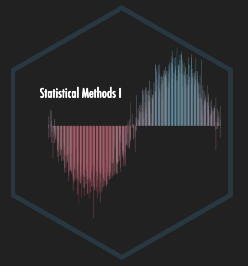
The Normal Curve

EDP 613

Week 5

Prepping a New R Script



1. Open up a blank R script using the menu path **File > New File > R Script**.
2. Save this script as `whatever.R` (replacing the term `whatever`) in your R folder. Remember to note where the file is!
3. After you have saved this file as `whatever.R`, go to the menu and this week try running the following alternative to **Session > Set Working Directory > To Source File Location** at the top of your script

```
setwd(dirname(rstudioapi::getActiveDocumentContext()$path))
```

Getting ready for this session

Get the files

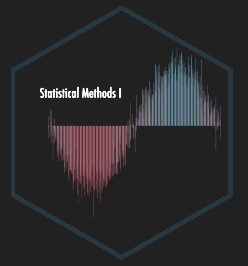
> - `Box Office.csv`
> - `teampolview.csv`

and save it in the same location as this script.

> - Install the packages `viridis` and `patchwork`.
> - Load up `tidyverse` and `viridis`

This week try using `pacman` to do it

```
pacman::p_load(tidyverse,
               patchwork,
               viridis)
```

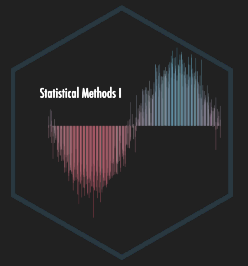


Last week's R activity

Load up data


```
boxoffice <- read_csv("Box Office.csv")
```

Before we go on



Thes solutions are just one of **many** ways to get to the actual answer. Your work may and will likely vary.

```
boxoffice %>%
  arrange(Rank) %>%
  head(5) %>%
  summarize(mean_pos =
              mean(AllPos,
                   na.rm = TRUE)) %>%
  pull()
```

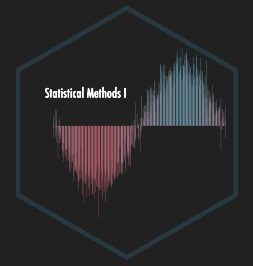
```
[1] 205.2
```

```
boxoffice %>%
  arrange(Rank) %>%
  tail(5) %>%
  summarize(mean_neg =
              mean(AllNeg,
                   na.rm = TRUE)) %>%
  pull()
```

```
[1] 33.2
```

```
boxoffice %>%
  group_by(year) %>%
  count(name = "number of movies") %>%
  ungroup()
```

```
# A tibble: 55 × 2
    year `number of movies`
   <dbl>              <int>
 1  1937                  1
 2  1939                  1
 3  1940                  2
 4  1942                  1
 5  1950                  1
 6  1953                  1
 7  1955                  1
 8  1956                  1
 9  1961                  1
10  1964                  1
# … with 45 more rows
```

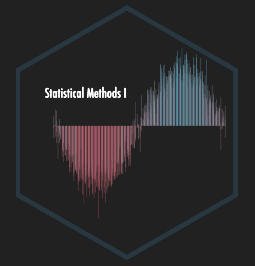


Save as a variable


```
boxoffice_annualnum <-
  boxoffice %>%
  group_by(year) %>%
  count(name = "number of movies") %>%
  ungroup()
```

```r
boxoffice_annualnum %>%
  summarize(median =
              median(`number of movies`,
                     na.rm = TRUE)) %>%
  pull()
```

