5.4 Summary

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In this chapter, we mainly talked about how to do Bayesian inference. Here are some points that we need to notice:

- For the methods of this chapter to apply to your situation, the data must have two nominal values, like heads and tails.
- Establish a description of your prior beliefs regarding values of θ by using a beta(θ;a,b) distribution. Then we should get value m, n, a, and b for beta distribution.
- Observe some data.
- Determine the posterior distribution of beliefs regarding values of θ. When the prior is a beta distribution, the posterior is a beta distribution too.
- Make inferences from the posterior, depending on your goal. If your goal is to estimate θ, use the posterior distribution, perhaps as summarized by the 95% HDI. If your goal is to predict new data, then your predicted probability of "heads" on the next flip is the mean of the posterior, which is $(z + a)/(N + a + b)$. If our goal is to compare models, then use $p(D)$ to decide which model's prior better accounts for the data.