Babynames Exercise

Data Visualization - Columbia University

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Babynames Exercise

- For each year from 1880 to 2013, the data contains the number of children of each sex given each name. All names with more than 5 uses are given. (Source: http://www.ssa.gov/oact/babynames/limits.html)

Install data package

We are using the package "babynames" to get familiar with time series plots.

```
library(babynames)
```

And while we are at it, let's load a few more necessary and helpful packages.

```
library(ggplot2)     # the king of plotting
library(magrittr)    # chain operators, e.g. to "pipe" a value forward
library(dplyr)       # for data manipulation
```

Let's check the data

```
str(babynames)
```

```
## Classes 'tbl_df', 'tbl' and 'data.frame':    1825433 obs. of  5 variables:
##  $ year: num  1880 1880 1880 1880 1880 1880 1880 1880 1880 1880 ...
##  $ sex : chr  "F" "F" "F" "F" ...
##  $ name: chr  "Mary" "Anna" "Emma" "Elizabeth" ...
##  $ n   : int  7065 2604 2003 1939 1746 1578 1472 1414 1320 1288 ...
##  $ prop: num  0.0724 0.0267 0.0205 0.0199 0.0179 ...
```

From A...

```
head(babynames)
```

```
## # A tibble: 6 × 5
##    year   sex      name     n       prop
##   <dbl> <chr>     <chr> <int>      <dbl>
## 1  1880     F      Mary  7065 0.07238359
## 2  1880     F      Anna  2604 0.02667896
## 3  1880     F      Emma  2003 0.02052149
## 4  1880     F Elizabeth  1939 0.01986579
## 5  1880     F    Minnie  1746 0.01788843
## 6  1880     F  Margaret  1578 0.01616720
```

to ... Z

```
tail(babynames)
```

```
## # A tibble: 6 × 5
##    year   sex    name     n         prop
##   <dbl> <chr>   <chr> <int>        <dbl>
## 1  2014     M    Zyel     5 2.463303e-06
## 2  2014     M  Zykeem     5 2.463303e-06
## 3  2014     M  Zymeer     5 2.463303e-06
## 4  2014     M Zymiere     5 2.463303e-06
## 5  2014     M   Zyran     5 2.463303e-06
## 6  2014     M   Zyrin     5 2.463303e-06
```

