A Minimal Book Example

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Contents

Chapter 1

Prerequisites

This is a *sample* book written in **Markdown**. You can use anything that Pandoc's Markdown supports, e.g., a math equation $a^2 + b^2 = c^2$.

The **bookdown** package can be installed from CRAN or Github:

```
install.packages("bookdown")
# or the development version
# devtools::install_github("rstudio/bookdown")
```

Remember each Rmd file contains one and only one chapter, and a chapter is defined by the first-level heading `#`.

To compile this example to PDF, you need XeLaTeX. You are recommended to install TinyTeX (which includes XeLaTeX): https://yihui.org/tinytex/.

Chapter 2

Part2.1-Model

θ :

the Net Present Value of Stream of benefits

- If she decides to reject the technology, she receives nothing and no longer gathers information about the technology.
- If she decides to *adopt* the technology, she pays a fixed adoption cost K and receives a net expected benefit:

$$\int_{\theta} \theta \pi(\theta) d\theta - K$$

θ has the density π.

- Now, if consumer choose to gather additional information, she pays *c in that period* and observe the signal x, drawn with likelihood function

$$L(x|\theta)$$

Having observed signal x, the consumer then updates her prior π using Baye's rule:

$$\prod(\theta; \pi, x) = \frac{L(x|\theta)\pi(\theta)}{f(x; \pi)}$$

where the f(x;π) is the predictive ditribution for signals x,

$$f(x;\pi) = \int_\theta L(x|\theta)\pi(\theta)d\theta$$

The consumer then continues into the next period, starting with a new prior distribution that is equal to her posterior distribution from this stage.

Because our dynamic programming state variable is distibution itself , we will frequently supress the domain of the distribution and write the posterior as

The consumer's optimal value function with k periods remaining

$$v_0^*(\pi) = 0$$
$$v_k^*(\pi) = max(0, \int_\theta \theta\pi(\theta)\theta - K, -c + \delta E[v_{k-1}^*(\Pi(\pi, x))])$$

where δ (0<δ<1) is the discount factor and the expectation of the next period value function is taken over all possible random signals.

$$E[v_{k-1}^*(\Pi(\pi, \tilde{x})] = \int_x v_{k-1}*(\Pi(\pi, x))f(x;\pi)dx$$

Chapter 3

Part 2.2-Example

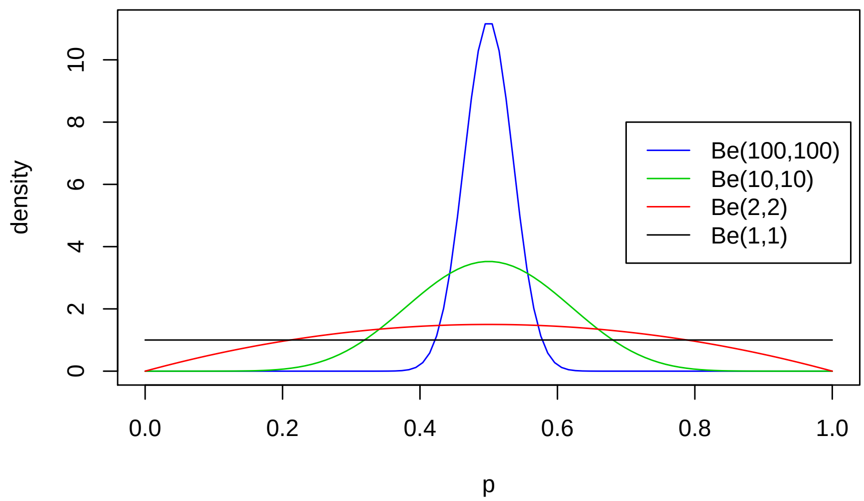
$$\theta = Ap^*$$

$$f(p^*) = \frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)\Gamma(\beta)}(p^*)^{\alpha-1}(1-p^*)^{\beta-1}$$

3.1 Beta Distribution

Example:

```
p = seq(0,1,length.out = 100)
plot(p,dbeta(p,100,100),ylab = "density", type="l", col=4)
lines(p,dbeta(p,10,10), type = "l", col=3)
lines(p,dbeta(p,2,2), type = "l", col=2)
lines(p,dbeta(p,1,1), type = "l", col=1)
legend(0.7,8, c("Be(100,100)","Be(10,10)","Be(2,2)", "Be(1,1)"),col=c(4,3,2,1), lty = c(1,1,1,1)
```




```
p = seq(0,1, length=100)
plot(p, dbeta(p, 900, 100), ylab="density", type ="l", col=4)
lines(p, dbeta(p, 90, 10), type ="l", col=3)
lines(p, dbeta(p, 30, 70), col=2)
lines(p, dbeta(p, 3, 7), col=1)
legend(0.2,30, c("Be(900,100)","Be(90,10)","Be(30,70)", "Be(3,7)"),lty=c(1,1,1,1),col=
```