Data Science for Everyone – Data Wrangling

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Slides based off slides courtesy of Jordan Crouser (https://jcrouser.github.io/)

Plan for Today

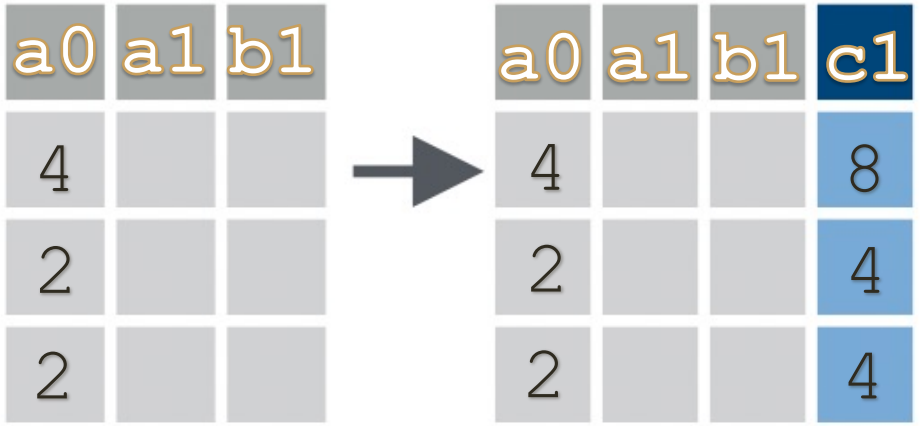
- Wrangling Data in one Table

The 5 Verbs

- `select()`
- `filter()`
- `mutate()`
- `arrange()`
- `summarize()`

The 5 Verbs: `dplyr`

`mutate()` the data i.e. add or modify a column

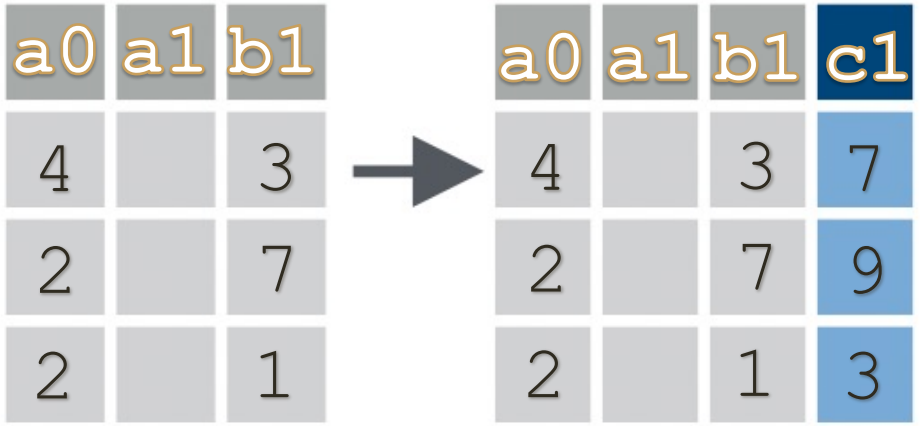


- Add a column to the dataset as a product of existing column. Ex.

```
data %>%
   mutate(c1 = a0 * 2)
```

The 5 Verbs: `dplyr`

`mutate()` the data i.e. add or modify a column



- Add a column to the dataset as a product of existing column(s). Ex.

```
data %>%
   mutate(c1 = a0 + b1)
```

`mutate()` the data i.e. add or modify a column

```{r, message=FALSE}
library(tidyverse)
library(babynames)
head(babynames)
```

A tibble: 6 x 5

year <dbl>	sex <chr>	name <chr>	n <int>	prop <dbl>
1880	F	Mary	7065	0.07238359
1880	F	Anna	2604	0.02667896
1880	F	Emma	2003	0.02052149
1880	F	Elizabeth	1939	0.01986579
1880	F	Minnie	1746	0.01788843
1880	F	Margaret	1578	0.01616720

