

February  
10, 2020

# StatPREP



# MAA

MATHEMATICAL ASSOCIATION OF AMERICA

## NEWSLETTER

### STATPREP: OUT & ABOUT

BY MIKE BRILLESLYPER



StatPREP at  
JMM

*From left: Kate  
Kozak, Ambika  
Silva, Jenna  
Carpenter,  
Hwayeon Ryu*

Hub leaders and members of the StatPREP leadership team have been getting the word out about StatPREP and the resources available on [statprep.org](http://statprep.org). In Denver, at the Joint Mathematics Meetings 2020, which just concluded, StatPREP was represented in the poster session for NSF projects funded by the Division of Undergraduate Education, in an MAA minicourse on Stats for Data Science (Danny Kaplan referenced the “Little Apps” and the interactive R-tutorials), and StatPREP was also mentioned in Danny’s presentation in the MAA Invited Paper Session on Modernizing Introductory Statistics Course. StatPREP has been a regular topic of presentation at past JMM, Mathfest, and AMATYC conferences.

As we roll into the last two summers of StatPREP workshops, there are more dissemination events planned. Tentatively planned upcoming events include a joint presentation by hub leaders at AMATYC 2020 in Spokane WA, a poster

*....continued on page 2*

#### 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

Rachel Levy  
MAA

##### HUB LEADERS

Joe Roith, St. Olaf’s Col-  
lege, Northfield, MN (2017-  
18)

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

Helen Burn, Highline Col-  
lege, Seattle, WA (2018-19)

Hwayeon Ryu, Elon Univer-  
sity, Elon, NC (2018-19)

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

Thomas Kinzeler, Tarrant  
County College, Fort Worth,  
TX (2019-2020)

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

Brooke Orosz, Essex Coun-  
ty College, Newark, NJ  
(2020-2021)

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## STATPREP: OUT & ABOUT continued...

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presentation at Mathfest 2020 in Philadelphia, a possible workshop at USCOTS 2021 at Penn State, and a minicourse at JMM 2021 in Washington DC.

In addition to national meetings, there are many opportunities to present about StatPREP at regional and affiliate meetings. In January 2020, Ambika Silva did a poster presentation at the Hawaii International Conference on Education, where she had an opportunity to talk about StatPREP to educators from many disciplines from all over the world.

For JMM in January, several members of the leadership team hosted a poster presentation as well as an MAA Pavilion session. Hwayeon Ryu, a regional hub leader, was also in attendance and stopped by the poster.

The leadership team and hub leaders are working on possible presentations at upcoming affiliate meetings in CMC<sup>3</sup> (CA AMATYC Affiliate) and CMC<sup>3</sup> South, as well as WAMATYC (Washington state). We encourage all StatPREP participants to consider giving a presentation about their experiences using StatPREP materials at their local AMATYC affiliate meeting or at an MAA section meeting. The complete list of upcoming meetings can be found at <https://amatyc.site-ym.com/page/AffiliateConferences> and <https://www.maa.org/programs-and-communities/member-communities/maa-sections/section-meetings>.

If you would like to give a presentation involving StatPREP and you would like some help, feel free to reach out to your StatPREP hub leader or any member of the leadership team.

