Week 1: Welcome!
Introduction to R and Programming

Emily, Elena, & Willa
7/6/2022

Berkeley
UNIVERSITY OF CALIFORNIA

Today's agenda

1. Welcome & introductions

2. Goals and structure of the bootcamp

3. Get to know your peers

4. Let's look at some real data!

5. Introduction to R and datatypes

Berkeley
UNIVERSITY OF CALIFORNIA

Who we are!

Emily (she/her/hers)
4th year PhD Student • Clinical Science • Hinshaw Lab

Elena (she/her/hers)
5th year PhD Student • Developmental • Bunge Lab

Willa (she/her/hers)
5th year PhD Student • Cognitive Neuroscience • Weiner Lab

Why we are doing this!

- Coding skills are becoming increasingly more important, not just for research but for many jobs → It's a transferable skill

- Learning to code can feel really inaccessible and even scary!
  - If you feel this way, you're not alone!

- We want to help make learning R and programming feel more accessible and fun

Why teach R? And why is it so great?!

R is built for working with and analyzing data frames. And that is exactly what we need!

Check out these sites for more information:

- Why is R so great?
- Why R is like a relationship…

From: YaRrr! The Pirate's Guide to R

Goals for the bootcamp

- Learn foundational R and programming skills so you can learn more on your own and in your lab
  - Don't just do, **understand**!

- Feel confident in your skills moving forward

- Build an inclusive, welcoming, and supportive community around programming and data skills for people at all skill levels and from all backgrounds

Goals for the bootcamp

- Learn foundational R and programming skills so you can learn more on your own and in your lab
  - Don't just do, **understand**!

- Feel confident in your skills moving forward

- Build an inclusive, welcoming, and supportive community around programming and data skills for people at all skill levels and from all backgrounds

Day 1

Berkeley
UNIVERSITY OF CALIFORNIA

Goals for the bootcamp

- Learn foundational R and programming skills so you can learn more on your own and in your lab
  - Don't just do, **understand**!

- Feel confident in your skills moving forward

- Build an inclusive, welcoming, and supportive community around programming and data skills for people at all skill levels and from all backgrounds
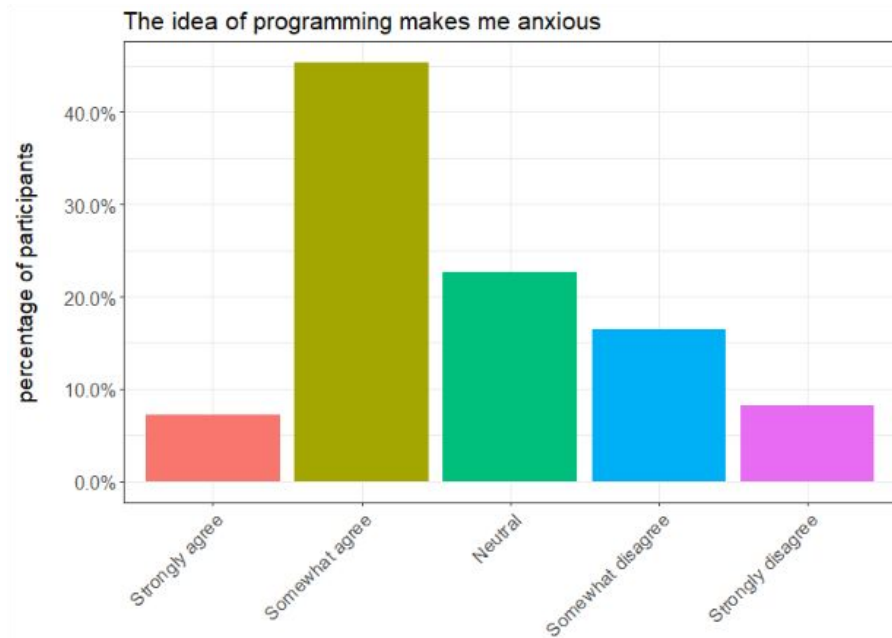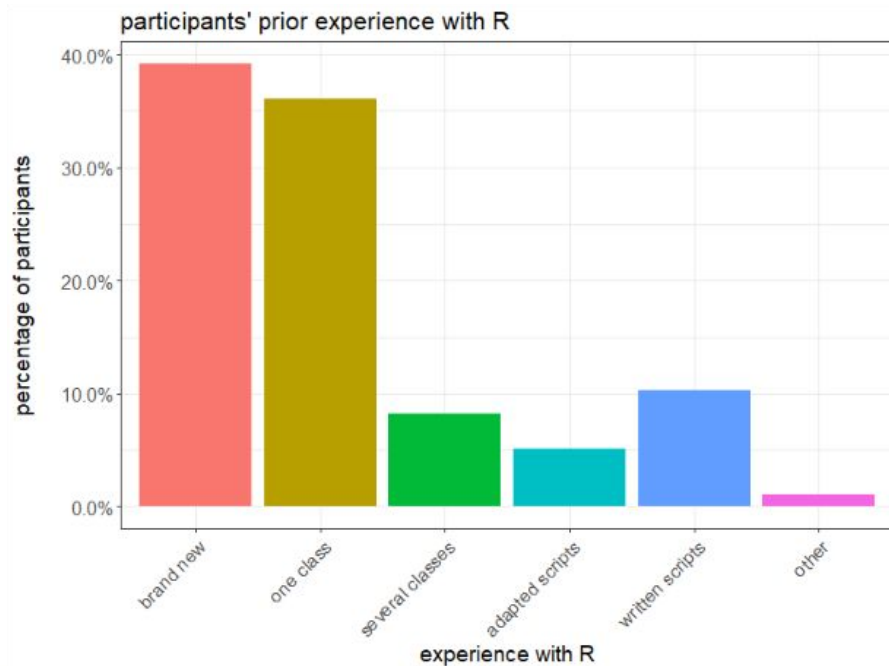
Day 1

