Final Project: World Happiness Report

Lizeth Andrea Castellanos Beltran

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Introduction

The World Happiness Report is a landmark survey of the state of global happiness. The first report was published in 2012, the second in 2013, the third in 2015, and the fourth in the 2016 Update. The World Happiness 2017, which ranks 155 countries by their happiness levels, was released at the United Nations at an event celebrating International Day of Happiness on March 20th. The report continues to gain global recognition as governments, organizations and civil society increasingly use happiness indicators to inform their policy-making decisions. Leading experts across fields – economics, psychology, survey analysis, national statistics, health, public policy and more – describe how measurements of well-being can be used effectively to assess the progress of nations. The reports review the state of happiness in the world today and show how the new science of happiness explains personal and national variations in happiness.

Data

The happiness scores and rankings use data from the Gallup World Poll. The scores are based on answers to the main life evaluation question asked in the poll. This question, known as the Cantril ladder, asks respondents to think of a ladder with the best possible life for them being a 10 and the worst possible life being a 0 and to rate their own current lives on that scale. The scores are from nationally representative samples for the years 2013-2016 and use the Gallup weights to make the estimates representative. The columns following the happiness score estimate the extent to which each of six factors:

1. Economic production
2. Social support
3. Life expectancy
4. Freedom
5. Absence of corruption
6. Generosity

All factors contribute to making life evaluations higher in each country than they are in Dystopia, a hypothetical country that has values equal to the world's lowest national averages for each of the six factors.

Download the data

The data set for the year 2015 is available in the kaggle website: https://www.kaggle.com/unsdsn/world-happiness/data Because of kaggle site requires to login to make the download, I am providing the dataset in the github directory.

Supposing you have logged in the kaggle site, the URL for the CSV file is https://www.kaggle.com/unsdsn/world-happiness/downloads/2015.csv

Column Metadata

- Read the data(If you have the file in the local directory)

```
library(readr)
df <- read_csv("2015.csv")
```

```
## Parsed with column specification:
## cols(
##   Country = col_character(),
##   Region = col_character(),
##   `Happiness Rank` = col_integer(),
##   `Happiness Score` = col_double(),
##   `Standard Error` = col_double(),
##   `Economy (GDP per Capita)` = col_double(),
##   Family = col_double(),
##   `Health (Life Expectancy)` = col_double(),
##   Freedom = col_double(),
##   `Trust (Government Corruption)` = col_double(),
##   Generosity = col_double(),
##   `Dystopia Residual` = col_double()
## )
```

```
df;
```

```
## # A tibble: 158 x 12
##        Country                    Region `Happiness Rank`
##          <chr>                     <chr>            <int>
##  1 Switzerland           Western Europe                1
##  2     Iceland           Western Europe                2
##  3     Denmark           Western Europe                3
##  4      Norway           Western Europe                4
##  5      Canada            North America                5
##  6     Finland           Western Europe                6
##  7 Netherlands           Western Europe                7
##  8      Sweden           Western Europe                8
##  9 New Zealand Australia and New Zealand               9
## 10   Australia Australia and New Zealand              10
## # ... with 148 more rows, and 9 more variables: `Happiness Score` <dbl>,
## #   `Standard Error` <dbl>, `Economy (GDP per Capita)` <dbl>,
## #   Family <dbl>, `Health (Life Expectancy)` <dbl>, Freedom <dbl>, `Trust
## #   (Government Corruption)` <dbl>, Generosity <dbl>, `Dystopia
## #   Residual` <dbl>
```

Goal and Question

I will to try to answer this question: What countries or regions rank the highest in overall happiness and each of the six factors contributing to happiness?

Lucas said: “The countries are already ranked, as you can see in the column”Happiness Rank“. It would be indeed interesting to check whether a certain factor contribute more to the overall happiness than others. Please, be extremely rigorous in your report, justifying your choices following the LP methodology.”

