Extra

Question 10 for 0.5 extra on Assignment 1

Group number 5: Saif Abdoelrazak, Koert Möllers, Charlotte de Jong

In this bonus exercise, we will be using the `economics` dataset to highlight the Great Recession, which caused a surge in unemployment rates in the United States. We will also be showing the decline in personal consumption during the recession.

First, we declare our libraries

```
library(ISLR)
library(tidyverse)
```

```
## -- Attaching packages -------------------------------- tidyverse 1.3.0 --

## v ggplot2 3.3.0     v purrr   0.3.4
## v tibble  3.0.0     v dplyr   0.8.5
## v tidyr   1.0.2     v stringr 1.4.0
## v readr   1.3.1     v forcats 0.5.0

## -- Conflicts ----------------------------------- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(ggplot2)
```

Then we subset our data, in order to only show data from 2000-01-01 until 2010-12-01

```
economics_subset <- subset(economics,
                           date > "1999-12-01" & date < "2011-01-01")
head(economics_subset)
```

```
## # A tibble: 6 x 6
##   date          pce    pop psavert uempmed unemploy
##   <date>      <dbl>  <dbl>   <dbl>   <dbl>    <dbl>
## 1 2000-01-01 6535. 280976     5.4     5.8     5708
## 2 2000-02-01 6620. 281190     4.8     6.1     5858
## 3 2000-03-01 6686. 281409     4.5     6       5733
## 4 2000-04-01 6671. 281653     5       6.1     5481
## 5 2000-05-01 6708. 281877     4.9     5.8     5758
## 6 2000-06-01 6744. 282126     4.9     5.7     5651
```

```
tail(economics_subset)
```

```
## # A tibble: 6 x 6
##   date          pce     pop psavert uempmed unemploy
##   <date>      <dbl>   <dbl>   <dbl>   <dbl>    <dbl>
## 1 2010-07-01 10185. 309746.     6.8    22.3    14512
## 2 2010-08-01 10228. 309958.     6.9    21       14648
## 3 2010-09-01 10249  310176.     6.7    20.3    14579
## 4 2010-10-01 10305. 310400.     6.6    21.2    14516
## 5 2010-11-01 10355. 310596.     6.6    21       15081
## 6 2010-12-01 10392. 310782.     7.1    21.9    14348
```

Then lastly, we plot our graph which includes an annotation that highlights the great recession

```
ecoplot <- ggplot() +
  geom_line(data = economics_subset, mapping = aes(x = `date`, y = `unemploy`, colour = 'unemployed in
  geom_line(data = economics_subset, mapping = aes(x = `date`, y = `pce`, colour = 'personal consumption
  scale_x_date(date_labels = "20%y", date_breaks = "2 year") +
  labs(title = "Personal Consumption and Unemployment from 2000-2010 in the US")+
  ylab( "Unemployment in thousands/Personal consumption in billions($)") +
  xlab("Date") +
  annotate(geom = "rect", xmin = as.Date("2007-12-01"), xmax = as.Date("2009-06-01"), ymin = 0, ymax =
  annotate(geom = "text", x = as.Date("2008-06-01"), y = 1000, label = "The Great Recession")+
  theme_minimal()

ecoplot
```

Personal Consumption and Unemployment from 2000–2010 in the US

The Great Recession

colour
— personal consumption in billions($)
— unemployed in thousands

Unemployment in thousands/Personal consumption in billions($)

Date