

R - handout - Pathway to Using R For Statistical Analysis

Ver 1.2 9/16 JM Gay DVM PhD

Steps for getting started:

Step 0: Scan [https://en.wikipedia.org/wiki/R_\(programming_language\)](https://en.wikipedia.org/wiki/R_(programming_language)) for background on R

Step 1: Install R from CRAN (Comprehensive R Archive Network) <https://cran.r-project.org/>

Step 2: To get a feel for R, run Appendix A commands by cutting and pasting into R - [html](#) - pgs 82-84 in [pdf](#)

Step 3: Scan [An Introduction to R](#) for explanation of the Appendix A commands - [html](#) [pdf](#)

R command reference lists: (excellent reminders for commonly used commands)

Step 4: Print off one or two for quick reference, then highlight useful commands as you encounter them

- R reference card - J Baron, 1 pg - [pdf](#)
- R Reference Card 2.0 - M Baggott, 2012, 6 pgs - [pdf](#)
- R Commands Summary - S Holmes, 4 pgs - [pdf](#)
- A short list of the most useful R commands - Personality Project - [html](#)
- Base R Cheat Sheet - RStudio, 2015, 2 pgs - [pdf](#)
- R Functions for Regression Analysis - V Ricci, 2005, 6 pgs - [pdf](#)
- R Reference Card for Data Mining - Y Zhao, 2016, 5 pgs - [pdf](#)
- Table of Useful R commands (with usage examples) - T Schofield, 17 pgs - [pdf](#)
- The Ultimate R Cheat Sheet - Data Management, ver 4 - A Hamann, 4 pgs - [pdf](#)
- Data Wrangling with dplyr and tidyr - RStudio, 2015 - [pdf](#)
- Data Visualization with ggplot2 - RStudio, 2015, 2 pgs - [pdf](#)

Beginner's guides: (mostly from CRAN [contributed documentation](#); note the section of documents >100 pages)

Step 5: Scan one or two, running the commands on the associated datasets

- A (very) short introduction to R, P Torfs & C Brauer, 2014, 12 pgs - [pdf](#)
- The Friendly Beginners' R Course, T Marthews, 2014, 14 pgs - [ZIP](#)
- Kickstarting R, J Lemon - [html](#)
- R for Biologists, M Martinez, 2009, 35 pgs - [pdf](#)
- R for Beginners, E Paradis, 2005, 76 pgs - [pdf](#)
- Statistical Analysis with R: A quick start, O Nenadic, W Zucchini, 2004, 46 pgs - [pdf](#)
- Introduction to R and basics in statistics, S von Felten & P Korner-Nievergelt, 2012, 53 pgs - [pdf](#)
- The R Guide, WJ Owen, 2010, 61 pages - [pdf](#)
- An introduction to data cleaning with R, E de Jonge, 2013. 53 pgs - [pdf](#)
- [A Little Book of R](#) for Biomedical Statistics, 0.2, A Coghlan, 2015, 35 pgs - [html](#) - [pdf](#)
- [A Little Book of R](#) for Multivariate Analysis, 0.1, A Coghlan, 2014, 51 pgs - [html](#) - [pdf](#)
- [A Little Book of R](#) for Time Series, 0.2, A Coghlan, 2016, 75 pgs - [html](#)
- [A Little Book of R](#) for Bioinformatics, 0.1, A Coghlan, 2016, 185 pgs - [html](#) - [pdf](#)

Tutorial websites: (Googling 'r tutorial', 'r beginners', 'learning r', . . . hits many more)

Step 6: Work through tutorials doing the specific tasks or tests you intend to do)

- [R Tutorials](#) - WB King, Carolina Costal U - (extensive site working through many analyses)
- [RExercises](#) (specific tasks, such as doing a t-test on data, with answers)
- Computerworld Learn to Use R: [Your hands-on guide](#)
- SimpleR - Using R for Introductory Statistics - [pdf](#)
- Datacamp [R Tutorial](#), K Black
- R for Absolute Beginners - [RPubs](#)
- R Tutorial - [R Introduction](#) - [Elementary Statistics with R](#)
- [R Tutorial Series](#), JM Quick
- [Using R for psychological research](#): A simple guide to an elegant language
- Wiki - R Programming

- [importing and exporting data](#)
- [working with dataframes](#)
- [descriptive statistics](#)
- [linear models](#)
- [graphics](#)

Online reference sites: (excellent sources of basic scripts for performing common tasks)

Step 7: Start performing data analysis tasks by adapting these scripts, saving working script sets as you go

- [Cookbook for R](#)
- [Quick-R](#) (menu on left; associated with book “R in Action, 2nd ed, R Kabacoff, 2015”)
- UCLA idre [Resources to learn and use R](#) - [R Starter Kit](#) (note the scripts for common textbook exercises)

