

1 | Introduction to Probability

Probability: the likelihood of something happening

- "Success"
- "Failure"

At the moment, those are the two categories.

1.1 | A Statistical Trial

Each trial is an event with an outcome. Say, your case for "success" is rolling a 6. All other events are considered as a "failure"

Therefore...

$$Prob(success) = \frac{\# \text{ times success}}{\# \text{ trials}} \quad (1)$$

Statistics is not a hard and fast mathematical thing.

1.1.1 | Definitions

In order to perform the trials, we need to define a few things.

X - Random Variable: a statistic that we could measure

There is a basic bell curve that comes with most trials, given y , and the y is the count.

We don't want to sample the whole population, so we therefore want to sample a subset.

1. Mean The mean of our samples could be defined as follows:

$$\bar{x}_{10} = \frac{\sum_{i=1}^n x_i}{n} \quad (2)$$

Where little x_{10} represents the random variable of a subset of the population, and hence \bar{x}_{10} is the mean of the 10 samples. If we increase the sample size, it will become harder for the sample size to deviate.

Hence...

$$\bar{x}_{10} \approx \bar{X} \quad (3)$$

that the mean of 10 random samples is pretty close to the actual mean.

And, the distribution of the sampled means will become a bell curve slightly "fatter" than that in the original distribution. **As sample size increases, the skinnier the bell curve for the distribution of means increases.**

2. Standard Deviation 'n-1' standard deviation.