Capital Punishment in the U.S.
STT2860 Project 02 Fall 2022

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Contents

Packages Used

```
library(tidyverse)
library(readr)
```

Read Data Files

```
death_row_size <- readRDS("deathrowsize.rds")
death_sentences_NC <- readRDS("deathsentencesNC.rds")
cap_punish <- readRDS("cappunish.rds")
```

Plot #1: How Many States Have Capital Punishment?

- Create a barplot for the variable `dp2`.
- Use `color =` and `fill =` to format the bars.
- Use `labs()` to add a title and better axis labels.
- Apply a built-in theme from **ggplot2** or **ggthemes**.
- You may optionally add a subtitle or caption to the plot.
- This plot should *not* have a visible legend anywhere on it.

```
cap_punish %>%
ggplot(aes(x = dp2)) +
  geom_bar(aes(fill = dp2), color = "black") +
  labs(title = "State Decisions on Capital Punishment",
       x = "Decision",
       y = "Number of States") +
  theme(plot.title = element_text(hjust = 0.5, size = 18),
        legend.position = "none")
```
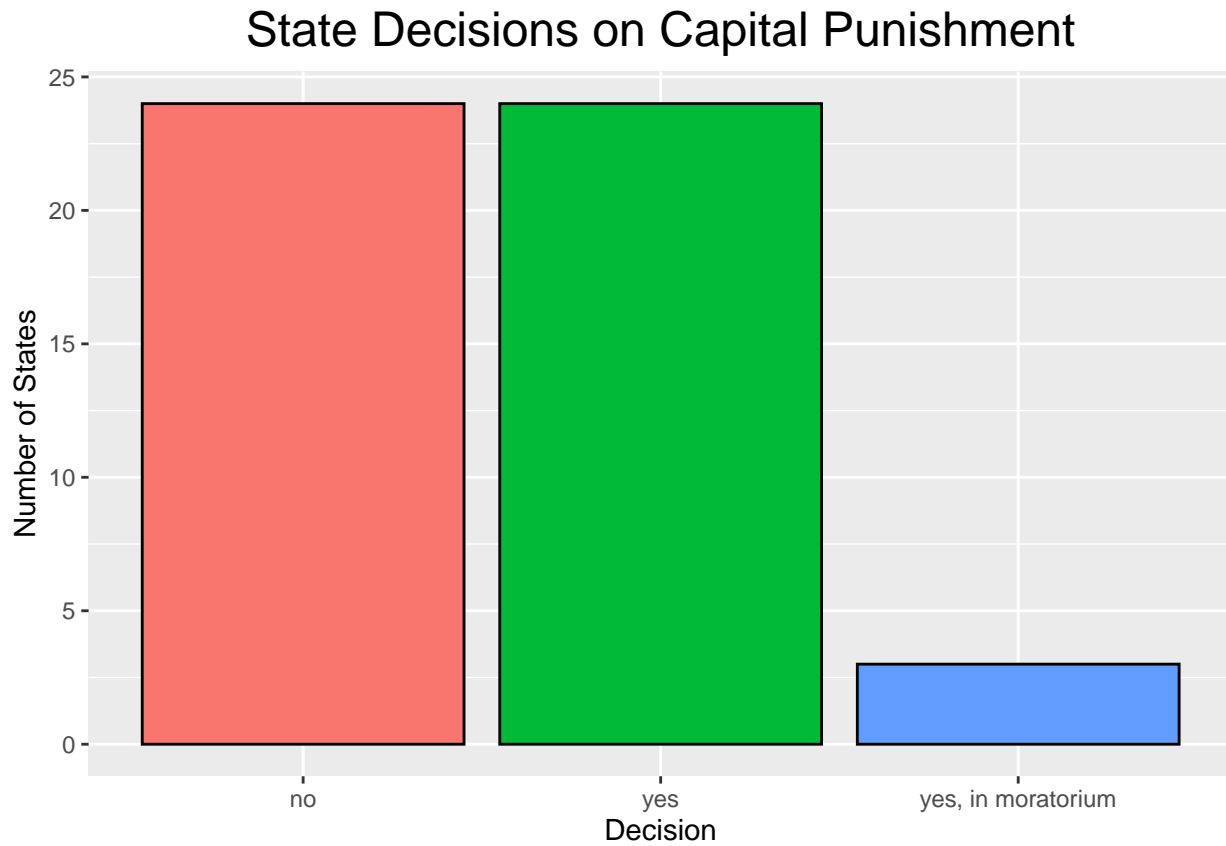

Plot #2: Capital Punishment By Region of the U.S.