### SAVE THE DATE!

### Summer 2020 StatPREP Workshops

Fort Myers, FL: May 29 - 30, 2020, Florida Southwestern State College

Fort Worth, TX: June 3 - 4, 2020, Tarrant County College

New Jersey: June 5 - 6, 2020, Essex County College

Columbia, MD: June 12-13, 2020, Howard Community College



# DISCOVERING STATPREP.ORG - INSTRUCTOR TUTORIALS

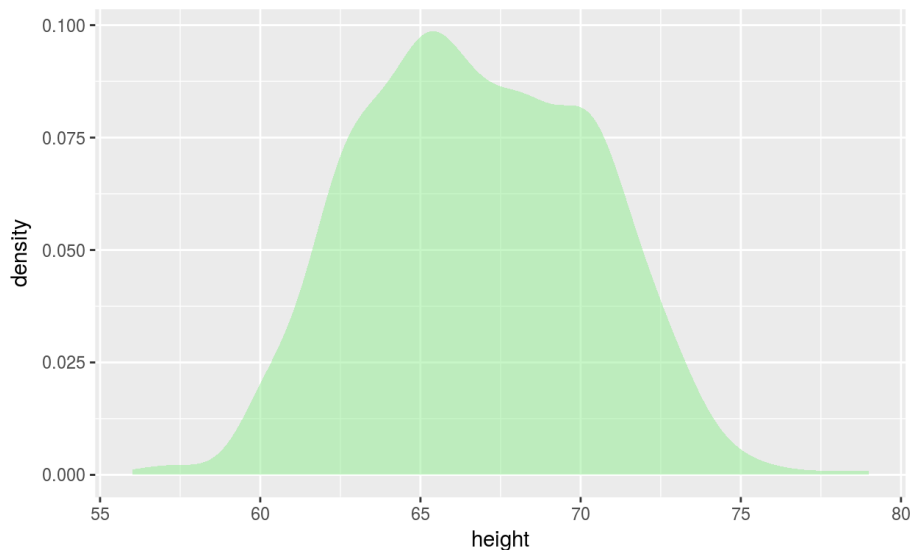
BY AMBIKA SILVA

If you've thought about using R in your classroom and want to dip a toe into R, try checking out the "Instructor Tutorials" page. You can find this under the "Resources" tab on the main page of the StatPREP website, or by going to <http://statprep.org/resources/>. With only a web browser, you can see commands and graphics that are used in an R computing environment. For instance, under Graphics, you can be introduced to the different graphs R creates. Clicking on histograms will take you to [https://dtkaplan.shinyapps.io/Tutorial\\_Densities/](https://dtkaplan.shinyapps.io/Tutorial_Densities/). Clicking next will take you to some code:

The following command block contains an example of a distribution display with the variable on the x-axis.

```
Code  
1 gf_density(~ height, data = Galton, fill = "lightgreen")
2
3
```

By clicking the "Run Code" button, you can see a density curve!

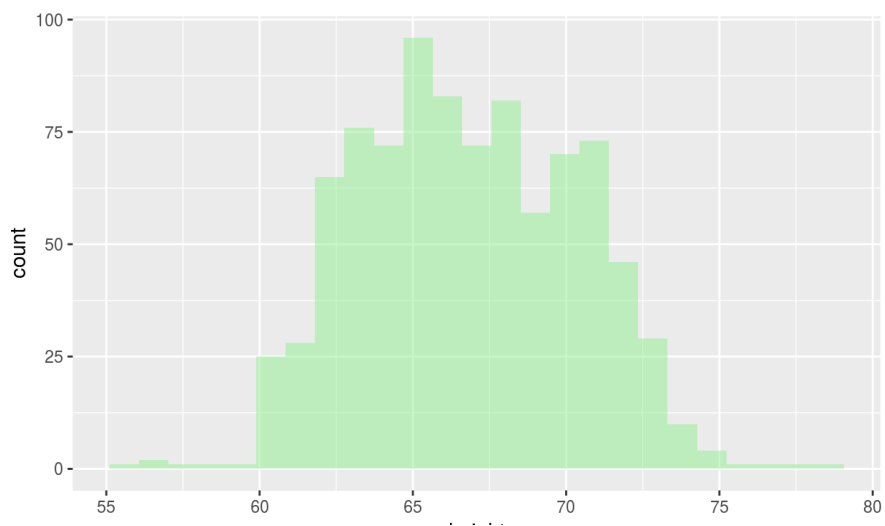


Maybe that's not what you were looking for. Maybe you want to do a histogram. By changing the code in the box so that it looks like:

```
Code  
1 gf_histogram(~ height, data = Galton, fill = "lightgreen")
2
3
```

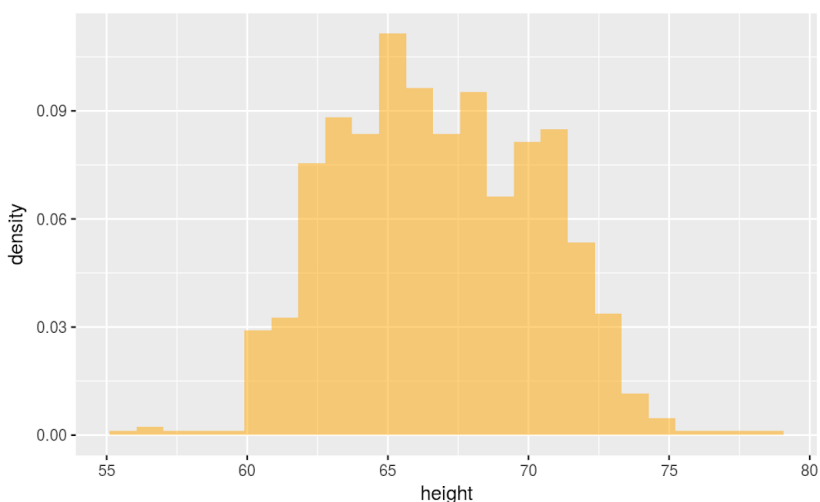
## DISCOVERING STATPREP.ORG Continued...

