Mathematics of Binary Events: Bernoulli & Binomial Distributions

Puzzle #1: A Fair Coin Flip

Suppose we flip a fair-sided coin and count how many heads we get. What are the possible outcomes?

Outcome #1:		**Probability Histogram for flipping a fair coin and counting the number of heads:**
P(Outcome #1):		
Outcome #2:		
P(Outcome #2):		

Puzzle #2: A Dice Roll

Suppose we roll a fair, six-sided die and want to know if the result was 1.

Outcome #1:		**Probability Histogram for rolling a die and getting a 1:**
P(Outcome #1):		
Outcome #2:		
P(Outcome #2):		

Bernoulli Distribution for Discrete Random Variables

Any event that has exactly two outcomes with a fixed probability is called a Bernoulli distribution. Every Bernoulli distribution has a probability, p, describing the probability of that event occurring. *We know a lot of these already!*

Event	Probability Distribution
Probability of drawing a queen in a deck of 52 cards.	**Bernoulli(p=1/13)**
Probability of "heads" on a fair coin.	
Probability of a 1 on a six-sided fair die.	