

February
15, 2021



MAA
MATHEMATICAL ASSOCIATION OF AMERICA

PROGRAMS

StatPREP

NEWSLETTER

Summer 2021 Workshop Plan

FROM THE STATPREP TEAM



Photo taken during a 2019 StatPREP Summer Workshop.

Cancelling the 2020 summer workshops of StatPREP due to the COVID-19 pandemic was the right decision. Now a new decision has to be made for the 2021 summer workshops. We asked our workshop participants from the four hub locations of Tarrant County College, Howard Community College, Florida SW State College, and Essex County

College what type of workshop they would prefer for this coming summer and they told us: virtual would be best. So virtual it is. The StatPREP Summer 2021 Workshops will be virtual and use a little bit different format to take advantage of online access for participants!

Our plan for the two-day workshop is to incorporate data centric concepts into the teaching of statistics and demonstrate how to present the concepts using the Little Apps developed by StatPREP. Another two day workshop will introduce faculty to the basics of the statistical software R Studio. In addition there will be a two day intermediate workshop on R Studio. Lastly, there will be a one day workshop on creating a data science workshop at your college.

The summer schedule is set for all workshops to be offered in June and repeated in July for those who can not attend in June. The content and dates of the workshops are still being finalized. The workshops will have limited enrollment to allow interaction between workshop participants. Please watch for an announcement of the detailed plan, including dates, and that the application to attend a workshop is available. Hope to see you and your colleagues virtually this summer.

WHO'S WHO:

LEADERSHIP TEAM

Mike Brilleslyper,
Air Force Academy

Jenna Carpenter,
Campbell University

Danny Kaplan,
Macalester College

Kathryn Kozak
Coconino Community
College

Donna LaLonde,
ASA

Ambika Silva
College of the Canyons

Deirdre Longacher Smeltzer
MAA

HUB LEADERS

Joe Roith, St. Olaf's College,
Northfield, MN (2017-18)

**Ambika Silva, College of the
Canyons, Santa Clarita, CA**
(2017-18)

Helen Burn, Highline College,
Seattle, WA (2018-19)

Hwayeon Ryu, Elon University,
Elon, NC (2018-19)

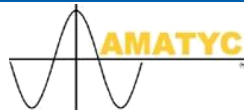
**Carol Howald, Howard Com-
munity College, Columbia,**
MD (2019-2020)

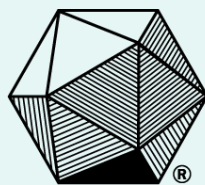
**Thomas Kinzeler, Tarrant
County College, Fort Worth,**
TX (2019-2010)

**Rona Axelrod, Florida SW
State College, Fort Myers,**
FL (2020-2021)

**Brooke Orosz, Essex County
College, Newark, NJ (2020-
2021)**

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HUB LEADER SPOTLIGHT

My name is Joe Roith and I'm a Visiting Assistant Professor at St. Olaf College in Northfield, MN. I'm a statistician who specializes in statistics education, all kinds of regression analysis, and I dabble in sports analytics as well. I've been the StatPREP hub leader for the Twin Cities region since 2017, one of the pilot locations. During those first couple years, we worked hard to develop some great teaching materials. The Little Apps that we all love to use in our classes were born from some of the amazing discussions we had in those early workshops. Now I maintain our StatPREP community in Minnesota as well as provide support to the growing number of hubs and workshops around the country. In my spare time I love to hike, rock climb, and just be outside any time of the year!

I'd like to know how people emulate the real-world statistical situations our students will face in their careers. Maybe it's projects, maybe it's using real data in your examples. I'll share some of my own techniques and I look forward to hearing what others are doing.

