



DATA SCIENCE

# Lightning Talks



# We follow the R-Ladies International Code of Conduct

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R-Ladies is dedicated to providing a harassment-free experience for everyone. We do not tolerate harassment of participants in any form.

This code of conduct applies to all R-Ladies spaces, including meetups, Twitter, Slack, mailing lists, both online and offline. Anyone who violates this code of conduct may be sanctioned or expelled from these spaces at the discretion of the Global Leadership Team.

Some R-Ladies spaces may have additional rules in place, which will be made clearly available to participants. Participants are responsible for knowing and abiding by these rules.

Harassment includes:

- Offensive comments related to gender, gender identity and expression, sexual orientation, disability, mental illness, neuro(a)typicality, physical appearance, body size, age, race, or religion.
- Unwelcome comments regarding a person's lifestyle choices and practices, including those related to food, health, parenting, drugs, and employment.
- Deliberate misgendering or use of 'dead' or rejected names.
- Gratuitous or off-topic sexual images or behaviour in spaces where they're not appropriate.
- Physical contact and simulated physical contact (eg, textual descriptions like "*hug*" or "*backrub*") without consent or after a request to stop.

<https://github.com/r-ladies/starter-kit/wiki/Code-of-Conduct>



# Thank you sponsors!



wework





# The Agenda!

- Sheila Braun: Fairness while Sampling from Very Large Datasets
- Rajvi Mehta: Important Skills for Women in Data
- Jaclyn Taroni: Leveraging Docker for Reproducible Training Workshops
- Alice Walsh: Do we need another Wawa?

Live-tweet this event:  
@RLadiesPhilly,  
#RLadies, #rstats



# Find us online!

- **Philly Website:** <https://rladiesphilly.org>
- **Global Website:** <https://rladies.org>
  - Add yourself to the directory of R-Ladies worldwide:  
<https://rladies.org/directory/>
- **Twitter:** [@RLadiesGlobal / \[@RLadiesPhilly\]\(https://twitter.com/RLadiesPhilly\)](https://twitter.com/RLadiesGlobal)
- **Meetup:** <https://www.meetup.com/rladies-philly/>
- **Slack:** <https://join.slack.com/t/rladies-philly/signup>
- **Email:** [philly@rladies.org](mailto:philly@rladies.org)

The screenshot shows the Twitter profile for R-Ladies Philly (@RLadiesPhilly). The header image is a panoramic view of the Philadelphia city skyline. The bio reads: "A place for women interested in R! R-Ladies is a worldwide organization whose mission is to promote gender diversity in the R community" and includes a location pin for Philadelphia, PA. The stats show 13 tweets, 34 following, 52 followers, and 7 likes. Recent tweets include one from R-Ladies Philly (@RLadiesPhilly) thanking others for sharing their new meetup stats, and one from Technical.ly Philly (@Technical.lyPHL) about gender diversity in the R community.





# Important Skills for Women in Data

Rajvi Mehta

July 16th 2019



# Who am I?

- **Data Scientist** at Vanguard
- Philadelphia Chapter Lead of **Women in Data**
- Born in Bombay, India
- Masters of Quantitative Finance, U of Buffalo, NY
- Starting coding in **2016**.



@ womenindataorg



# Women in Data - Philadelphia

Awareness

Education

Opportunity

---

Symposiums

Career Tracks

Residency Programs

Job Board

*ONLY IN PHILADELPHIA CHAPTER*

- **Mini Workshop Series : Focus on your soft skills**
- **Networking Happy Hour**
- **Partnering with other organizations.**



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# Why is this talk important?

**133 Million** New Jobs by  
2022

Immediate need to **re-skill the workforce**

**75 Million** Jobs displaced

Entering the **Age of Automation**

Retention in **STEM**



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# Why do we do it?

Data Field is new and massive

- Data governance
- Risk Data Officer
- Data Science
- Data Analytics



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# What are our strengths?

- Women are more **aware of risk**
- Good at **Communication, team nurturing, and problem solving**
- Data is **asking the right questions and listening to all answers**



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# What do we need?

- **Personalized mentorship programs.**
- STEM Professionals should support young girls and provide opportunities.
- Problem-solving abilities and critical-thinking skills > Technical skills

- **Soft skills like –**

**Improve communication:** Toastmasters,

**Emotional intelligence:** Lead a team.

**Asking right questions:** Implement it daily.

- Pick up a **certification program**
- Strive to be **innovative** in your role – white papers, building cross-departmental teams.





# Results in.....

## Visibility

*Valued Skills  
Assignments  
Networks*

GENDER

### To Succeed in Tech, Women Need More Visibility

by Shelley Correll and Lori Mackenzie

SEPTEMBER 13, 2016

Save Share Comment Text Size Print PDF \$0.95 Buy Copies



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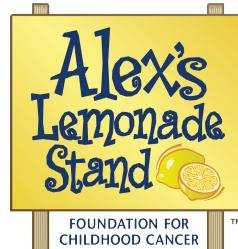
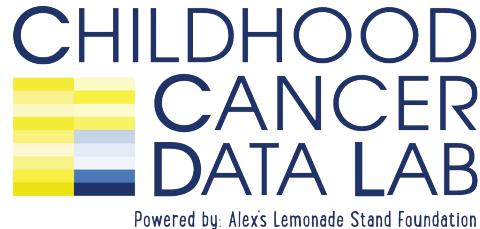


