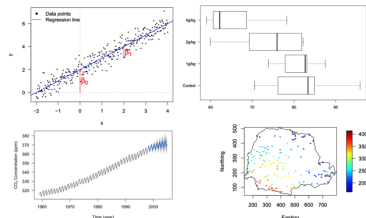


Lecture 0

Course Overview

DSA 8020 Statistical Methods II

Whitney Huang
Clemson University



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About the Instructor

- Sixth-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



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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

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Notes

Logistics

- There will be **three projects**. The due dates are:
 - **Project I:** Feb. 20, Thursday
 - **Project II:** Apr. 3, Thursday
 - **Project III:** May 1, 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. 17-21 (Spring Break)

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Course Materials at CANVAS

- Course syllabus / Announcements
- Lecture slides/notes/videos
- R Sessions/Labs/Projects
- Data sets for lectures and labs

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Reference Books

- *Linear Models with R*, 2nd Edition, Julian Faraway, 2014 [\[Link\]](#)
- *An Introduction to Statistical Learning: with Applications in R*, 2nd Edition, Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani, 2021 [\[Link\]](#)
- *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 [\[Link\]](#)

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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

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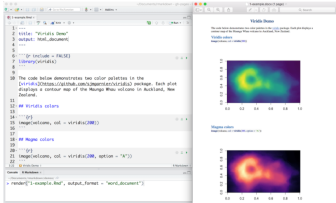
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Notes

Computing

We will use software to perform statistical analyses. Specifically, we will be using R/Rstudio

- 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



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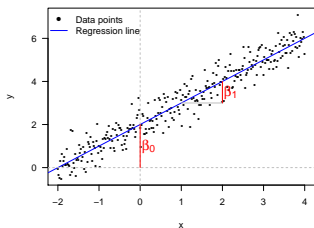
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Part I: Regression Analysis (Week 1 - Week 7)



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

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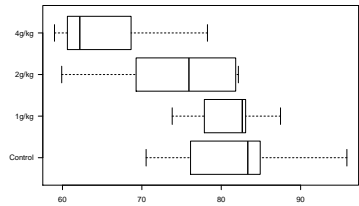
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Part II: Experimental Design (Week 8 - Week 12)



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

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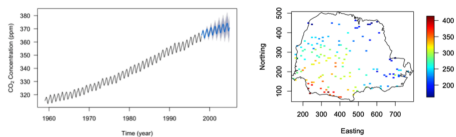
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Part III: Spatial and Time Series Analysis (Week 13 - Week 16)



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

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