Load the necessary packages:

```
library(dplyr);
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(magrittr);
library(ggplot2);
```

Grafica happiness score

```
library(readr)
library(ggplot2)
df <- read_csv("2015.csv")
```

```
## Parsed with column specification:
## cols(
##   Country = col_character(),
##   Region = col_character(),
##   `Happiness Rank` = col_integer(),
##   `Happiness Score` = col_double(),
##   `Standard Error` = col_double(),
##   `Economy (GDP per Capita)` = col_double(),
##   Family = col_double(),
##   `Health (Life Expectancy)` = col_double(),
##   Freedom = col_double(),
##   `Trust (Government Corruption)` = col_double(),
##   Generosity = col_double(),
##   `Dystopia Residual` = col_double()
## )
```

```
df;
```

```
## # A tibble: 158 x 12
##        Country                    Region `Happiness Rank`
##          <chr>                     <chr>            <int>
##  1 Switzerland           Western Europe                1
##  2     Iceland           Western Europe                2
##  3     Denmark           Western Europe                3
##  4      Norway           Western Europe                4
##  5      Canada            North America                5
##  6     Finland           Western Europe                6
##  7 Netherlands           Western Europe                7
##  8      Sweden           Western Europe                8
##  9 New Zealand Australia and New Zealand               9
## 10   Australia Australia and New Zealand              10
## # ... with 148 more rows, and 9 more variables: `Happiness Score` <dbl>,
## #   `Standard Error` <dbl>, `Economy (GDP per Capita)` <dbl>,
## #   Family <dbl>, `Health (Life Expectancy)` <dbl>, Freedom <dbl>, `Trust
## #   (Government Corruption)` <dbl>, Generosity <dbl>, `Dystopia
## #   Residual` <dbl>
```

```
df %>%
 #arrange(`Happiness Rank`) %>%
 head(10) %>%
 mutate(Country = factor(Country, levels = rev(Country))) %>%
 ggplot(aes(x=Country, y=`Happiness Score`,fill = `Happiness Score`)) +
 geom_bar(stat = "identity") + #position = position_stack(reverse = TRUE)) +
 coord_flip() + theme_bw() +
 scale_fill_gradient(low = "yellow ", high = "green ")+
 theme(legend.position = "top")
```


```
library(readr)
df <- read_csv("2015.csv")
```