Thank you

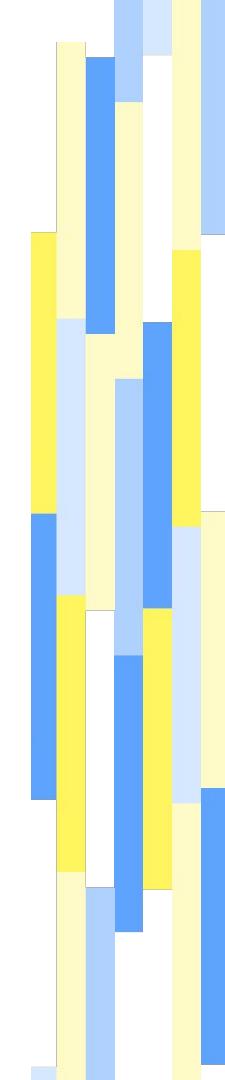


# Leveraging Docker for Reproducible Training Workshops

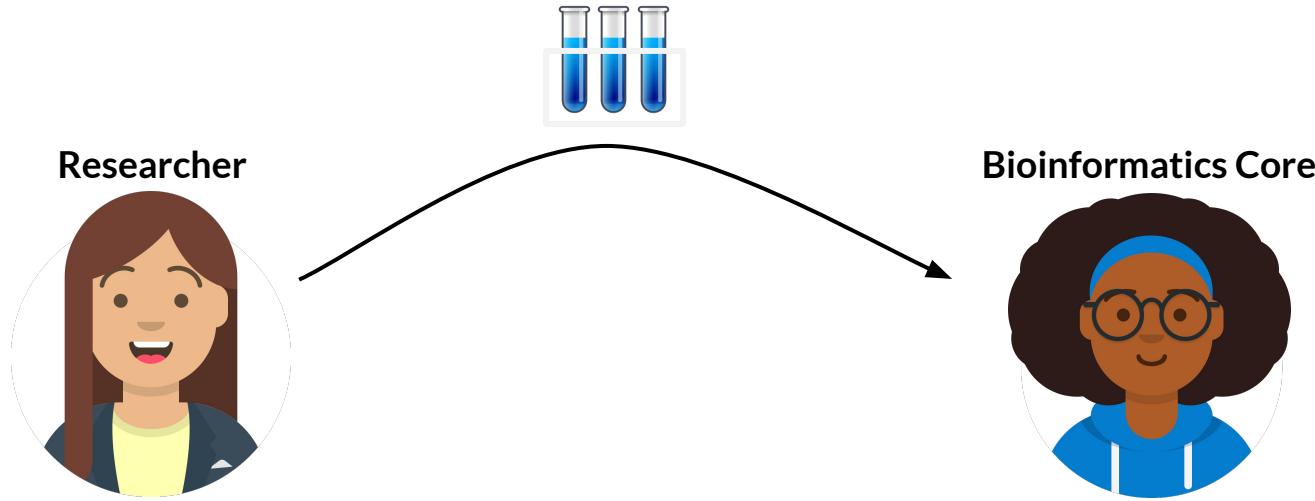
Jaclyn Taroni



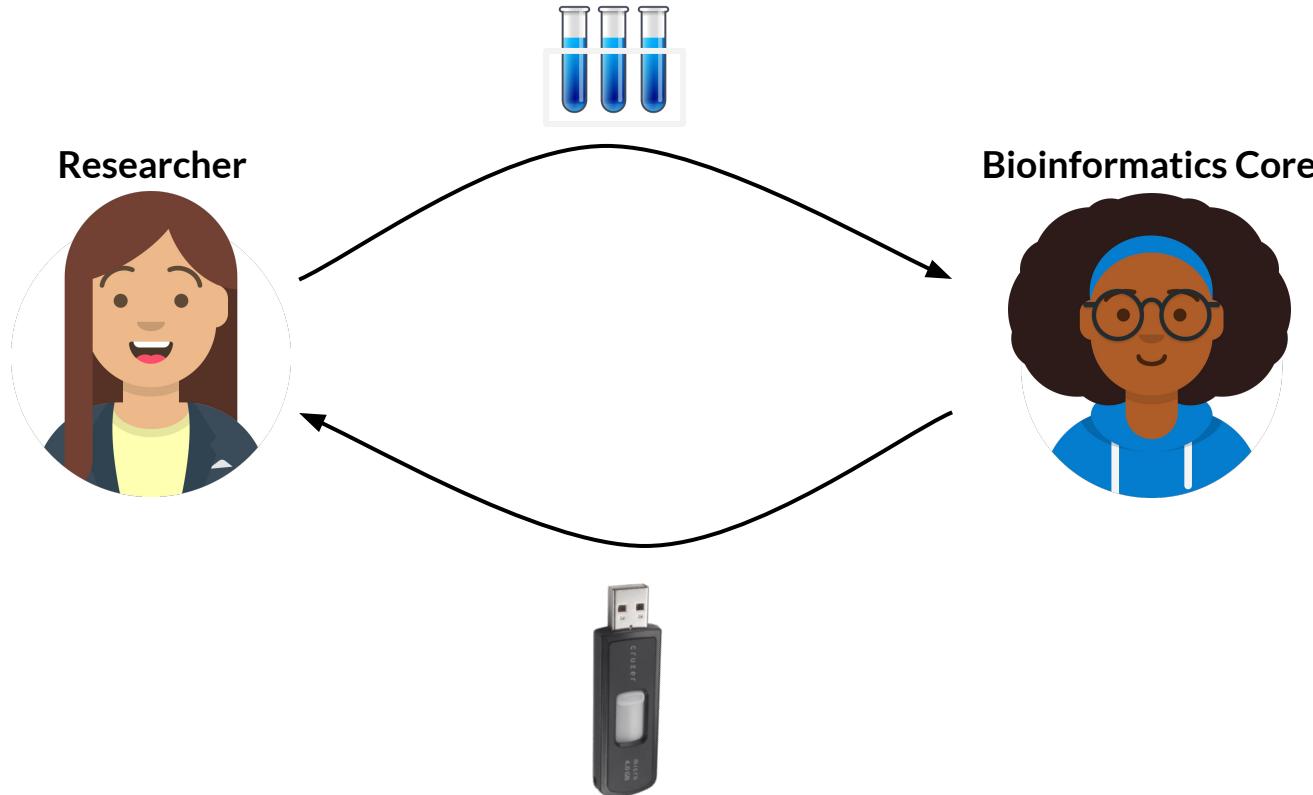
Life science research requires computational skills that are not always cultivated via semester-long instruction



