Homework 5

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This homework is due on March 22, 2021 at 11:00pm. Please submit as a pdf file on Canvas.

For both problems in this homework, we will work with the `internet` dataset. It contains the number of internet users over time for 20 select countries. Internet users are reported as percentages.

```
internet <- read_csv("https://wilkelab.org/SDS375/datasets/internet.csv")
internet
```

```
## # A tibble: 460 x 3
##    country         year    users
##    <chr>          <dbl>    <dbl>
##  1 Argentina       1994 0.0437
##  2 Brazil          1994 0.0377
##  3 Canada          1994 2.38
##  4 Chile           1994 0.141
##  5 China           1994 0.00117
##  6 Germany         1994 0.923
##  7 Algeria         1994 0.000361
##  8 France          1994 0.900
##  9 United Kingdom  1994 1.04
## 10 India           1994 0.00107
## # ... with 450 more rows
```

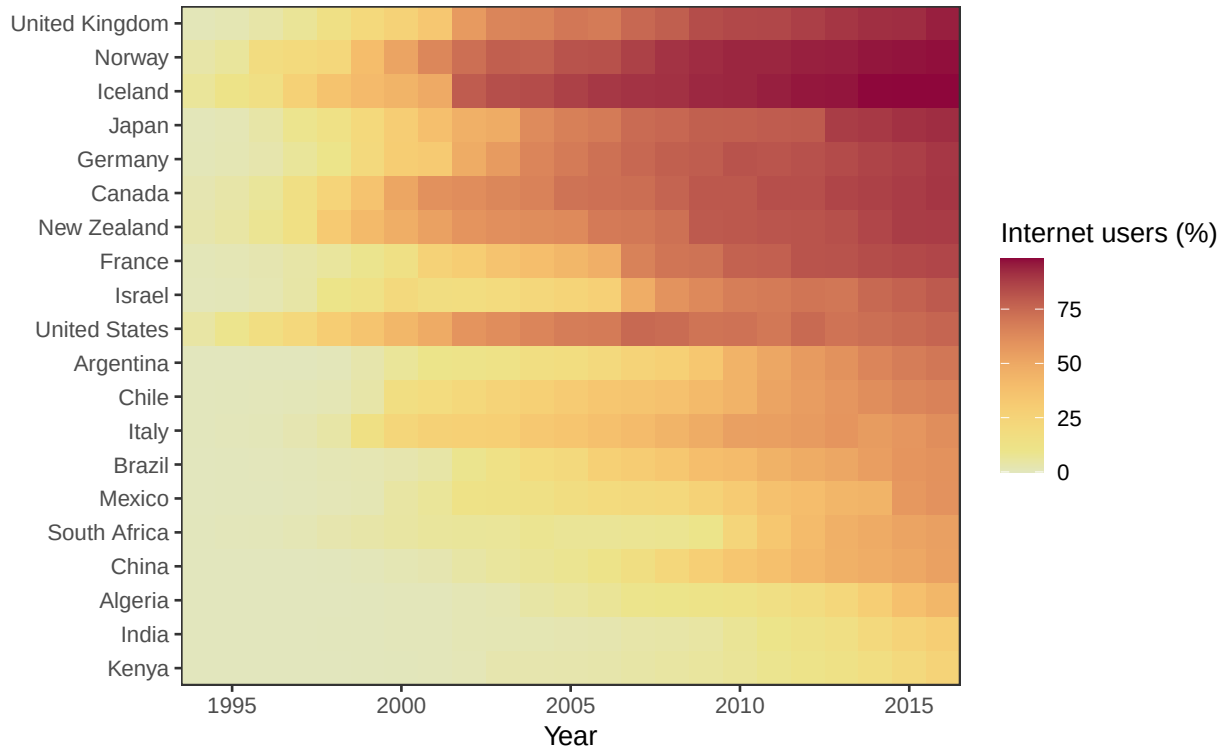
Problem 1: (5 pts)

Take the following plot and make two modifications:

1. Put the countries into a meaningful order
2. Use scale and theme functions to improve the visual design of the plot

Grading rubric: 2 pts for ordering, 3 pts for visual design

```
internet %>%
  # ordered by the increase in percentage of Internet users from 1994 to 2016
  mutate(country = fct_reorder(country, users, function(x){max(x)-min(x)})) %>%
  ggplot(aes(x = year, y = country, fill = users)) +
  scale_x_continuous(name = 'Year', expand = c(0, 0)) +
  scale_y_discrete(name = NULL, expand = c(0, 0)) +
  geom_tile() +
  scale_fill_continuous_sequential(palette = "Heat", name = 'Internet users (%)') +
  theme_bw()
```



