# Stats

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# Probability Distributions

## Binomial

The binomial distribution is used to model a situation with a fixed number of independent trials each with a constant probability of success.

You can model  $X$  as a binomial distribution if:

- There a fixed number of trials,  $n$
- Each trial must succeed or fail
- There is a fixed probability of success,  $p$
- Each trial is independent

$$\text{If } X \sim B(n, p), \text{ then } P(X = x) = \binom{n}{x} p^x (1 - p)^{n-x} \quad (0 \leq x \leq n)$$

## Normal

The normal distribution  $X \sim N(\mu, \sigma^2)$  is symmetrical, meaning the mean and median are equal.