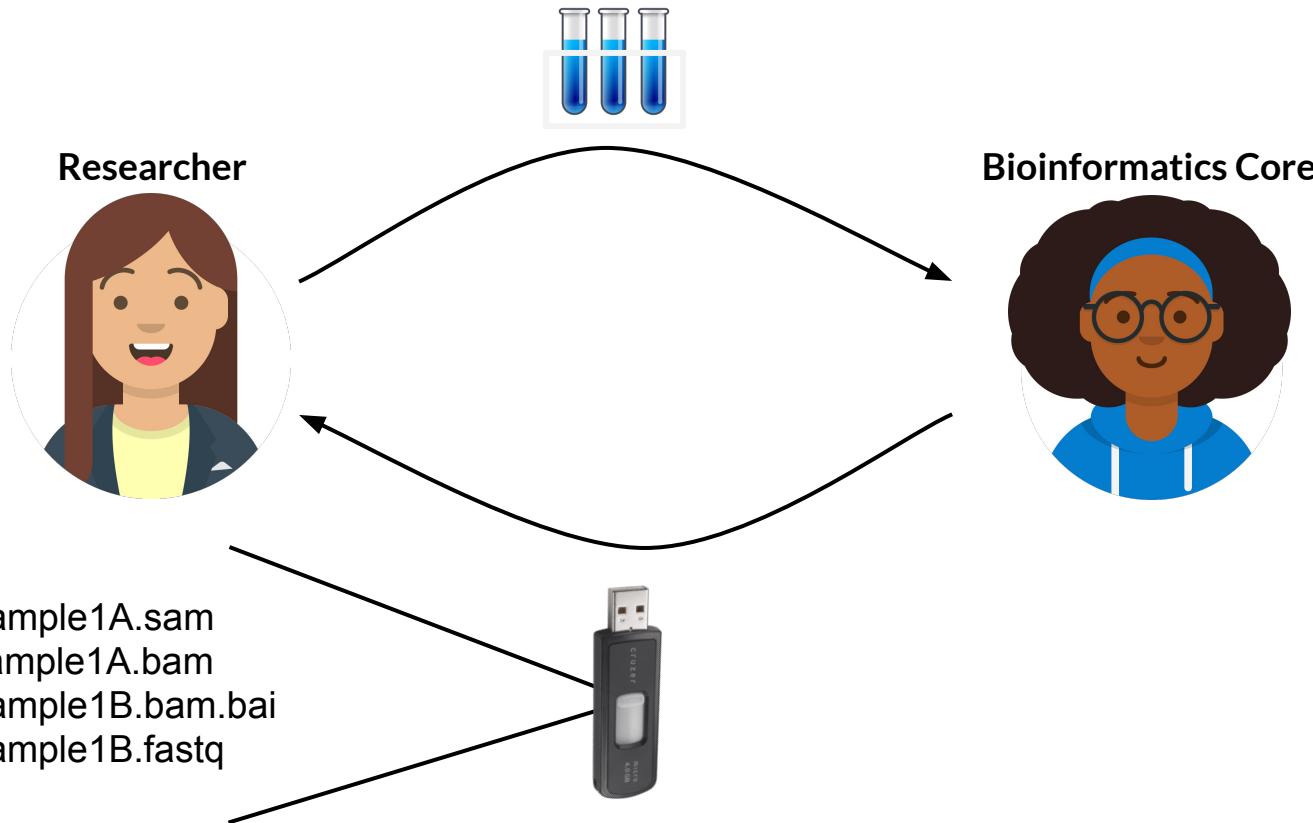
# The bioinformatics knowledge gap



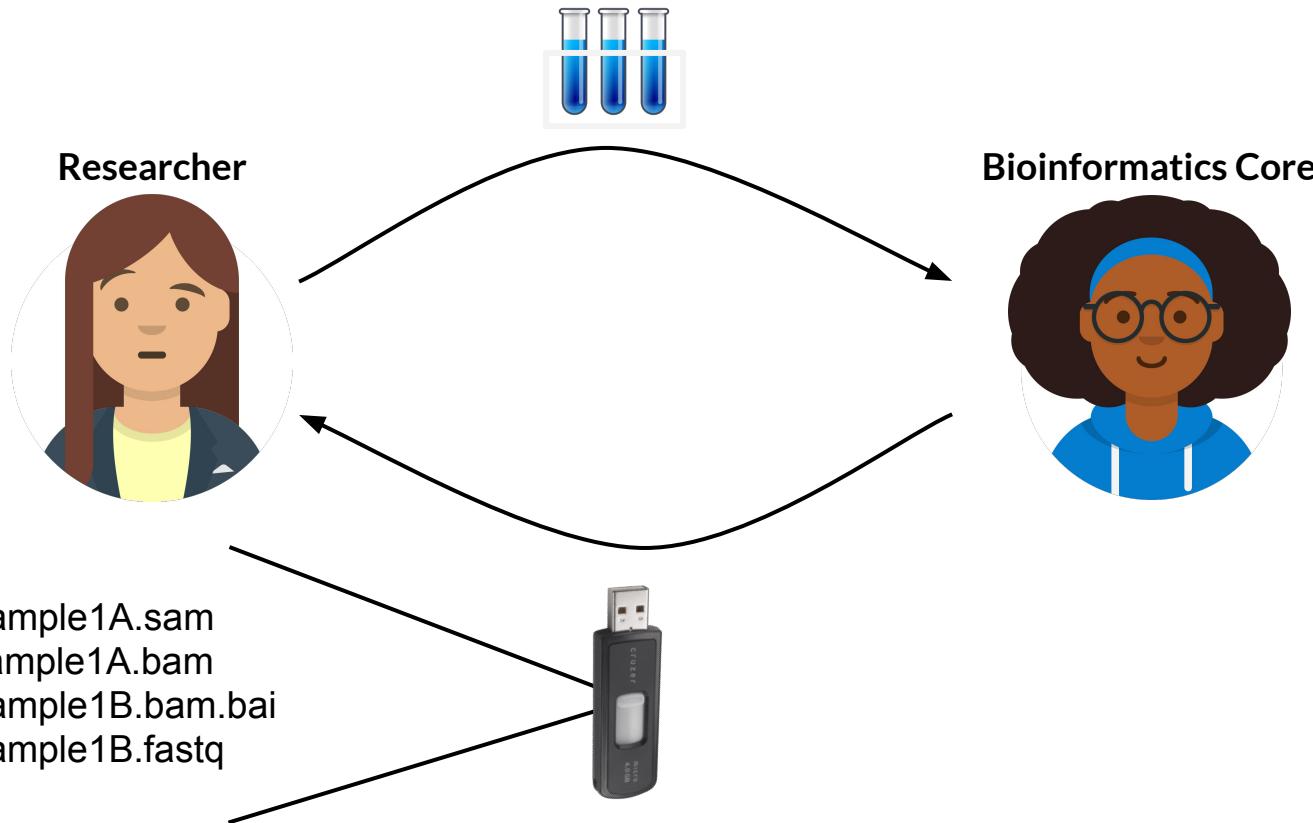
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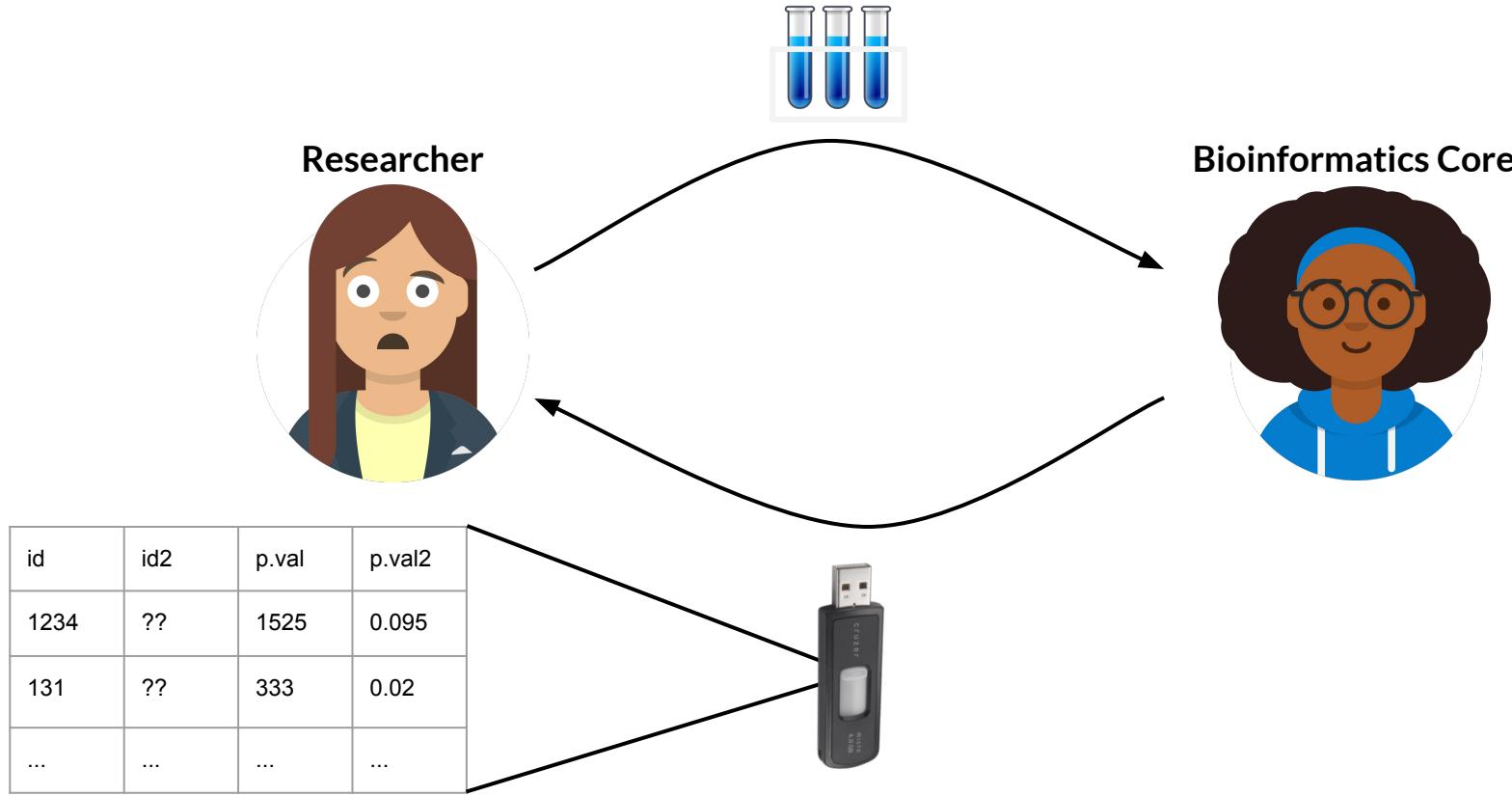
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# The bioinformatics knowledge gap

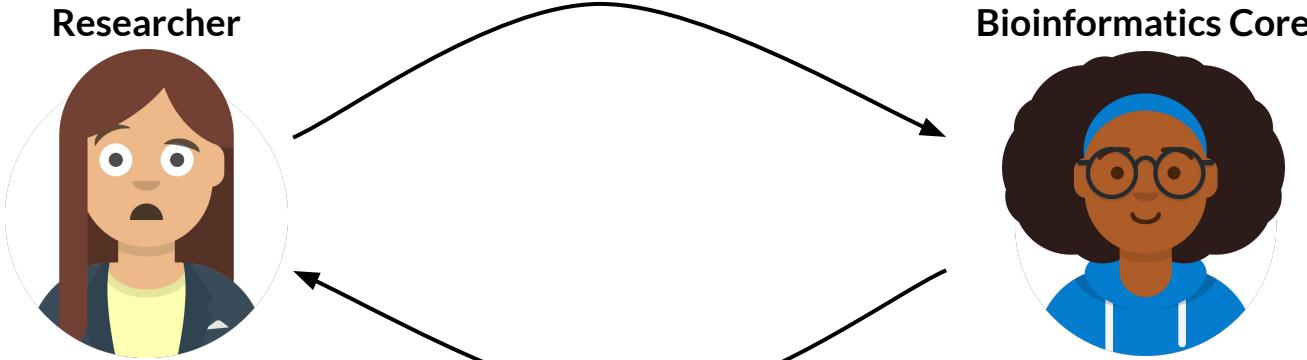


# The bioinformatics knowledge gap



# The bioinformatics knowledge gap

How were these data processed?  
How do I use these files?  
How do I analyze this to answer my question?



id	id2	p.val	p.val2
1234	??	1525	0.095
131	??	333	0.02
...	...	...	...



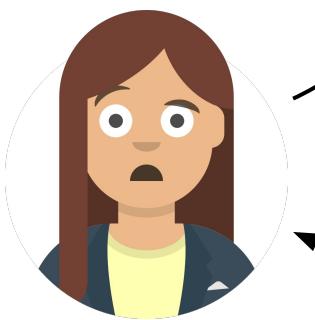
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How were these data processed?

How do I use these files?

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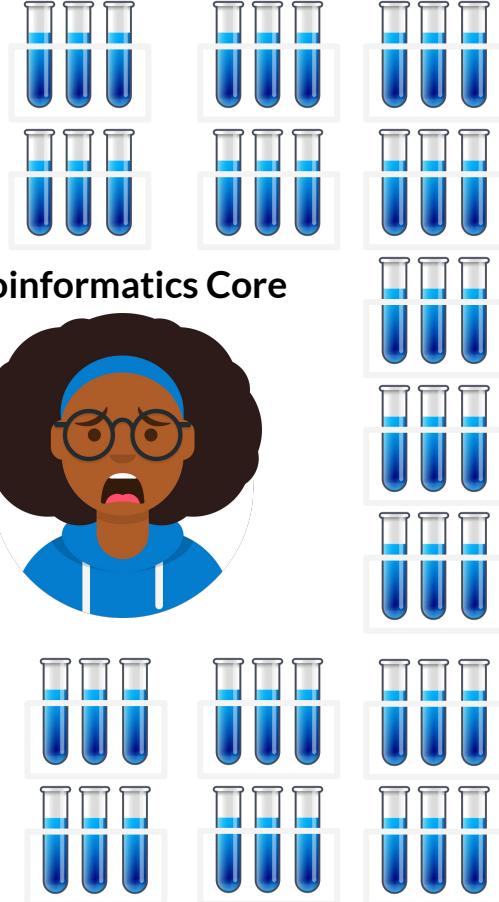
Researcher



Bioinformatics Core



id	id2	p.val	p.val2
1234	??	1525	0.095
131	??	333	0.02
...	...	...	...



