

# Introduction to R

Some of What Makes It Powerful and Cool

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Applications

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# The traditional approach to lab reports

## Excel and Word

- ▶ Enter values into Excel
- ▶ Try to get chart/plot to look the way you want
- ▶ Copy figure into Word document
- ▶ Identify key values from your analysis
- ▶ Provide comments on trends in the plot
- ▶ “Print off” and turn in

## What if you need to make modifications?

- ▶ Try to follow how you created formulas in Excel for analysis
- ▶ Make sure to not inadvertently change any Excel cell values
- ▶ Redo making of Excel figure(s) (often from scratch)
- ▶ Remember to copy new figure(s) into Word document
- ▶ Remember to update values in modified Word document
- ▶ **This process is often tedious and frustrating. *What if there was a better way?***

# Use R!

## What is R?

- ▶ R is a completely free software package and language for statistical analysis and graphics.
- ▶ It *excel/s* in helping you with
  - ▶ data manipulation
  - ▶ automation
  - ▶ reproducibility
  - ▶ improved accuracy
  - ▶ error finding
  - ▶ customizability
- ▶ Any downsides?

# Learning how to use R

## RStudio, R Markdown, & me!

- ▶ RStudio is a powerful user interface that helps you get better control of your analysis.
- ▶ It is also completely free.
- ▶ You can write your entire paper/report (text, code, analysis, graphics, etc.) all in R Markdown.
- ▶ If you need to update any of your code, R Markdown will automatically update your plots and output of your analysis and will create an updated PDF file.
- ▶ **No more copy-and-paste!**
- ▶ My main responsibility in this position is to help members of the Reed community learn R and help them with their analysis and graphics.

# What to do next?

## Installation and help

- ▶ `http://reed.edu/data-at-reed/software/R/r_studio.html`
- ▶ `http://reed.edu/data-at-reed/resources/`
- ▶ `https://www.rstudio.com/wp-content/uploads/2015/02/rmarkdown-cheatsheet.pdf`
- ▶ `http://www.cookbook-r.com/`
- ▶ `cismay@reed.edu`

# Who am I?

## Background

- ▶ Grew up in western South Dakota (town of 112 people)
- ▶ BS in Mathematics, minor in Computer Science from SDSM&T
- ▶ MS in Statistics from Northern Arizona University
- ▶ Worked as an actuary before obtaining PhD in Statistics from Arizona State University
- ▶ Was Assistant Professor of Statistics and Data Science at Ripon College in Wisconsin the last two years
- ▶ Moved to Portland area this summer
- ▶ Starting working at Reed one month ago today
- ▶ Love helping others with statistical consulting and R programming

## When am I available?


- ▶ Generally available 9 AM to 5 PM Monday - Friday

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Slides available at <http://rpubs.com/cismay/chem101>