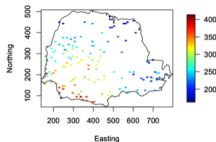
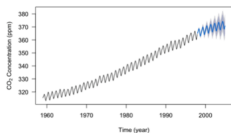
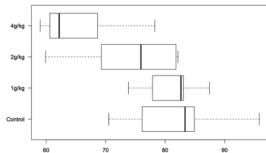
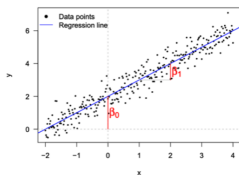


Lecture 0

Course Overview

DSA 8020 Statistical Methods II

Whitney Huang
Clemson University



About the Instructor

About the Instructor

- Fifth year Assistant Professor of Statistics
- Born in Laramie, Wyoming, grew up in Taiwan



- Got a B.S. in Mechanical Engineering, switched to Statistics in graduate school



- Ph.D. in Statistics at Purdue, two-year postdoc at Research Triangle, NC and Victoria, Canada



University
of Victoria

How to reach me?

- **Email:** wkhuang@clermson.edu
- **Office:** O-221 Martin Hall
- **Office Hours:** Wednesdays 8:00pm - 9:00pm ET via Zoom and by appointment

Class Policies

- There will be [three projects](#). The due dates are:
 - **Project I:** Feb. 22, Thursday
 - **Project II:** Apr. 4, Thursday
 - **Project III:** May 2, Thursday
- There will be [weekly R Labs](#):
 - To be uploaded to Canvas by [11:59 pm ET](#) on the due dates
 - Worst grade will be dropped
- No lectures in the week Mar. 18-22 ([Spring Break](#))

- [Course syllabus / Announcements](#)
- [Lecture slides/notes/videos](#)
- [R Labs/Projects](#)
- [Data sets for lectures and labs](#)

- *An Introduction to Statistical Learning: with Applications in R*, 2nd Edition, Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani, 2021 [\[Link\]](#)
- *Linear Models with R*, 2nd Edition, Julian Faraway, 2014 [\[Link\]](#)
- *Extending the Linear Model with R*, 2nd Edition, Julian Faraway, 2016 [\[Link\]](#)
- *A First Course in Design and Analysis of Experiments*, Gary Oehlert, 2010 [\[Link\]](#)
- *Design and Analysis of Experiments*, 2nd Edition, Angela Dean, Daniel Voss, and Danel Draguljic, 2017 [\[Link\]](#)

Evaluation

Grades will be weighted as follows:

R Labs	25%
Project I	25%
Project II	25%
Project III	25%

Final course grades will be assigned using the following grading scheme:

≥ 90.00	A
88.00 ~ 89.99	A-
85.00 ~ 87.99	B+
80.00 ~ 84.99	B
78.00 ~ 79.99	B-
75.00 ~ 77.99	C+
70.00 ~ 74.99	C
68.00 ~ 69.99	C-
≤ 67.99	F

We will use software to perform statistical analyses.

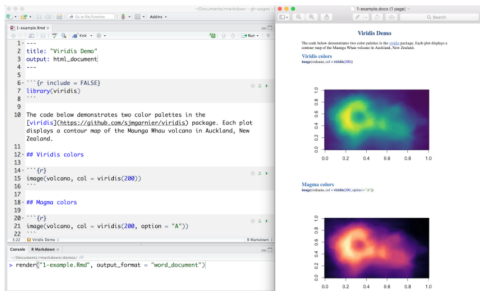
Specifically, we will be using [R/Rstudio](https://www.r-project.org/)  

- a **free/open-source** programming language for statistical analysis
- available at <https://www.r-project.org/> (R); <https://rstudio.com/> (Rstudio)
- We will use **R Markdown** for homework assignments

[About the Instructor](#)

[Class Policies](#)

[Class Overview](#)



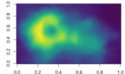
The screenshot shows the RStudio interface with an R Markdown document. The code in the editor includes a title, output format, library loading, and two plots using the viridis package. The first plot uses the default viridis color palette, and the second plot uses the 'A' option. The rendered output shows the title, a description of the code, and the two contour plots.

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1 ---
2 title: "Viridis Demo"
3 output: html_document
4 ---
5
6 [r-include = FALSE]
7 library(viridis)
8
9
10 The code below demonstrates two color palettes in the
11 [viridis](https://github.com/jrnier/viridis) package. Each plot
12 displays a contour map of the Mungo Whou volcano in Auckland, New
13 Zealand.
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15 # Viridis colors
16 [r]
17 image(volcano, col = viridis(200))
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20 # Magma colors
21 [r]
22 image(volcano, col = viridis(200, option = "A"))
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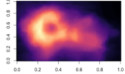
Viridis Demo

The code below demonstrates two color palettes in the [viridis](https://github.com/jrnier/viridis) package. Each plot displays a contour map of the Mungo Whou volcano in Auckland, New Zealand.