6 rows

The 5 Verbs: `dplyr`

`mutate()` the data i.e. add or modify a column

- Work with whoever is near you to add a column to babynames called popular that is TRUE if a name was assigned to more than 1% of all babies in a given year

The 5 Verbs: `dplyr`

`mutate()` the data i.e. add or modify a column

- Work with whoever is near you to add a column to babynames called popular that is TRUE if a name was assigned to more than 1% of all babies in a given year

```
babynames <- babynames %>%
  mutate(popular = prop > 0.01)
```

rename

`rename()` change the name of a variable

```
babynames <- babynames %>%
  rename(is_popular = popular)
```

Review

Use `is_popular` and `filter()` to create a subset of babynames that contains only popular names

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```
popular <- babynames %>%
  filter(is_popular)
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How many names are popular?

Review

Use `is_popular` and `filter()` to create a subset of babynames that contains only popular names

```
popular <- babynames %>%
  filter(is_popular)
```

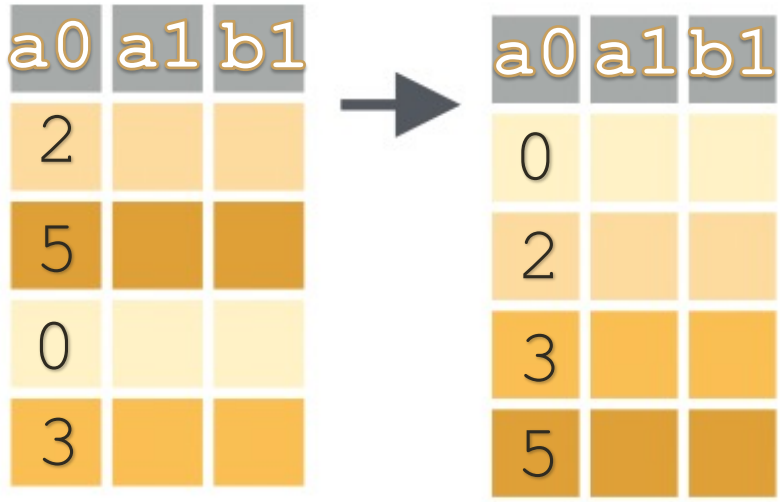
How many names are popular?

```
nrow(popular)
```

3878

The 5 Verbs: `dplyr`

`arrange()` the rows in a specific order

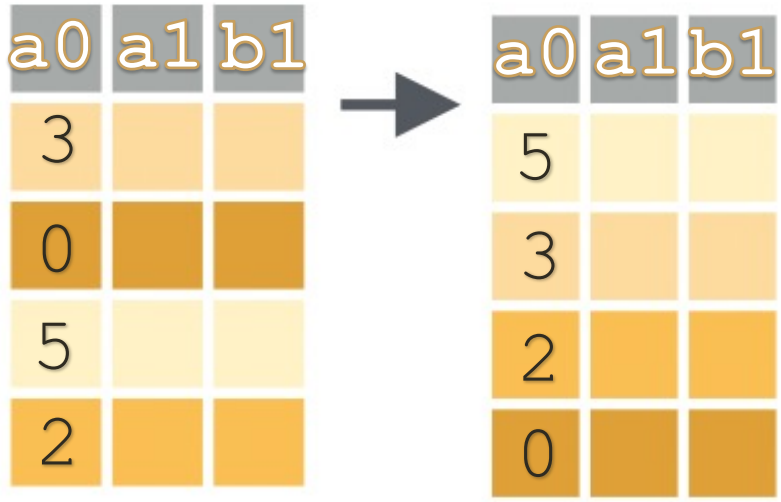


- Order rows by value of a column(s) from low to high. Ex.

```
data %>%
   arrange(a0)
```

