Introduction to Probability

1. what's probability

- Probability is the likelihood of an event occurring.
- This event can be pretty much anything
- probability ranges from 0 to 1 and it's a ratio notice the probability formula

$$p(x) = \frac{\text{wanted outcomes}}{\text{All outcomes}}$$

x is an event
p(x) is the probability of event x happening

2. Expected Values

- Expected value is the specific outcome we expect to occur when we run an experiment.
- can also be called an average

categorical

$$E(x) = n*p$$

E(x) is the Expected value n is the number of experiments p is the probability

numerical

$$E(x) = \sum_{i=1}^{n} x_i * p_i$$

E(x) is the Expected value
x is a random variable
p is the probability
i is the element number
n is the total number of elements
this is called sigma sympol in
math it represents the sum

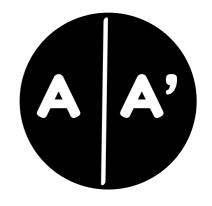
3. probability frequency distrubation

- probability frequency distribution A collection of the probabilities for each possible outcome of an event.
- We need the probability frequency distribution to try and predict future events when the expected value is unattainable.
- Frequency is the number of times a given value or outcome appears in the sample space
- The frequency distribution table is a table matching each distinct outcome in the sample space to its associated frequency.

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	2	1		1/36
	3	2		2/36
	4	3		3/36
	5	4]	4/36
	6	5]	5/36
	7	6		6/36
	8	5]	5/36
	9	4]	4/36
	10	3]	3/36
	11	2]	2/36
	12			1/36

4. Complements

Characteristics of complements:



- Can never occur simultaneously.
- Add up to the sample space. (A + A' = Sample space) •
- Their probabilities add up to 1. (P(A) + P(A') = 1) •
- The complement of a complement is the original event. ((A')' = A)