R Learners

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Intro

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- Brain Modulation Lab
- https://github.com/feyderm/Pitt_R_lectures

Base R vs. Tidyverse

- Base R
    - The R language - does not depend on any packages (i.e. external code)
- Ex.
    - `df$variable`
    - `df[c(1:4), ]`

Base R vs. Tidyverse

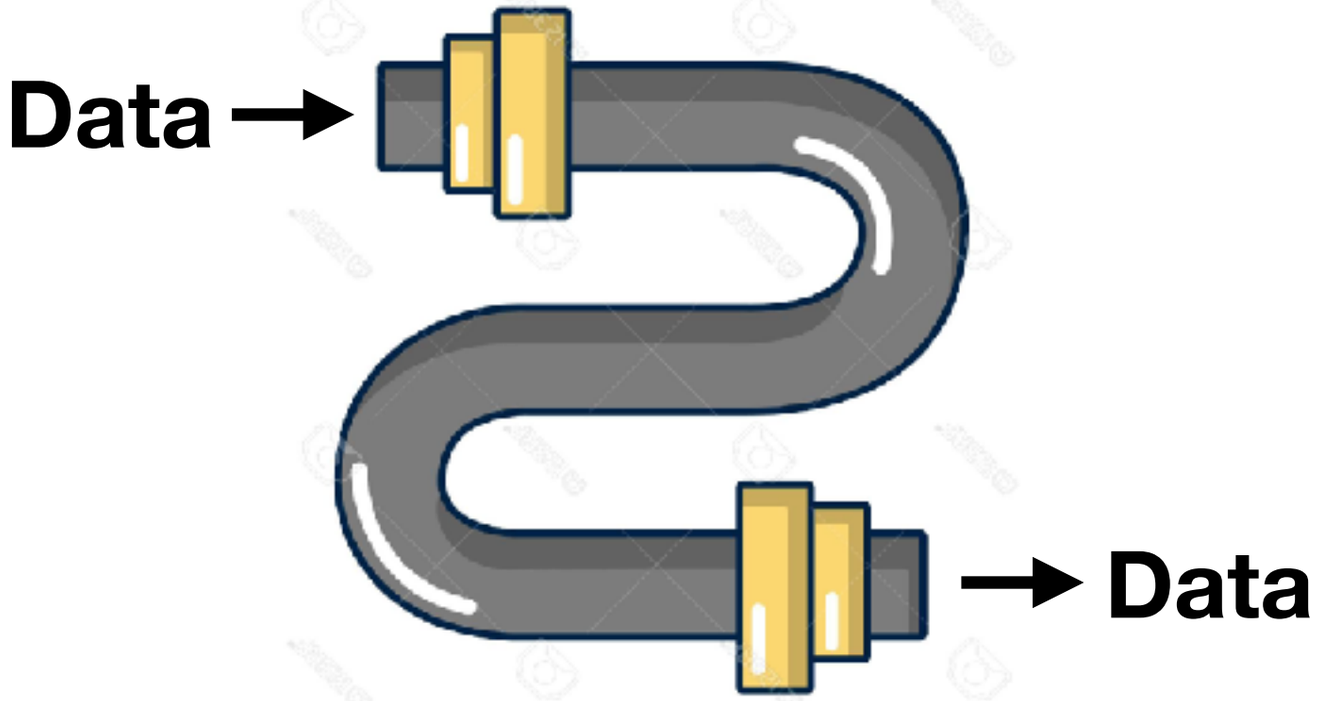
- “[An] opinionated collection of R packages designed for data science. All packages share an underlying design philosophy, grammar, and data structures.”

http://r4ds.had.co.nz/

Base R vs. Tidyverse

- Selecting a column
  - **Base R**: `df$variable`
  - **Tidyverse**: `df %>% select(variable)`

Piping



Piping

```
df %>%
  filter(var_1 < 10) %>%
  select(var_2, var_3)
```

Dplyr

- “a grammar of data manipulation”

https://www.rstudio.com/wp-content/uploads/2015/02/data-wrangling-cheatsheet.pdf

Summarizing Data

```
experiment %>%
  summarize(mean_RT = mean(RT))
```

Summarizing Data

```
experiment %>%
  group_by(SerialPosition) %>%
  summarize(mean_RT = mean(RT))
```

Summarizing Data

```
experiment %>%
  group_by(SerialPosition, Condition) %>%
  summarize(mean_RT = mean(RT))
```

Summarizing Data

```
experiment %>%
  group_by(SerialPosition) %>%
  summarize(
    n = n(),
    min_RT = min(RT),
    max_RT = max(RT),
    mean_RT = mean(RT),
    median_RT = median(RT),
    mode_RT = mode(RT),
    sd_RT = sd(RT),
    var_RT = var(RT),
    has_NA = any(is.na(RT))
  )
```

Useful Things

```
experiment <- experiment %>%
  rename(item_name = ItemName)
```

Useful Things

```
experiment %>% arrange(RT)
```

ggplot2

- data visualization package

https://www.rstudio.com/wp-content/uploads/2015/03/ggplot2-cheatsheet.pdf

ggplot2

- based on *The Grammar of Graphics*

Histogram

```
ggplot(data = experiment, mapping = aes(x = RT)) +
  geom_histogram()
```

Scatterplot

```
ggplot(data = experiment, mapping = aes(x = Age, y = RT)) +
  geom_point()
```

Bar Chart

```
experiment %>%
  group_by(Age) %>%
  mutate(mean_RT = mean(RT)) %>%
  ggplot(mapping = aes(x = Age, y = mean_RT)) +
  geom_col()
```

geoms

```
ggplot(data = experiment, mapping = aes(Age, RT)) +
  geom_point()
```

```
ggplot(data = experiment, mapping = aes(Age, RT)) +
  geom_boxplot()
```

```
ggplot(data = experiment, mapping = aes(Age, RT)) +
  geom_violin()
```

Facets

```
ggplot(data = experiment, mapping = aes(Age, RT)) +
  geom_point() +
  facet_wrap(~TestingRoom)
```