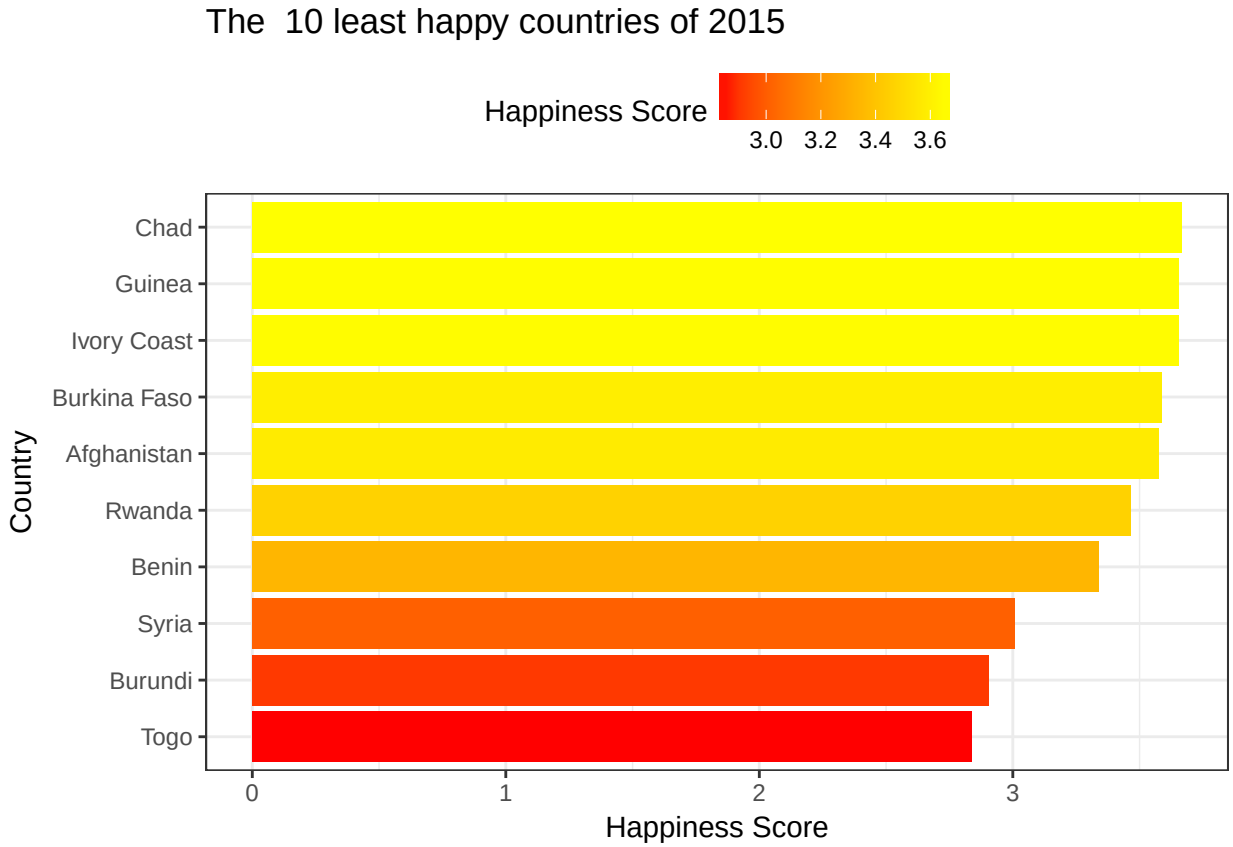
```
## Parsed with column specification:
## cols(
##   Country = col_character(),
##   Region = col_character(),
##   `Happiness Rank` = col_integer(),
##   `Happiness Score` = col_double(),
##   `Standard Error` = col_double(),
##   `Economy (GDP per Capita)` = col_double(),
##   Family = col_double(),
##   `Health (Life Expectancy)` = col_double(),
##   Freedom = col_double(),
##   `Trust (Government Corruption)` = col_double(),
##   Generosity = col_double(),
```

```
##   `Dystopia Residual` = col_double()
## )
```

```
df;
```

```
## # A tibble: 158 x 12
##        Country                    Region `Happiness Rank`
##          <chr>                     <chr>            <int>
##  1 Switzerland            Western Europe                1
##  2     Iceland            Western Europe                2
##  3     Denmark            Western Europe                3
##  4      Norway            Western Europe                4
##  5      Canada             North America                5
##  6     Finland            Western Europe                6
##  7 Netherlands            Western Europe                7
##  8      Sweden            Western Europe                8
##  9 New Zealand Australia and New Zealand                9
## 10   Australia Australia and New Zealand               10
## # ... with 148 more rows, and 9 more variables: `Happiness Score` <dbl>,
## #   `Standard Error` <dbl>, `Economy (GDP per Capita)` <dbl>,
## #   Family <dbl>, `Health (Life Expectancy)` <dbl>, Freedom <dbl>, `Trust
## #   (Government Corruption)` <dbl>, Generosity <dbl>, `Dystopia
## #   Residual` <dbl>
```

```
df %>%
  #arrange(`Happiness Rank`) %>%
  tail(10) %>%
  mutate(Country = factor(Country, levels = rev(Country))) %>%
  ggplot(aes(x=Country, y=`Happiness Score`,fill = `Happiness Score`)) +
    geom_bar(stat = "identity") + #position = position_stack(reverse = TRUE)) +
  coord_flip() + theme_bw() +
  ggtitle("The  10 least happy countries of 2015") +
  scale_fill_gradient(low = "red ", high = "yellow")+
  theme(legend.position = "top")
```




```
df %>% head(n=2);
```

```
## # A tibble: 2 x 12
##       Country         Region `Happiness Rank` `Happiness Score`
##         <chr>          <chr>            <int>             <dbl>
## 1 Switzerland Western Europe                1             7.587
## 2     Iceland Western Europe                2             7.561
## # ... with 8 more variables: `Standard Error` <dbl>, `Economy (GDP per
## #   Capita)` <dbl>, Family <dbl>, `Health (Life Expectancy)` <dbl>,
## #   Freedom <dbl>, `Trust (Government Corruption)` <dbl>,
## #   Generosity <dbl>, `Dystopia Residual` <dbl>
```

```
df %>% filter(Region == "Western Europe");
```

```
## # A tibble: 21 x 12
##        Country         Region `Happiness Rank` `Happiness Score`
##          <chr>          <chr>            <int>             <dbl>
##  1 Switzerland Western Europe                1             7.587
##  2     Iceland Western Europe                2             7.561
##  3     Denmark Western Europe                3             7.527
##  4      Norway Western Europe                4             7.522
##  5     Finland Western Europe                6             7.406
##  6 Netherlands Western Europe                7             7.378
##  7      Sweden Western Europe                8             7.364
##  8     Austria Western Europe               13             7.200
##  9  Luxembourg Western Europe               17             6.946
## 10     Ireland Western Europe               18             6.940
```

```
## # ... with 11 more rows, and 8 more variables: `Standard Error` <dbl>,
## #   `Economy (GDP per Capita)` <dbl>, Family <dbl>, `Health (Life
## #   Expectancy)` <dbl>, Freedom <dbl>, `Trust (Government
## #   Corruption)` <dbl>, Generosity <dbl>, `Dystopia Residual` <dbl>
```

```
df %>% group_by(Region) %>% summarize(occurrence=n());
```

```
## # A tibble: 10 x 2
##                            Region occurrence
##                             <chr>      <int>
##  1       Australia and New Zealand          2
##  2      Central and Eastern Europe         29
##  3                  Eastern Asia          6
##  4     Latin America and Caribbean         22
##  5 Middle East and Northern Africa         20
##  6                  North America          2
##  7               Southeastern Asia          9
##  8                   Southern Asia          7
##  9              Sub-Saharan Africa         40
## 10                  Western Europe         21
```

