Data Carpentry Day 2 Checklist

- Make sure to grab coffee! You might want it ☺
- Copy down my contact info if you anticipate having R questions--I am happy to offer R consulting/help.
- Make sure you have a copy of the R CHEAT SHEET and DPLYR EXERCISES handouts.
- Please add an R/ folder to your DataCarpentry folder!
- Please make sure you have R AND RStudio installed! If you are unsure if you have them, please ask Alex for help. Also, go ahead and open **RStudio-**-that is what we will use today (not “Basic” R).
- **Go ahead and install the dplyr package for R--ask helpers for help!**
- Note: Today’s morning lessons differ somewhat from those found online.

Data Carpentry

Day 2

Spreadsheets

- Make it a rectangle
- Rows = observations, columns = variables
- One head row; avoid spaces
- One data type per cell
- Fill in all cells
- Consistently code missing values
- Care about date data
- Don’t do calculations in raw data files
- Save as CSV files
- Don’t use font color or highlighting to code data

OpenRefine

- For cleaning and exploration of data
- NOT for editing your raw data!
- Use Facets and filters to explore
- Split columns
- Remove training/ending text
- Find outliers
- All actions are reproducible

SQL

- SELECT (choose columns)
- FROM (data sheet(s))
- WHERE (subset specific observations)
- AND/OR/IN (used in setting criteria)
- ORDER BY (sort data)
- GROUP BY (lump data into groups)
- COUNT & SUM (summarization)
- JOIN ON (combining data)

dplyr

R function	SQL Keyword
• select	SELECT
• filter	WHERE
• mutate	(weight/1000)
• group_by	GROUP BY
• summarize	COUNT, AVG, SUM
• arrange	ORDER BY

“File organization and naming are powerful weapons against chaos.”

-Jenny Bryan

“Your closest collaborator is you from six months ago, but you don’t reply to emails.”

-(Paraphrasing) Mark Holder

Have sympathy for your future self--be an organized analyst!

Organizing projects

- All files in common folder (directory)
- Separate raw data from “clean” data
- Separate code (and output) from data
- Use file names that are meaningful, sortable, & consistent
- Code dates: 2018-01-08
  - raw_data/
  - clean_data/
  - SQL/
  - R/

Today: R!

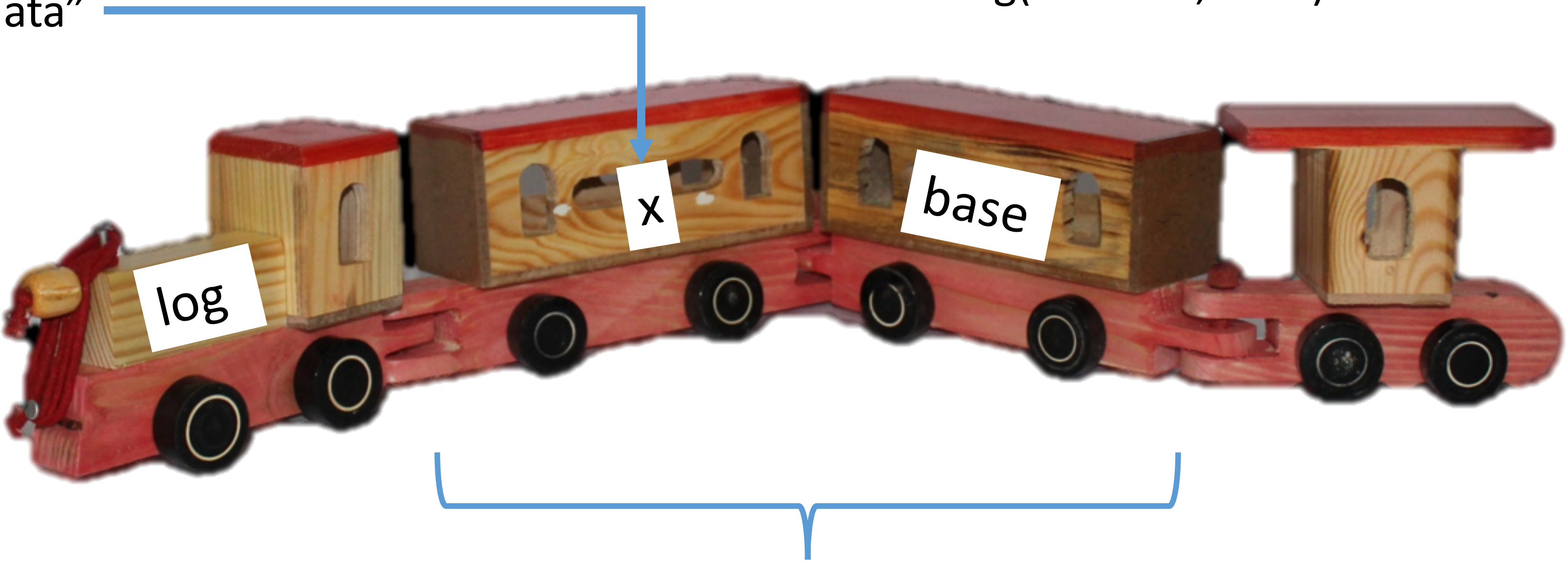
- Full programming language
- Focused on programming and data
- Super for data analysis and visualization
- Great community of supporters
- R Archive has >9000 add-on packages
- RStudio: “Integrated Development Environment” (IDE) for R