- Create a barplot for the variable `region`.
- Use `fill =` to shade each bar according to `dp2`.
- Change the `position =` to set each bar equal to 100%.
- Use `width =` to make the bars narrower than the default.
- Use `labs()` to add a title, axis labels, and a better legend label.
- Use `scale_fill_manual()` to choose a different color scheme for the plot.
- Use `theme()` to move the legend to the bottom of the plot instead of the right
- You may optionally add a subtitle, caption, or ggplot2 built-in theme to the plot.

```
colors <- c("#66c2a5","#fc8d62","#8da0cb")
cap_punish %>%
ggplot(aes(x = region)) +
  geom_bar(aes(fill = dp2), position = "fill", width = 0.65) +
  scale_fill_manual(values = colors) +
  scale_fill_discrete("Has Death Penalty") +
```

```
labs(title = "Death Penalty by Major US Region",
     x = "US Region",
     y = "Ratio of States") +
theme(legend.position = "bottom",
      plot.title = element_text(hjust = 0.5, size = 18))
```

Death Penalty by Major US Region
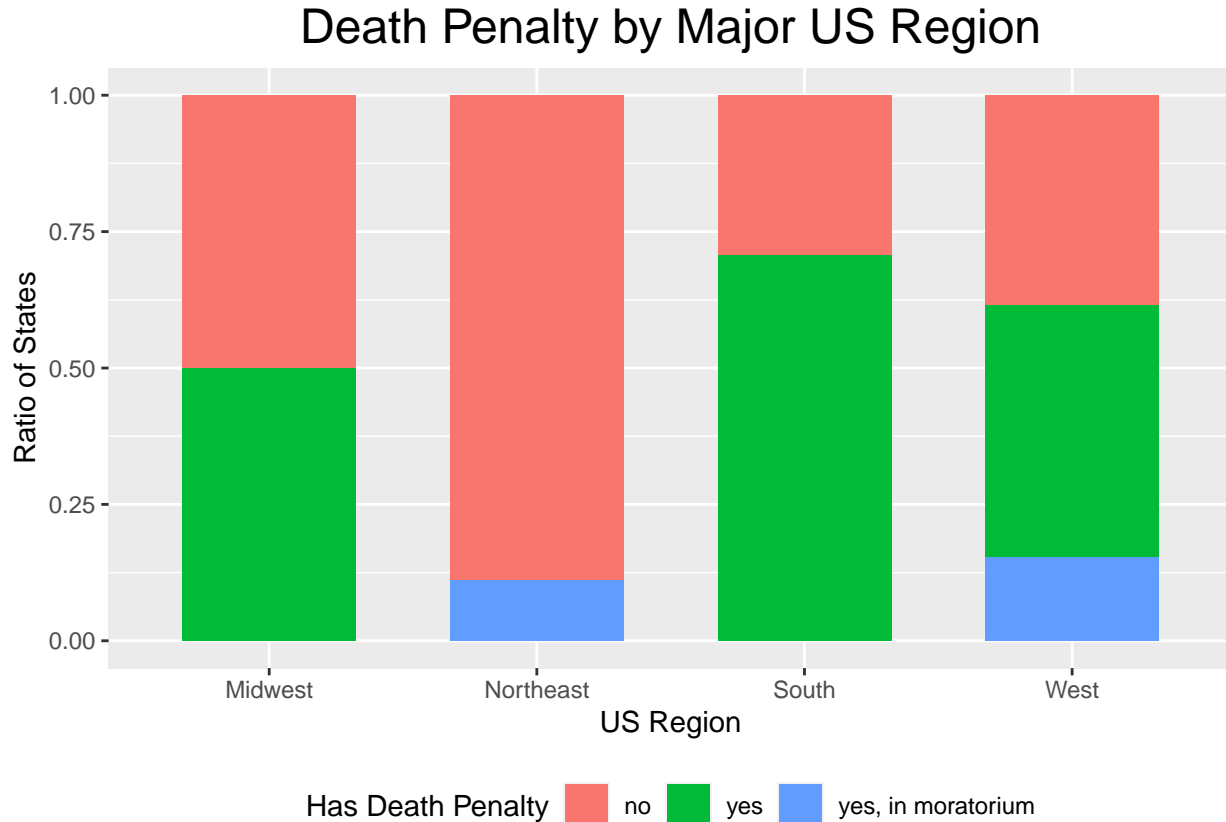
Plot #3: Number of Prisoners on Death Row