Clicking Run Code again yields:



Now I can talk about shape, center, and spread of a histogram with my class, using real data! If your students have access to a computer, then they get to feel like their coding. More fun, let them change the color! I love orange, so I changed it:

```
Code  
1 gf_histogram(~ height, data = Galton, fill = "orange")
2
3
```



While R may not be suitable for all of your statistical software needs, these resources can help you and your students get a feel for the codes and outputs easily. If you try playing with these tutorials or used them in your class, we would love to hear about how it worked at [MAA Connect!](#)

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# THE JOURNAL OF STATISTICS EDUCATION

BY DONNA LALONDE

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“A Survey of Kissing Numbers,” you might not guess is the title of an article found in a mathematics journal. Since we celebrate Valentine’s Day in February, it seemed an appropriate introduction for a February newsletter article highlighting journals as teaching and learning resources. Although there are many journals, this article will focus on the Journal of Statistics Education (JSE). JSE is an open access journal of the American Statistical Association (<https://www.tandfonline.com/toc/ujse20/current>). The goal of JSE is to “disseminate accessible knowledge for the improvement of statistics education at all levels, including: elementary, secondary, post-secondary, post-graduate, continuing, and workplace education.”

Exploring JSE, you will discover a variety of article types including original research articles, overviews and reflective essays, reviews of software, books and teaching materials, data sets and stories, and data science. A recent research article, “Supporting Data Science in the Statistics Curriculum” by Loy, Kuiper, and Chihara, described a multi-institutional project to develop, implement, and evaluate a series of tutorials and case studies that instructors could integrate into existing curriculum (<https://www.tandfonline.com/doi/full/10.1080/10691898.2018.1564638>). Also in a recent issue, a data sets and stories article by Beth Chance and Shea Reynolds, described using a dataset of Kentucky Derby winning times for “Predicting the Kentucky Derby Winner! Sort of.” The authors explained their classroom use of this rich data set and offered teaching tips (<https://www.tandfonline.com/doi/full/10.1080/10691898.2019.1623137>). Most issues also include an interview with a statistics educator. For example Allan Rossman interviewed Brian Kotz on the topic of data science at two-year colleges (<https://www.tandfonline.com/doi/full/10.1080/10691898.2018.1446645>).

If you would like to learn more about kissing numbers, the essay “Kissing Numbers, Sphere Packing, and Unexpected Proofs,” from the AMS Notices might be of interest (<http://www.ams.org/notices/200408/fea-pfender.pdf>). Of course, also explore the incredibly rich resources provided by the Journal of Statistics Education.

# WHAT DOES RSTUDIO'S NEW PUBLIC BENEFIT CORPORATION (PBC) STATUS MEAN?

BY DANIEL KAPLAN

We educators, like everyone else, work in an economic environment. The large majority of us are employed by the government or not-for-profit sector. It's not uncommon for us to think of this as a moral choice. While I applaud people who make occupational choices to help others, I also encourage people to keep in mind that there are many ways to help others, one of which was illustrated in late January in an important announcement by RStudio.

Most of my career has been attending or working for not-for-profit educational organizations. There are many famous ones where even a cursory examination suggests that they are overly focused on spending money rather than on using their resources to maximize public benefit. The Quaker college I attended, for instance, now spends approximately \$150,000 per year on each student, this wealth going primarily to the children of wealthy families who are already highly accomplished and would thrive if they attended a school spending, say \$20,000, per student. This is a massive misallocation of resources in a very obvious sense, the result of the school's financial model

of relying (and successfully soliciting) donations from well-heeled

**Want more StatPREP? Check out:**

**<http://statprep.org/>**

alumni. Problems in the ethical calculus of doing good while supporting yourself well enough to continue doing good do not have easy solutions, and they naturally generate suspicions of self-serving and hypocrisy.