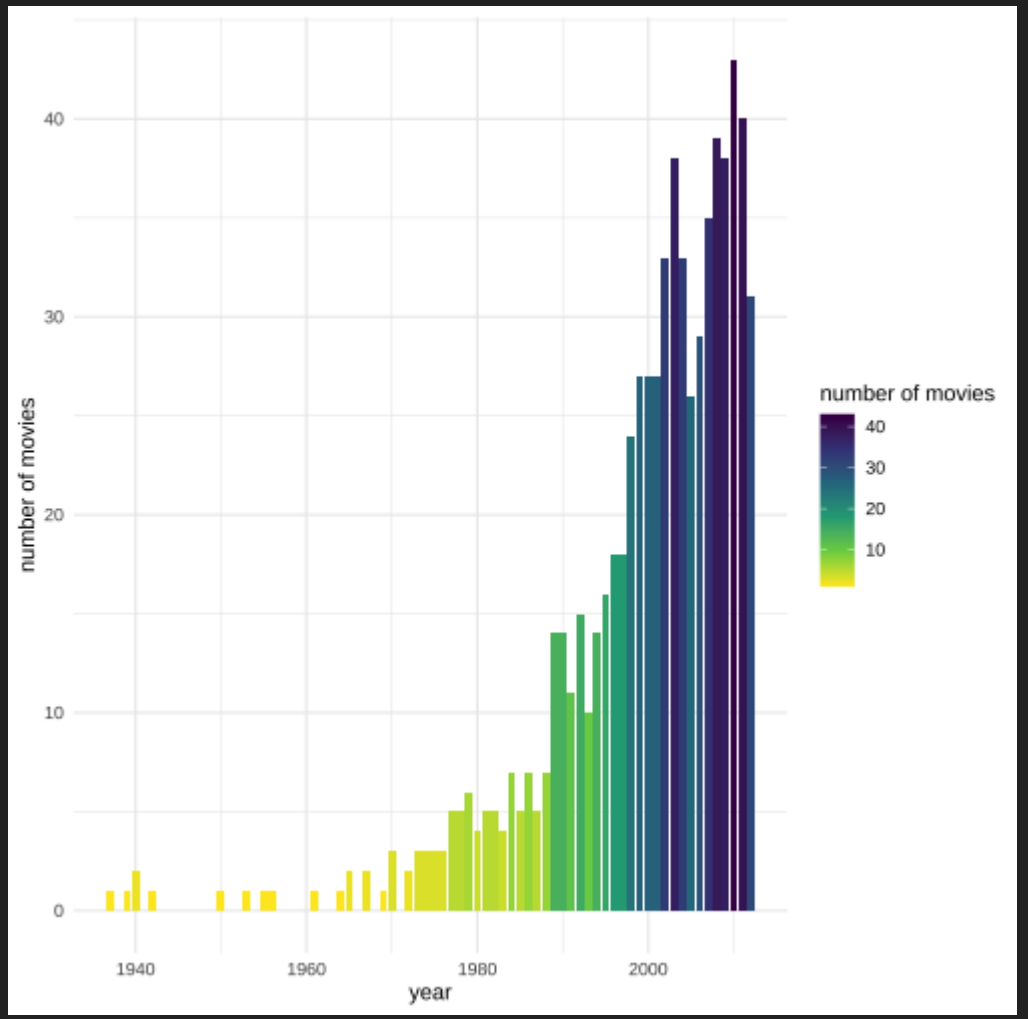
```
[1] 6
```

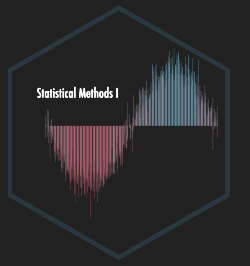


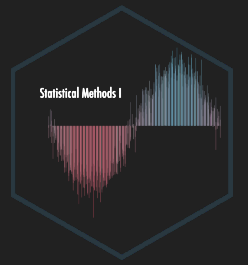
```r
boxoffice_annualnum %>%
  summarize(mean =
              mean(`number of movies`,
                   na.rm = TRUE)) %>%
  pull()
```

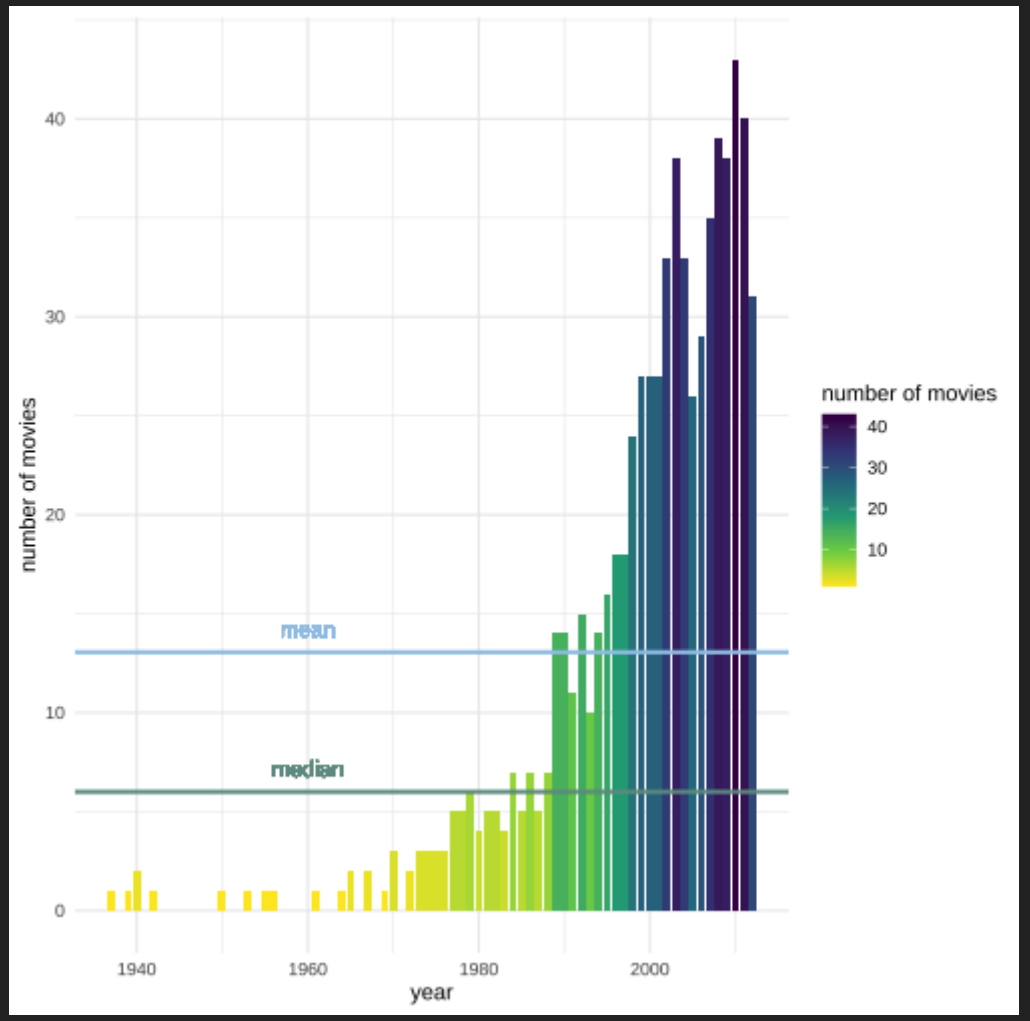
```
[1] 13.05455
```

```r
ggplot(boxoffice_annualnum,
       aes(year,
           `number of movies`,
           fill = `number of movies`)) +
  geom_bar(stat = "identity") +
  theme_minimal() +
  scale_fill_viridis_c(direction = -1)
```



