6.1 Bayes' Rule for Discrete Value of $ heta$

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This chapter mainly deals with inferring a binomial proportion via grid approximation (for discrete values).

6.1 Bayes' Rule for Discrete Value of θ

In previous chapter, the parameter θ denotes the value of a binomial proportion, such as the underlying propensity for a coin to come up heads.

Previously, we assume that θ was continuous over the interval [1,0], We assume that θ has any value in that domain. The prior probability density at each value of θ, such as a beta distribution.

However, in this case, we assume that θ is discrete, like 0.25, 0.75, etc. Then the Bayes' rule can be expressed as

$$p(\theta|D) = \frac{p(D|\theta)\, p(\theta)}{\sum_\theta p(D|\theta)\, p(\theta)}$$

where the sum in the denominator is over the finite number of discrete values of θ that we are considering, and $p(\theta)$ denotes the probability mass at θ.