Day 100

And it is always a work in progress!
Be patient with yourself!

Some things to keep in mind

- People are coming in with different backgrounds and experiences

- Some things we talk about may be easy for you, and others may be new

- Be open to brushing up on things you already know and supporting your peers while they learn something new!

- We have tried to make this workshop accessible and interesting for people at various different levels

Let's look at some data!

participants' prior experience with R

The idea of programming makes me anxious

Let's look

participants' prior exper...
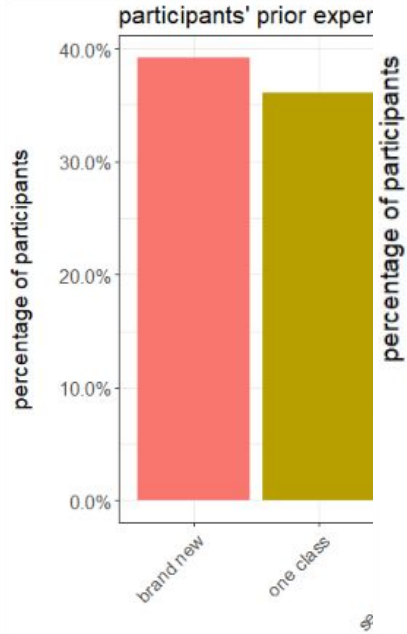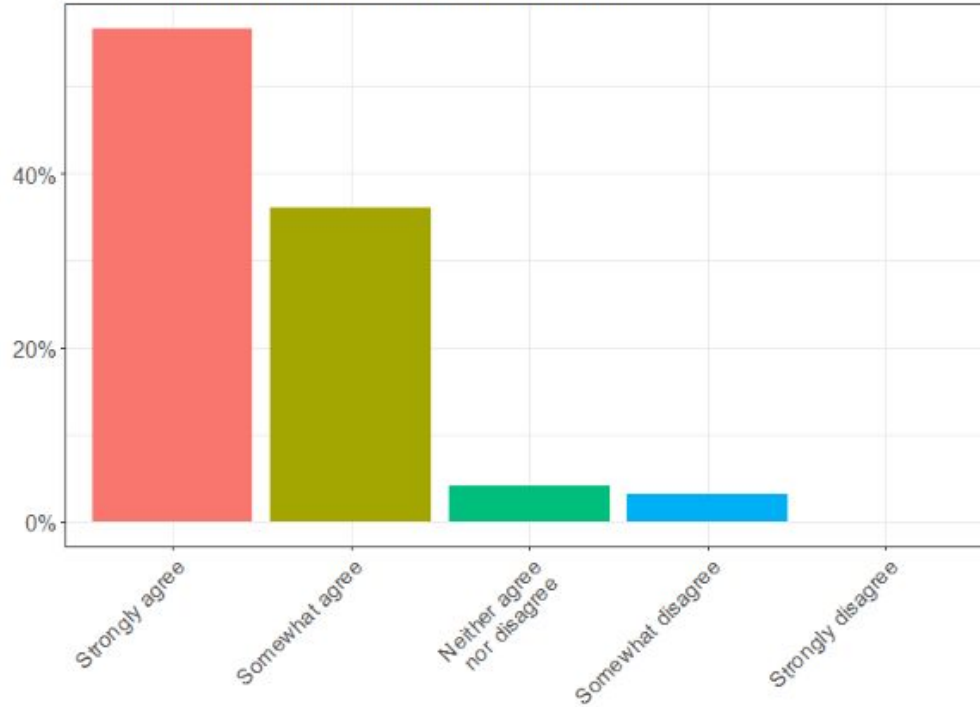
I can learn and master R if I put my mind to it