R Functions and inputs

log(x, base)

log(3, 5) = 0.683
log(5, 3) = 1.465

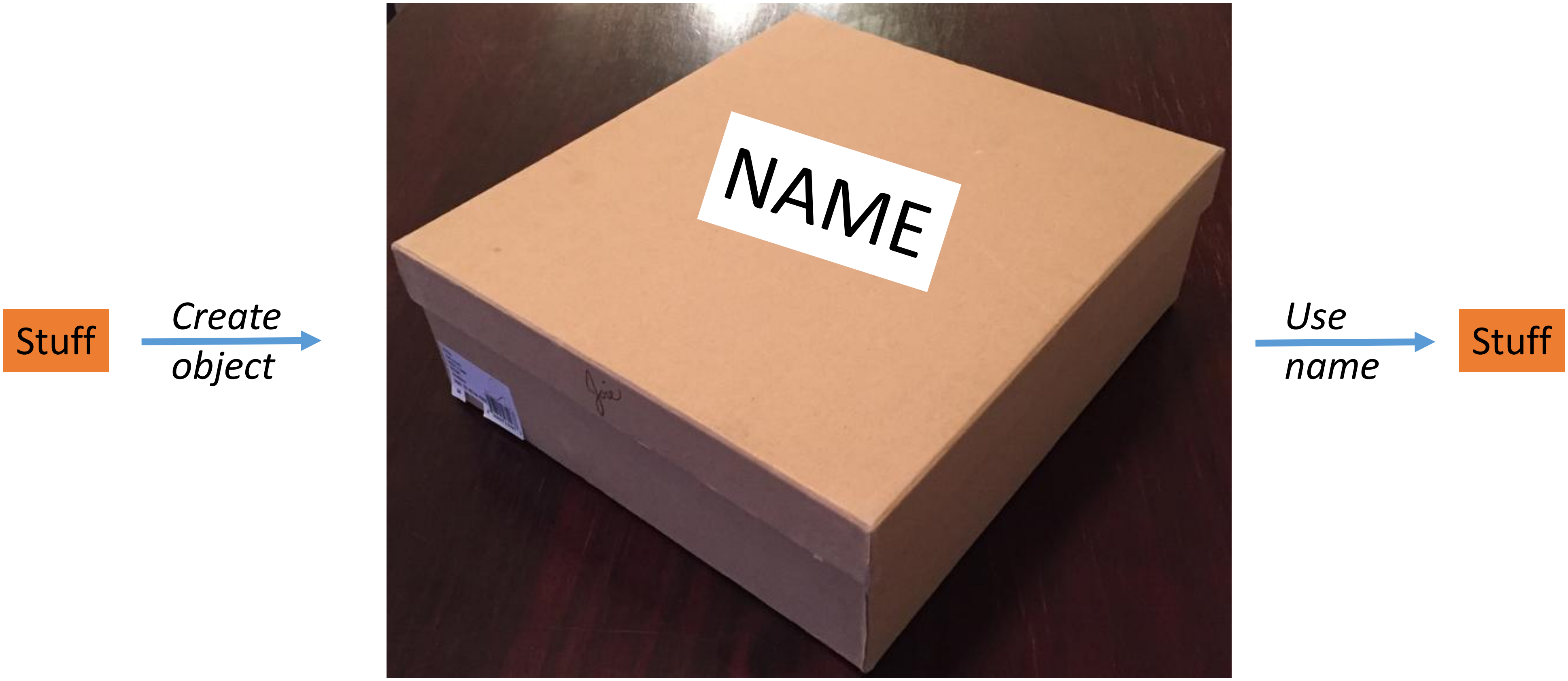
log(3, 5) = 0.683
log(base = 5, x = 3) = 0.683



x often = “data”