How many names?

```
# How many unique names?
length(unique(babynames$name))
```

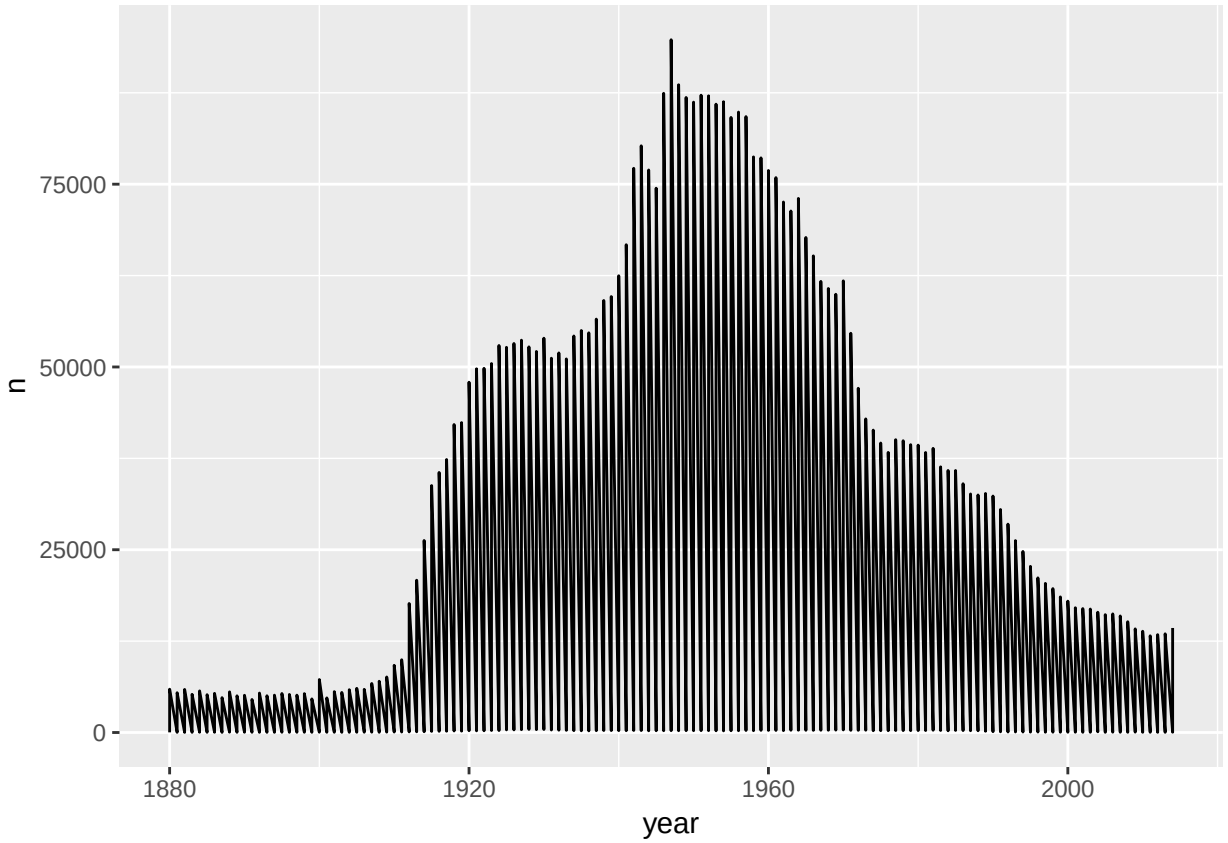
```
## [1] 93889
```

```
# How many kids in database (note n>5 per name/year)
sum(babynames$n)/10^6
```

```
## [1] 337.1354
```

Plot a single name over time - Choose yours!

```
ggplot(babynames, aes(year, n)) +
  geom_line(data = filter(babynames, name=="James"))
```



Want went wrong here?

