Transform Data

dplyr

Your Turn 1

Alter the code to select just the `n` column:

```
select(babynames, n)
```

```
# A tibble: 1,924,665 x 1
       n
   <int>
 1  7065
 2  2604
 3  2003
 4  1939
 5  1746
 6  1578
 7  1472
 8  1414
 9  1320
10  1288
# ... with 1,924,655 more rows
```

Quiz

Which of these is NOT a way to select the `name` and `n` columns together?

```
select(babynames, -c(year, sex, prop))
```

```
# A tibble: 1,924,665 x 2
   name          n
   <chr>     <int>
 1 Mary       7065
 2 Anna       2604
 3 Emma       2003
 4 Elizabeth  1939
 5 Minnie     1746
 6 Margaret   1578
 7 Ida        1472
 8 Alice      1414
 9 Bertha     1320
10 Sarah      1288
# ... with 1,924,655 more rows
```

```
select(babynames, name:n)
```

```
# A tibble: 1,924,665 x 2
   name          n
   <chr>     <int>
```

```
 1 Mary       7065
 2 Anna       2604
 3 Emma       2003
 4 Elizabeth  1939
 5 Minnie     1746
 6 Margaret   1578
 7 Ida        1472
 8 Alice      1414
 9 Bertha     1320
10 Sarah      1288
# ... with 1,924,655 more rows
```

```
select(babynames, starts_with("n"))
```

```
# A tibble: 1,924,665 x 2
   name          n
   <chr>     <int>
 1 Mary       7065
 2 Anna       2604
 3 Emma       2003
 4 Elizabeth  1939
 5 Minnie     1746
 6 Margaret   1578
 7 Ida        1472
 8 Alice      1414
 9 Bertha     1320
10 Sarah      1288
# ... with 1,924,655 more rows
```

```
select(babynames, ends_with("n"))
```

```
# A tibble: 1,924,665 x 1
       n
   <int>
 1  7065
 2  2604
 3  2003
 4  1939
 5  1746
 6  1578
 7  1472
 8  1414
 9  1320
10  1288
# ... with 1,924,655 more rows
```

Your Turn 2

Use `filter`, `babynames`, and the logical operators to find:

- All of the names where prop is greater than or equal to 0.08

- All of the children named "Sea"

```
filter(babynames, prop >= 0.08)
```

```
# A tibble: 3 x 5
```

```
   year sex   name        n   prop
  <dbl> <chr> <chr>   <int>  <dbl>
1  1880 M     John     9655 0.0815
2  1880 M     William  9532 0.0805
3  1881 M     John     8769 0.0810
```

```
filter(babynames, name == "Sea")
```

```
# A tibble: 4 x 5
   year sex   name      n       prop
  <dbl> <chr> <chr> <int>      <dbl>
1  1982 F     Sea       5 0.00000276
2  1985 M     Sea       6 0.00000312
3  1986 M     Sea       5 0.0000026
4  1998 F     Sea       5 0.00000258
```

Your Turn 3

Use Boolean operators to return only the rows that contain:

- *Boys* named Sue
- Names that were used by exactly 5 or 6 children in 1880
- Names that are one of Acura, Lexus, or Yugo

```
filter(babynames, sex == 'M', name == "Sue")
```

```
# A tibble: 52 x 5
    year sex   name      n       prop
   <dbl> <chr> <chr> <int>      <dbl>
 1  1917 M     Sue       7 0.0000073
 2  1927 M     Sue       5 0.0000043
 3  1928 M     Sue       5 0.00000438
 4  1930 M     Sue       5 0.00000443
 5  1931 M     Sue       6 0.00000561
 6  1932 M     Sue       7 0.00000652
 7  1933 M     Sue       7 0.00000686
 8  1934 M     Sue      14 0.0000132
 9  1935 M     Sue      13 0.0000122
10  1936 M     Sue       9 0.00000846
# ... with 42 more rows
```

```
filter(babynames, year == 1880, (n == 5) | (n == 6))
```

```
# A tibble: 455 x 5
    year sex   name          n      prop
   <dbl> <chr> <chr>   <int>     <dbl>
 1  1880 F     Abby          6 0.0000615
 2  1880 F     Aileen        6 0.0000615
 3  1880 F     Alba          6 0.0000615
 4  1880 F     Alda          6 0.0000615
 5  1880 F     Alla          6 0.0000615
 6  1880 F     Alverta       6 0.0000615
 7  1880 F     Ara           6 0.0000615
 8  1880 F     Ardelia       6 0.0000615
 9  1880 F     Ardella       6 0.0000615
```

```
10  1880 F     Arrie       6 0.0000615
# ... with 445 more rows
```

```
filter(babynames, (name == "Acura") | (name == "Lexus") | (name == "Yugo"))
```

```
# A tibble: 57 x 5
    year sex   name      n       prop
   <dbl> <chr> <chr> <int>      <dbl>
 1  1990 F     Lexus    36 0.0000175
 2  1990 M     Lexus    12 0.00000558
 3  1991 F     Lexus   102 0.0000502
 4  1991 M     Lexus    16 0.00000755
 5  1992 F     Lexus   193 0.0000963
 6  1992 M     Lexus    25 0.0000119
 7  1993 F     Lexus   285 0.000145
 8  1993 M     Lexus    30 0.0000145
 9  1994 F     Lexus   381 0.000195
10  1994 F     Acura     6 0.00000308
# ... with 47 more rows
```

```
filter(babynames, name %in% c("Acura", "Lexus", "Yugo")) # Same as above
```

```
# A tibble: 57 x 5
    year sex   name      n       prop
   <dbl> <chr> <chr> <int>      <dbl>
 1  1990 F     Lexus    36 0.0000175
 2  1990 M     Lexus    12 0.00000558
 3  1991 F     Lexus   102 0.0000502
 4  1991 M     Lexus    16 0.00000755
 5  1992 F     Lexus   193 0.0000963
 6  1992 M     Lexus    25 0.0000119
 7  1993 F     Lexus   285 0.000145
 8  1993 M     Lexus    30 0.0000145
 9  1994 F     Lexus   381 0.000195
10  1994 F     Acura     6 0.00000308
# ... with 47 more rows
```

Help Me

What is the smallest value of n? What is the largest?

```
arrange(babynames, n) # Smallest
```

```
# A tibble: 1,924,665 x 5
    year sex   name          n      prop
   <dbl> <chr> <chr>     <int>     <dbl>
 1  1880 F     Adelle        5 0.0000512
 2  1880 F     Adina         5 0.0000512
 3  1880 F     Adrienne      5 0.0000512
 4  1880 F     Albertine     5 0.0000512
 5  1880 F     Alys          5 0.0000512
 6  1880 F     Ana           5 0.0000512
 7  1880 F     Araminta      5 0.0000512
 8  1880 F     Arthur        5 0.0000512
 9  1880 F     Birtha        5 0.0000512
10  1880 F     Bulah         5 0.0000512
```

```
# ... with 1,924,655 more rows
```

```r
arrange(babynames, desc(n))
```

```
# A tibble: 1,924,665 x 5
    year sex   name        n   prop
   <dbl> <chr> <chr>   <int>  <dbl>
 1  1947 F     Linda   99686 0.0548
 2  1948 F     Linda   96209 0.0552
 3  1947 M     James   94756 0.0510
 4  1957 M     Michael 92695 0.0424
 5  1947 M     Robert  91642 0.0493
 6  1949 F     Linda   91016 0.0518
 7  1956 M     Michael 90620 0.0423
 8  1958 M     Michael 90520 0.0420
 9  1948 M     James   88588 0.0497
10  1954 M     Michael 88514 0.0428
# ... with 1,924,655 more rows
```

Your Turn 4

Use `%>%` to write a sequence of functions that:

1. Filters babynames to just the girls that were born in 2017, *then...*

2. Selects the `name` and `n` columns, *then...*

3. Arranges the results so that the most popular names are near the top.

```r
babynames %>%
  filter(sex == 'F', year == 2017) %>%
  select(name, n) %>%
  arrange(desc(n)) -> girls_2017
```