Problem 2: (5 pts) Take the plot from the previous problem and make the following modifications:

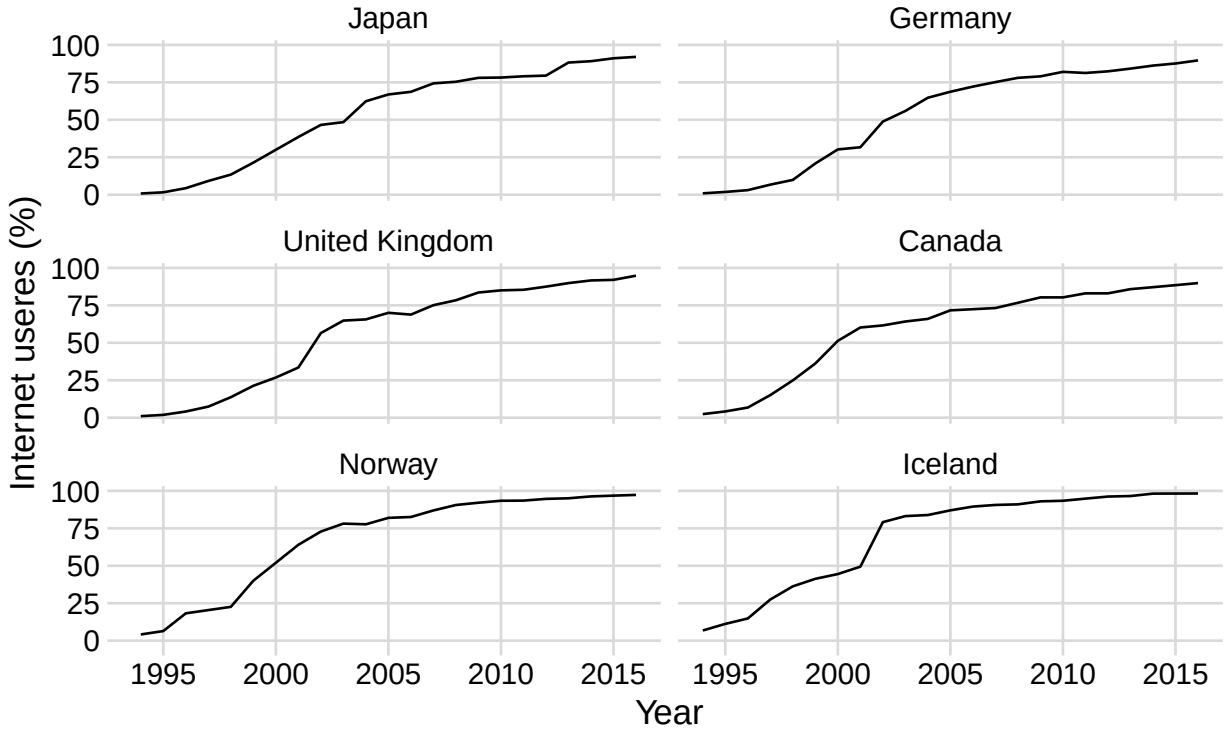
1. Select a subset of 6 countries, using arbitrary criteria
2. Use `geom_line()` to show internet users over time, and use facets to show the different countries
3. Use a different ordering than you used in Problem 1.
4. Modify the visual design so it is appropriate for your new plot

Hint: To get started, see slides 33 to 43 in the class on getting things into the right order: https://wilkelab.org/SDS375/slides/getting-things-in-order.html#33

Grading rubric: 3 pts for making the right plot, 2 pts for visual design

```
# select 6 countries with the largest increase in Internet users
selected_country <-
  c('United Kingdom', 'Norway', 'Iceland', 'Japan', 'Germany', 'Canada')

internet %>%
  filter(country %in% selected_country) %>%
  # ordered by median
  mutate(country = fct_reorder(country, users, median)) %>%
  ggplot(aes(x = year, y = users, group = country)) +
  geom_line() +
  scale_y_continuous(name = 'Internet useres (%)') +
  labs(x = 'Year') +
  facet_wrap(~country, ncol = 2, nrow = 3) +
  theme_minimal_grid()
```


Japan
Germany
United Kingdom
Canada
Norway
Iceland
Internet useres (%)
100
75
50
25
0
1995
2000
2005
2010
2015
Year