Check the data again

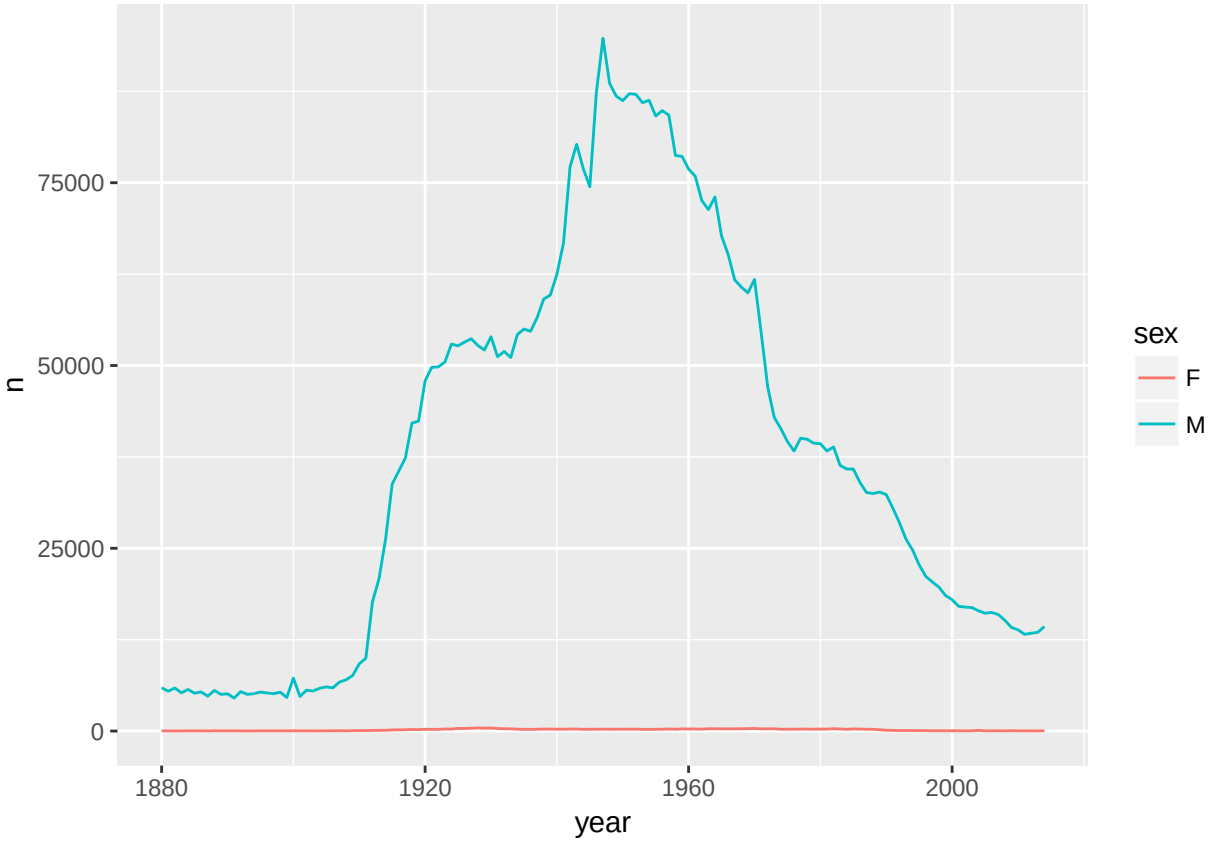
```
head(filter(babynames, name=="James"))
```

```
## # A tibble: 6 × 5
##    year   sex  name      n         prop
##   <dbl> <chr> <chr> <int>        <dbl>
## 1  1880     F James    22 0.0002253983
## 2  1880     M James  5927 0.0500591216
## 3  1881     F James    24 0.0002427774
## 4  1881     M James  5442 0.0502567323
## 5  1882     F James    18 0.0001555775
## 6  1882     M James  5892 0.0482820221
```

```
  # -> There are female and male entries for some names.
```

Plot a single name over time

```
ggplot(babynames, aes(year, n)) +
  geom_line(data = filter(babynames, name=="James"), aes(color=sex))
```



Top 10 Names of all time

```
library{magrittr}  # this is for the chain operator %>%
```

- We select the top 10 boys and girls names of all time from the overall dataset

```
# Try to follow this code chunk at home, using dplyr() and magrittr()
top10 <- babynames %>%
  group_by(sex, name) %>%
  summarize(total = sum(n)) %>%
  arrange(desc(total)) %>%
  group_by(sex) %>%
  mutate(rank=row_number()) %>%
  filter(rank<=10)  %>%
  arrange(sex, rank)

top10f <- top10 %>% filter(sex=="F")
top10m <- top10 %>% filter(sex=="M")
```

Top 10 Names of all time - for girls

```
## Source: local data frame [10 x 4]
## Groups: sex [1]
##
##      sex      name   total  rank
##    <chr>     <chr>   <int> <int>
## 1      F      Mary 4115282     1
## 2      F Elizabeth 1601128     2
## 3      F  Patricia 1570567     3
## 4      F  Jennifer 1462742     4
## 5      F     Linda 1450843     5
## 6      F   Barbara 1432944     6
## 7      F  Margaret 1240006     7
## 8      F     Susan 1120469     8
## 9      F   Dorothy 1105680     9
## 10     F     Sarah 1060643    10
```

