STAT 216 Coursepack

Fall 2022
Montana State University

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Preface

Placeholder

Fall 2022 Calendar of In-Class Activities

Placeholder

<div align="right">WEEK 1</div>

Basics of Data

Placeholder

1.1 Week 1 Reading Guide: Basics of Data

Sections 1.1 (Case study) and 1.2 (Data basics)

Vocabulary

Notes

Example (Section 1.1 — Case study: Using stents to prevent strokes)

Section 2.1 (Sampling principles and strategies)

Vocabulary

Notes

Notes on types of sampling bias

1.2 Activity 1: Intro to Data

1.2.1 Learning outcomes

1.2.2 Terminology review

1.2.3 General information on the Coursepack

1.2.4 General information on labs

Steps of the statistical investigation process

1.2.5 Take-home messages

1.2.6 Additional notes

Study Design

Placeholder

2.1 Week 2 Reading Guide: Sampling, Experimental Design, and Scope of Inference

Sections 2.2 (Observational studies), 2.3 (Experiments), and 2.4 (Scope of inference)

Reminders from Section 1.2

Vocabulary

Notes

2.2 Activity 2A: American Indian Address

2.2.1 Learning outcomes

2.2.2 Terminology review

2.2.3 American Indian Address

By eye selection

2.2.4 Take-home messages

2.2.5 Additional notes

2.3 Activity 2B: American Indian Address (continued)

2.3.1 Learning outcomes

2.3.2 Terminology review

Random selection

Effect of sample size

2.3.3 Take-home messages

2.3.4 Additional notes

2.4 Week 2 Lab: Study Design

2.4.1 Learning outcomes

2.4.2 Terminology review

2.4.3 General information labs

Study design

Atrial fibrillation

2.4.4 Take-home messages

Exploring Categorical and Quantitative Data

Placeholder

3.1 Week 3 Reading Guide: Introduction to R, Categorical Variables, and a Single Quantitative Variable

Chapter 3 (Applications: Data)

Notes

Functions

Chapter 4 (Exploring categorical data)

Vocabulary

Notes

Review of Simpson's Paradox

Chapter 5 (Exploring quantitative data)

Type of Plots

Vocabulary

Notes

3.1.1 Summarizing Chapters 4 and 5

Notes

Data visualization summary

3.2 Activity 3: Graphing Categorical Variables

3.2.1 Learning outcomes

3.2.2 Terminology review

3.2.3 Graphing categorical variables

Nightlight use and myopia

R code

Displaying a single categorical variable

Displaying two categorical variables

3.2.4 Take-home messages

3.2.5 Additional notes

3.3 Week 3 Lab: IPEDs

3.3.1 Learning outcomes

Exploring Multivariable Data

Placeholder

4.1 Week 4 Reading Guide: Two Quantitative Variables and Multivariable Concepts

Section 6.1 (Fitting a line, residuals, and correlation)

Reminders from Section 5.1

Vocabulary

Notes

Example: Brushtail possums

Section 6.2 (Least squares regression)

Vocabulary

Notes

Example: Elmhurst College

Section 6.3 (Outliers in linear regression)

Vocabulary

Notes

Section 6.4 (Chapter 6 review)

Notes

Section 7.1 (Gapminder world)

Vocabulary

Notes

Section 7.2 (Simpson's Paradox, revisited)

Reminder from Section 4.4

Notes

Example: SAT scores

4.2 Activity 4A: Movie Profits — Linear Regression

4.2.1 Learning outcomes

4.2.2 Terminology review

4.2.3 Movies released in 2016

Vocabulary review

Slope

Exam 1 Review

Placeholder