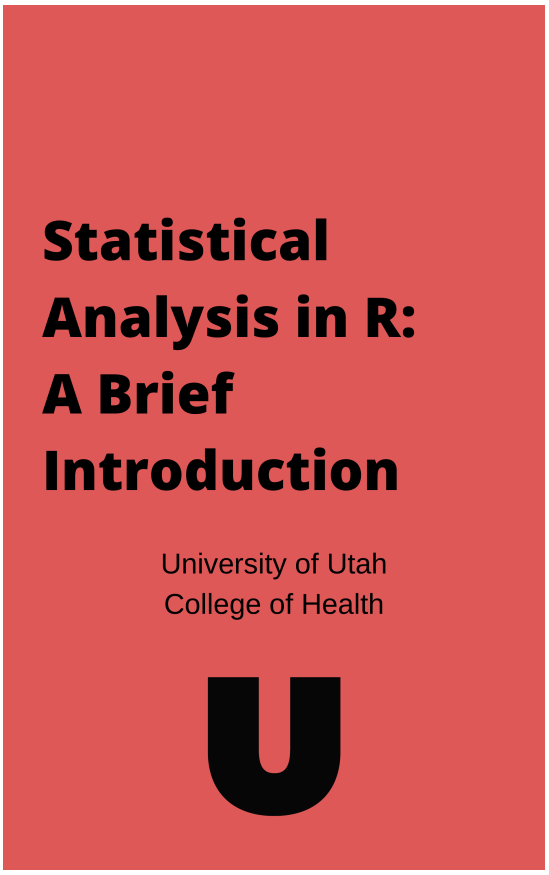
Contents

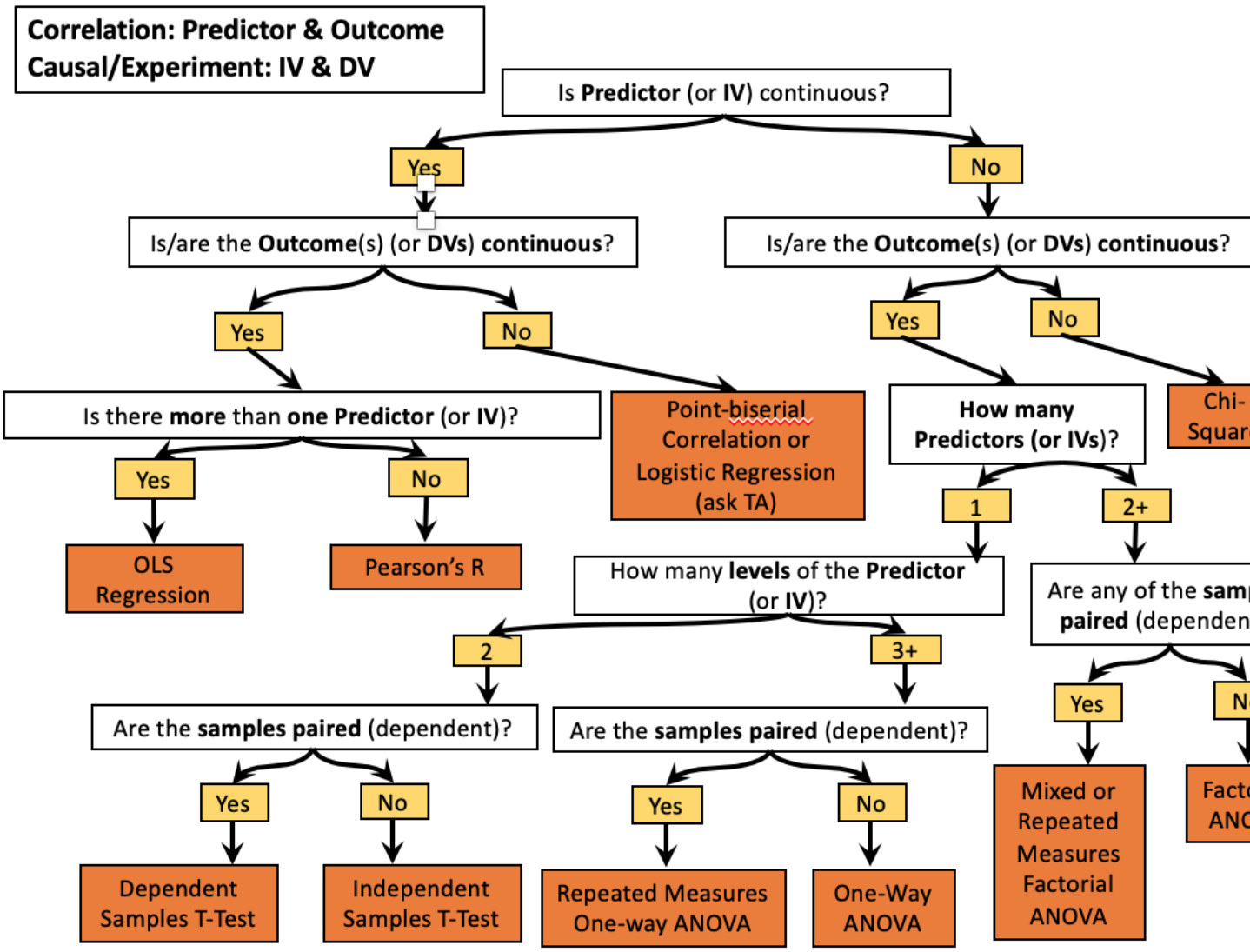
Welcome



The purpose of this book is to provide a brief introduction to performing statistical analysis in R. It is assumed that the reader is selecting the appropriate statistical model for whatever research question they would like to answer, but they are unsure of how to perform the analysis in R. Consequently, statistical theory will not be covered in this book. It is also assumed that the reader is enirely unfamiliar with programming languages and concepts. Before delving into the various statstical models, a concise overview of programming concepts will be covered, so that hopefully the reader will feel comfortable with modifying and extending on example code to suit their analytic endeavors.

Chapters 1 and 2 will cover downloading and describing R and the RStudio IDE (what even is an IDE?), and programming basics, such as data types and data structures, objects and assignments, and functions and arguments. Chapters 3 and 4 will cover installing/importing packages (what is a package and why do I need it?), importing data, and formatting the data in a way that is conducive to analysis. Chapters 5 and 6 will briefly cover descriptive statistics, quality assurance, and visualizing data. Chapters 7-13 will cover various statistical tests that all fall under the GLM umbrella.

Statistical Model Flowchart



Above is a statistical test flowchart that can help you decide which model is most appropriate for your analysis. Again, this book will not cover statistical theory or when it's most appropriate to select a certain model, but this flowchart can still serve as a handy reference while reading this book.

Functions List

```
install.packages()
library()

head()
tail()
str()

mean()
sd()
summary()

plot()

ez::ezANOVA()
cor()
cor.test()
Hmisc::rcorr()
ppcor::pcor()
var()
kurtosis()
skewness()
shapiro.test()
help()

# Linear Model
lm()