...me anxious
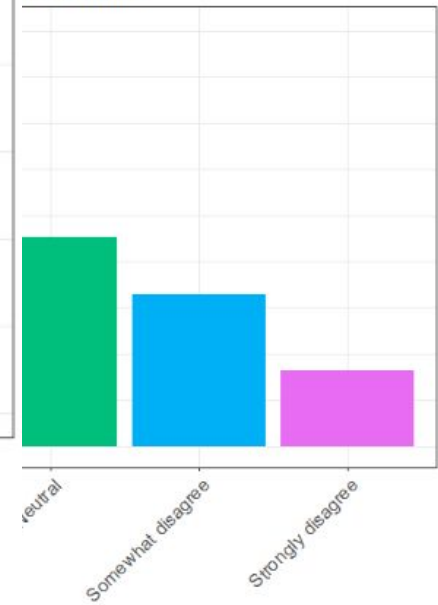
Structure of the bootcamp

Typical session structure

1. Introduction to the skill we're covering
2. Live coding demo
3. Individual practice and work on real data
4. Talk it over with peers
   - Emily, Willa, and Elena will come around to answer questions
5. Discussion

Download the materials you need each week from our course page.

If you have specific questions during (eg. errors), you can ask during class. We can answer questions as we walk around during individual practice as well.

Structure of the bootcamp

Session 1 (7/6)	Session 2 (7/13)	Session 3 (7/20)	Session 4 (7/27)
Intro to R and types of data	Accessing and working with dataframes	Cleaning and organizing data	Data visualization (graphing!)

- We will be working with the same dataset throughout to get a feel for the process of exploring data and getting it ready for analysis.

- Sessions build on each other so make sure to catch up if you have to miss a session.

Let's meet each other! (10 minutes)

Break into group of ~5

Introduce yourselves. Ideas to talk about:

- Your name, where you are from, what your role is, what lab you're in, and what project you are working on.
- Meme that made you laugh recently?
- Favorite summertime activities?
- Any book or TV recommendations?

While you are in your groups, we will be around to see if you need any help with your R and RStudio install.

Berkeley
UNIVERSITY OF CALIFORNIA

Let's dig into some data!

Course page: https://tinyurl.com/rbootcamp2022

The data file can be found under s1_materials on the course page (download and unzip folder)

Data: A survey from July 2020 about attitudes and beliefs around Covid-19. Researchers collected data from > 1000 people in the US to study trust in the news, the science, and the attitudes around COVID-19.

Questions to keep in mind

- *What are some things you notice about these data just by looking at the spreadsheet?*
- *What are some questions we could ask with this data ?*

Berkeley
UNIVERSITY OF CALIFORNIA

Data types

Think about the data we just looked at:
What kind of information do we want to represent?

- Numbers
- Words (also called "strings" or "characters")
- Logical - True/False or 0/1 (also called "booleans")
- *Categorical

That's all that data types are: the different kinds of information we want to be able to work with and handle.

* This type is special to R!

Berkeley
UNIVERSITY OF CALIFORNIA

Let's get started in R!

Extra slides

Integer, Double, and Numeric Types

This data type takes care of storing numbers

Integers: 0, -1, 5

Numeric: 0.5, 4.5, -3.1415

This distinction is not super important in R, but it can be in other programming languages because the computer stores this information slightly differently.

Character or String

This data type takes care of storing letters and words

Character: "C", "e",

String: "hello", "world", "party!", "1"

Note the use of single and double quotation marks! These are important to indicate to the computer that the words are strings!

In R, all the examples above are type character. Some other programming languages distinguish between character and a string of characters, so it is good to know both words.

Boolean or Logical

This data type takes care of storing TRUE/FALSE. It can only have these two values.

We will learn more about why this type is important as we go.

This data type exists in all programming languages. It is foundational to how programming works!

Berkeley
UNIVERSITY OF CALIFORNIA