Zooming Through Data

Unit 1 - Lab 4

Directions: Follow along with the slides and answer the questions in **BOLDED** font in your journal.

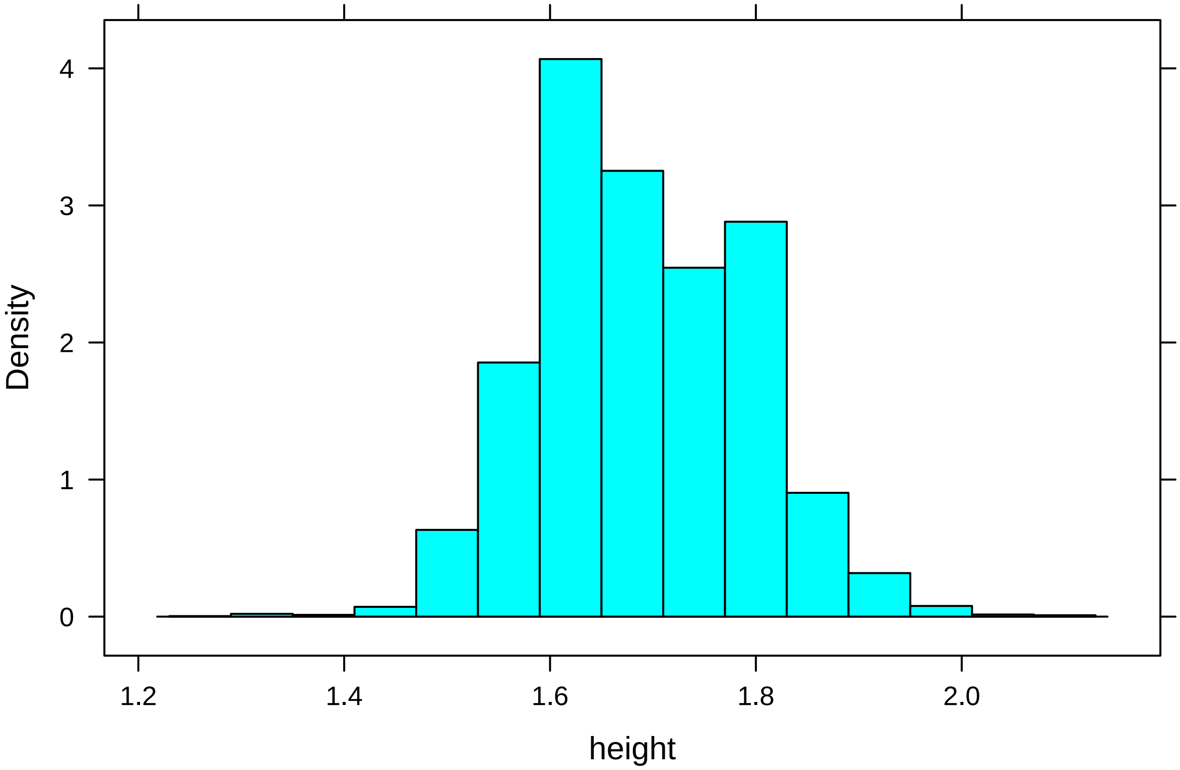
Data with Clarity

- We've looked at graphs of entire variables (All of their values).
- Doing this is helpful to get a **big picture** idea of our data.
- For example, load the CDC data from the previous labs and run this command to look at our survey taker's *heights*.

```
histogram(~height, data = cdc)
```

Let's start with the big picture

- **Interpret this graph. What does it tell you about which variable?**



Subsetting

- To get a better idea of the details of our data, we need to learn how to **subset**
- **Subsetting** is when look at a small portion of the data.

  - We sometimes call **subsetting** *conditioning*.
  - Usually, the smaller portion are all similar in some way.
- There's *many* ways to subset data using RStudio, we'll focus on learning the most common methods.

Subsetting numerical variables

- Start with all of our values for **heights** and make a histogram.

```
histogram(~height, data = cdc)
```

- We can **separate** (often called **facet**) our data based on a categorical variable with the `|` key.

```
histogram(~height | gender, data = cdc)
```

- **Run each line of code. How does the plot change after you *separated* the variables?**
- It would be much easier to compare the heights of males and females if the histograms were stacked on top of one another.
- We can change the **layout** of our separated plots by including the `layout` argument.
- Type the following command into your console.

```
histogram(~height | gender, data = cdc,
          layout = c(1,2))
```

- **How does the heights of males and females differ?**
- **Are the shapes of the height's distributions similar or different?**

Subsetting numerical data

- Another way to subset our data would be to look at the values for just females or just males.
- We can do this with the `subset` argument
- Type the following command into the console

```
histogram(~height, data = cdc,
          subset = (gender == "Male"))
```

- **How would you translate `subset = (gender == "Male")` into everyday English?**

So what's really going on?

Here's a breakdown of what your code is telling `R`.

```
histogram(~height, data = cdc,
          subset = (gender == "Male"))
```

- **histogram**: Make a *histogram* . . .
- **~weight**: using the variable *weight* . . .
- **data = cdc**: from the *cdc* data set . . .

Here's a breakdown of what your code is telling `R`.

```
histogram(~height, data = cdc,
          subset = (gender == "Male"))
```

- **subset = (gender == "Male")**
  - Before making the plot, *subset* the values . . .
  - Using only the rows where the variable *gender* . . .
  - Is 'exactly equal' to (==) . . .
  - The value of *"Male"*
- **How does your translation of `subset = (gender == "Male")` compare to the translation above?**

What is exactly equal ("==")

- When you use a double equal sign, "=="
- You're **asking** R if a *variable* is equal to a *value*
- Type these commands into the console:

```
x <- 5
```

```
x == 5
```

```
x == 6
```

Review

- **Explain how R interprets each step in the following code:**

```
x <- 5
```

```
x == 5
```

```
x == 6
```

Answers

- Assign the value of `5` to the object named `x`

```
x <- 5
```

- Find out if the object `x` is equal to `5`

```
x == 5
```

- Is the object `x` equal to `6`?

```
x == 6
```

Back to subsetting . . .

- Subsetting doesn't only have to occur when plotting.
- Sometimes we'd like to be able to subset all of our data.
  - This lets us *zoom* into the data to get a more detailed view of our data.
- We do this with the `subset()` function.

Subsetting our data

- Suppose we're interested in only looking at the students in our `cdc` data set with asthma.
- We'll create this new data set using the following:

```
cdc_asthma <- subset(cdc, asthma == "Yes")
```

- **What happened in the *environment* pane after running the code?**

Break it down

- **Explain each part of:**

```
cdc_asthma <- subset(cdc, asthma == "Yes")
```

- **`cdc_asthma`:**
- **`<-`:**
- **`subset`:**
- **`cdc`:**
- **`asthma == "Yes"`:**

On your own!

- Using the CDC data:
- **Choose a categorical variable**
  - **Create a subset of your data based on one of the values of your variable**

- **Choose a second categorical variable using your subset data**
  - **Create a bargraph of this second variable**
- **Choose a third categorical variable**
  - **Split the bargraph you created into different bargraphs based on the value of this third variable**