Lab 03 - Nobel laureates - results

Honorata Hurnik + Kamil Klecha

```
library(tidyverse)
```

```
nobel <- read_csv("data/nobel.csv")
```

1. How many observations and how many variables are in the dataset? Use inline code to answer this question. What does each row represent?

```
nrow(nobel)
```

```
## [1] 935
```

```
ncol(nobel)
```

```
## [1] 26
```

Each row represents a nobel laureat.

2. Create a new data frame called nobel_living that filters for

- laureates for whom country is available
- laureates who are people as opposed to organizations (organizations are denoted with "org" as their gender)
- laureates who are still alive (their died_date is NA)

```
nobel_living <- filter(nobel, !is.na(country), gender!="org", is.na(died_date))
head(nobel_living)
```

```
## # A tibble: 6 x 26
##      id firstname surname  year category affiliation city  country born_date
##   <dbl> <chr>     <chr>   <dbl> <chr>    <chr>       <chr> <chr>   <date>
## 1    68 Chen Ning Yang     1957 Physics  Institute ~ Prin~ USA     1922-09-22
## 2    69 Tsung-Dao Lee      1957 Physics  Columbia U~ New ~ USA     1926-11-24
## 3    95 Leon N.   Cooper   1972 Physics  Brown Univ~ Prov~ USA     1930-02-28
## 4    97 Leo       Esaki    1973 Physics  IBM Thomas~ York~ USA     1925-03-12
## 5    98 Ivar      Giaever  1973 Physics  General El~ Sche~ USA     1929-04-05
## 6    99 Brian D.  Joseph~  1973 Physics  University~ Camb~ United~ 1940-01-04
## # ... with 17 more variables: died_date <date>, gender <chr>, born_city <chr>,
## #   born_country <chr>, born_country_code <chr>, died_city <chr>,
## #   died_country <chr>, died_country_code <chr>, overall_motivation <chr>,
## #   share <dbl>, motivation <chr>, born_country_original <chr>,
## #   born_city_original <chr>, died_country_original <chr>,
## #   died_city_original <chr>, city_original <chr>, country_original <chr>
```

Most living Nobel laureates were based in the US when they won their prizes

... says the Buzzfeed article. Let's see if that's true.

First, we'll create a new variable to identify whether the laureate was in the US when they won their prize.

```
nobel_living <- nobel_living %>%
  mutate(
    country_us = if_else(country == "USA", "USA", "Other")
  )
```

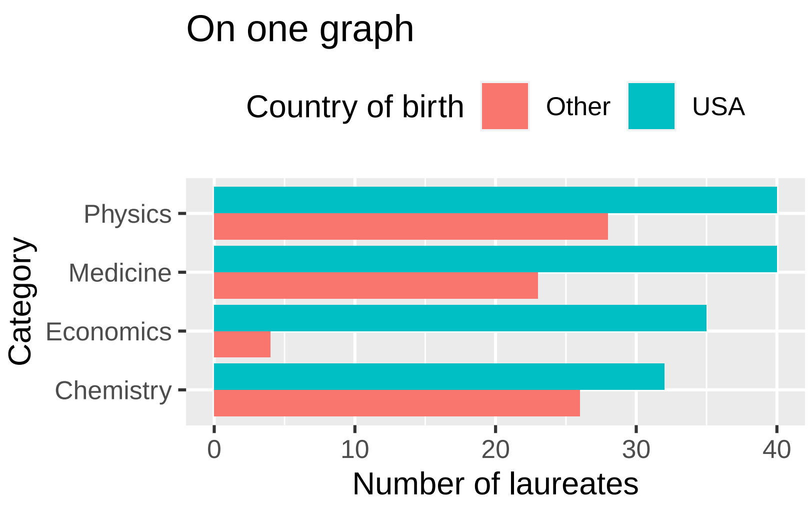
Next, we will limit our analysis to only the following categories: Physics, Medicine, Chemistry, and Economics.

```
nobel_living_science <- nobel_living %>%
  filter(category %in% c("Physics", "Medicine", "Chemistry", "Economics"))
```

