RWorksheet_Soldevilla#4c.Rmd

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```r
install.packages("ggplot2")
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.3'
## (as 'lib' is unspecified)
```

```r
install.packages("dplyr")
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.3'
## (as 'lib' is unspecified)
```

```r
install.packages("tidyverse")
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.3'
## (as 'lib' is unspecified)
```

#1

#1a

```r
# Show your solutions on how to import a csv file into the environment
library(readr)
mpg <- read_csv("mpg.csv")
```

```
## New names:
## Rows: 234 Columns: 12
## -- Column specification
## -------------------------------------------------------- Delimiter: "," chr
## (6): manufacturer, model, trans, drv, fl, class dbl (6): ...1, displ, year,
## cyl, cty, hwy
## i Use `spec()` to retrieve the full column specification for this data. i
## Specify the column types or set `show_col_types = FALSE` to quiet this message.
## * `` -> `...1`
```

```r
mpg
```

```
## # A tibble: 234 x 12
##     ...1 manufacturer model      displ  year   cyl trans drv     cty   hwy fl
##    <dbl> <chr>        <chr>      <dbl> <dbl> <dbl> <chr> <chr> <dbl> <dbl> <chr>
##  1     1 audi         a4           1.8  1999     4 auto~ f        18    29 p
##  2     2 audi         a4           1.8  1999     4 manu~ f        21    29 p
##  3     3 audi         a4           2    2008     4 manu~ f        20    31 p
##  4     4 audi         a4           2    2008     4 auto~ f        21    30 p
##  5     5 audi         a4           2.8  1999     6 auto~ f        16    26 p
##  6     6 audi         a4           2.8  1999     6 manu~ f        18    26 p
##  7     7 audi         a4           3.1  2008     6 auto~ f        18    27 p
##  8     8 audi         a4 quattro   1.8  1999     4 manu~ 4        18    26 p
##  9     9 audi         a4 quattro   1.8  1999     4 auto~ 4        16    25 p
## 10    10 audi         a4 quattro   2    2008     4 manu~ 4        20    28 p
## # i 224 more rows
## # i 1 more variable: class <chr>
```

#1b

```
#  Which variables from mpg dataset are categorical?

#The variables that are categorical in mpg dataset are manufacturer, model, trans, drv, and fl.
```

#1c

```
#Which are continuous variables?

#The continuous variables in the mpg dataset are displ, year, cyl, cty, and hwy.
```

#2

```
#Which manufacturer has the most models in this data set? Which model has the most variations? Show you

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
```

```
manufacturer_most_models <- mpg %>%
  group_by(manufacturer) %>%
  summarize(number_of_models = n_distinct(model)) %>%
  top_n(1, number_of_models)
model_most_variations <- mpg %>%
  group_by(model) %>%
  summarize(number_of_variations = n_distinct(trans)) %>%
  top_n(1, number_of_variations)
cat("Manufacturer with the most models:", manufacturer_most_models$manufacturer, "\n")
```

```
## Manufacturer with the most models: toyota
```

```
cat("Model with the most variations:", model_most_variations$model, "\n")
```