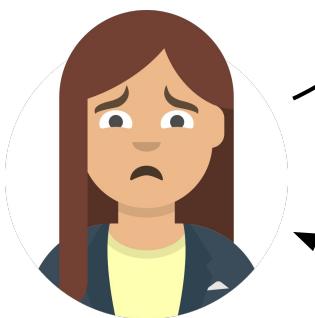
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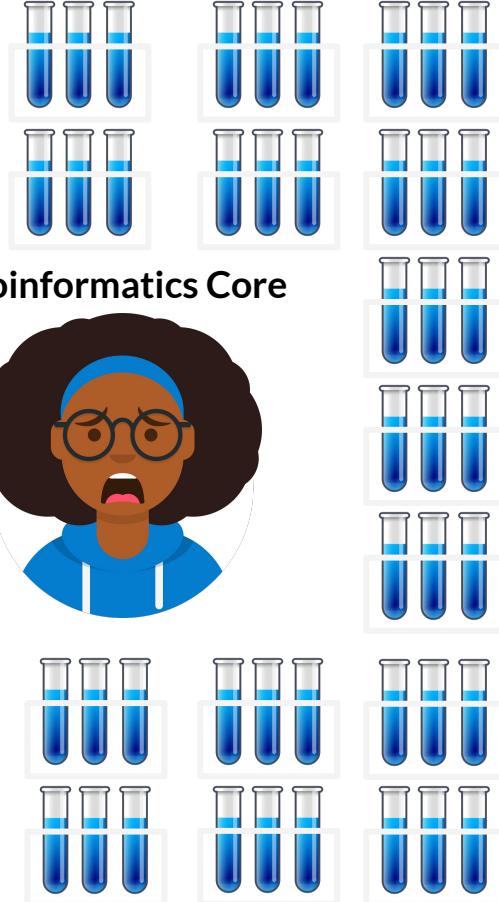
Researcher



Bioinformatics Core



id	id2	p.val	p.val2
1234	??	1525	0.095
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...	...	...	...



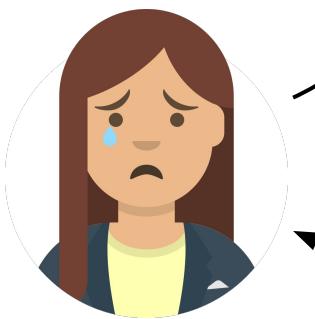
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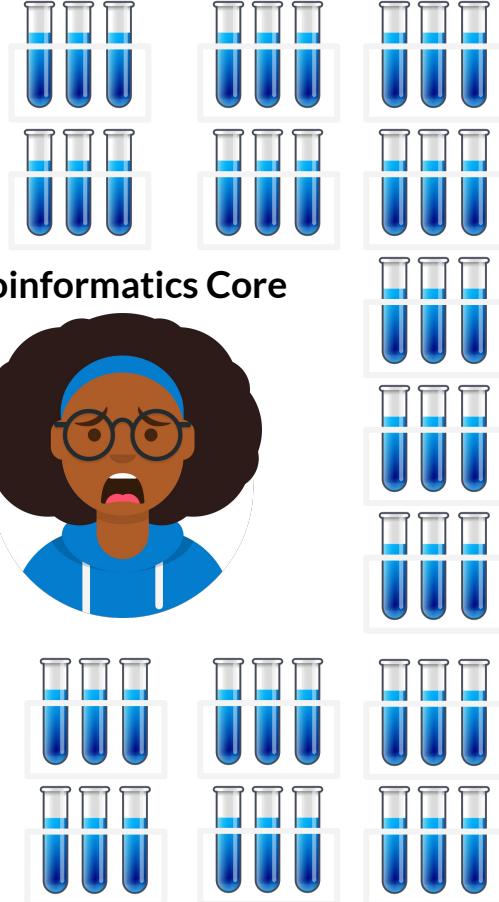
Researcher

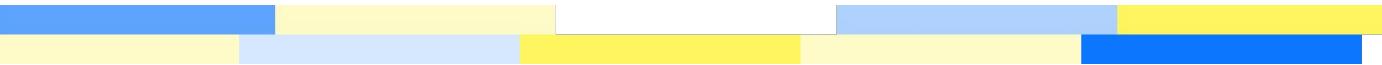


Bioinformatics Core



id	id2	p.val	p.val2
1234	??	1525	0.095
131	??	333	0.02
...	...	...	...





We provide 3 day workshops to help ***close  
the gap***



## Day 1

Environment set up  
Intro to Docker

Intro to R and R Notebooks  
Intro to Tidyverse

Bulk RNA-seq  
Pre-processing  
Differential expression

## Day 2

Single-cell RNA-seq  
Normalization  
Pre-processing  
droplet-based  
Dimension reduction

Machine Learning  
Data prep  
Clustering  
PLIER  
Plot preparation

## Day 3

Own data/Exercise  
notebooks

Presentations

Talk by CCDL staff

# Excerpt from **What you will learn** introduction

**“Our overarching goals:** To prepare you to perform ‘frontline’ analyses of your own data, to get you more comfortable reading documentation/learning new methods on your own, and to give you tools to collaborate more effectively with analysts when needed”

# CCDL's magic tips for biologists beginning data analysis

1. Look at your data 
2. Document your analyses 
3. Work reproducibly for future you's sake 

R Markdown Notebooks help us model all points!

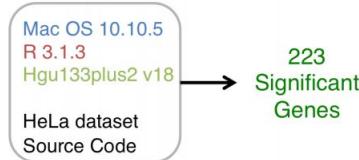
# Requirements

- Make it easy to continue to access tools used during the workshop after completing the training = own laptop set up for their own research.
- Get 20+ tools installed on 10+ different laptops in a short amount of time.
- Eliminate uncertainty that arises from software versioning issues *in the classroom* and *prior to training* given a small team of instructors + hands-on nature of the course.
- Use R Markdown Notebooks to teach/model core parts of our philosophy.