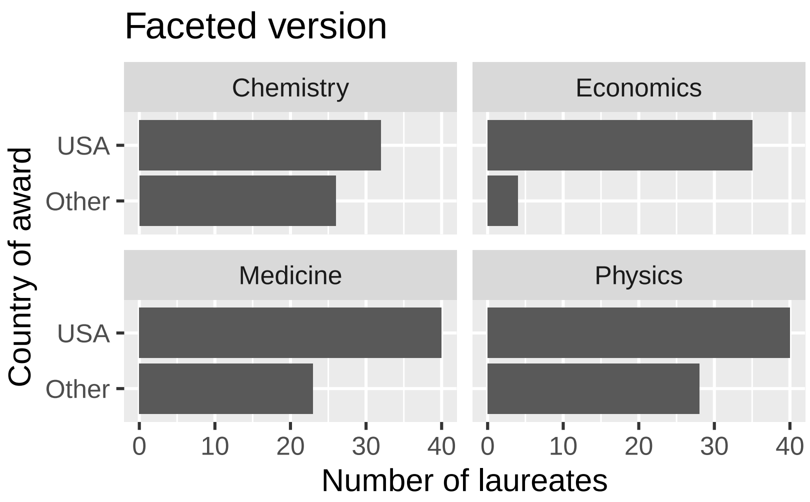
3. Create a faceted bar plot visualizing the relationship between the category of prize and whether the laureate was in the US when they won the nobel prize. Interpret your visualization, and say a few words about whether the Buzzfeed headline is supported by the data.

```
-   Your visualization should be faceted by category.
-   For each facet you should have two bars, one for winners in the US and one for Other.
-   Flip the coordinates so the bars are horizontal, not vertical.
```

```
ggplot(nobel_living_science, aes(y = category, fill=country_us)) +
  geom_bar(position="dodge") +
  theme(legend.position="top") +
  ggtitle("On one graph") +
  labs(y="Category",fill="Country of birth",x="Number of laureates")
```



```
ggplot(nobel_living_science, aes(y = country_us)) +
  geom_bar() +
  facet_wrap(~category) +
  ggtitle("Faceted version") +
  labs(y="Country of award",fill="Country of birth",x="Number of laureates")
```



```
print("It seems like the data supports the claim, as most of the Nobel lauerates were based in US when
```

```
## [1] "It seems like the data supports the claim, as most of the Nobel lauerates were based in US when
```

4. Create a new variable called `born_country_us` that has the value `"USA"` if the laureate is born in the US, and `"Other"` otherwise. How many of the winners are born in the US?

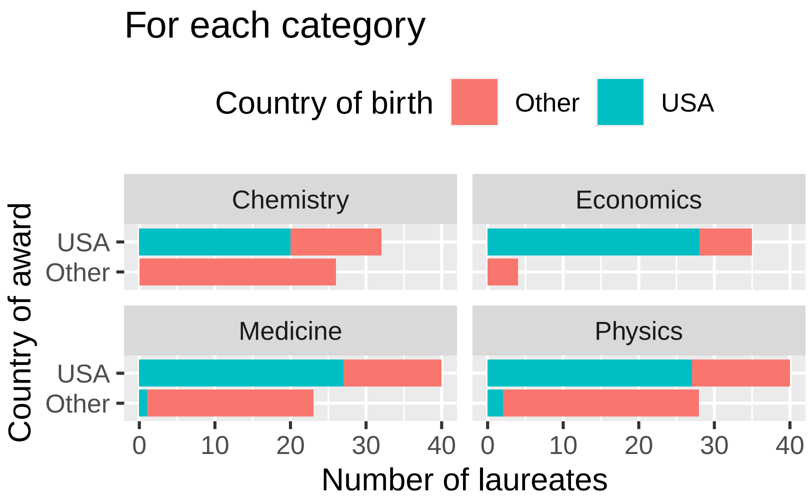
```
nobel_living_science <- nobel_living_science %>%
  mutate(
    born_country_us = if_else(born_country == "USA", "USA", "Other")
  )
sum(nobel_living_science$born_country_us == "USA")
```

```
## [1] 105
```

5. Add a second variable to your visualization from Exercise 3 based on whether the laureate was born in the US or not. Based on your visualization, do the data appear to support Buzzfeed's claim? Explain your reasoning in 1-2 sentences.

```
-   Your final visualization should contain a facet for each category.
-   Within each facet, there should be a bar for whether the laureate won the award in the US or not.
-   Each bar should have segments for whether the laureate was born in the US or not.
```

```
ggplot(nobel_living_science, aes(y = country_us, fill=born_country_us)) +
  facet_wrap(~category) +
  geom_bar(position="stack") +
  theme(legend.position="top") +
  ggtitle("For each category") +
  labs(y="Country of award",fill="Country of birth",x="Number of laureates")
```



6. In a single pipeline, filter for laureates who won their prize in the US, but were born outside of the US, and then create a frequency table (with the `count()` function) for their

birth country (`born_country`) and arrange the resulting data frame in descending order of number of observations for each country. Which country is the most common?

```
nobel_living_science_filtered <- nobel_living_science %>%
filter(country_us == "USA") %>%
filter(born_country_us == "Other")

count(nobel_living_science_filtered, born_country, sort = TRUE)
```

```
## # A tibble: 21 x 2
##    born_country       n
##    <chr>          <int>
##  1 Germany            7
##  2 United Kingdom     7
##  3 China              5
##  4 Canada             4
##  5 Japan              3
##  6 Australia          2
##  7 Israel             2
##  8 Norway             2
##  9 Austria            1
## 10 Finland            1
## # ... with 11 more rows
```

```
print("The most common is Germany and United Kingdom.")
```

```
## [1] "The most common is Germany and United Kingdom."
```