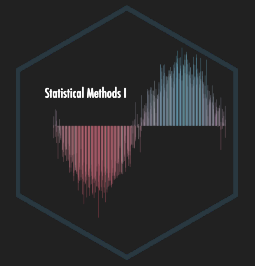



Statistical Methods I


number of movies
40
30
20
10
0
mean
median
1940
1960
1980
2000
year
number of movies
40
30
20
10

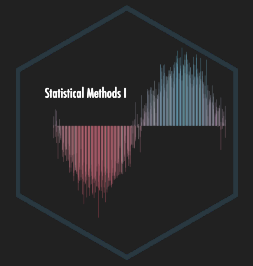
```
boxoffice %>%
  group_by(year) %>%
  tally() %>%
  rename(`number of movies` = n) %>%
  ungroup() %>%
  filter(`number of movies` ==
           max(`number of movies`))
```

```
# A tibble: 1 × 2
   year `number of movies`
  <dbl>              <int>
1  2010                 43
```



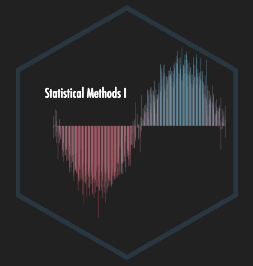
```
boxoffice %>%
  group_by(year) %>%
  summarise(`number of movies` = n()) %>%
  ungroup() %>%
  filter(`number of movies` ==
           max(`number of movies`))
```

```
# A tibble: 1 × 2
   year `number of movies`
  <dbl>              <int>
1  2010                 43
```



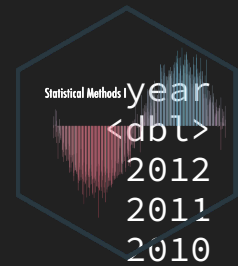
```r
boxoffice %>%
  group_by(year) %>%
  mutate(`number of movies` = n()) %>%
  ungroup() %>%
  distinct(year, .keep_all=TRUE) %>%
  filter(`number of movies` ==
           max(`number of movies`)) %>%
  select(year, `number of movies`)
```

```
# A tibble: 1 × 2
   year `number of movies`
  <dbl>              <int>
1  2010                 43
```



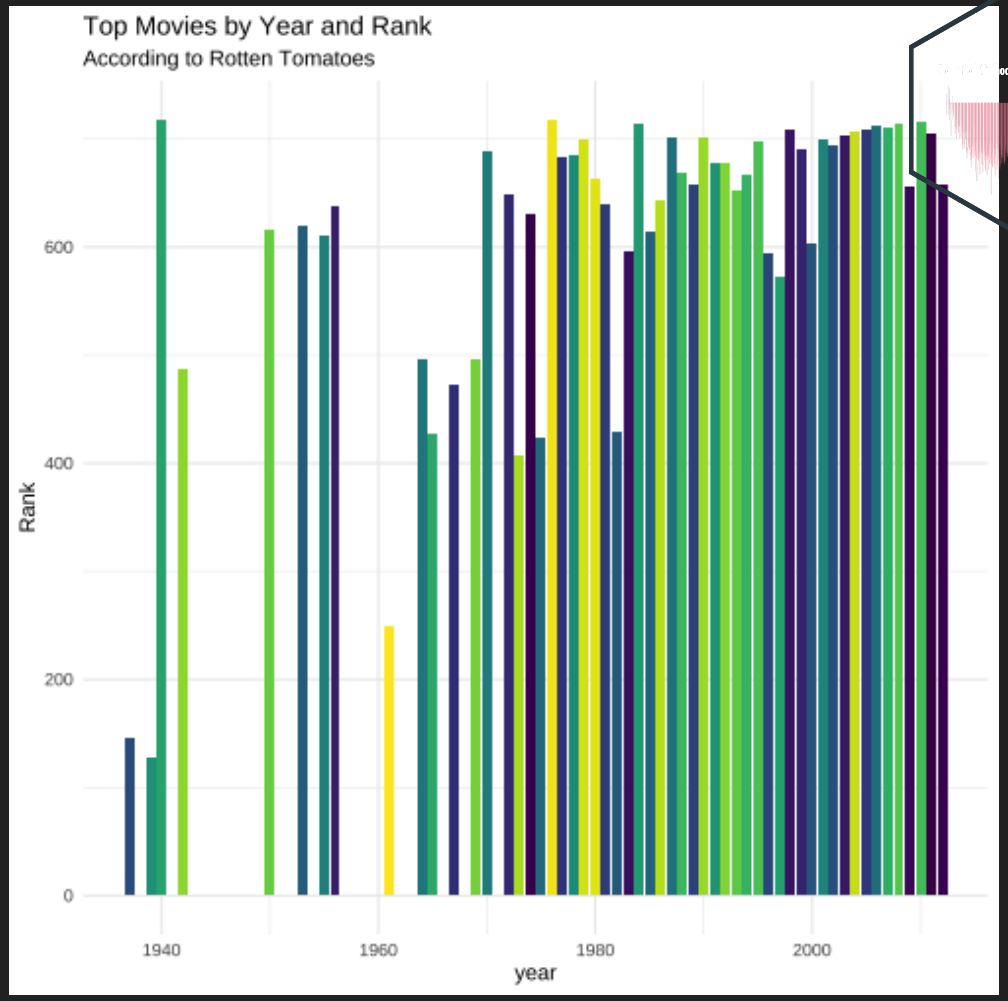
```
boxoffice %>%
  group_by(year) %>%
  filter(Rank == max(Rank)) %>%
  select(Rank, Movie, year) %>%
  arrange(-year) %>%
  ungroup()
```

```
# A tibble: 55 × 3
    Rank Movie                                                year
   <dbl> <chr>                                               <dbl>
 1   658 Wrath of the Titans (Warner Bros.)                   2012
 2   705 Zookeeper (Sony / Columbia)                          2011
 3   716 Dear John (Sony / Screen Gems)                       2010
 4   656 Up in the Air (Paramount)                            2009
 5   714 Cloverfield (Paramount)                              2008
 6   711 Disturbia (Paramount / DreamWorks)                   2007
 7   712 Nacho Libre (Paramount)                              2006
 8   708 The Dukes of Hazzard (Warner Bros.)                  2005
 9   706 Alien Vs. Predator (Fox)                             2004
10   704 The Texas Chainsaw Massacre (2003) (New Line)        2003
# … with 45 more rows
```