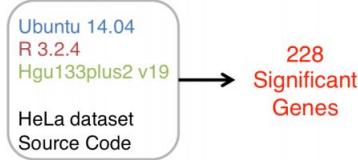
# We know providing code isn't enough

## A. CURRENT SYSTEM

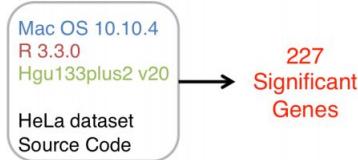
Author's Local Machine



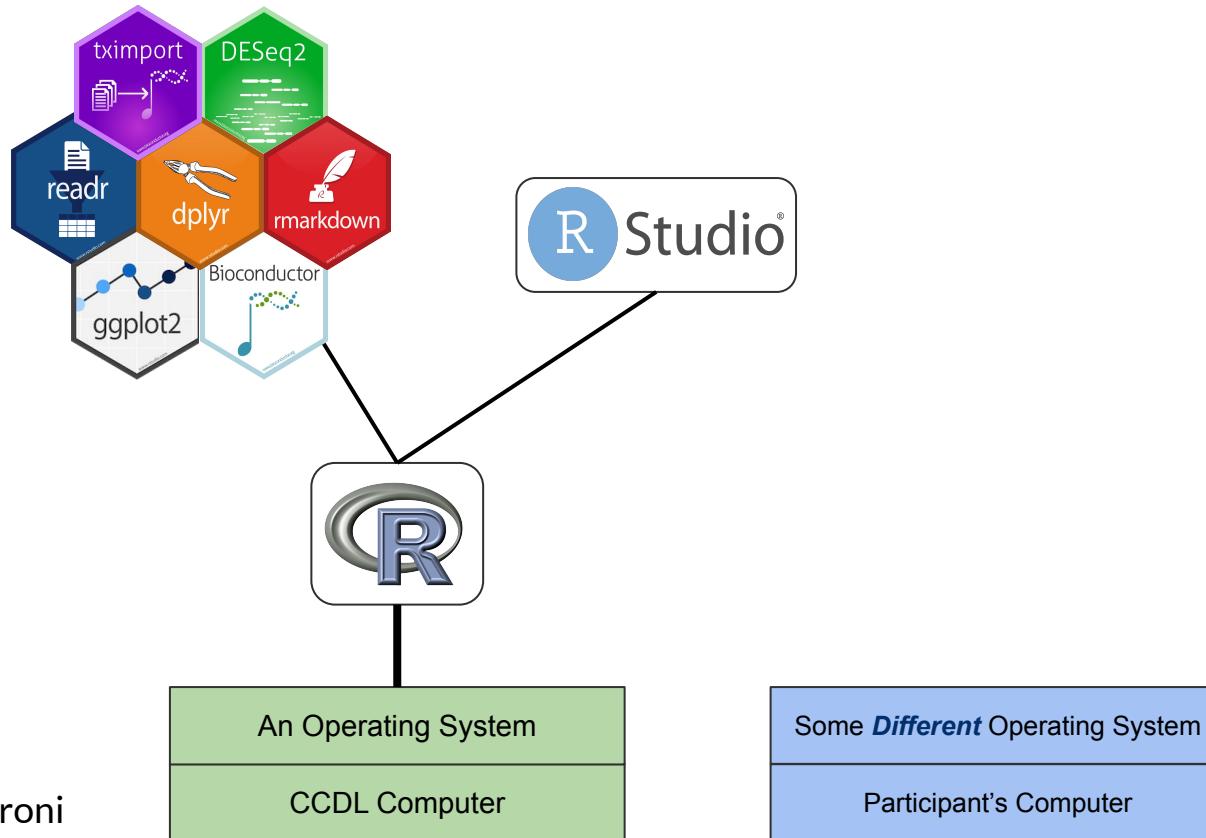
Reader A



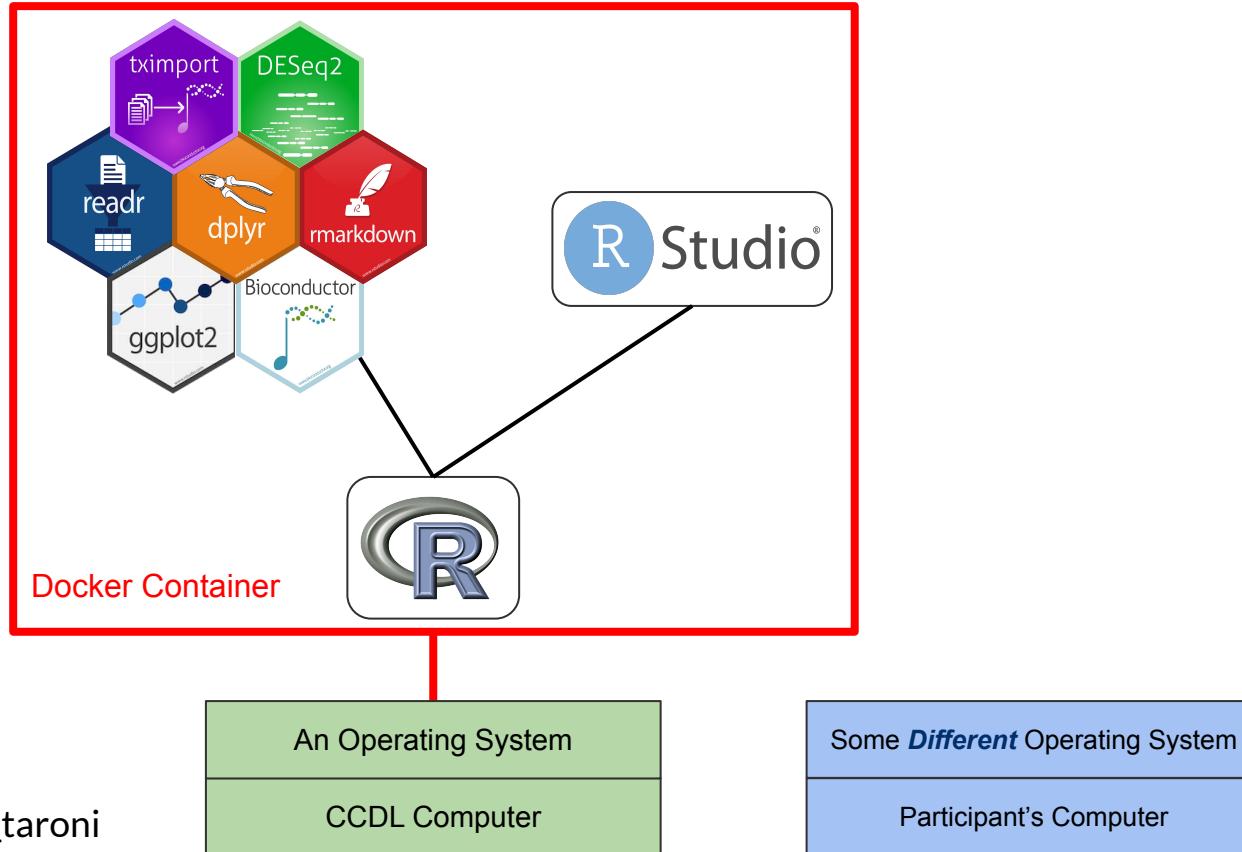
Reader B



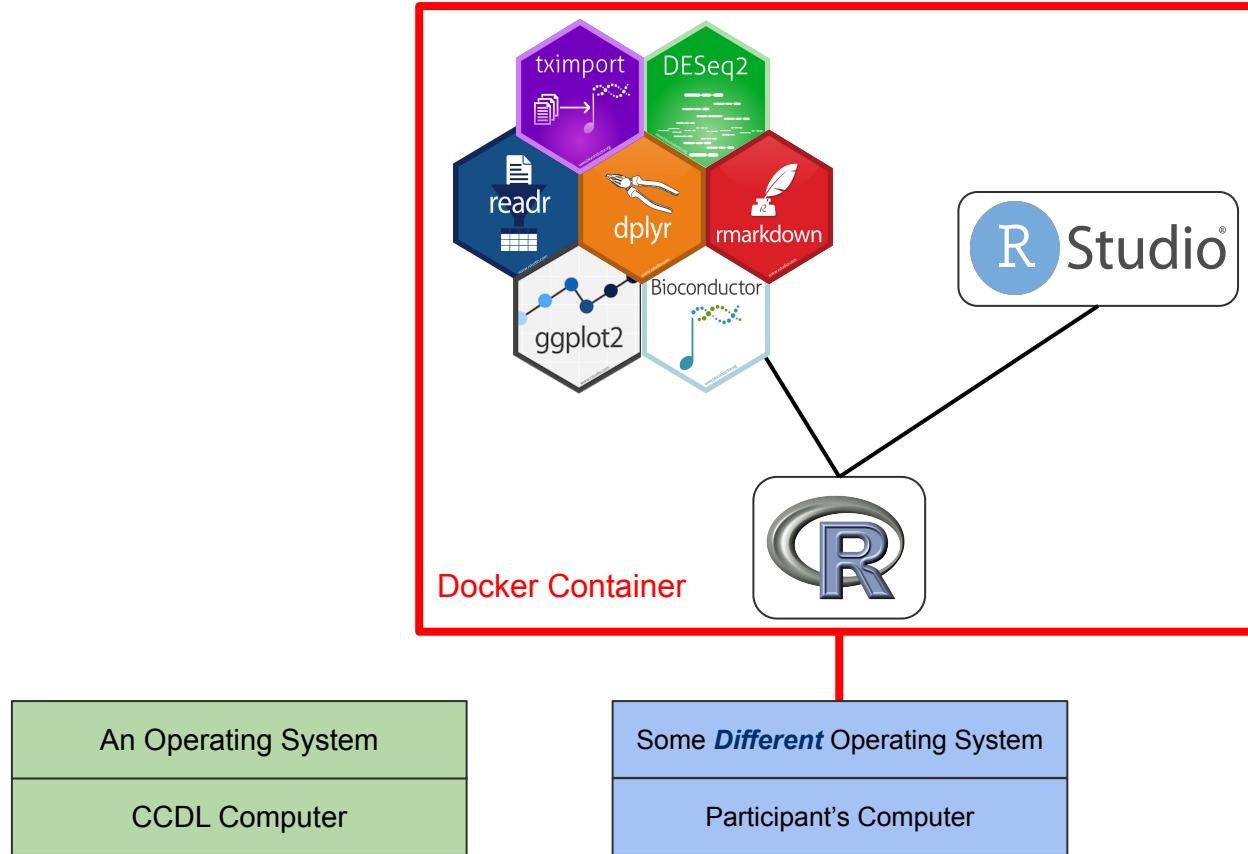
# Docker: Conduct your analyses in easily transferable environment



# Docker: Conduct your analyses in easily transferable environment



# Docker: Conduct your analyses in easily transferable environment



Rocker Project

HOME

IMAGES

USE ▾

# The Rocker Project

Docker Containers for the R Environment



# The Rocker Images: choosing a container

The rocker project provides a collection of containers suited for different needs. find a base image to extend or images with popular software and optimized libraries pre-installed. Get the latest version or a reproducibly fixed environment.