NEW YEAR'S RESOURCES

BY DONNA LALONDE

Bayes Rules! Is part of the title of a new book by my colleagues Alicia A. Johnson, Miles Ott, and Mine Dogucu. The complete title of the book is *Bayes Rules! An Introduction to Bayesian Modeling with R*. Although this is not a suitable introductory statistics text, it will be a wonderful addition to an instructor's resource library. The book is a work in progress, but Alicia, Miles, and Mine are making chapters available as they are written. Once completed the text will be available online, and the print version will be for sale by CRC Press. The authors believe we "learn by doing," so they have included their R scripts and a lot of practice problems. The completed book will have four Units - Unit 1: Bayesian foundations, Unit 2: Posterior simulation & analysis, Unit 3: Bayesian regression & classification, and Unit 4: Hierarchical Bayesian models.

...continued on page 3



NEW YEAR'S RESOURCES Continued...

The second resource is the second edition of the book, *Modern Data Science with R* by Benjamin S. Baumer, Daniel T. Kaplan, and Nicholas J. Horton. The book is freely available online, and the print version can be purchased from CRC Press or Amazon. The book is supported by a website which includes instructor resources. This text is a great resource for identifying datasets. Topics covered in the text include - data visualization, data wrangling, data science ethics, and statistical foundations. This is a comprehensive text, so it is an excellent addition to an instructor's resource library.

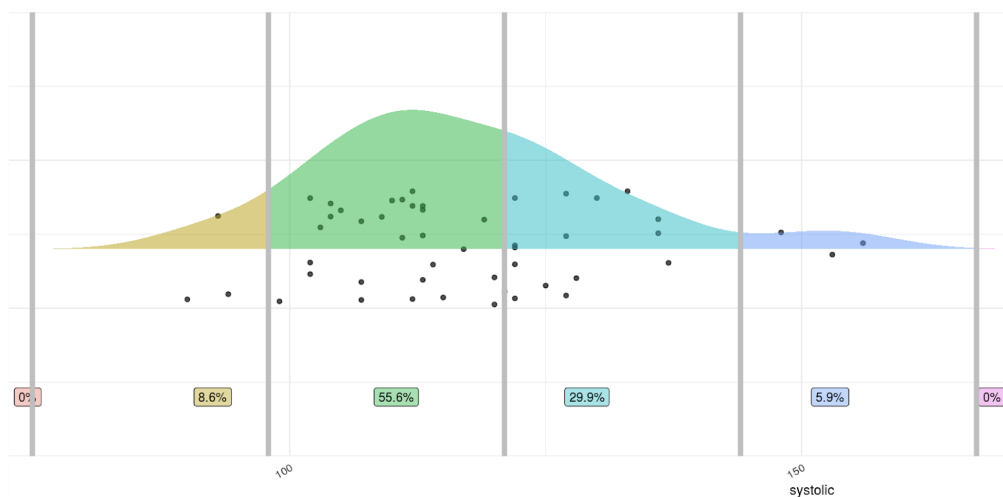
My final new year resource is a follow up on a previous resource - Data Science in a Box. I've learned a lot from the conversations on the [Slack Channel](#) so would encourage you to join this community. Also, check out the dsbox package - <https://rstudio-education.github.io/dsbox/> which is a supplement to the Data Science Course in Box project.

Please share your New Year's resources (and resolutions) in the StatPrep community!

COMMON AND RARE LITTLE APP ACTIVITY

BY KATHRYN KOZAK

When teaching the normal curve, it is useful to have a way for students to visualize the distribution of the normal curve. The density little app found at https://maa-statprep.shinyapps.io/Little_App_Density/ gives a visualization of the normal curve and the proportion of data in specific intervals.