I like to think of the StatPREP project as a successful result of a not-for-profit/government organization. We're funded by the US National Science Foundation, our materials are available for free, are open source, and so on. Some of the NSF money goes to the mechanics of the workshops, some goes to cloud computing resources (for which we pay). But to be honest, most of the money is paid to our staff, typically at the level of one month per year of our daytime job's salary.

No sensible person would be in this for the money. (Sound familiar?) We do it because we believe in the importance of high quality stats and data science education, particularly in the two-year college environment which is providing such a valuable social benefit to so many students. And, importantly, we don't have to put up with much guff. We work together as a staff, but we the staff



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# WHAT DOES RSTUDIO'S NEW PBC STATUS MEAN? Continued...

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decide on what and how to work. This works for what we are doing, because we don't need a complex organization to run a workshop or to produce Little Apps or other resources. But don't be deceived, because there are complex organizations that we rely on: the NSF, the MAA, the host colleges for our workshop hubs ... all of which are government/not-for-profit. And then there is one for-profit organization which has been fundamental to our work, without which we would have gotten nowhere. That's RStudio PBC.

Take the Little Apps, for example. They are written in a web framework called Shiny: an RStudio product. The instructor tutorials are written in a framework called Learnr: an RStudio product. Most of our web pages are written in Blogdown: an RStudio product. The large majority of our documents are written in knitr, our graphics are generated by ggplot2, data wrangling is accomplished by dplyr, rstudio.cloud is the engine used in our workshops, shinyapps.io serves up the Little Apps: all RStudio products. All are provided gratis, except shinyapps.io for which we pay a nominal fee. Each of these is the product of an extensive and expensive software development and maintenance team: about 60 highly skilled engineers and statisticians.

They are free for us to use, for you to use, for your students to use, and for anybody else in the world to use. But for how long? The examples of Facebook and others has rightfully made people suspicious of corporations. And there is a pattern in the interaction we

academics have with many of the products we use with our students. Software (Mathematica, JMP, MATLAB) must be licenced and paid for, sometimes rising rapidly in price when acquired by a new owner (e.g. SPSS). Textbook companies want to lock us in to their expensive offerings by providing proprietary homework software.

Some see cupidity in this pattern. Maybe that's a factor, but in my opinion, mostly it's the result of how you bring together an extensive and expert team to build and sustain sophisticated products and the legal consequences that accrue. The key legal structure is a corporation. In the US and UK, by law, corporations are accountable only to their shareholders and legally

*....continued on page 8*

# WHAT DOES RSTUDIO'S NEW PBC STATUS MEAN? Continued...

forbidden from considering any objective other than shareholder value. The corporations whose products work well for the classroom are typically privately held, which allows the individual owner to apply her or his values in making decisions. But individuals don't last forever, and when the corporation is sold the shareholders will change and with them the ethos and telos of the entire organization.

Over the last decade, a new legal structure has emerged (at least, in 32 of the 50 states). Called the "public benefit corporation," (PBC) it legally mandates the organization to consider not just shareholder interests but STAKEHOLDER interests. Stakeholders include employees, the community, the environment, and the users of the product. In late January 2020, RStudio announced that it has shifted from Inc. to PBC. It now has a legal obligation to the technical computing community, not just to its shareholders. And it's subject to accreditation review, in much the same way as colleges and universities.

The PBC puts profit in its place. And for RStudio, that means that its for-pay, commercial-facing products can continue to subsidize its larger beneficial mission, which explicitly includes education, rather than exclusively rewarding the shareholders who provided the start-up funding.



Not on MAA Connect? Learn how to join in the fun by watching our recent October webinar, with host Deveney Brown, MAA Communities Coordinator.

<http://statprep.org/webinar-series/>

After you create your account, be sure to join our **StatPREP Hub Communities.**



# UPCOMING EVENTS

## February 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27 Webinar	28	29

## DON'T MISS THE SPRING STATPREP WEBINARS!

Coming up next...

FEB. 27 - 11AM EST

### COURSE CURRICULA & STATPREP

Danny Kaplan and Kate Kozak will introduce the three new StatPREP companion tools for Statistics Using Technology by Kozak, OpenIntro Statistics by Diez, et al, and Elementary Statistics by Triola. Do you use one of these books in your introductory statistics classes? If so, tune in to this webinar to learn how StatPREP can help you teach data-centric stats! If you don't use these books, you can still learn where the StatPREP material can be used with your textbook.

Each webinar is recorded and posted on the [StatPREP website](#) so that you can view previous webinars.



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