```
## Model with the most variations: a4 a4 quattro altima camry civic dakota pickup 4wd explorer 4wd gti
```

#2a

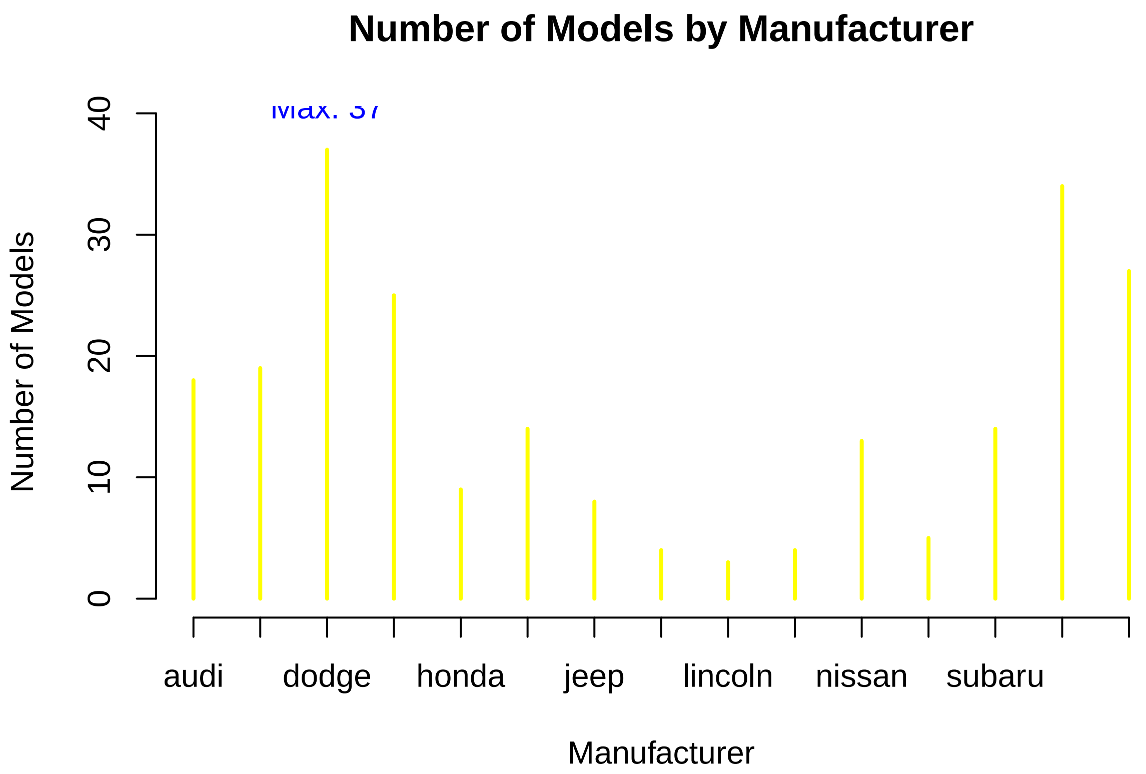
```
#  Group the manufacturers and find the unique models. Show your codes and result.

library(dplyr)
unique_models_by_manufacturer <- mpg %>%
  group_by(manufacturer) %>%
  distinct(model)
print(unique_models_by_manufacturer)
```

```
## # A tibble: 38 x 2
## # Groups:   manufacturer [15]
##    manufacturer model
##    <chr>        <chr>
##  1 audi         a4
##  2 audi         a4 quattro
##  3 audi         a6 quattro
##  4 chevrolet    c1500 suburban 2wd
##  5 chevrolet    corvette
##  6 chevrolet    k1500 tahoe 4wd
##  7 chevrolet    malibu
##  8 dodge        caravan 2wd
##  9 dodge        dakota pickup 4wd
## 10 dodge        durango 4wd
## # i 28 more rows
```

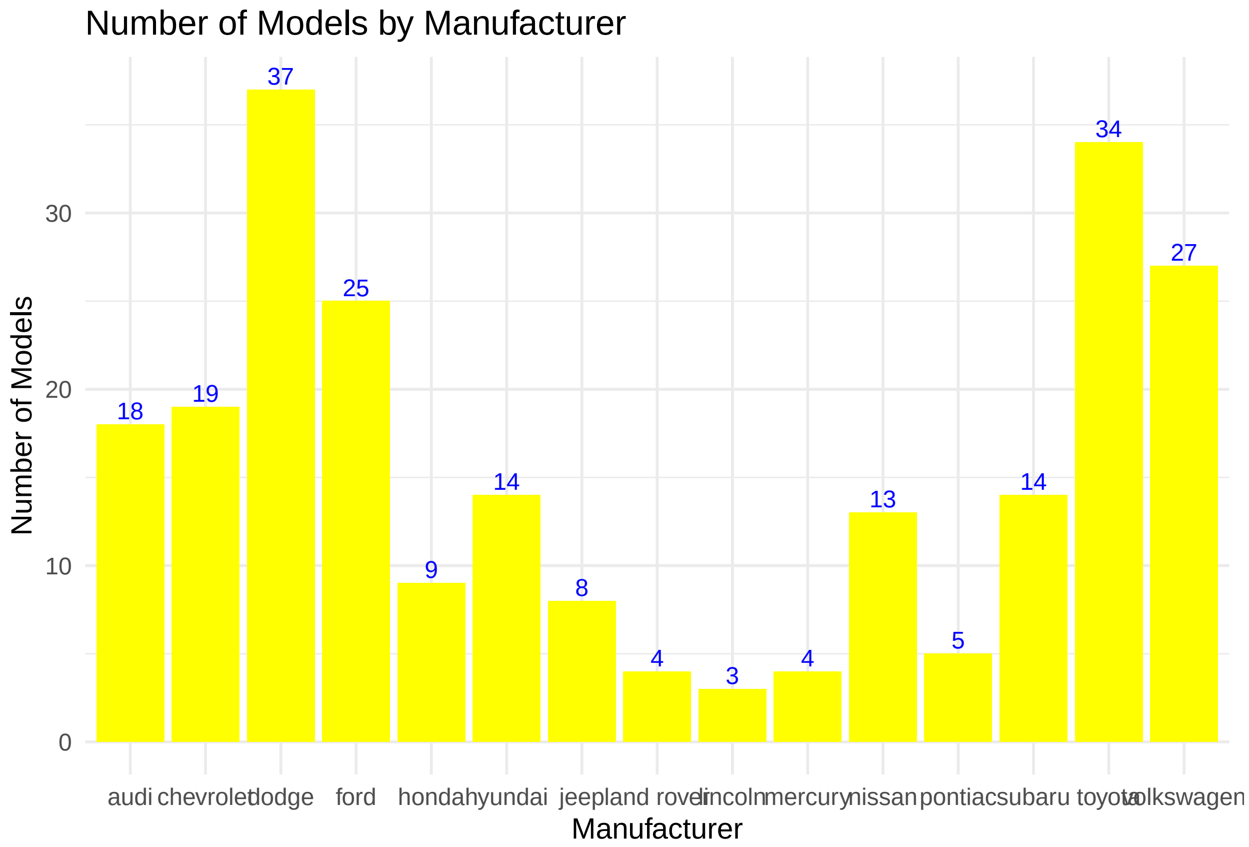
#2b