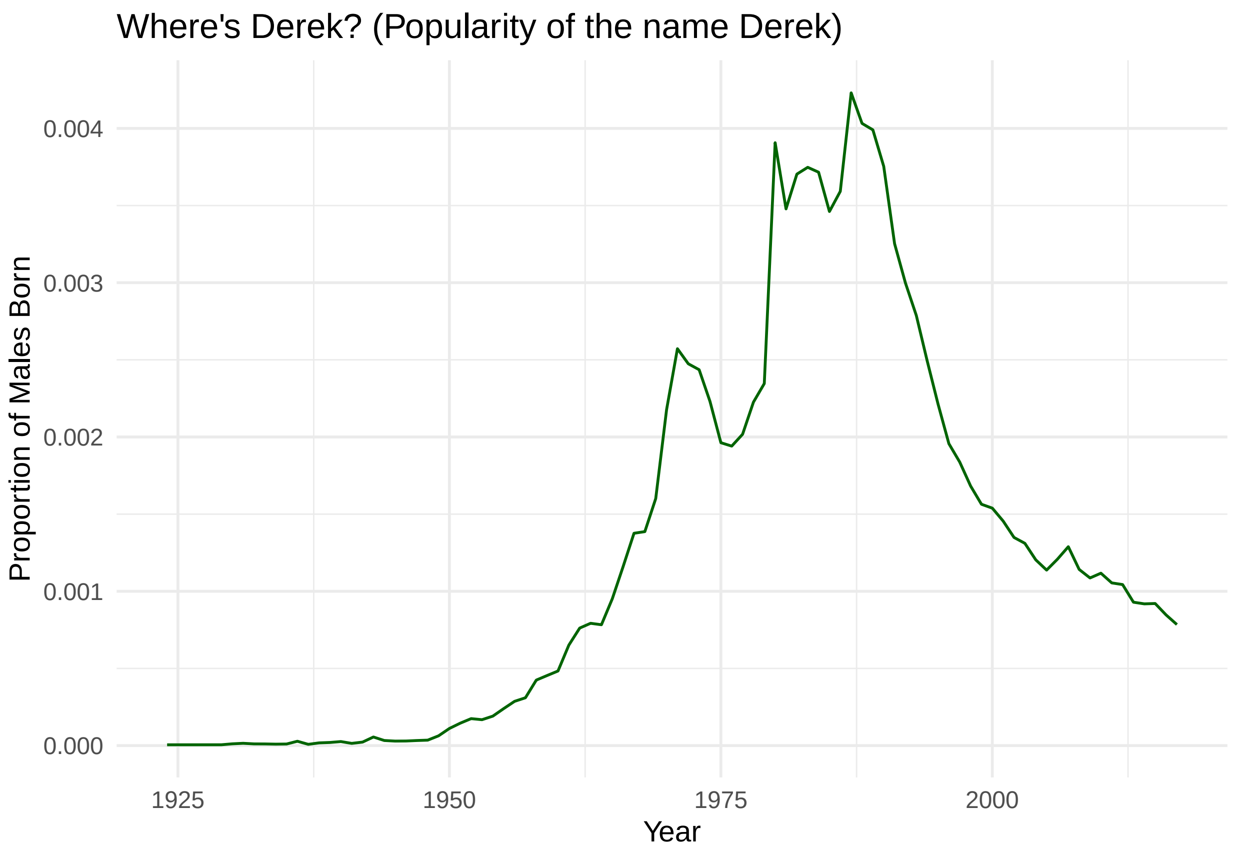
Your Turn 5

1. Trim `babynames` to just the rows that contain **your** `name` and **your** `sex`

2. Trim the result to just the columns that will appear in your graph (not strictly necessary, but useful practice)

3. Plot the results as a line graph with `year` on the x axis and `prop` on the y axis

```r
babynames %>%
  filter(name=="Derek", sex=="M") %>%
  select(year, prop) %>%
  ggplot() +
  geom_line(aes(x=year, y=prop), color = "darkgreen") +
  labs(title = "Where's Derek? (Popularity of the name Derek)",
       x = "Year",
       y = "Proportion of Males Born") +
  theme_minimal()
```



Take aways

- Extract variables with `select()`
- Extract cases with `filter()`
- Arrange cases, with `arrange()`