

Task 8-notes

A **binomial distribution** can be thought of as simply the probability of a SUCCESS or FAILURE outcome in an experiment or survey that is repeated multiple times. The binomial is a type of distribution that has **two possible outcomes**

For example, a coin toss has only two possible outcomes: heads or tails and taking a test could have two possible outcomes: pass or fail.

Binomial distributions must also meet the following three criteria:

1. **The number of observations or trials is fixed.** In other words, you can only figure out the probability of something happening if you do it a certain number of times. This is common sense—if you toss a coin once, your probability of getting a tails is 50%. If you toss a coin a 20 times, your probability of getting a tails is very, very close to 100%.
2. **Each observation or trial is independent.** In other words, none of your trials have an effect on the probability of the next trial.
3. The **probability of success** (tails, heads, fail or pass) is **exactly the same** from one trial to another.

Ex: flip coin n times

There are 2^n sequences of Heads and Tails of length n

exactly k heads and $n-k$ tails

so the formula is going to be $n!/(n-k)!*k!$

$$p = (n!/(n-k)!*k!) * (p^k)*(1-p)^{(n-k)}$$