2.2 Three Goals for Inference from Data

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When we make observations of the world, we typically have one of three goals, and I will show them as below:

2.2.1 Estimation of Parameter Values

One goal we might have is to decide to what extend should we believe in each of possible parameter values. In the case of the coin, we used the observed data to determine the extent to which we should believe that the bias is 20%, 50%, or 80%. What we are determining is how much we believe in each of the available parameter values.

2.2.2 Prediction of Data Values

The second goal is, given our current beliefs about the world. For example, given that we have just observed the ball leaving the pitcher's hand and we now believe it's a curve ball, where do we predict the ball will be when it gets near the plate? Or, given that we only saw how the ball crossed over the plate, and from that we believe it was a curve ball, then what do we predict was the pitcher's grip on the ball as it was released?

2.2.3 Model Comparison

The third goal is to compare which model is better. If we have two different models of how something might happen, then an observation of what really does happen can influence which model we believe in most. What Bayesian inference tells us is how to shift our magnitude of belief across the available models.

Chapter 3

I skipped this part because it's quite basic and has been shown in previous books.