Viridis colors

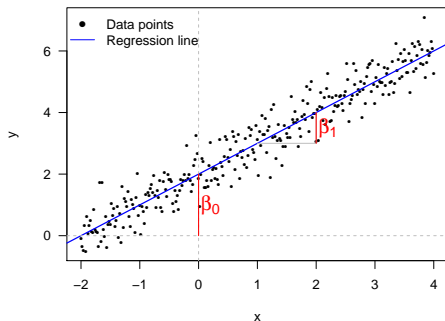


Magma colors



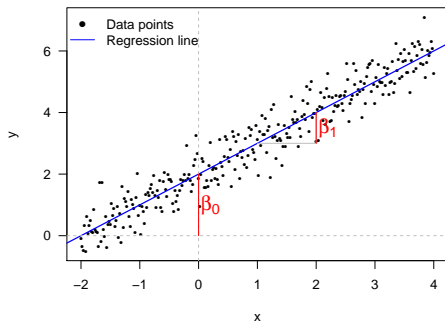
Class Overview

Part I: Regression Analysis (Week 1 - Week 7)



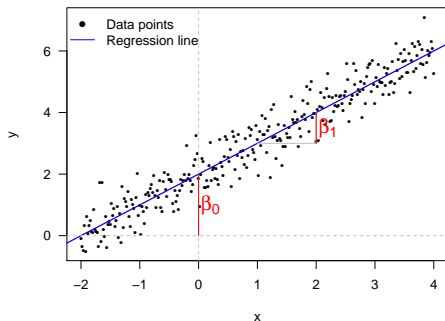
- Multiple Linear Regression

Part I: Regression Analysis (Week 1 - Week 7)



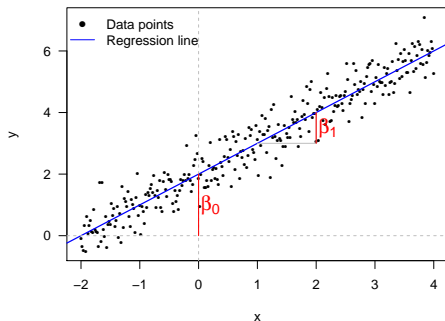
- Multiple Linear Regression
- Regression with Quantitative and Qualitative Predictors

Part I: Regression Analysis (Week 1 - Week 7)



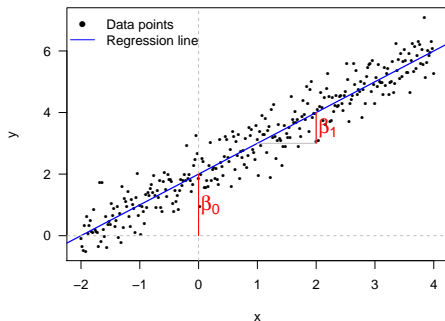
- Multiple Linear Regression
- Regression with Quantitative and Qualitative Predictors
- Nonlinear and Non-parametric Regression

Part I: Regression Analysis (Week 1 - Week 7)

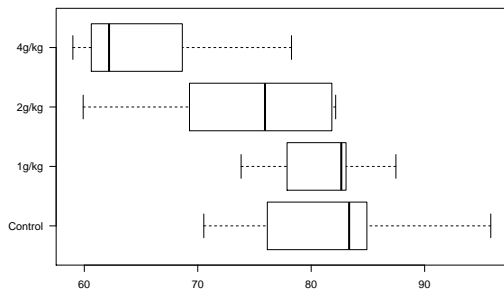


- Multiple Linear Regression
- Regression with Quantitative and Qualitative Predictors
- Nonlinear and Non-parametric Regression
- Ridge Regression and Lasso

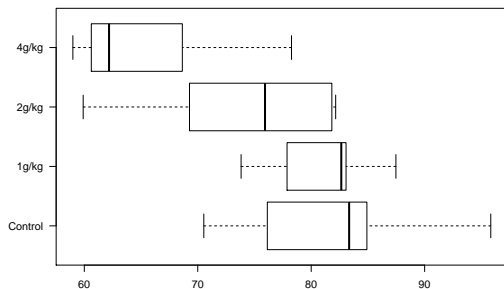
Part I: Regression Analysis (Week 1 - Week 7)



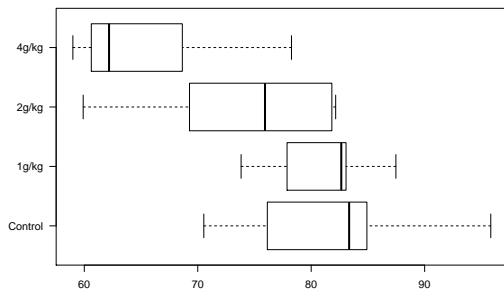
- Multiple Linear Regression
- Regression with Quantitative and Qualitative Predictors
- Nonlinear and Non-parametric Regression
- Ridge Regression and Lasso
- Logistic Regression and Poisson Regression



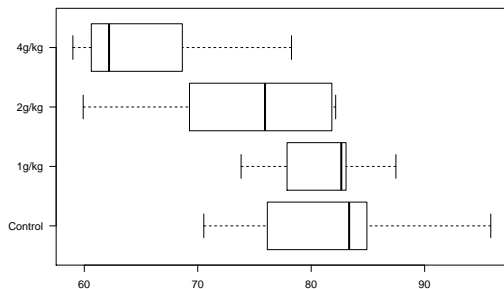
- Introduction to Experimental Design



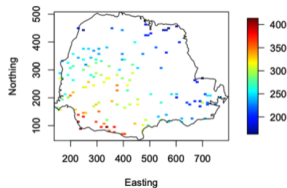
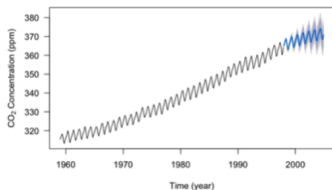
- Introduction to Experimental Design
- Completely Randomized Designs, Block Designs, Nested and Split-Plot Designs



- Introduction to Experimental Design
- Completely Randomized Designs, Block Designs, Nested and Split-Plot Designs
- Random and Mixed Effects Models



- Introduction to Experimental Design
- Completely Randomized Designs, Block Designs, Nested and Split-Plot Designs
- Random and Mixed Effects Models
- Computer Experiments



- Stationary Processes, Autocovariance Function
- Autoregressive Integrated Moving Average (ARIMA) Models and Seasonal Models
- Stationarity and Isotropy, Covariance Function
- Gaussian Process Spatial Interpolation (aka Kriging)