

IS4 in R: Understanding Randomness (Chapter 9)

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Introduction and background

This document is intended to help describe how to undertake analyses introduced as examples in the Fourth Edition of *Intro Stats* (2013) by De Veaux, Velleman, and Bock. More information about the book can be found at http://wps.aw.com/aw_deveaux_stats_series. This file as well as the associated R Markdown reproducible analysis source file used to create it can be found at <https://nhorton.people.amherst.edu/is4>.

This work leverages initiatives undertaken by Project MOSAIC (<http://www.mosaic-web.org>), an NSF-funded effort to improve the teaching of statistics, calculus, science and computing in the undergraduate curriculum. In particular, we utilize the `mosaic` package, which was written to simplify the use of R for introductory statistics courses. A short summary of the R needed to teach introductory statistics can be found in the `mosaic` package vignettes (<http://cran.r-project.org/web/packages/mosaic>). A paper describing the `mosaic` approach was published in the *R Journal*: <https://journal.r-project.org/archive/2017/RJ-2017-024>.

Note that some of the figures in this document may differ slightly from those in the IS4 book due to small differences in datasets. However in all cases the analysis and techniques in R are accurate.

Chapter 9: Understanding Randomness

Section 9.1: What is Randomness?

Section 9.2: Simulating by Hand

Here is the box and whisker plot from page 257.

```
library(mosaic)
obs <- c(5, 4, 7, 5, 18, 6, 5, 4, 6)
ID <- 1:length(obs)
data <- data.frame(ID, obs)
gf_boxplot(obs ~ 1, data = data, color = "darkslategray4") %>%
  gf_theme(axis.text.x = element_blank(), axis.ticks.x = element_blank()) %>%
  gf_labs(x = "")
```