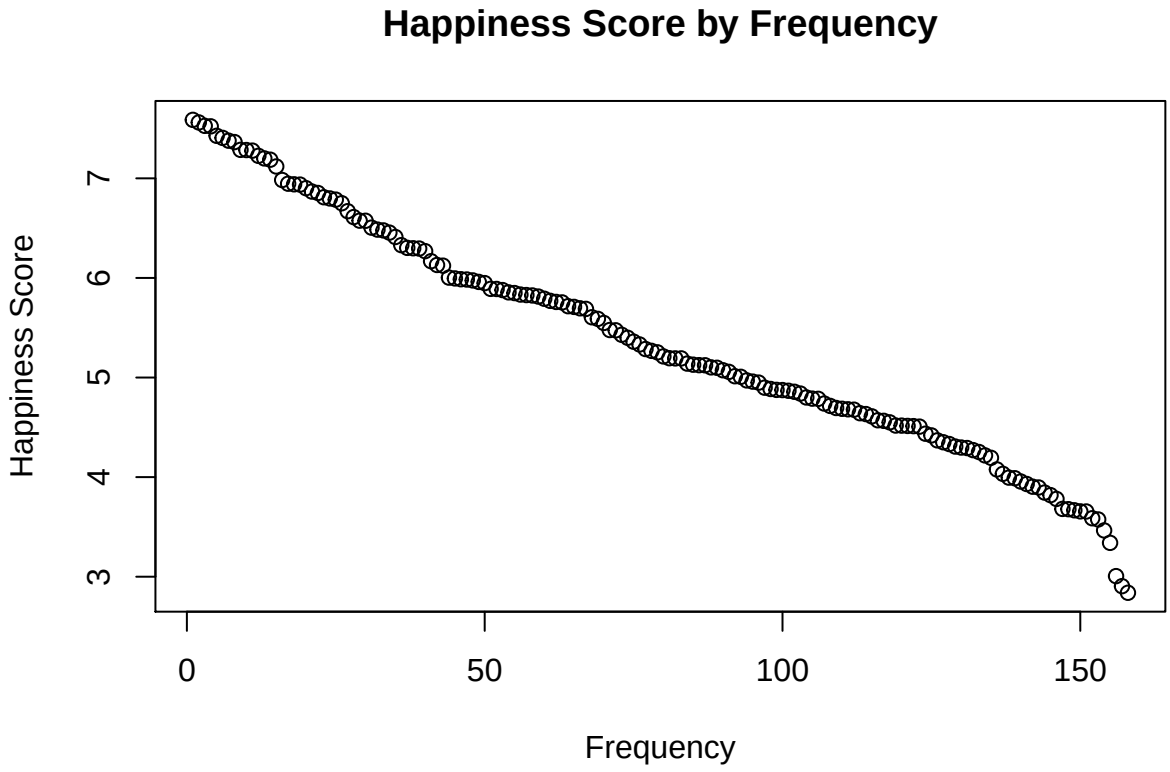
```
summary(df)
```

```
##    Country             Region          Happiness Rank   Happiness Score
##  Length:158         Length:158         Min.   :  1.00   Min.   :2.839
##  Class :character   Class :character   1st Qu.: 40.25   1st Qu.:4.526
##  Mode  :character   Mode  :character   Median : 79.50   Median :5.232
##                                        Mean   : 79.49   Mean   :5.376
##                                        3rd Qu.:118.75   3rd Qu.:6.244
##                                        Max.   :158.00   Max.   :7.587
##  Standard Error    Economy (GDP per Capita)     Family
##  Min.   :0.01848   Min.   :0.0000           Min.   :0.0000
##  1st Qu.:0.03727   1st Qu.:0.5458           1st Qu.:0.8568
##  Median :0.04394   Median :0.9102           Median :1.0295
##  Mean   :0.04788   Mean   :0.8461           Mean   :0.9910
##  3rd Qu.:0.05230   3rd Qu.:1.1584           3rd Qu.:1.2144
##  Max.   :0.13693   Max.   :1.6904           Max.   :1.4022
##  Health (Life Expectancy)    Freedom       Trust (Government Corruption)
##  Min.   :0.0000           Min.   :0.0000   Min.   :0.00000
##  1st Qu.:0.4392           1st Qu.:0.3283   1st Qu.:0.06168
##  Median :0.6967           Median :0.4355   Median :0.10722
##  Mean   :0.6303           Mean   :0.4286   Mean   :0.14342
##  3rd Qu.:0.8110           3rd Qu.:0.5491   3rd Qu.:0.18025
##  Max.   :1.0252           Max.   :0.6697   Max.   :0.55191
##    Generosity     Dystopia Residual
##  Min.   :0.0000   Min.   :0.3286
##  1st Qu.:0.1506   1st Qu.:1.7594
##  Median :0.2161   Median :2.0954
##  Mean   :0.2373   Mean   :2.0990
##  3rd Qu.:0.3099   3rd Qu.:2.4624
##  Max.   :0.7959   Max.   :3.6021
```

