



NYC DATA SCIENCE
ACADEMY

Likelihood Functions

Simplicity

If people do not believe that mathematics is simple, it is only because they do not realize how complicated life is.

- John von Neumann

Hidden Goal

The whole of science is nothing more than a refinement of everyday thinking.

- Albert Einstein

Let's Flip A Coin



Let's Flip A Coin

50% Head
(Therefore 50%
Tail)



Let's Flip A Coin

50% Head
(Therefore 50%
Tail)



50% x

50% x

50% = 12.5%

Let's Flip A Coin

60% Head
(Therefore 40%
Tail)



Let's Flip A Coin

60% Head
(Therefore 40%
Tail)



60% x

40% x

60% = 14.4%

Let's Flip A Coin

What's the best probability?



Let's Flip A Coin

2/3 Head
(Therefore 1/3
Tail)



$2/3$ x



$1/3$ x



$2/3 \approx 14.8\%$

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- How do we assure that $\frac{2}{3}$ was better than any other estimated probability?
- What if we care about more than the three events?
- Can we change conditions other than the probability of individual event?

These are actually all valid questions and are handled in some other discussions like gradient descent, bias-variance trade off, and generalization of models.

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