## The versioned stack

image	description	size	metrics	build status
r-ver	Specify R version in docker tag. Builds on <a href="#">debian:stable</a>	239.4MB 8 layers	docker pulls 120k	docker build automated
rstudio	Adds rstudio	0B 21 layers	docker pulls 3M	docker build automated
tidyverse	Adds tidyverse & devtools	711.1MB 24 layers	docker pulls 675k	docker build automated
verse	Adds tex & publishing-related packages	1.1GB 26 layers	docker pulls 415k	docker build automated
geospatial	Adds geospatial libraries	1.5GB 30 layers	docker pulls 103k	docker build automated

This stack builds on stable Debian releases ([debian:8](#) for versions < [3.4.1](#), [debian:9](#) after). Images in this stack accept a version tag specifying which version of R is desired, e.g. [rocker/rstudio:3.4.0](#) for R [3.4.0](#). Version-tagged images are designed to be stable, consistently providing the same versions of all software (R, R packages, system libraries) rather than the latest available (though Debian system libraries will still receive any security patches.) Omit the tag or specify [:latest](#) to always receive the latest (nightly build) versions, or [:devel](#) for an image running on the current development (pre-release) version of R. This is a linear stack, with each image extending the previous one.

## The base stack

image	description	size	metrics	build status
r-base	Current R via apt-get with <a href="#">debian:testing</a> & <a href="#">unstable</a> repos	267.6MB 12 layers	docker pulls 3M	docker build automated
r-devel	R-devel added side-by-side onto r-base (using alias <a href="#">RD</a> )	1.6GB 20 layers	docker pulls 7k	docker build automated
drd	lighter r-devel, built not quite daily	728.7MB 16 layers	docker pulls 5k	docker build automated

This stack builds on [debian:testing](#) and [debian:unstable](#). This is a branched stack, with all other images extending [r-base](#). Use this stack if you want access to the latest versions of system libraries and compilers through [apt-get](#).

# We provide a versioned image for every workshop and use Kitematic to manage volumes

1. Pull the appropriate image using command line.

- In Mac, search for and open `Terminal`.
- In Windows, search for and open `Command Prompt`.

In your respective command line interface, copy and paste the following:

```
docker pull ccdl/training_rnaseq:2019-czi
```

2. Run the container. Change the `<PASSWORD>` in the line below to whatever you'd like.

```
docker run -e PASSWORD=<PASSWORD> -p 8787:8787 ccdl/training_rnaseq:2019-czi
```

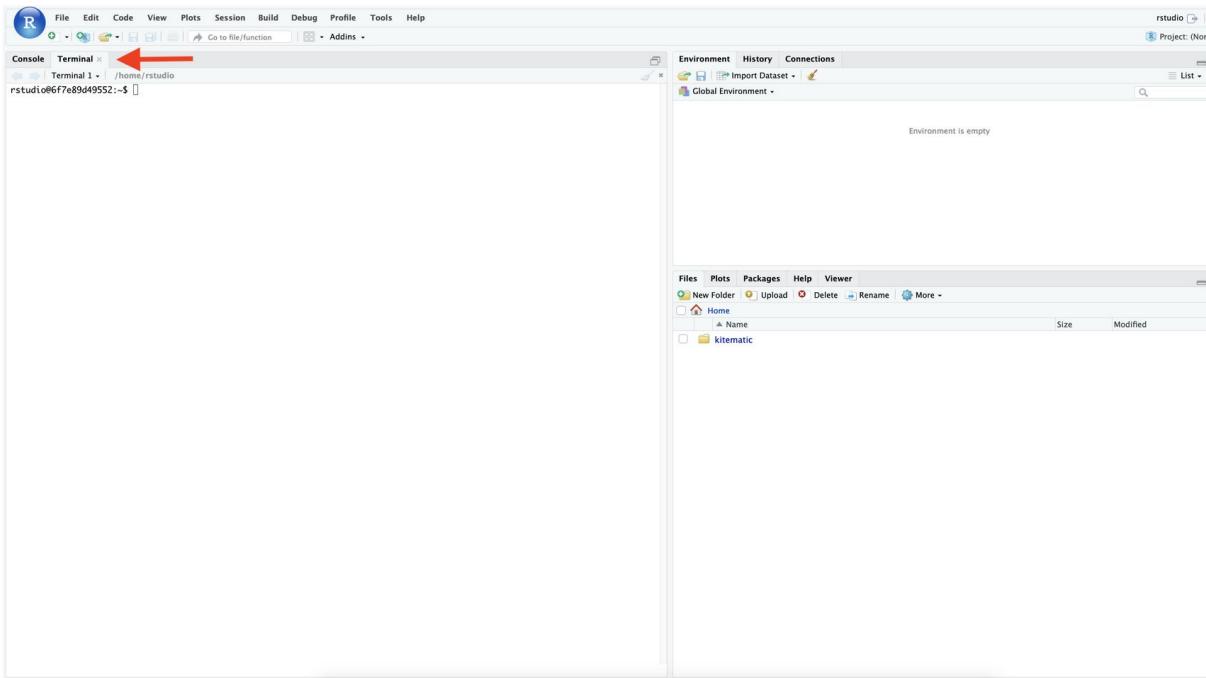
3. Open `Kitematic` - you should see an image running.

4. `Settings > Volumes` > Set local folder to `training-modules` that was transferred from the flash drive, using the `CHANGE` button.



# Use RStudio Terminal to avoid docker exec

3. You can switch to a **Terminal** where commands will be carried out by clicking the **Terminal** tab to the right of the **Console** tab. This is a [command-line interface](#). Commands here are for programs on your system *other than R*.



# Using Docker for CCDL workshops

- ✖ Requires admin access
- ✖ Requires Windows 10 Pro and installation on Windows laptops can be highly specific to a given make and model
- 💡 Requires use of the command line prior to the start of instruction
- ✓ Install one hard thing once instead of attempting to install 20+ things of various levels of difficulty
- 😄 Increased control over versions helps in the classroom and in preparing material
- 🚀 Participants “take the stack with them”

The dependencies get you everytime!

-CCDL workshop participant



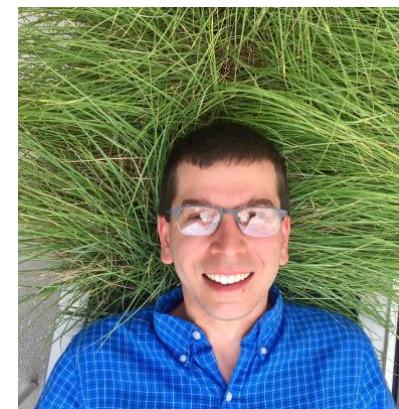
**Deepa Prasad**  
UX Designer



**Candace Savonen**  
Biological Data Analyst



**Chante Bethell**  
Biological Data Analyst



**Casey Greene**  
Director of the CCDL



**Kurt Wheeler**  
Data Engineer



**Ariel Rodriguez Romero**  
Software Engineer



**Jaclyn Taroni**  
Data Scientist

[ccdatalab.org](http://ccdatalab.org)  
[github.com/AlexsLemonade](https://github.com/AlexsLemonade)  
[@CancerDataLab](https://twitter.com/CancerDataLab)

**CHILDHOOD  
CANCER  
DATA LAB**

Powered by: Alex's Lemonade Stand Foundation

# **Do we need a new Wawa?**

**Alice M Walsh, PhD**



@alicenotalice

# A new Wawa in the neighborhood!

Goodman Properties is planning a Wawa with gas (“Super Wawa”) at the corner of Easton Road and Waverly Road in Glenside, PA.

Concerns from neighbors and the community were raised about safety, traffic, and the juxtaposition with smaller scale properties and businesses in the area

This is what one neighbor had to say on a local [website](#):

Sadly Bruce Goodman regards urban-oriented developments like a warm turd. His company's website shows a portfolio of sprawl, which brings more asphalt moonscapes to southeastern Pennsylvania. Sprawl, left unchecked, spreads like a cancer. It's bad for the environment. It makes us fatter. And it ultimately strains the treasuries of the towns where it develops.

The Philadelphia Inquirer

inquirer.com

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## Super-sized Wawas not always wanted in Philadelphia suburbs

by Erin McCarthy, Updated: August 31, 2018



A photograph showing a red "Wawa" sign mounted on a building. To the right of the sign is a white, three-dimensional logo of a bird in flight. Below the main sign, there is a smaller, illuminated blue sign with the letters "Wawa".

Over the last few years, there have been fierce fights over Wawa plans in [Voorhees](#), [Doylestown](#), [Hatboro](#), [Abington](#), [Upper Gwynedd](#), and [Brick](#), N.J. On Fayette Street in Conshohocken, a battle over a Super Wawa has been going on since 2010.