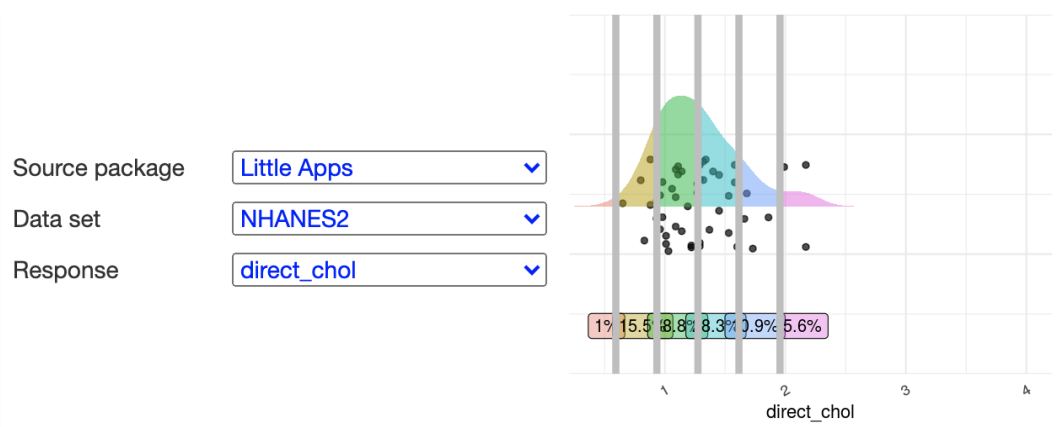


The graph shows the percentages that are in different intervals under the normal curve. The bars can be slid to create different intervals and the proportions of data in those intervals will be displayed below the graph.

...continued on page 4.

LITTLE APP ACTIVITY Continued...

The app also allows the students to pick other datasets, and variables.



To aid in having students explore the density Little App, there is an activity called Common and Rare: http://www.statprep.org/LittleAppSite/posts/Activities/Common_and_rare/. This activity has students explore the normal distribution and the empirical rule.

The activity starts with an orientation to instruct the students as to what is considered common, uncommon, and rare in a normal distribution using the empirical rule. Then the activity instructs the students to pick a particular variable for a dataset, and then explores what is considered common, uncommon, and rare values for the variable of interest.

3. In the Data tab, switch the Data set to `Natality_2014`. Use `mager`, the age of the mother when she gave birth, as the response variable. Go back to the Graph tab, Drag the bars so that about 10% of the distribution is to the left of common and 10% is to the right.
 - *At what age is the leftmost boundary of 'common'? . . .*
 - *At what age is the rightmost boundary of 'common'? . . .*
4. As set in (3), common covers about 80% of the distribution. If you place the cursor on the lower common bar and leave it there for a few seconds, the z-score will be displayed above the graph, next to the bookmark icon in the tool bar. You can do this at any point on the curve.
 - *At what standard deviation measure is the leftmost boundary of 'common'? . . .*
 - *At what standard deviation measure is the rightmost boundary of 'common'? . . .*

LITTLE APP ACTIVITY Continued...

5. Consider blood pressure. A high systolic blood pressure is generally defined to be at or above 130 mmHg. Switch back to the NHANES2 data set and select `systolic` as the response variable.

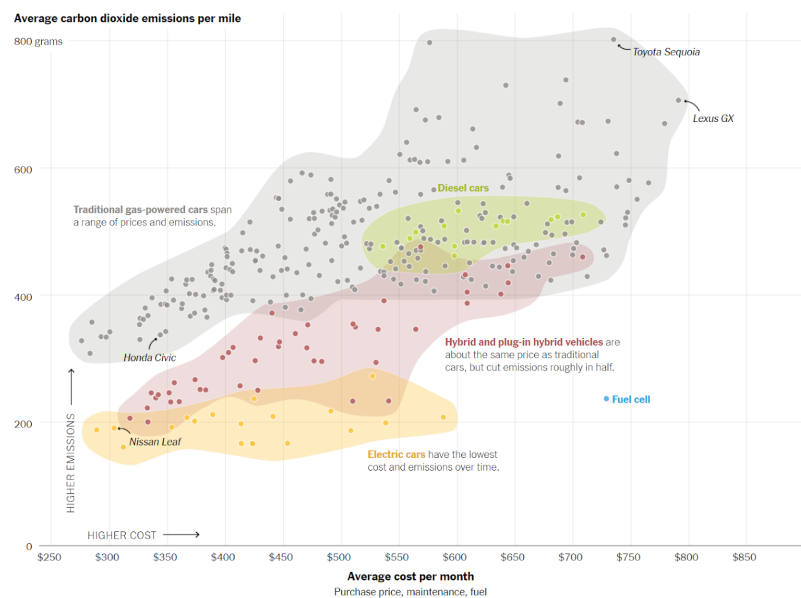
- *What fraction of the people in NHANES2 have a systolic pressure above 130 mmHg?