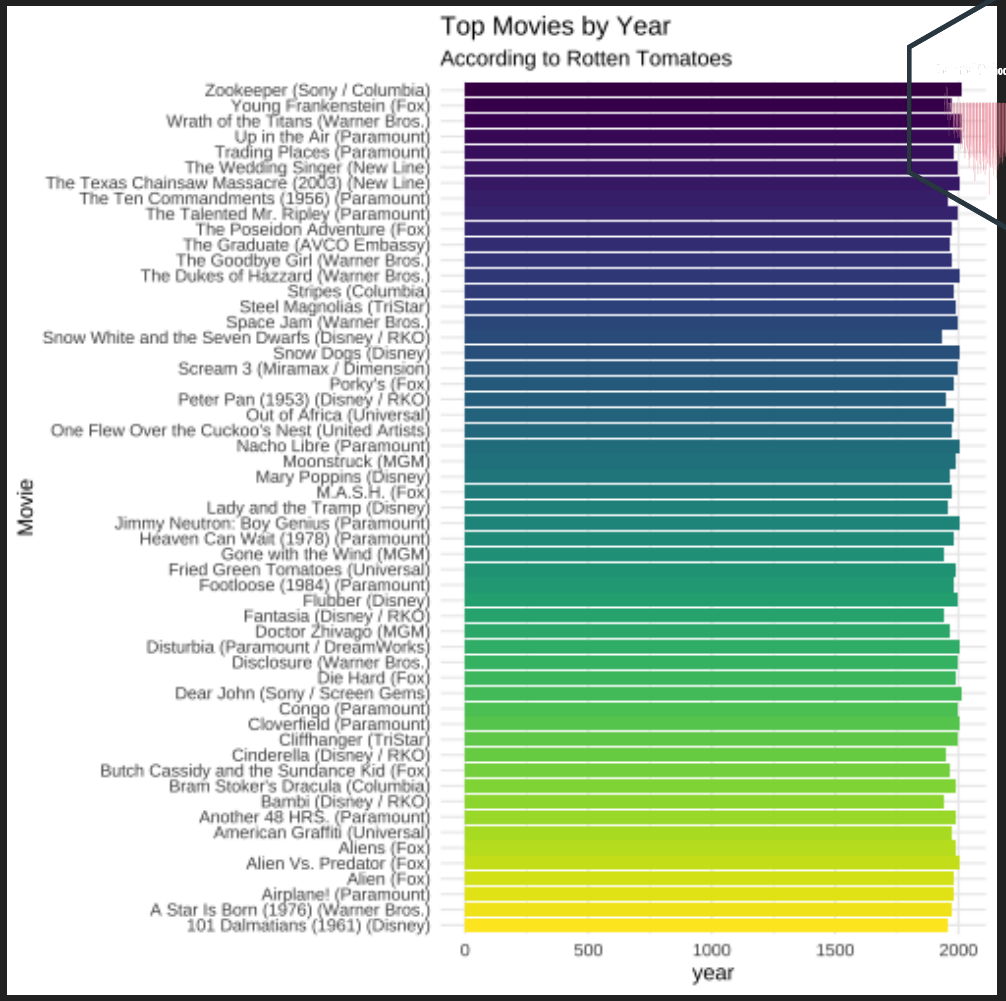


```r
top_movie_year <-
  boxoffice %>%
  group_by(year) %>%
  filter(Rank == max(Rank)) %>%
  select(Rank, Movie, year) %>%
  arrange(-year) %>%
  ungroup()
```