Arguments

R Objects



Stuff

Create object

Use name

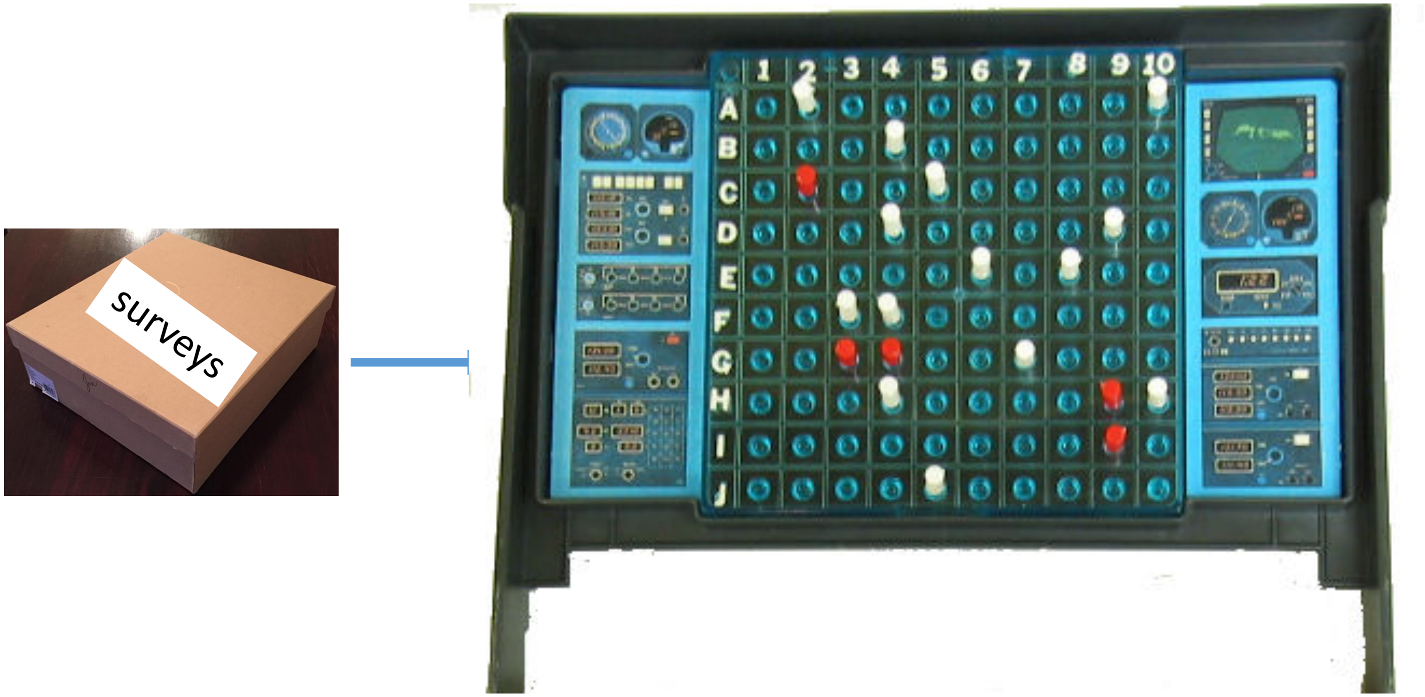
Stuff

Challenge

What would *y* equal after these three lines of code were executed (try to answer without running them first!)? Why? How would you make it equal something else?

```
x <- 50
y <- x * 2
x <- 75
```

Indexing



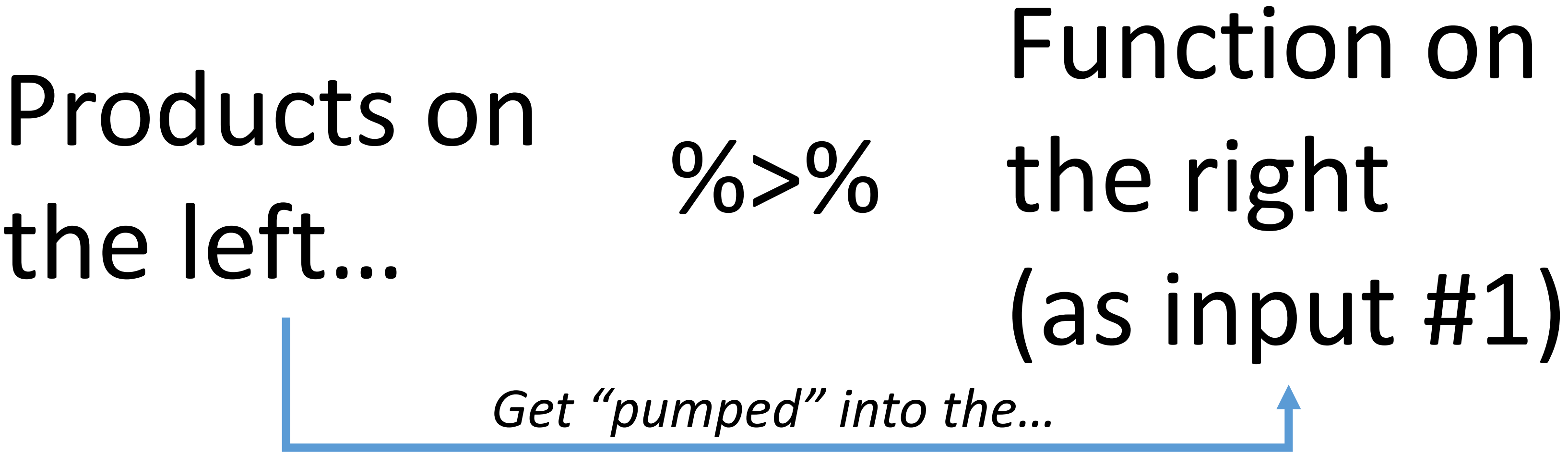
Challenge

Use the *nrow*() function + indexing to save just the last row of *surveys* into a new object called *surveys_last*

Challenge

Work with your table mates to return the values in the first 4 rows of surveys but only from the 3rd, 5th, and 8th columns. (Hint: Use c() for that second part!).

Pipe Operator: %>%



Products on the left…

%>%

Function on the right (as input #1)

Get "pumped" into the…

You can string multiple operations together!