"The closer you were, the more concern there was," Sharkey said. "The farther you were, the more support there was."

change.org

Start a petition

My petitions

Browse

Membership

Stop Super Wawa in Wayne

# Is this new Wawa unusual?

- Are other Super Wawa locations in similar areas?
- Are other Super Wawa locations this close to other Wawas?

# Step 1: Find all Wawa locations in Northeast

- Retrieved the Wawa locations from wawa.com for the area around Glenside, PA.
  - Wawa.com data does not include detailed information on location size, number of pumps, etc.
- *Retrieved data on 485 unique Wawa locations (PA, NJ, DE, MD)*
  - 470/485 [97 %] open 24 hours
  - 280/485 [58 %] have gas
  - 280/485 [58 %] have restrooms

# How to find the Wawas?

– FIND A WAWA

## Location Results

List View Search Again

Map View NO FUEL  FUEL 

12 stores within 5 Miles of 200 South Easton Road, Glenside, PA, USA

+ Find a Wawa for what you need

### Results

Change Fuel Type: Regular + 

 88 Limekiln Pk. Glenside, PA 0.6 Miles	<a href="#">+ More Info</a>	 
 8250 Limekiln Pk Wyncote, PA 1.4 Miles	<a href="#">+ More Info</a>	\$2.89 <sup>9</sup> Regular 
 816 Old York Road Jenkintown, PA 1.7 Miles	<a href="#">+ More Info</a>	\$2.89 <sup>9</sup> Regular 

The screenshot shows a Mac OS X desktop with a browser window open to the Wawa website. The main content area displays "Location Results" for "12 stores within 5 Miles of Glenside, PA, USA". Below this, there are two buttons: "Search Again" and "Map View". Underneath the results, there are two links: "List View" and "Map View".

The browser's address bar shows the URL: `wawa.com`. The title bar includes the Wawa logo.

At the bottom of the screen, the Mac OS X menu bar is visible, showing the system status and some open application icons.

A large red arrow points upwards from the bottom right towards the developer tools interface.

The developer tools are open under the "Network" tab. The left sidebar lists several files: "collect", "collect", "LocationByLatLong.ashx", "messages.json", and "messages.json".

The "Summary" section for "LocationByLatLong.ashx" provides the following details:

- URL: `https://www.wawa.com/Handlers/LocationByLatLong.ashx?limit=50&lat=40.099907&long=-75.1527927999999`
- Status: 200 OK
- Source: Network
- Address: `45.60.73.20:443`

The "Request" section shows the following details:

- Method: GET
- Path: `/Handlers/LocationByLatLong.ashx`
- Protocol: HTTP/1.1
- Cookies:  
\_fb\_dtsg=fb\_1.156303899052.1453432727; \_ga=GA1.2.1101.2.1918334461.1563038999; \_gat\_UA=4364500-1; \_gcl\_au\_ncap\_ses\_886\_2023331=Q7WZlW1Pbm37h7VLODUVKIOdA==; nbl\_2023331=5+PiNowJUHGO+5Uje7avudgAAAAAAQbOcap\_2023331=MHNQDy128Q/WlfHbY5d54UXAF/0AAAACQUPAUox44zy; ASP.NET\_SessionId=fimppbwot0313rwqswejz14; AWSSELBA=502EE01CFCBC
- Headers:  
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10\_14\_6) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/87.0.4285.120 Safari/537.36  
Accept: \*/\*  
Accept-Encoding: gzip, deflate  
Accept-Language: en-US,en;q=0.9  
Referer: https://www.wawa.com/  
Origin: https://www.wawa.com  
DNT: 1  
Sec-Fetch-Dest: empty  
Sec-Fetch-Mode: cors  
Sec-Fetch-Site: same-origin  
Cache-Control: no-cache, no-store, max-age=0, must-revalidate  
Pragma: no-cache  
Cookie: \_fb\_dtsg=fb\_1.156303899052.1453432727; \_ga=GA1.2.1101.2.1918334461.1563038999; \_gat\_UA=4364500-1; \_gcl\_au\_ncap\_ses\_886\_2023331=Q7WZlW1Pbm37h7VLODUVKIOdA==; nbl\_2023331=5+PiNowJUHGO+5Uje7avudgAAAAAAQbOcap\_2023331=MHNQDy128Q/WlfHbY5d54UXAF/0AAAACQUPAUox44zy; ASP.NET\_SessionId=fimppbwot0313rwqswejz14; AWSSELBA=502EE01CFCBC

# How to find the locations using R

```
library(httr)
library(jsonlite)

# Build urls for grid of lat/long around PHL ----
lats <- c(39.9526 - seq(0.1,0.6,0.2) ,39.9526 + seq(0,0.6,0.2) )
longs <- c(-75.1652 - seq(0.1,0.6,0.2), -75.1652 + seq(0,0.6,0.2))
all_combs <- tidyr::crossing(lats, longs)
urls <-
paste0('https://www.wawa.com/Handlers/LocationByLatLong.ashx?limit=50&lat=',
      all_combs$lats, '&long=', all_combs$longs)

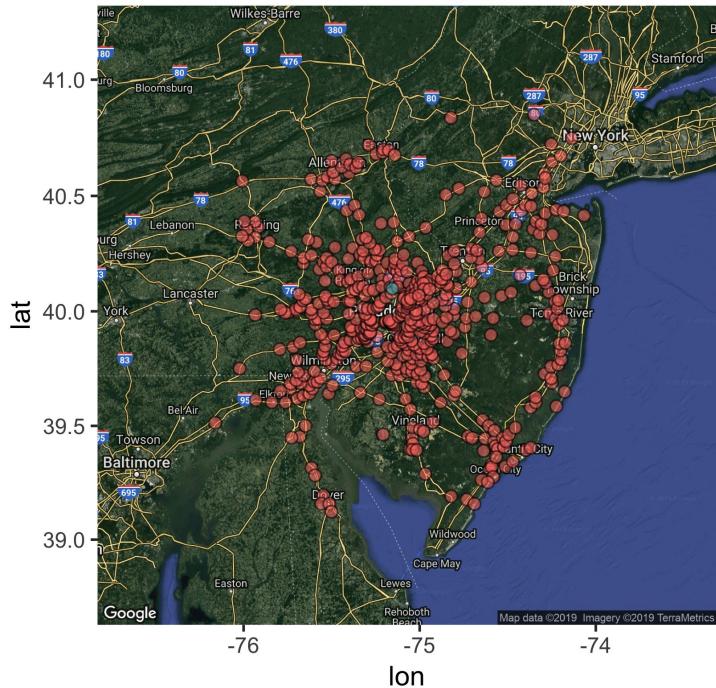
# Create a list of results using GET ----
raw_results_wawa <- lapply(urls, GET)
# Convert returned json to a data.frame ----
jsonRespTexts <- lapply(raw_results_wawa, function(rr) content(rr, as="text"))
)
res_list_wawa <- lapply(jsonRespTexts, fromJSON)
res_list_wawa <- lapply(res_list_wawa, function(rr) rr$locations)
# Do some additional cleaning... not shown
```

# This is what you get

```
> glimpse(wawa_df)
Observations: 486
Variables: 31
$ locationID      <chr> "00859", "00843", "00828", "00830", "00850", "00844", "0085...
$ storeName        <chr> "WAWA, STORE # 0859", "WAWA, STORE # 0843", "WAWA, STORE # ...
$ openType         <chr> "24hours", "24hours", "24hours", "24hours", "24hours", "24h...
$ areaManager      <chr> "MACCUBBIN, CHRISTOPH", "MACCUBBIN, CHRISTOPH", "MACCUBBIN, ...
$ regionalDirector <chr> "SHARPLESS, JOHN", "SHARPLESS, JOHN", "SHARPLESS, JOHN", "S...
$ telephone        <chr> "302-378-5314", "302-376-1780", "302-378-8270", "302-653-53...
$ isActive         <chr> "FALSE", "FALSE", "FALSE", "FALSE", "FALSE", "FALSE", "FALS...
$ storeOpen         <chr> "00:00:00", "00:00:00", "00:00:00", "00:00:00", "00:00:00", ...
$ storeClose        <chr> "00:00:00", "00:00:00", "00:00:00", "00:00:00", "00:00:00", ...
$ open24Hours       <chr> "TRUE", "TRUE", "TRUE", "TRUE", "TRUE", "TRUE", "TR...
$ storeNumber       <chr> "00859", "00843", "00828", "00830", "00850", "00844", "0085...
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$ hasMenu          <chr> "TRUE", "TRUE", "TRUE", "TRUE", "TRUE", "TRUE", "TR...
$ addressUrl        <chr> "de-middletown-690-middletown-odessa-rd", "de-middletown-52...
$ context           <chr> "friendly", "friendly", "friendly", "friendly", "friendly", ...
$ address           <chr> "690 Middletown Odessa Rd.", "528 West Main St.", "2398 Dup...
$ city              <chr> "Middletown", "Middletown", "Middletown", "Smyrna", "Newark...
```