The 5 Verbs: `dplyr`

`arrange()` the rows in a specific order



- Order rows by value of a column(s) from low to high. Use `desc()` to go from high to low. Ex.

```
data %>%
   arrange(desc(a0))
```

The 5 Verbs: `dplyr`

`arrange()` the rows in a specific order

- Work with whoever is near you to find the most popular names of all time

The 5 Verbs: `dplyr`

`arrange()` the rows in a specific order

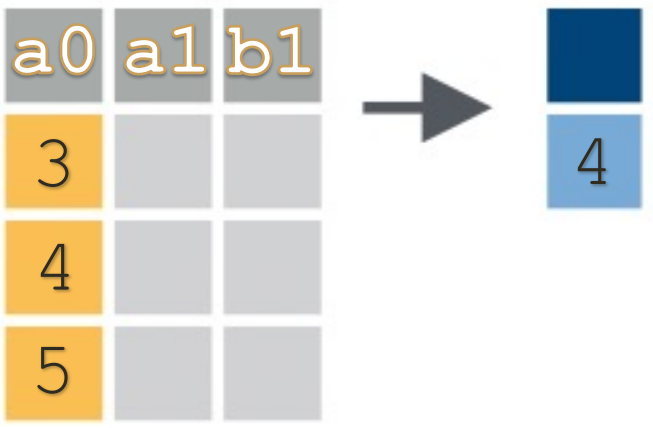
- Work with whoever is near you to find the most popular names of all time

```
popular %>%
  arrange(desc(prop))
```

year <dbl>	sex <chr>	name <chr>	n <int>	prop <dbl>	is_popular <lgl>
1880	M	John	9655	0.08154561	TRUE
1881	M	John	8769	0.08098299	TRUE
1880	M	William	9532	0.08050676	TRUE
1883	M	John	8894	0.07907394	TRUE
1881	M	William	8524	0.07872038	TRUE
1882	M	John	9557	0.07831617	TRUE
1884	M	John	9388	0.07648813	TRUE

The 5 Verbs: `dplyr`

`summarize()` column with a single value(s)



- Apply a summary function to a column. Ex.

```
data %>%
   summarize(mean(a0))
```

The 5 Verbs: `dplyr`

`summarize()` column with a single value(s)

```{r}
ab %>%
  summarize(max_abs = max(n))
```

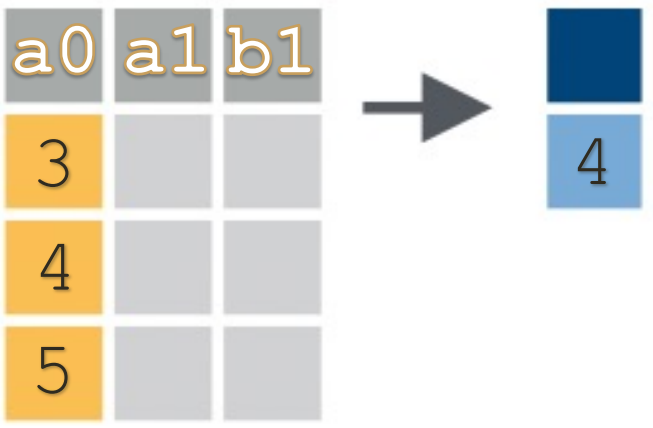
A tibble: 1 x 1

max_abs <int>
41

1 row

The 5 Verbs: `dplyr`

`summarize()` column with a single value(s)



- Tip: use the function `n()` inside of summarize to keep track of how many rows were summarized

The 5 Verbs: dplyr

`summarize()` column with a single value(s)

```{r}
ab %>%
  summarize(num_rows = n(), max_abs = max(n))
```

A tibble: 1 x 2

num_rows <int>	max_abs <int>
29	41

1 row

Your Turn!

- Work with classmates:
  - Choose a name and find the year it was used most frequently
  - What was the most popular name that year?
  - In which year was the name you picked given to M and F babies most equally? i.e. closest to a 50/50 split