- Create a barplot for the total number of prisoners (y) in each year (x).
- Fill the bars using the variable `decade` and outline them all in black.
- Set the width of all the bars so there is no visible gap in between them.
- Scale the x-axis to include a tick mark at each decade (1970, 1980, etc).
- Scale the y axis so that it is numbered 0, 500, 1000, 1500, 2000, etc.
- Use `labs()` to add or change the title, axis labels, and legend label.
- Use `theme()` to do the following:
    - center your title
    - set the plot background to white or blank
    - set all axis tick marks to transparent or blank
    - set the major x-axis gridlines to transparent or blank
    - set the major y-axis gridlines to light gray
- You may optionally change the bar color scheme used in your plot

```
death_row_size %>%
ggplot(aes(x = year, y = total)) +
  geom_col(aes(fill = decade), color = "black", width = 1) +
  scale_x_continuous(breaks = seq(1970, 2020, 10)) +
```

```
scale_y_continuous(breaks = seq(0, 4000, by = 500)) +
labs(title = "Number of Prisoners on Death Row", x = "Year", y = "Number of Prisoners") +
scale_fill_discrete(name = "Decade") +
theme(axis.ticks = element_blank(),
      panel.background = element_blank(),
      panel.grid.major.y = element_line(color = "grey"),
      panel.grid.major.x = element_blank(),
      plot.title = element_text(hjust = 0.5, size = 18))
```
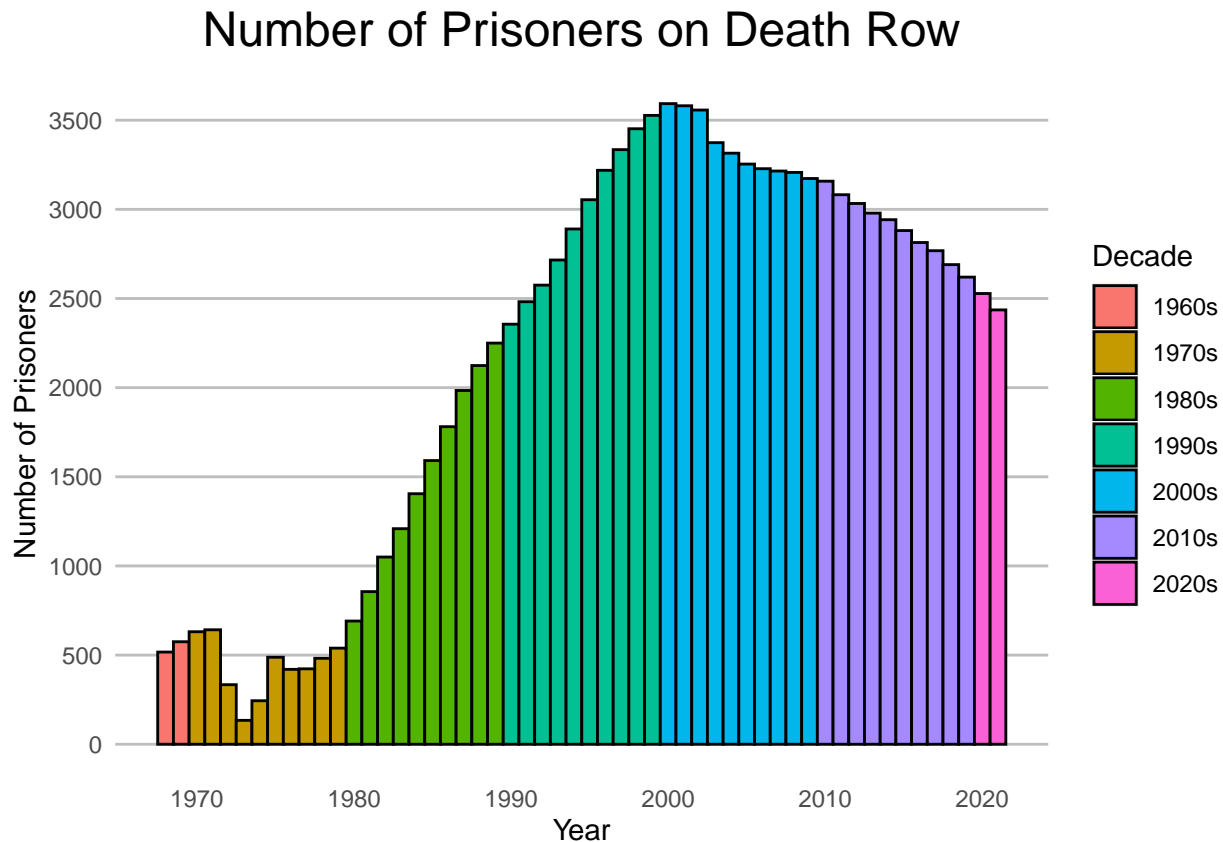