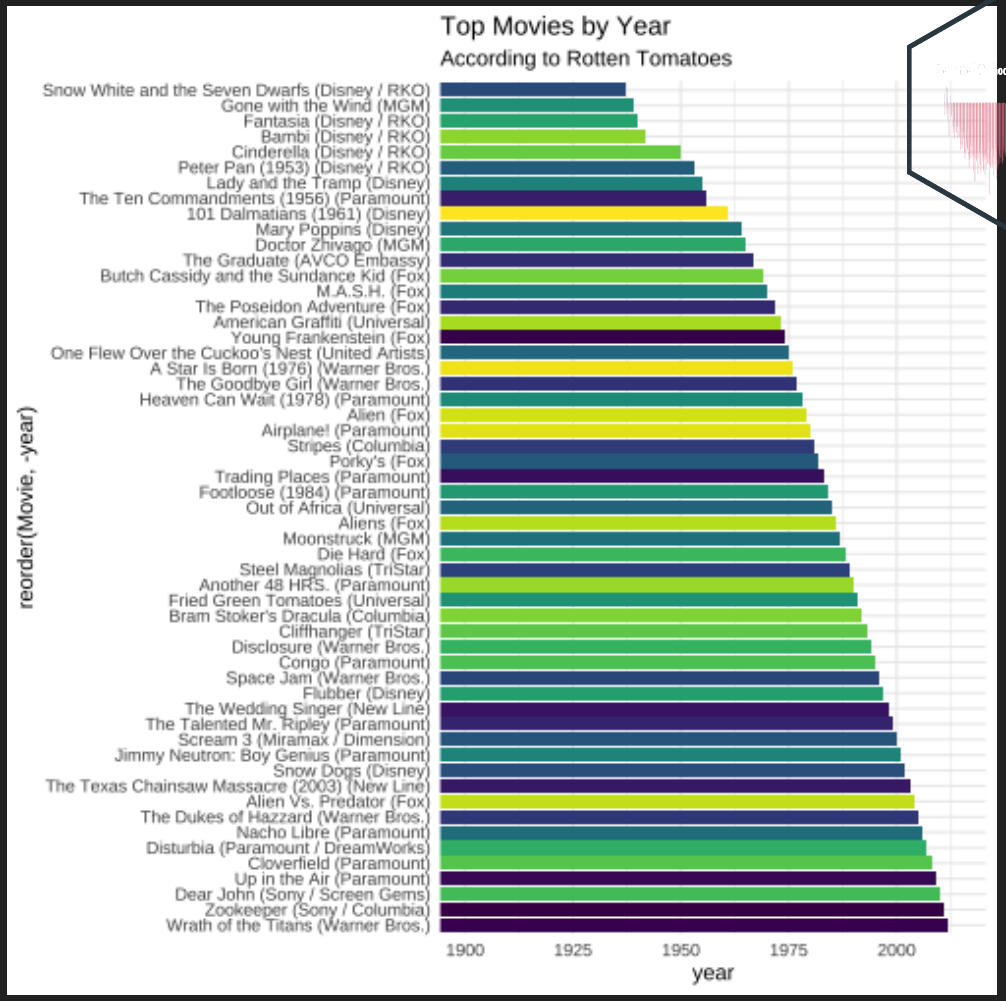
```
ggplot(top_movie_year,
       aes(year,
           Rank,
           fill = Movie)) +
  geom_bar(stat = "identity",
           show.legend = FALSE) +
  theme_minimal() +
  scale_fill_viridis_d(direction = -1) +
  labs(title = "Top Movies by Year and Rank",
       subtitle = "According to Rotten Tomatoes")
```



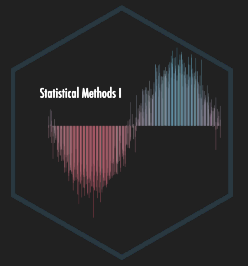
```
ggplot(top_movie_year,
       aes(year,
           Movie,
           fill = Movie)) +
  geom_bar(stat = "identity",
           show.legend = FALSE) +
  theme_minimal() +
  scale_fill_viridis_d(direction = -1) +
  labs(title = "Top Movies by Year",
       subtitle = "According to Rotten Tomatoes")
```



```
ggplot(top_movie_year,
       aes(year,
           reorder(Movie, -year),
           fill = Movie)) +
  geom_bar(stat = "identity",
           show.legend = FALSE) +
  theme_minimal() +
  scale_fill_viridis_d(direction = -1) +
  labs(title = "Top Movies by Year",
       subtitle = "According to Rotten Tomatoes")
  coord_cartesian(xlim = c(1900, 2015))
```



Ok now on to the normal curve!



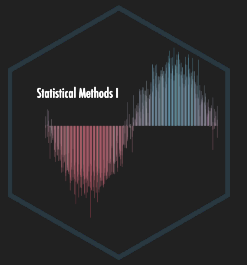
Load up data


```
nfl_pol <- read_csv("teampolview.csv")
```


```
nfl_pol %>%
  select(Team,
         `Total Respondents`, `Total Democrats`,
         Republican, `Other Republican`) %>%
  rowwise(Team) %>%
  mutate(`Total Republicans` = sum(c(Republican,`Other Republican`))) %>
  select(-c(Republican,`Other Republican`)) %>%
  mutate(percent_dem = round(`Total Democrats`/`Total Respondents`,2)) %
  mutate(percent_rep = round(`Total Republicans`/`Total Respondents`,2))
```