```r
# Graph the result by using plot() and ggplot(). Write the codes and its result.

models_per_manufacturer <- table(mpg$manufacturer)

#Using plot()
plot(models_per_manufacturer,
     main = "Number of Models by Manufacturer",
     xlab = "Manufacturer",
     ylab = "Number of Models",
     col = "yellow",
     ylim = c(0, max(models_per_manufacturer) + 2))

max_manufacturer <- which.max(models_per_manufacturer)
text(max_manufacturer, models_per_manufacturer[max_manufacturer] + 1,
     labels = paste("Max:", max(models_per_manufacturer)),
     col = "blue", pos = 3)

library(ggplot2)
```

```
##
## Attaching package: 'ggplot2'

## The following object is masked _by_ '.GlobalEnv':
##
##     mpg
```

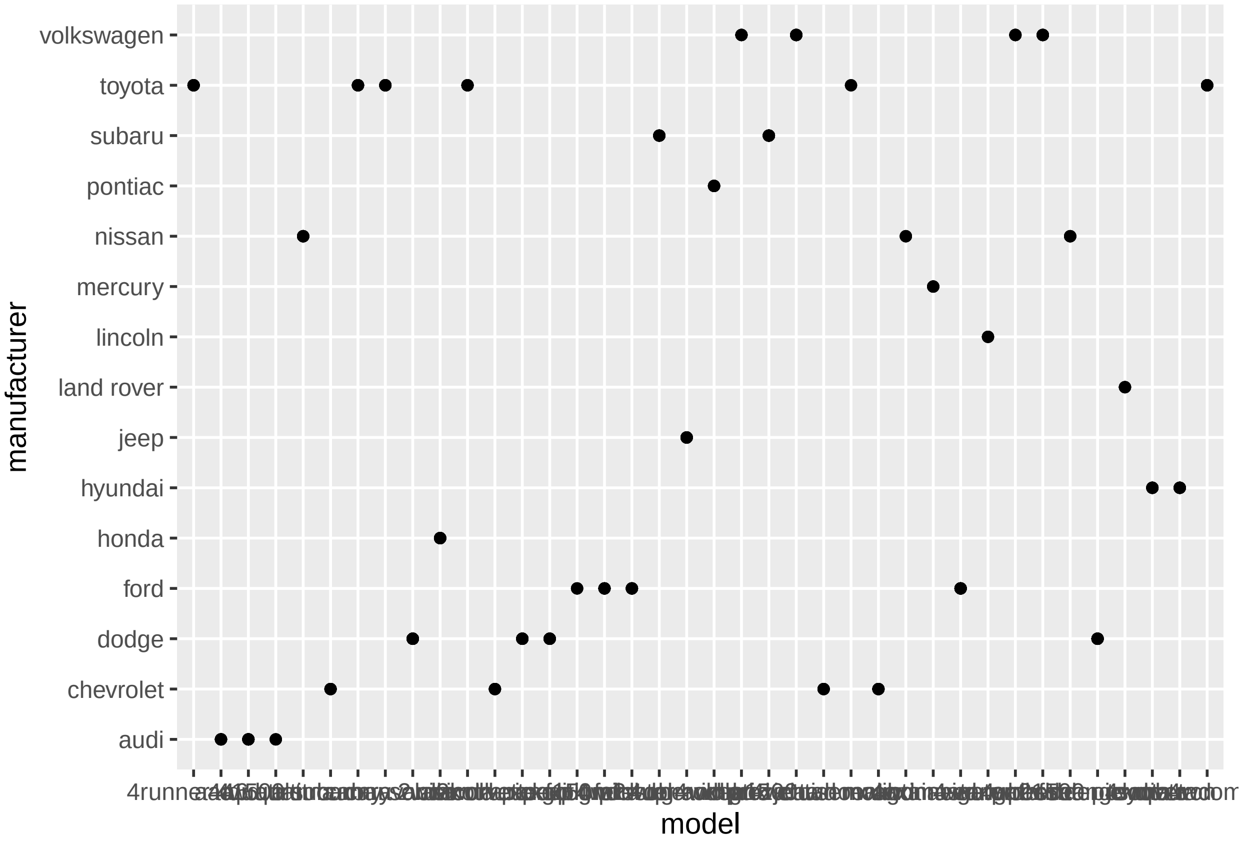


```
#Using ggplot2
ggplot(data = as.data.frame(models_per_manufacturer), aes(x = Var1, y = Freq)) +
  geom_bar(stat = "identity", fill = "yellow") +
  labs(title = "Number of Models by Manufacturer",
       x = "Manufacturer",
       y = "Number of Models") +
  geom_text(aes(label = Freq), vjust = -0.3, col = "blue", size = 3) +
  theme_minimal()
```



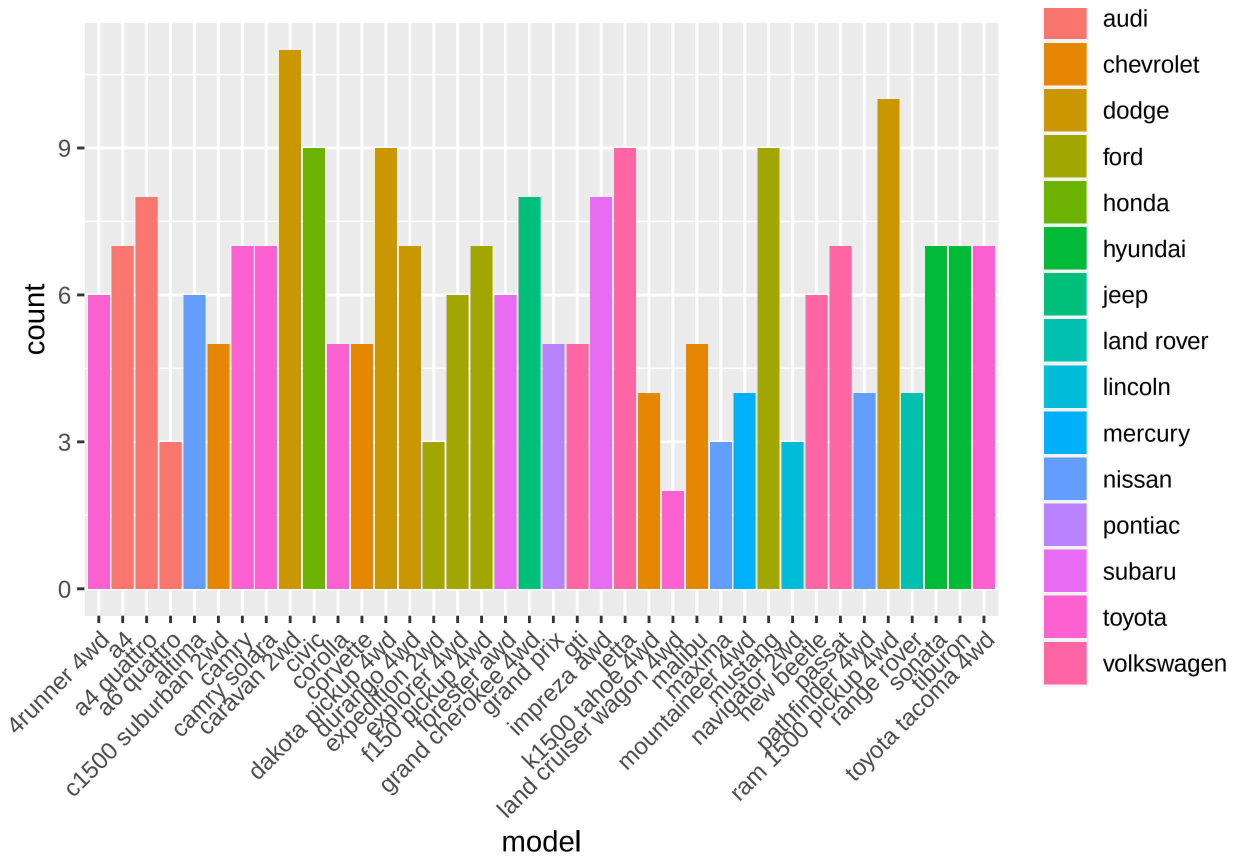
#2aa