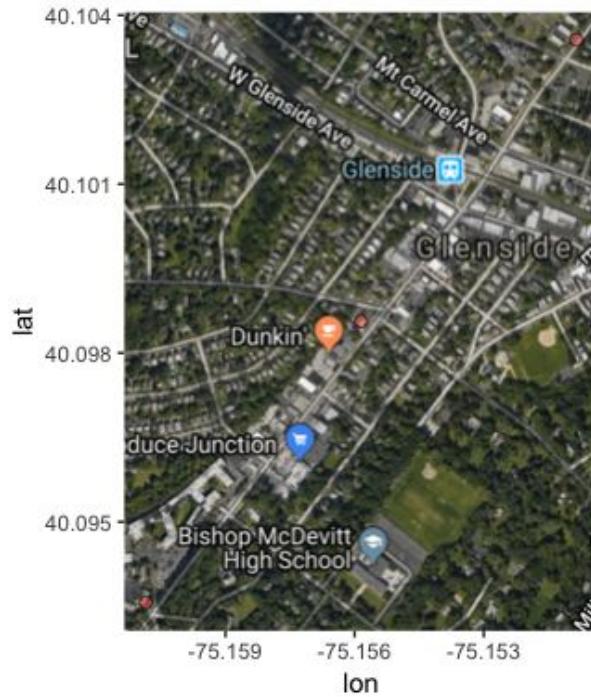
• • •

# It's a lot of Wawas



# Proposed new Wawa site

The proposed Wawa is at [200 S Easton Rd](#)



## Step 2: Add OpenStreetMaps Data

- Calculate the distance to the nearest Wawa for each location
- Retrieve number of lanes and max speed limit of road
  - May be misleading because nearest road might be a driveway or side road off of a major highway
  - Lanes and max speed limit are not available for most Wawa coordinates
- Count the number of houses, highways, and sidewalks in a set area around Wawa location
  - Not all buildings are on openstreetmaps - we need a better data source
  - Considered ‘highway=motorways’ as highways  
(<https://wiki.openstreetmap.org/wiki/Key:highway>)
  - Considered ‘footway=sidewalk’ as sidewalks

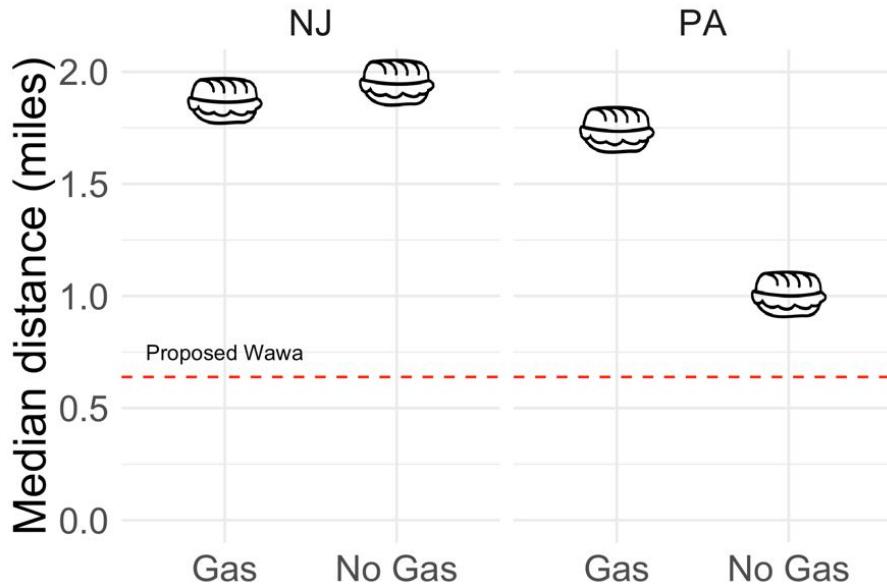
*These results could be sensitive to the size of the area selected. Here I used a 0.01 degree latitude and longitude rectangle centered around the location. This is approximately a 0.69 x 0.53 mile rectangle.*

# Results: The new Wawa will be unusually close to another Wawa location

- The closest Wawa to the proposed location will be 1028 meters from the nearest Wawa.
- That is 0.639 miles.
- The median distance between locations is 2645 meters.

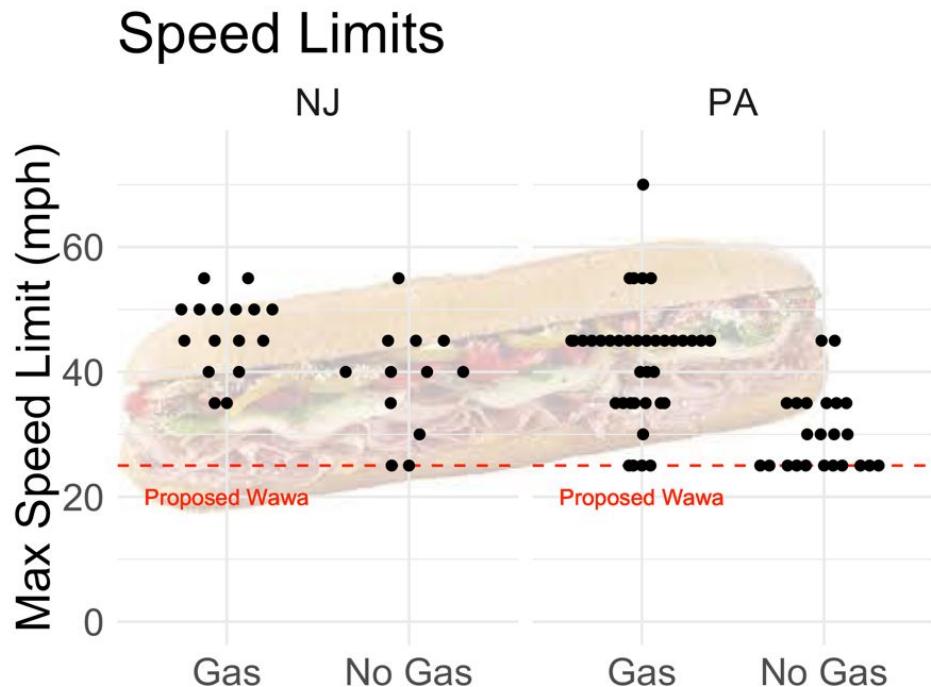
*The shortest distance between the Wawa coordinates was calculated according to the ‘Vincenty (ellipsoid)’ method as implemented in the ‘geosphere’ R package.*

Wawa in NJ and PA



# Results: Most Wawa locations with gas are on higher speed roads

- This is imperfect because the OpenStreetMap data was missing for some roads and the roads might be a driveway or service road off a larger (higher speed) road.



# Results: Most Wawa locations are in less residential/walkable areas

Here, I use the number of sidewalks from OpenStreetMaps as a surrogate measure of the area's walkability.

The proposed Wawa area has **25** sidewalks.

- **28/485 [5.8%]** current Wawa locations have as many or more “sidewalks” than the proposed site
- 13/28 have gas
- 10/28 are in Philadelphia (more urban design)

# Conclusions - will the Wawa be built?

Public Hearing on June 19, 2019: Zoning map amendment was tabled



Commissioner Drew Sharkey

June 6 ·

...

Thanks to all who attend the Wawa meeting last evening and demonstrated great patience. Here are sense notes after last evening's meeting in no particular order. Please know I am doing my best to sort this out.

- Developer showed designs where he attempted to flip pumps and building and explained why not workable.
- Development team explained their thoughts why reducing to 10 pumps was problematic.
- Developer agreed to restrict delivery and trash removal between the hours of 10pm and 9am.
- Developer agreed no external music and no vacuums onsite.
- Developer is willing to reduce size of canopy from 96' to 74'; but there are pro/cons to this.

Here are links to some other nearby Wawa with gas on google maps:

- [201 Old York Rd, Willow Grove, PA 19090](#)
- [816 Old York Road Jenkintown, PA 19046](#)

Also owned by Goodman Properties:

- [8250 Limekiln Pike, Cheltenham PA](#)
- [2500 Philmont Ave. Huntingdon Valley, PA](#)
- [1111 Grosser Road, Gilbertsville PA](#)

# Thanks!

Code is available at:

[https://github.com/awalsh17/wawa\\_stats](https://github.com/awalsh17/wawa_stats)



@alicenotalice