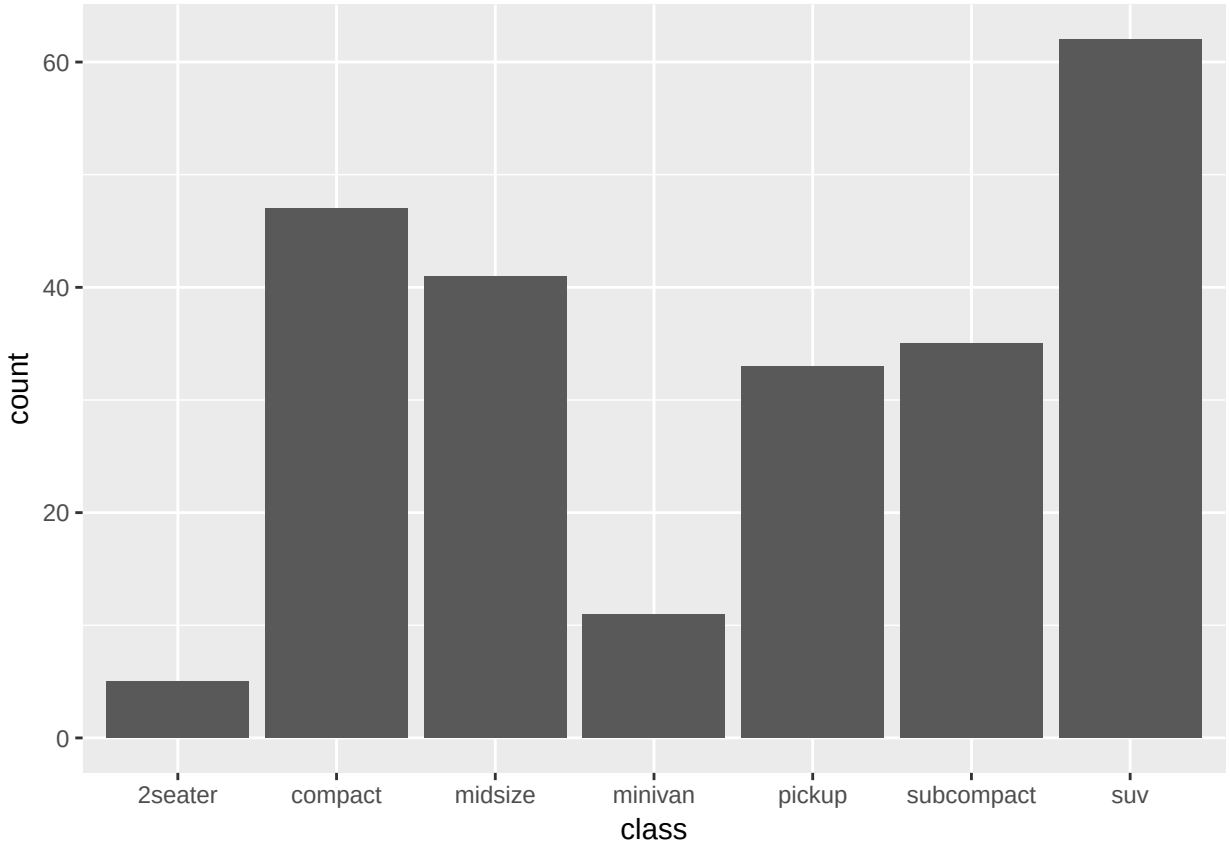
```
summary(df$`Happiness Score`)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   2.839   4.526   5.232   5.376   6.244   7.587
```