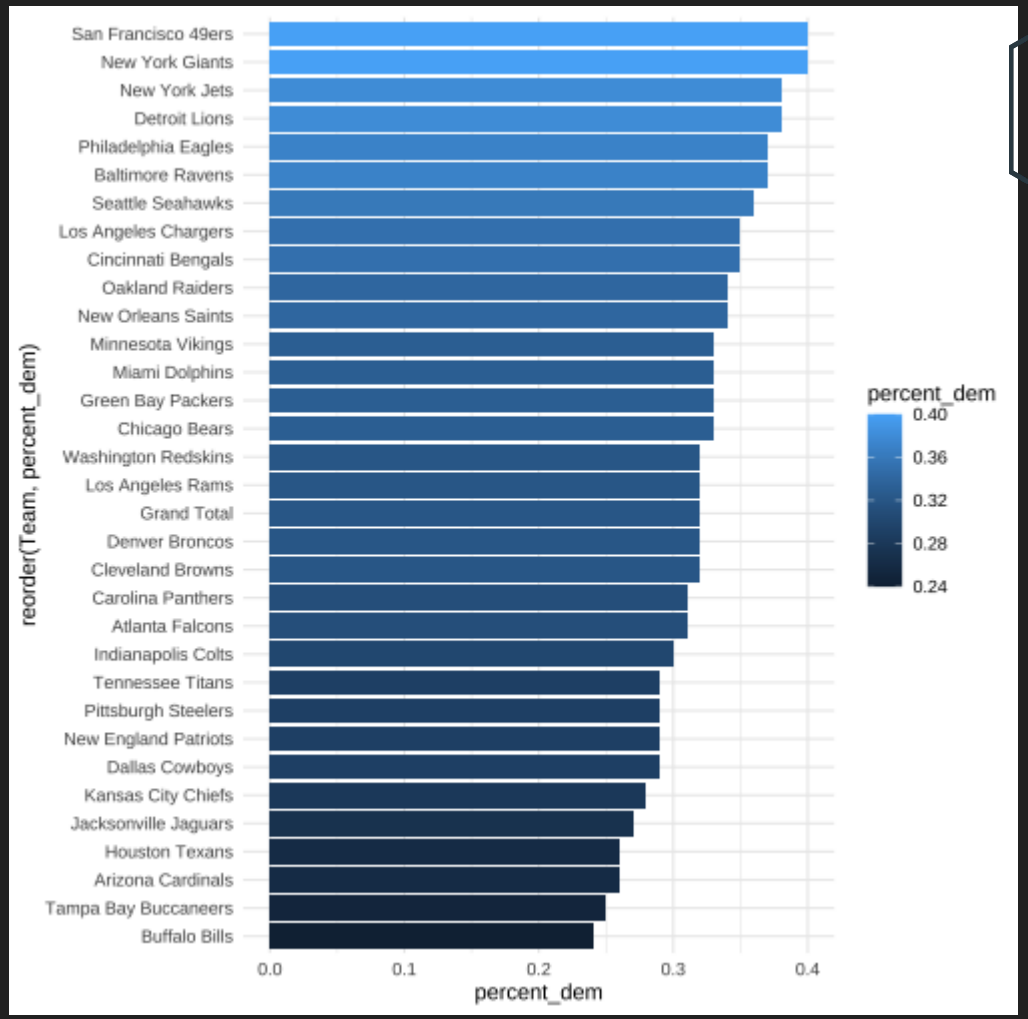
```
# A tibble: 33 × 6
# Rowwise:  Team
   Team    `Total Responde… `Total Democrat… `Total Republic…
   <chr>              <dbl>            <dbl>            <dbl>
 1 Arizon…              148               39               32
 2 Atlant…              188               59               44
 3 Baltim…              150               56               27
 4 Buffal…               92               22               16
 5 Caroli…              164               51               45
 6 Chicag…              285               94               55
 7 Cincin…              106               37               32
 8 Clevel…              105               34               28
 9 Dallas…              438              128              129
10 Denver…              313              100               87
# … with 23 more rows, and 2 more variables:
#   percent_dem <dbl>, percent_rep <dbl>
```

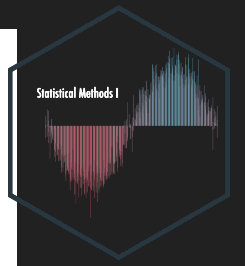
Give it a variable



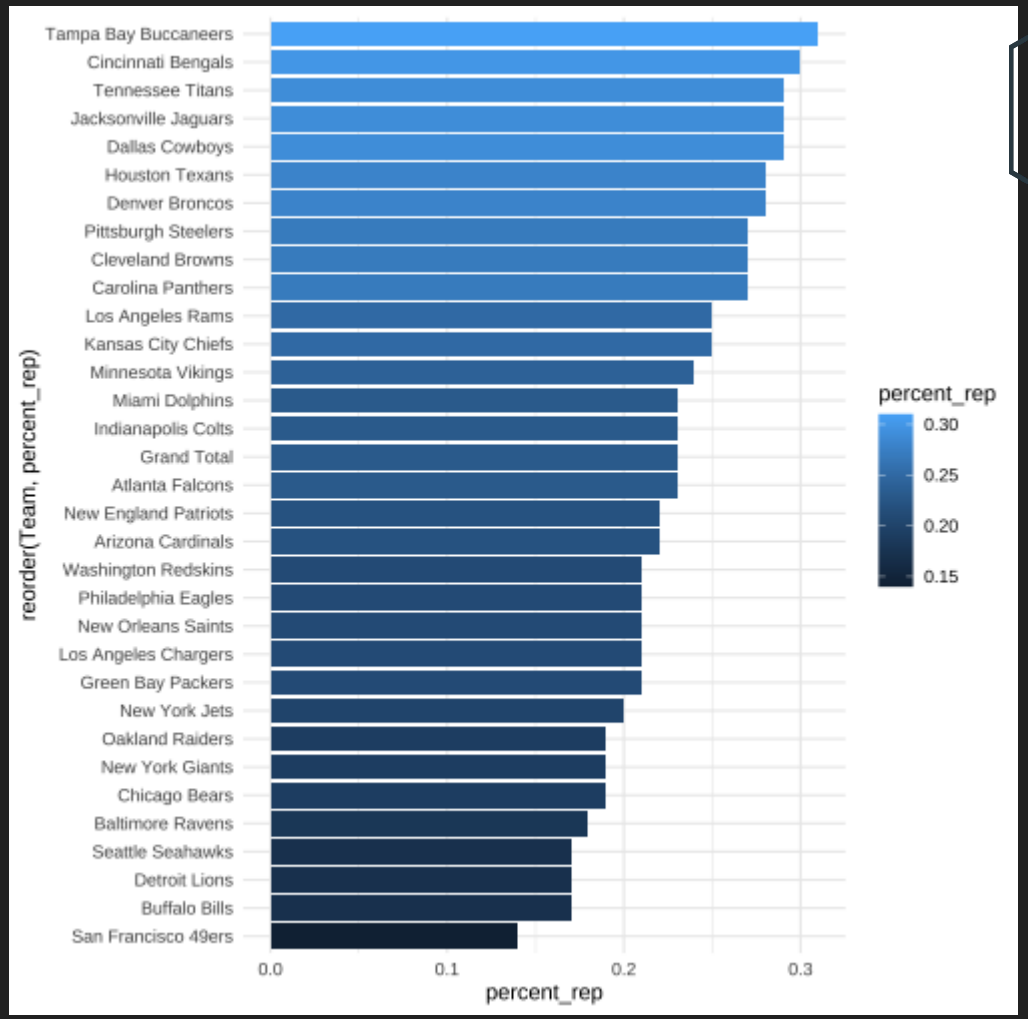

```
nfl_percentages <-
  nfl_pol %>%
  select(Team,
         `Total Respondents`,
         `Total Democrats`,
          Republican,
         `Other Republican`) %>%
  rowwise(Team) %>%
  mutate(`Total Republicans` = sum(c(Republican,`Other Republican`))) %>%
  select(-c(Republican,
            `Other Republican`)) %>%
  mutate(percent_dem = round(`Total Democrats`/`Total Respondents`,2)) %>%
  mutate(percent_rep = round(`Total Republicans`/`Total Respondents`,2))
```