# Student's t-test
t.test()

# Analysis of Variance
aov()
```

Resources

Link

Description

Swirl

Swirl is an R package that you can use to learn R in R.

StackOverflow

Need help with R? Stackoverflow is a website where you can post programming related questions

Quick R by Datacamp

Quick R by Datacamp is a webpage where the content is very simmilar to that of this guidebook: short and sweet, but still covering everything from install R to statistics.

R Programming for Data Science

R Programming for Data Science is a comprehensive introduction to R and data analysis.

Part I
R Basics

Placeholder

What is R?

Installing R

Step 2

Step 3

Step 5: Mac users

Step 5: Windows users

What is RStudio?

Installing RStudio

The RStudio Layout

Following Along

1 Basic Programming Concepts

Placeholder

Running R Code

R is a calculator

Objects and Assignment

Data Types

Data Structures

Factors

Data Frames

Functions and Arguments

Example

Test Your Knowledge

2 Packages and Libraries

Placeholder

What are Packages?

Installing Packages

What's a Library?

Loading Packages

3 Reading/Writing Data

Placeholder

getwd() and setwd()

The Easy Way

Reading Data

Writing Data

3.0.1 Setting the working directory

3.1 1.3 Importing/Exporting data

3.1.1 Importing

3.1.2 Exporting

4 Formatting Data

"Formatting" is an ambiguous term. In this book it means manipulating the data so that it's ready for analysis. It will cover: missing data, merging data files, changing variable types, recoding varibles, data transformation and tidy data principles.

5 Describing and Visualizing Data

Prior to statistical analysis, you might want to do some basic data summaries and quick visualizations.

Part II

Statistical Analysis

Placeholder

Step 1: Importing

Step 2: Viewing

Step 3: Formatting

Step 4: Modelling

The `lm()` Function

Model 1: Untransformed

Model 2: Mean-Centered

6 Multiple Regression

Placeholder

The `lm()` Function

Model 1