```
# Same dataset will be used. You are going to show the relationship of the model and the manufacturer.

library(ggplot2)
ggplot(mpg, aes(model, manufacturer)) +
  geom_point()
```



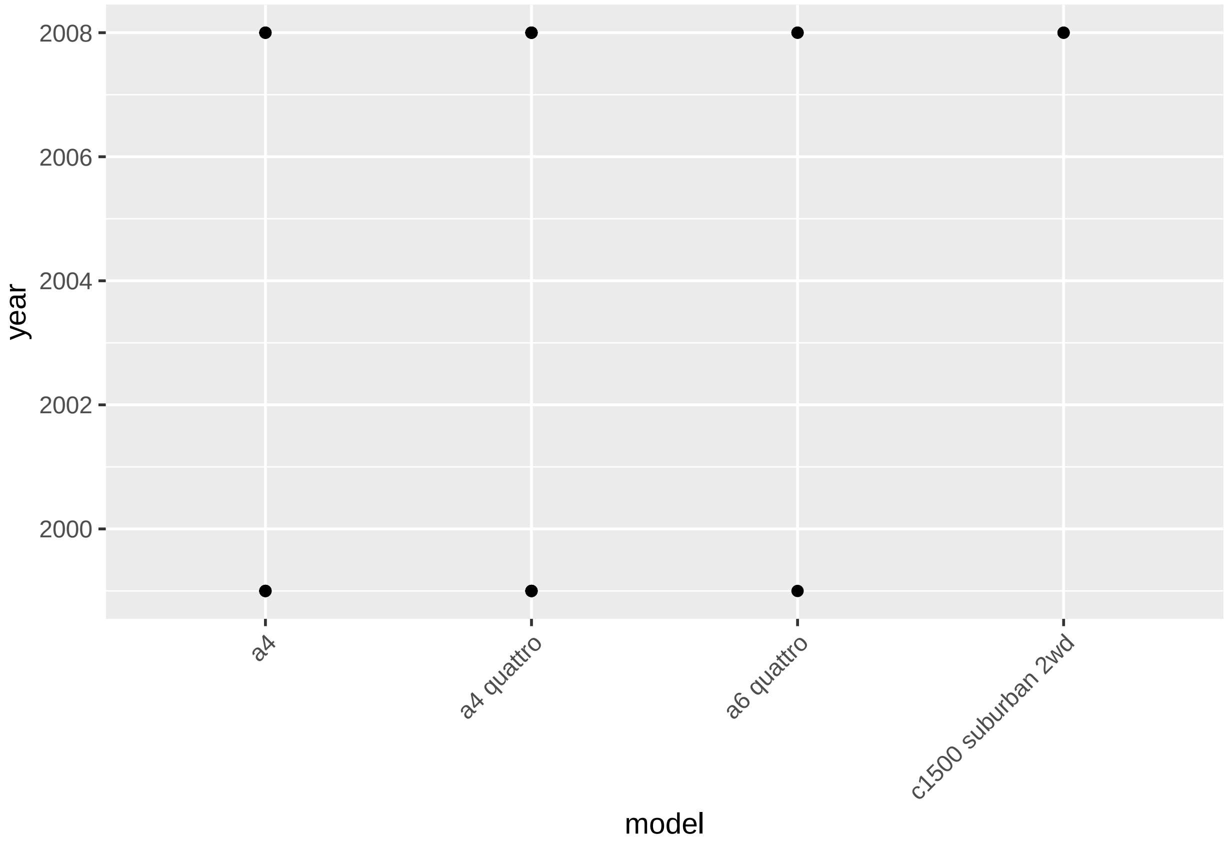
#2bb