## Plot #4: Number of Executions Since 1976

- Create a violin plot for the variable `post1976` (use `y = 0`)
- Add a boxplot and set the width so it fits inside the violin plot
- Fill each plot with a color of your choice (be colorblind-aware)
- Scale the x-axis of the plot so that it counts in increments of 25
- Get rid of all y-axis markings/gridlines using `scale_y_continuous()`
- Add a title, x-axis label, and a caption to identify the large outlier
- Add the built-in theme `theme_linedraw()` or `theme_minimal` to the plot

Hint: You can use the `NULL` vector in functions like `scale_y_continuous()`

```
cap_punish %>%
ggplot(aes(x = post1976, y = 0)) +
  geom_violin(fill = "darkorchid3") +
  geom_boxplot(fill = "aquamarine1", width = .1) +
  scale_x_continuous(breaks = seq(0, 600, by = 25)) +
  scale_y_continuous(breaks = NULL) +
```

```
  labs(title = "Number of Executions Since 1976",
       x = "Number of Executions",
       caption = "The outlier is Texas") +
  theme_linedraw()
```

Number of Executions Since 1976
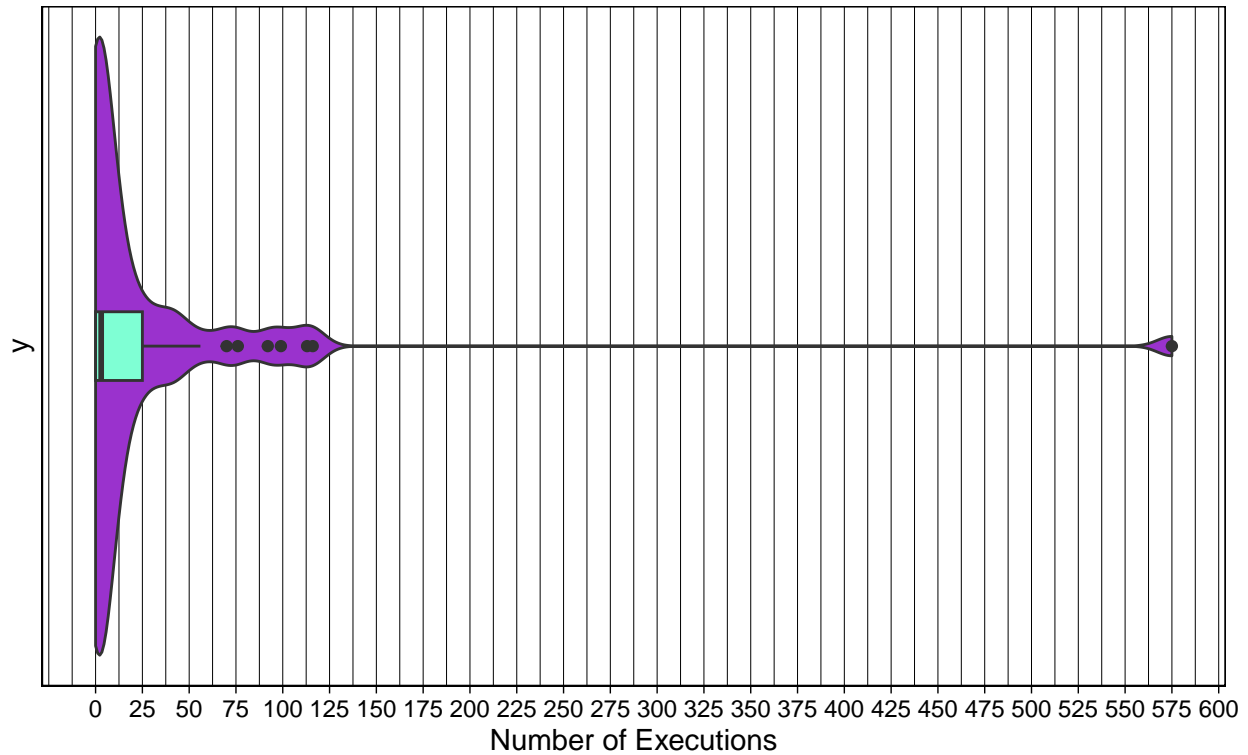
The outlier is Texas