Top 10 Names of all time - and boys

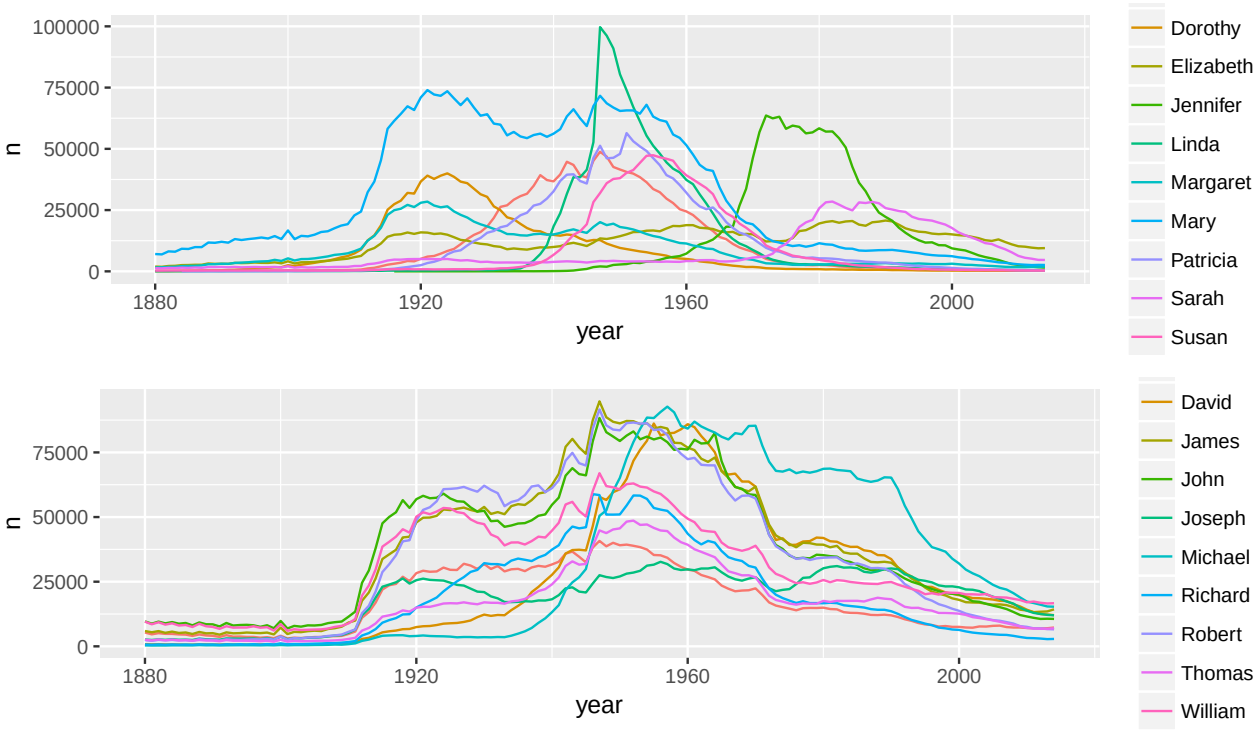
```
## Source: local data frame [10 x 4]
## Groups: sex [1]
##
##      sex    name   total  rank
##    <chr>   <chr>   <int> <int>
## 1      M   James 5105919     1
## 2      M    John 5084943     2
## 3      M  Robert 4796695     3
## 4      M Michael 4309198     4
## 5      M William 4055473     5
## 6      M   David 3577704     6
## 7      M  Joseph 2570095     7
## 8      M Richard 2555330     8
## 9      M Charles 2364332     9
## 10     M  Thomas 2283080    10
```

Plot most 10 common names for boys and girls

```
babynames %>%
  filter(sex=="F") %>%
  filter(name %in% top10f$name) %>%
  ggplot(., aes(year, n)) +
  geom_line(aes(color=name, group=name))

babynames %>%
  filter(sex=="M") %>%
  filter(name %in% top10m$name) %>%
  ggplot(., aes(year, n)) +
  geom_line(aes(color=name, group=name))
```

Plot 10 most common names



Continue the exercise at home

- Plot the most common names in 2013 over the entire period.
- Explore which names are most often used as unisex names. For which names has the popularity over time changed a lot?