```
# The plot might not be very informative because it's attempting to create a scatter plot using categor

#Tallying Data
library(ggplot2)
ggplot(mpg, aes(model, fill = manufacturer)) +
  geom_bar(position = "dodge") +
  theme(axis.text.x = element_text(angle = 45, hjust = 1))
```



#3

```
#Plot the model and the year using ggplot(). Use only the top 20 observations. Write the codes and its 

library(ggplot2)
top_20 <- head(mpg, 20)
ggplot(top_20, aes(model, year)) +
  geom_point() +
  theme(axis.text.x = element_text(angle = 45, hjust = 1))
```



#4

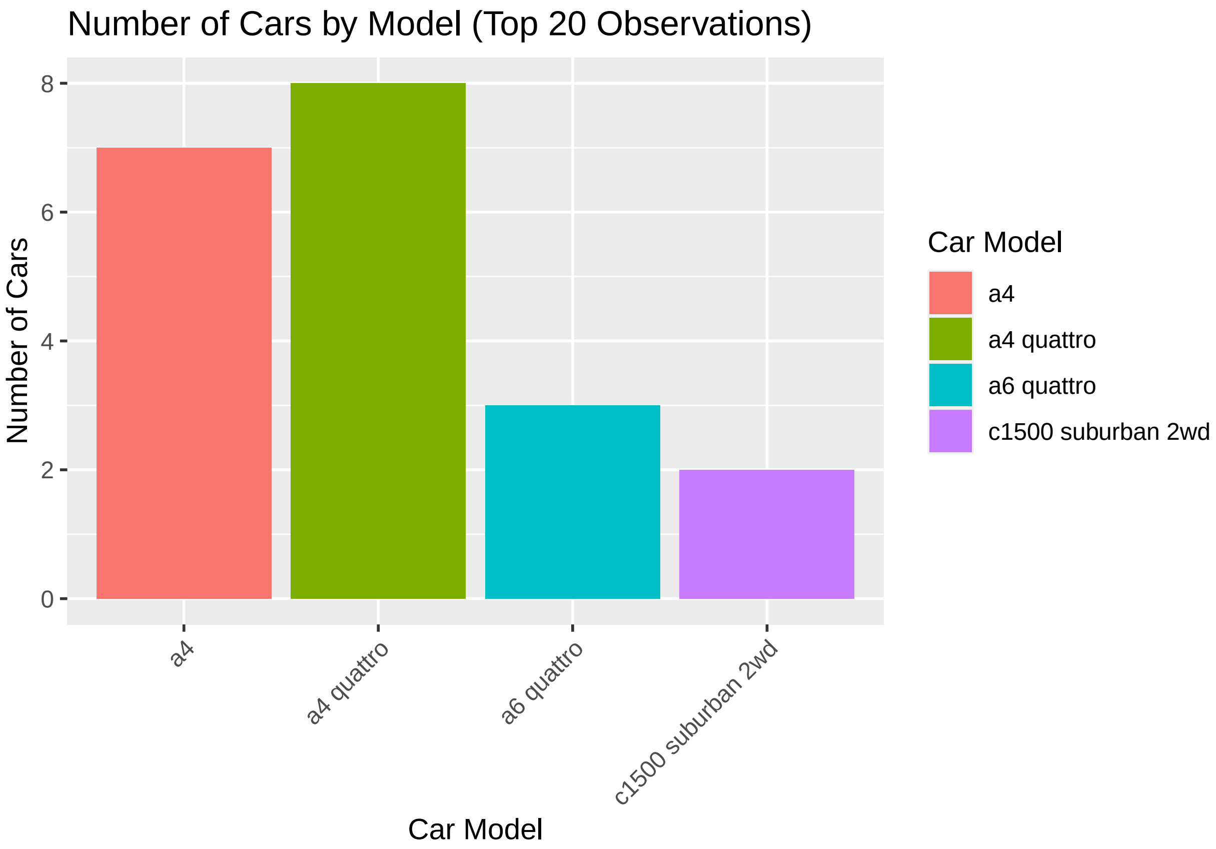
```
# Using the pipe (%>%), group the model and get the number of cars per model. Show codes and its result

library(dplyr)
car_counts <- mpg %>%
  group_by(model) %>%
  summarize(number_of_cars = n())
print(car_counts)
```