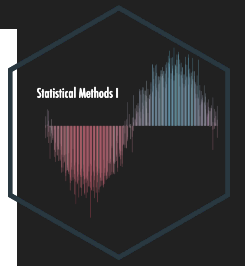
```
ggplot(nfl_percentages,
       aes(reorder(Team, percent_dem),
           percent_dem,
           fill = percent_dem)) +
  geom_bar(stat="identity") +
  coord_flip() +
  theme_minimal()
```





```
ggplot(nfl_percentages,
       aes(reorder(Team, percent_rep),
           percent_rep,
           fill = percent_rep)) +
  geom_bar(stat="identity") +
  coord_flip() +
  theme_minimal()
```





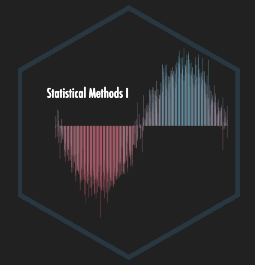
Let's compare them!

But first we need to assign variables

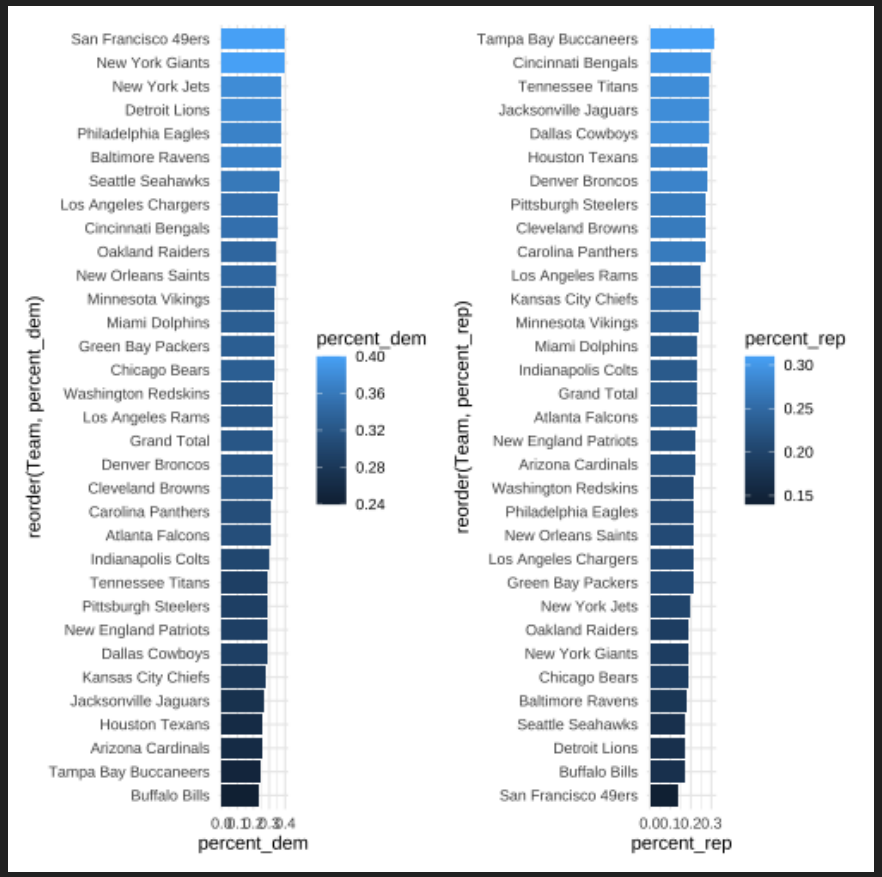
```
p1 <-
  ggplot(nfl_percentages,
         aes(reorder(Team, percent_dem),
             percent_dem,
             fill = percent_dem)) +
  geom_bar(stat="identity") +
  coord_flip() +
  theme_minimal()


p2 <-
  ggplot(nfl_percentages,
         aes(reorder(Team, percent_rep),
             percent_rep,
             fill = percent_rep)) +
  geom_bar(stat="identity") +
  coord_flip() +
  theme_minimal()
```

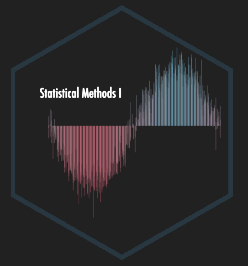
Patch it together using `Patchwork`




```
p1 + p2
```

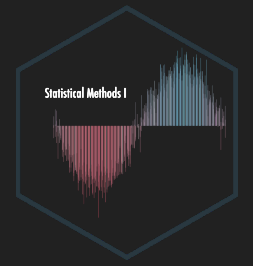


A better way



That's not really a comparison...at least not teamwise! Let's try something different