Lastly, the activity introduces the z-score, thus tying together many ideas of a normal distribution. This activity is very useful for introducing students to the concepts of the normal distribution, and allowing students to play around with different variables. You can also have the students pick their own variables, and allow your students to play with the data. I highly suggest that you use this activity when you first introduce the normal distribution.

BUILDING COMMUNITY THROUGH DISCUSSION BOARDS: THE PRICE OF ELECTRIC CARS

BY AMBIKA SILVA

When doing discussion boards, it's important to stay up to date. As such, I'm always on the lookout for new resources to use. The New York Times article entitled "Electric Cars Are Better for the Planet - and Often Your Budget, Too" was written less than a month ago, on January 15, 2021. This article has some wonderful graphics that can inspire a lot of conversation, both online and in person. I am looking forward to giving this new resource to my students this semester to see what insights they can glean from it.



Source: [carboncounter.com](https://www.carboncounter.com) by the MIT Trancik Lab | Note: The chart shows data for new cars, SUVs and other models that retail for \$55,000 or less. The most fuel-efficient trim for each car is included and additional trim levels are shown for cars over \$35,000 if they have a lower fuel economy rating than other trims shown (they are less efficient) by at least 4 miles per gallon.

BUILDING COMMUNITY Continued...

Sample Prompt

Read the following article: <https://www.nytimes.com/interactive/2021/01/15/climate/electric-car-cost.html?smid=url-share>

Answer the following questions in complete sentences, then respond to at least two classmates. You must have a minimum of 15 sentences total for your first post.

1. Who gathered the data, and what did they collect?
2. What did Dr. Trancik hope the data they collected would do?
3. Looking at the graphic provided above, pick one car either labeled or not labeled and describe all the data you can get about it. You should have at least three things you can say about the car!
4. Looking overall at the graphic, is there any trends you can see, either overall or by categorizing?
5. In the article, it gives an interactive tool: <https://www.carboncounter.com/#!/explore>. Use this tool to either find your car, your dream car, and/or a car you're interested in buying. Compare a few different types and describe what you notice either about your car, or comparing two different cars.

What am I hoping they discuss or understand afterwards?

For this discussion, I want to give them something relevant but is different than pandemic data that I have given recently. While electric cars are more expensive, this article may give them a different perspective about long term costs. Finally, it's great to give students information about relevant topics that they may share in their conversations outside of class as well as with their peers.

Join the Discussion!

Do you have thoughts on using this as a discussion post? Join the conversation online at MAA Connect, <https://connect.maa.org/home>.

UPCOMING EVENTS

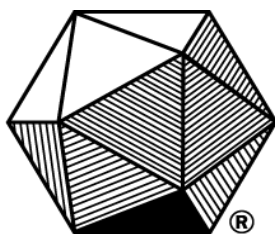
TUESDAY, FEBRUARY 23

4 PM EST

Resources for Teaching Statistics

Host: Julie Hanson, Kari Lock Morgan, Kathryn Kozak, Rebecca Wong, and Phil Yates

Teaching an introductory statistics course, but you need some guidance. The ASA/MAA Joint Committee, the ASA/AMATYC Joint Committee, and the StatPREP grant all have resources to help you teach statistics. This webinar will demonstrate the resources from each of these sources.



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Need Help Joining?

[Getting Started Guide](#)

[Getting Started Video](#)

[StatPREP October Webinar](#)