```
## # A tibble: 38 x 2
##    model              number_of_cars
##    <chr>                       <int>
##  1 4runner 4wd                     6
##  2 a4                              7
##  3 a4 quattro                      8
##  4 a6 quattro                      3
##  5 altima                          6
##  6 c1500 suburban 2wd              5
##  7 camry                           7
##  8 camry solara                    7
##  9 caravan 2wd                    11
## 10 civic                           9
## # i 28 more rows
```

#4a

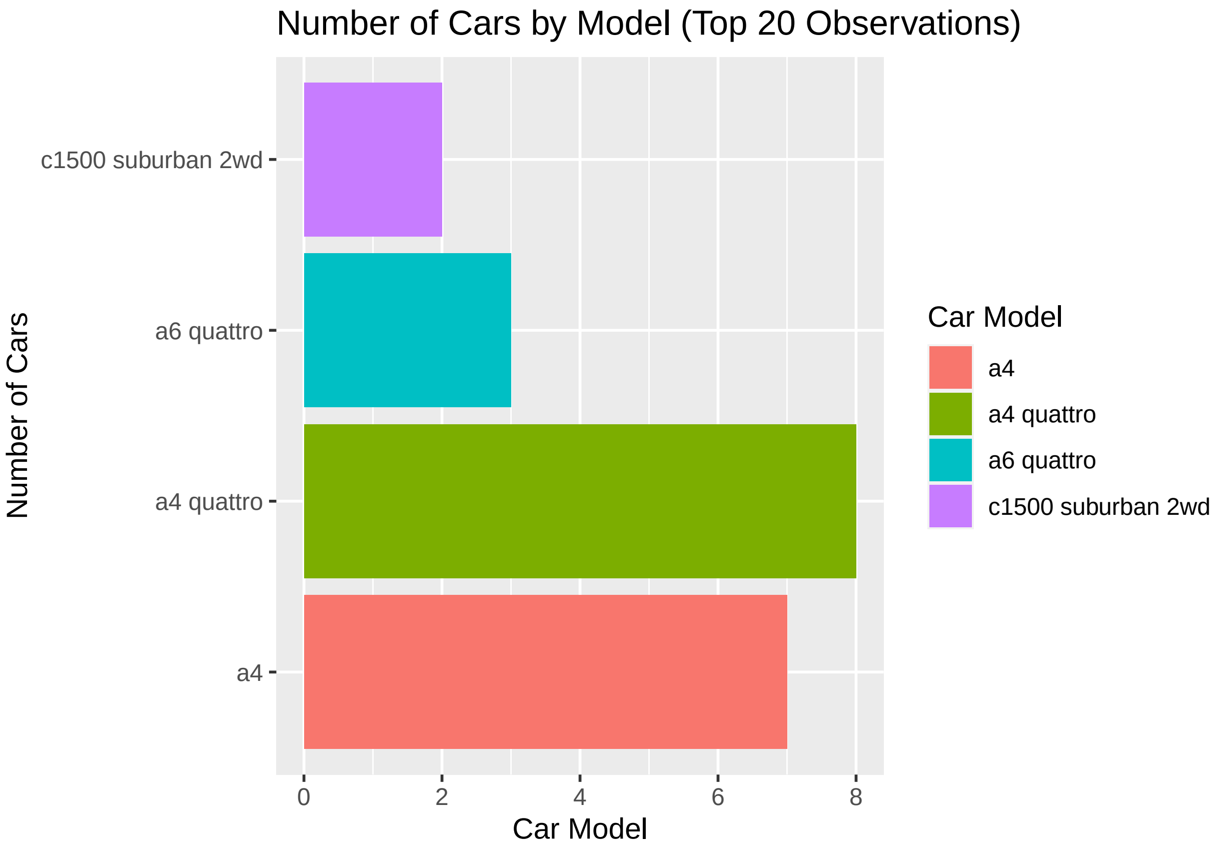
```
# a. Plot using geom_bar() using the top 20 observations only. The graphs should have a title, labels a
```

