Introductory R for Reproducible Scientific Research

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Chapter 1

Preface

Many higher degree research students and other researchers find themselves faced with the need to produce their statistical data analyses on their own. The open source R software is a popular programming language designed with statistical computing and data analysis in mind and it is commonly encouraged within academia because it is powerful, flexible and free to use and develop. It comes with access to an extensive suite of third-party packages which often implement statistical procedures and techniques that are at the cutting edge of research in various application areas. All this power and flexibility, however, comes at the cost of a fairly steep learning curve, especially when the student or researcher does not have a strong background in computer science, programming, mathematics and/or statistics. This book is aimed at assisting higher degree research students and other researchers to approach their scientific analyses in a reproducible way, emphasizing programming best practices (e.g. breaking down analyses into modular units, task automation and encapsulation), while also teaching the use of R for basic statistical data analysis.

Chapter 2

Setting Up {#1.1_setup}

Science is a multifaceted process that involves designing experiments or observational studies, collecting data and analyzing that data to gain insight into substantive research problems and to derive conclusions.

Chapter 3

Getting familiar with R and RStudio {#1.2__getting__familiar}

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Getting and Exploring Data in R

To get data into R and to explore data in R.

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