Plot #5: Death Sentences in NC Since 1976

Create a time series plot of death sentences in North Carolina. Use three geometries on this plot: `geom_area()`, `geom_line()` and `geom_point()`. Use `geom_vline()` to add a vertical line for 2001. The significance of this year is that the General Assembly modified the death penalty statute in several ways, including giving prosecutors the discretion to *not* seek the death penalty in cases where it previously would have been mandatory. Format and label your plot in such a way that the information it conveys would be clear to the reader (i.e., the plot is reasonably stand-alone).

```
death_sentences_NC %>%
ggplot(aes(x = year, y = sentences)) +
  geom_line() +
  geom_area(fill = "darkslategray") +
  geom_point() +
  geom_vline(xintercept = 2001, linetype = "dashed") +
  labs(x = "Year", y = "Number of Sentences") +
    theme_minimal()
```
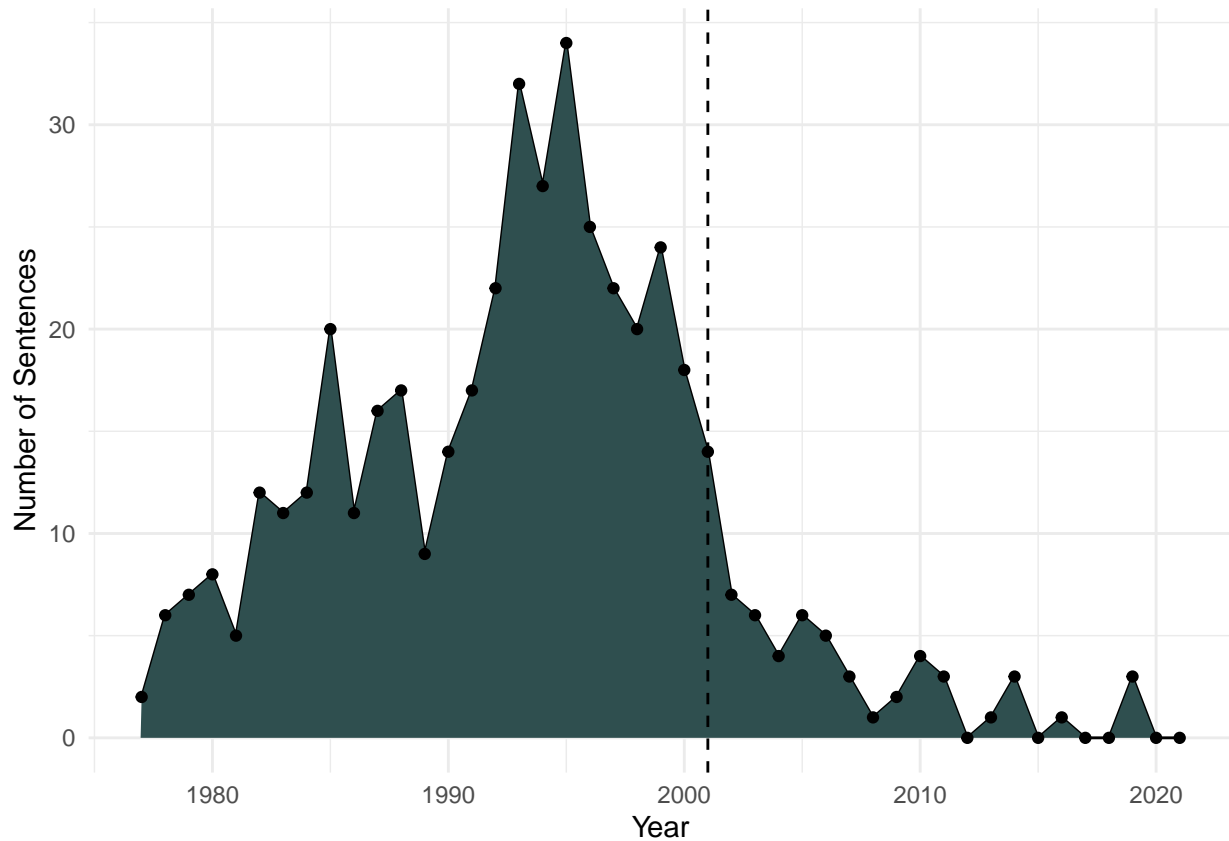
Information Conveyed by Your Plots

List two pieces of information you can learn or comparisons you can make from each plot above.