Online statistics textbooks using R: (more at [CRAN](#), [CrossValidated](#))

- [OpenIntro Statistics](#), 3rd ed, DM Diez, CD Barr, M Cetinkaya-Rundel, 2016, 436 pgs - [pdf](#)
- [Introduction to Statistical Thinking](#) (With R, without calculus), B Jakir, 324 pgs, 2011 - [pdf](#)
- [Learning statistics with R](#): A tutorial for psych students and other beginners, D Navarro, 616 pgs, 2015 - [pdf](#)
- [Introduction to Probability and Statistics Using R](#), G Kerns, 2010, 412 pgs - [pdf](#) [CRAN](#)
- [Biological Data Analysis Using R](#), RJ Dyer, 2009, 226 pgs - [pdf](#)
- [Experimental Design and Analysis](#), H Seltman, 2008, 428 pgs - [pdf](#)
- [Applied Epidemiology Using R](#), T Aragon, 2013 - [pdf](#)
- [A Short Introduction to R for Epidemiology](#), M Hills, M Plummer, B Carstensen, 2014 - [pdf](#)
- [Statistics \(the Easier Way\) with R](#): An informal text on applied statistics, [N Radziwill](#), 2015 - [pdf](#) first 82 pages
- [Introduction to the R Project for Statistical Computing for use at ITC](#), 4.0, DG Rossiter, 2012 - [pdf](#)
- [Ecological Models and Data in R](#), B Bolker, 2007, 516 pgs - [pdf](#)
- [R for Data Science](#), G Grolemund, H Wickham - [html](#)
- [Practical Regression and Anova using R](#), J Faraway, 2002 - [pdf](#)
- [R Graphics](#), 2nd ed, P Murrell, 2011 - [html](#) (R graphics code for book)

Print statistics textbooks worth having first:

- [A Handbook of Statistical Analysis with R](#), 3rd ed., T Hothorn, BS Everitt, 2014, 414 pgs (excellent examples)
- [R Graphics Cookbook](#), W Chang, 2013, 416 pgs (resource for constructing ggplot2 graphics)

Blogs for question and answer starting points: (great resources solving problems)

- [R-bloggers](#) (searchable aggregator of 580 R blogs with link to original blog post and related posts)
- [Crossvalidated](#) - [R](#) (question and answer website)
- [Stackoverflow](#) - [R](#) (question and answer website)
 - [The Guerilla Guide to R](#) - stackoverflow post collection
- Bioconductor: [1,000 R tutorials / links](#)

R for users of other statistical analysis programs:

- Imer for SAS PROC MIXED Users, D Bates - [pdf](#)
- R for SAS and SPSS users, B Muenchen, 2005, 81 pgs - [pdf](#) - <http://r4stats.com/>
- R for SAS programmers: It's different, but friendly, F Schuster, 2014 - [pdf](#)
- Migrating to R for SAS/SPSS/Stata Users, V Lew, 2009 - [pdf](#)
- Getting started in R ~ Stata: Notes on exploring data, O Torres-Reyna, 2010 - [pdf](#)
- R is for Revolution: A cutting-edge, free, open source statistical package, S Culpepper & H Aguinis, 2011 - [pdf](#)
- Is R suitable enough for biostatisticians involved in clinical research and evidence-based medicine? . . . and can it replace SAS in this area? A Olszewski, 2015, 178 pgs - pdf

Advanced statistical analysis with R:

- O Torres-Reyna, Princeton - [html](#)
 - Getting Started in Fixed/Random Effects Models using R - [pdf](#)
- [GLMM](#) - [FAQ](#)

Academic statistics courses providing datasets and R scripts online:

- Harvard BIO503
 - Introduction to Programming and Statistical Modelling in R, 2013, [A Culhane](#), 247 pgs - [pdf](#)
- Penn State [online](#)
 - Essential R: What you need to get started, E Nord, 2016, 187 pgs - [html](#) - [pdf](#)
 - STAT 484 - Topics in R Statistical Language - [html](#)
 - STAT 485 - Intermediate Topics in R Statistical Language - [html](#)
 - STAT 504: Analysis of Discrete Data - [html](#) - (some) R code [html](#)
 - STAT 505: Applied Multivariate Statistical Analysis - [html](#)

MOOC R courses:

- Computational Finance
 - Intro to computational finance with R - [html](#)
- [Coursera](#)
 - Master statistics with R - [Duke](#)
- DataCamp
 - [Open courses](#)
- [edX](#)
 - Introduction to R for Data Science - [html](#)
- OpenIntro
 - Datacamp Labs for R - [html](#)
- Swirl - Learn R, in R - [html](#)

My companion statistics material:

- Initial Statistical Analysis - [pdf](#)