STAT 216 Activity Coursepack

Fall 2020

Contents

Preface

This coursepack accompanies the textbook for STAT 216: Introduction to Statistics at Montana State University. Each of the activities in this workbook is designed to target specific learning outcomes of the course, giving you practice with important statistical concepts in a group setting with instructor guidance. Bring this workbook with you to class each week, and take notes in the workbook as you would your own notes. A well-written complete workbook will provide an optimal study guide for exams!

Fall 2020 Calendar of In-Class Activities

Placeholder

ACTIVITY 1

Martian Alphabet

Placeholder

1.1 Learning outcomes

1.2 Terminology review

1.3 Can you read "Martian"?

1.3.1 Steps of the statistical investigation process

1.4 Take home messages

1.5 Additional notes

ACTIVITY 2

Study Design

Placeholder

2.1 Learning outcomes

2.2 Terminology review

2.3 Types of sampling bias

2.4 Study design

2.5 Additional notes

ACTIVITY 3

Current Population Survey

Placeholder

3.1 Learning outcomes

3.2 Terminology review

3.3 "Current" Population Survey: 1985

3.3.1 Vocabulary review

3.3.2 `R` code

3.3.3 Displaying a single categorical variable

3.3.4 Displaying two categorical variables

3.4 Probability

3.5 Additional notes

ACTIVITY 4

IMDb Movie Reviews

Placeholder

4.1 Learning objectives

4.2 Terminology review

4.3 Movies released in 2016

4.4 Vocabulary review

4.5 Summarizing a single quantitative variable

4.6 Displaying a single quantitative variable

4.7 Displaying a single categorical and single quantitative variable

4.8 Additional notes

ACTIVITY 5

Movie Profits

Placeholder

5.1 Learning objectives

5.2 Terminology review

5.3 Movies released in 2016

5.3.1 Vocabulary review

5.3.2 Correlation

5.3.3 Slope

5.3.4 Residuals

5.3.5 Coefficient of determination (squared correlation)

5.3.6 Multivariate plots

5.4 Additional notes

ACTIVITY 6

Handedness of Male Boxers

Placeholder

6.1 Learning objectives

6.2 Terminology review

6.3 Steps of the statistical investigation process

6.4 Handedness of male boxers

6.4.1 Summary statistics review

6.4.2 Ask a research question

6.4.3 Design a study and collect data

6.4.4 Summarize and visualize the data

6.4.5 Use statistical analysis methods to draw inferences from the data

6.4.6 Communicate the results and answer the research question

6.4.7 Revisit and look forward

6.5 Additional notes

ACTIVITY 7

Winter Sports Helmet Use and Head Injuries

Placeholder

7.1 Learning objectives

7.2 Terminology review

7.3 Helmet Use and Head Injuries

7.3.1 Vocabulary review

7.3.2 Ask a research question

7.3.3 Summarize and visualize the data

7.3.4 Use statistical analysis methods to draw inferences from the data

7.3.5 Types of errors

7.4 Additional notes

ACTIVITY 8

COVID-19 and Air Pollution

Placeholder

8.1 Learning outcomes

8.2 Terminology review

8.3 COVID-19 and air pollution

8.3.1 Vocabulary review

8.3.2 Ask a research question

8.3.3 Summarize and visualize the data

8.3.4 Use statistical inferential methods to draw inferences from the data

8.3.5 Communicate the results and answer the research question.

8.3.6 Revisit and look forward

8.4 Additional notes

ACTIVITY 9

Weather Patterns and Record Snowfall

Placeholder

9.1 Learning objectives

9.2 Terminology review

9.3 Weather Patterns and Record snowfall

9.3.1 Quantitative variables review

9.3.2 Ask a research question.

9.3.3 Summarize and visualize the data

9.3.4 Use statistical inferential methods to draw inferences from the data

9.3.5 Communicate the results and answer the research question

9.3.6 Revisit and look rorward

9.4 Additional notes

ACTIVITY 10

Hand Dexterity

Placeholder

10.1 Learning outcomes

10.2 Terminology review

10.3 Hand dexterity

10.3.1 Vocabulary review

10.3.2 Conditions for the least squares line

10.3.3 Ask a research question

10.3.4 Summarize and visualize the data

10.3.5 Use statistical inferential methods to draw inferences from the data

10.3.6 Communicate the results and answer the research question

10.3.7 Revisit and look forward

10.4 Additional notes