Plot #1

- Item 1: States seem split almost precisely down the middle when it comes to the death penalty.
- Item 2: There is a small subset of yes states (approximately 3) who have put a temporary suspension on executions (moratorium).

Plot #2

- Item 1: The Northeast is the only US region with no outright/active yes votes. It is predominately no, with what I guess are one or two states with a temporary stay on executions. My guess is New Hampshire or Maine.
- Item 2: Both The south and midwest are purely yes or no votes. No states with a moratorium. (the South also has far and away the most "yes" states).

Plot #3

- Item 1: The number of prisoners on death row rises almost exponentially from the mid 1970's early 80's all the way until 2000/2001.
- Item 2: Then a sharp yoy decline after 9/11, then a somewhat more gradual decline that brings us to today.

Plot #4

- Item 1:Texas is far and away the obvious outlier with 575 executions since 1976.
- Item 2: The majority cluster of executions post 76 per state is in the range of 0 - 10. There are 6 other notable states in the 75-125 range aswell.

Plot #5

- Item 1: In the year 2020 there were no new death sentences issued in North Carolina.
- Item 2: 1995 was the year with the most new Death Sentences, appx 34.

```
sessionInfo()
```

```
R version 3.6.0 (2019-04-26)
Platform: x86_64-redhat-linux-gnu (64-bit)
Running under: Red Hat Enterprise Linux

Matrix products: default
BLAS/LAPACK: /usr/lib64/R/lib/libRblas.so

locale:
 [1] LC_CTYPE=en_US.UTF-8       LC_NUMERIC=C
 [3] LC_TIME=en_US.UTF-8        LC_COLLATE=en_US.UTF-8
 [5] LC_MONETARY=en_US.UTF-8    LC_MESSAGES=en_US.UTF-8
 [7] LC_PAPER=en_US.UTF-8       LC_NAME=C
 [9] LC_ADDRESS=C               LC_TELEPHONE=C
[11] LC_MEASUREMENT=en_US.UTF-8 LC_IDENTIFICATION=C

attached base packages:
[1] stats     graphics  grDevices utils     datasets  methods   base

other attached packages:
[1] forcats_0.5.2   stringr_1.5.0   dplyr_1.0.10    purrr_0.3.5
[5] readr_2.1.3     tidyr_1.2.1     tibble_3.1.8    ggplot2_3.4.0
[9] tidyverse_1.3.2

loaded via a namespace (and not attached):
 [1] tidyselect_1.2.0   xfun_0.35          haven_2.5.1
 [4] gargle_1.2.1       colorspace_2.0-3   vctrs_0.5.1
 [7] generics_0.1.3     htmltools_0.5.4    yaml_2.3.6
[10] utf8_1.2.2         rlang_1.0.6        pillar_1.8.1
[13] withr_2.5.0        glue_1.6.2         DBI_1.1.3
[16] dbplyr_2.2.1       modelr_0.1.10      readxl_1.4.1
[19] lifecycle_1.0.3    munsell_0.5.0      gtable_0.3.1
[22] cellranger_1.1.0   rvest_1.0.3        evaluate_0.18
[25] labeling_0.4.2     knitr_1.41         tzdb_0.3.0
[28] fastmap_1.1.0      fansi_1.0.3        highr_0.9
[31] broom_1.0.1        scales_1.2.1       backports_1.4.1
[34] googlesheets4_1.0.1 jsonlite_1.8.4    farver_2.1.1
[37] fs_1.5.2           hms_1.1.2          digest_0.6.31
[40] stringi_1.7.8      grid_3.6.0         cli_3.4.1
[43] tools_3.6.0        magrittr_2.0.3     crayon_1.5.2
[46] pkgconfig_2.0.3    ellipsis_0.3.2     xml2_1.3.3
[49] reprex_2.0.2       googledrive_2.0.0  lubridate_1.9.0
[52] timechange_0.1.1   assertthat_0.2.1   rmarkdown_2.18
```

```
[55] httr_1.4.4          rstudioapi_0.14     R6_2.5.1
[58] compiler_3.6.0
```