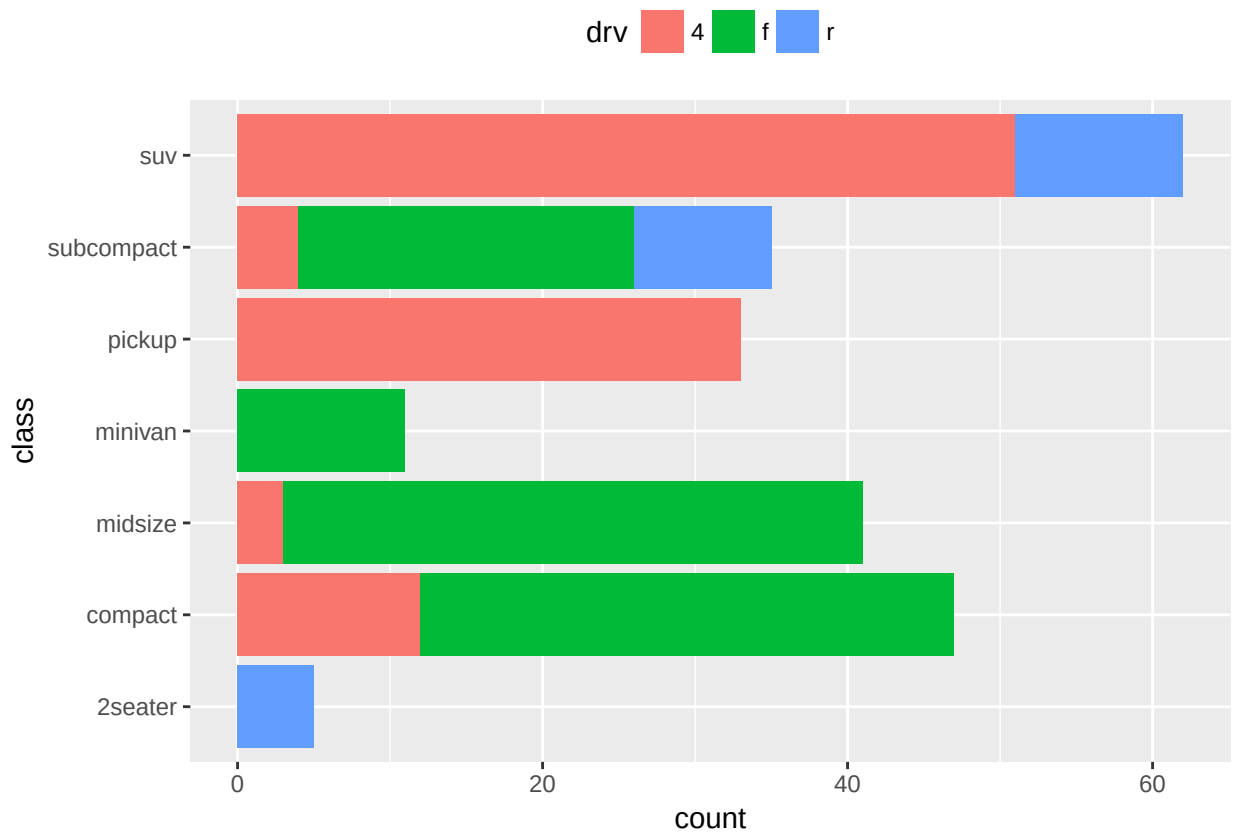
```r
plot(df$`Happiness Score`, main = "Happiness Score by Frequency", ylab="Happiness Score", xlab="Frequen
```




```r
g <- ggplot(mpg, aes(class))
g + geom_bar()
```




```
g +
 geom_bar(aes(fill = drv), position = position_stack(reverse = TRUE)) +
 coord_flip() +
 theme(legend.position = "top")
```



Answer of the Question