More Data Wrangling: Going from wide to long using `pivot_longer`



wide format

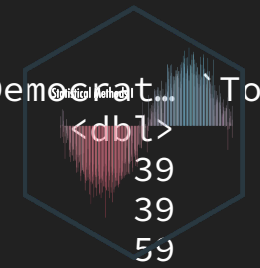
id	thing1	thing2	thing3

long format

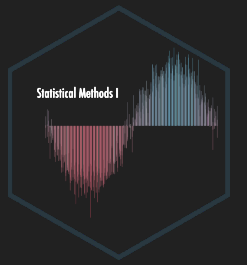
id	key	value
	thing1	
	thing1	
	thing1	
	thing2	
	thing2	
	thing2	
	thing3	
	thing3	
	thing3	

```
nfl_percentages %>%
  pivot_longer(c(percent_dem, percent_rep),
               names_to = "type",
               values_to = "political_percentages")
```

```
# A tibble: 66 × 6
   Team    `Total Responde… `Total Democrat… `Tot
   <chr>              <dbl>            <dbl>
 1 Arizon…              148               39
 2 Arizon…              148               39
 3 Atlant…              188               59
 4 Atlant…              188               59
 5 Baltim…              150               56
 6 Baltim…              150               56
 7 Buffal…               92               22
 8 Buffal…               92               22
 9 Caroli…              164               51
10 Caroli…              164               51
# … with 56 more rows, and 2 more variables: type
#   political_percentages <dbl>
```

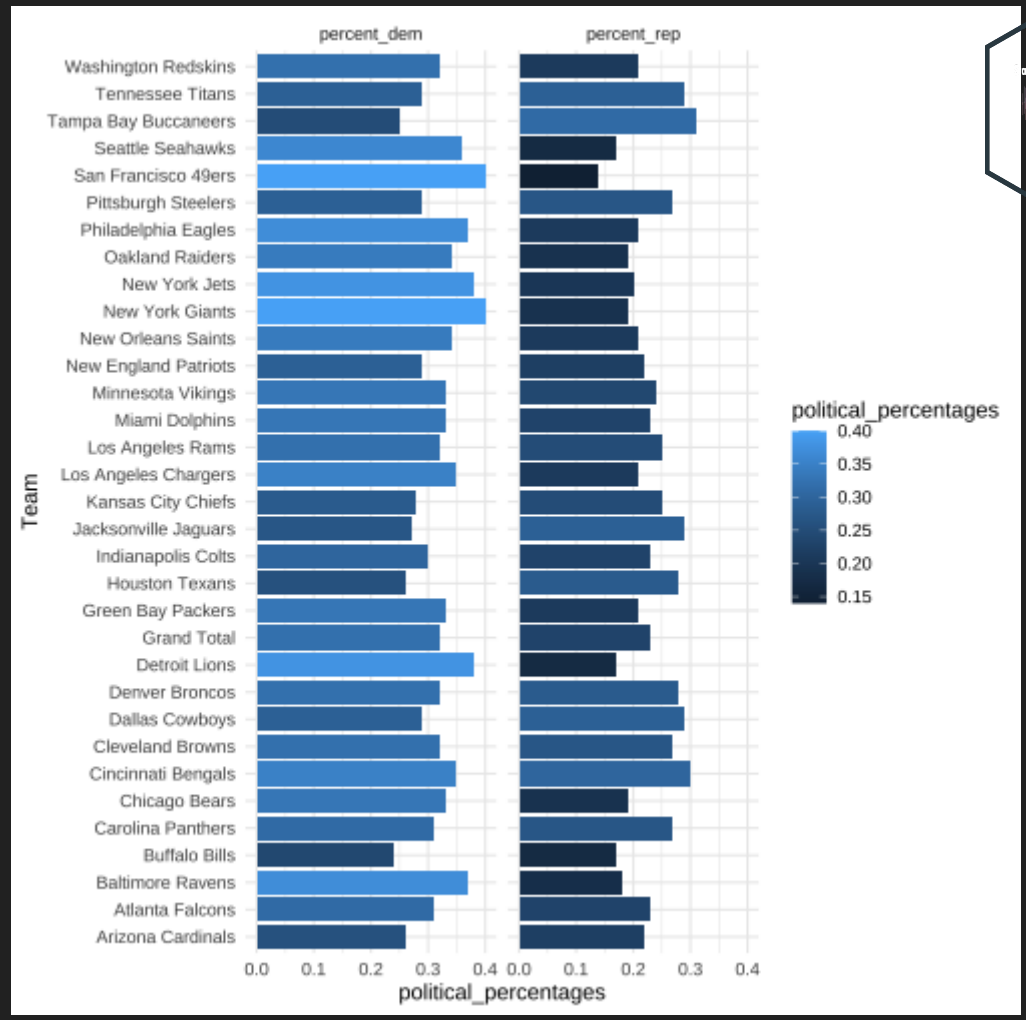


Give it a variable

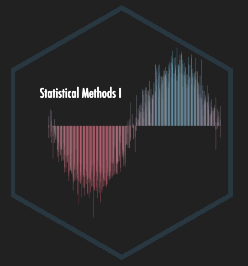



```
nlf_percentages_long <-
  nfl_percentages %>%
  pivot_longer(c(percent_dem, percent_rep),
               names_to = "type",
               values_to = "political_percentages")
```

```
ggplot(nlf_percentages_long,
       aes(Team,
           political_percentages,
           fill =  political_percentages)) +
  geom_bar(stat="identity") +
  coord_flip() +
  theme_minimal() +
  facet_wrap(.~type)
```



Your turn



Try these on your own

1. Compare how the different ethnicities within each political party differ.
2. Compare how each specific ethnicity between each political party differ.
3. Which ethnicity in each political party is the most conservative? the most liberal?

That's it for today!