```r
library(ggplot2)
top_20 <- head(mpg, 20)
ggplot(top_20, aes(x = model, fill = factor(model))) +
  geom_bar() +
  labs(title = "Number of Cars by Model (Top 20 Observations)",
       x = "Car Model",
       y = "Number of Cars") +
  scale_fill_discrete(name = "Car Model") +
  theme(axis.text.x = element_text(angle = 45, hjust = 1))
```



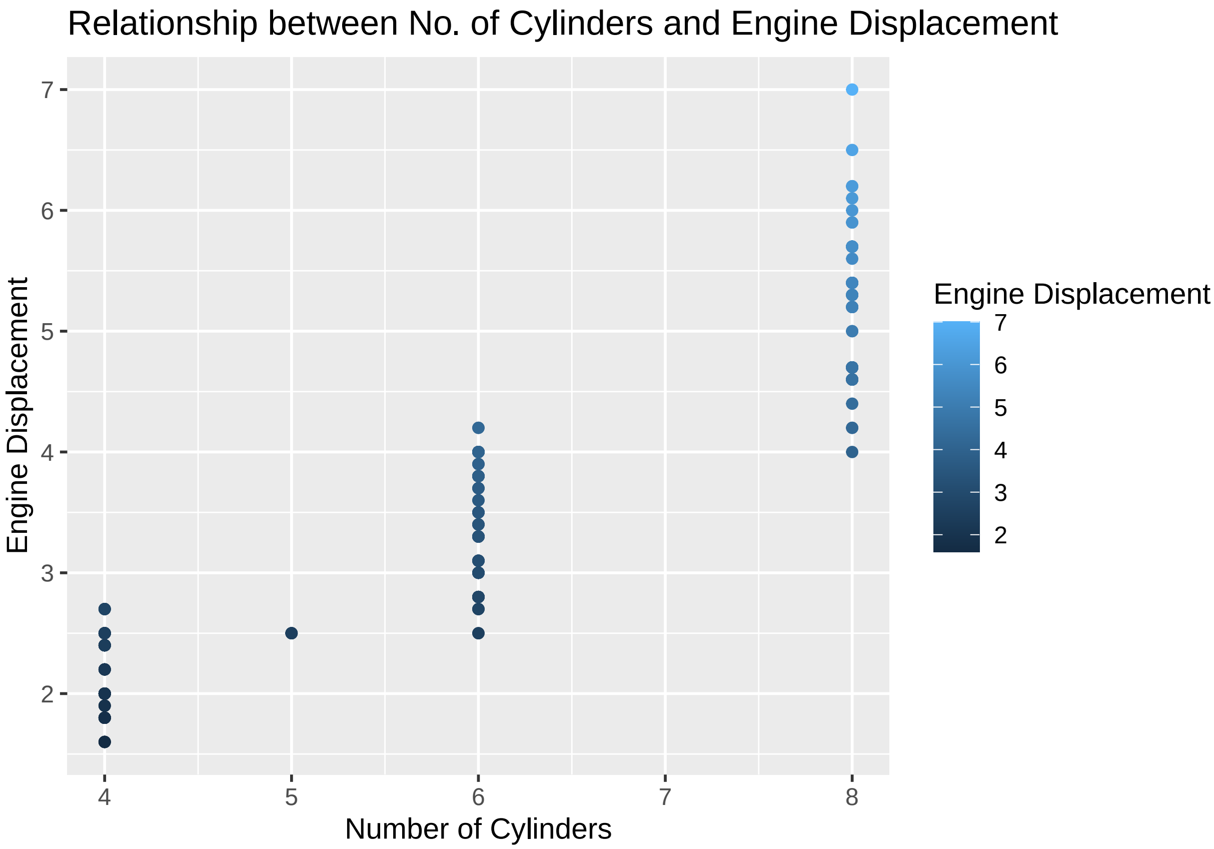
#4b

```r
# Plot using the geom_bar() + coord_flip() just like what is shown below. Show codes and its result.

library(ggplot2)
top_20 <- head(mpg, 20)
ggplot(top_20, aes(x = model, fill = factor(model))) +
  geom_bar() +
  labs(title = "Number of Cars by Model (Top 20 Observations)",
       x = "Number of Cars",
       y = "Car Model") +
  scale_fill_discrete(name = "Car Model") +
  coord_flip()
```



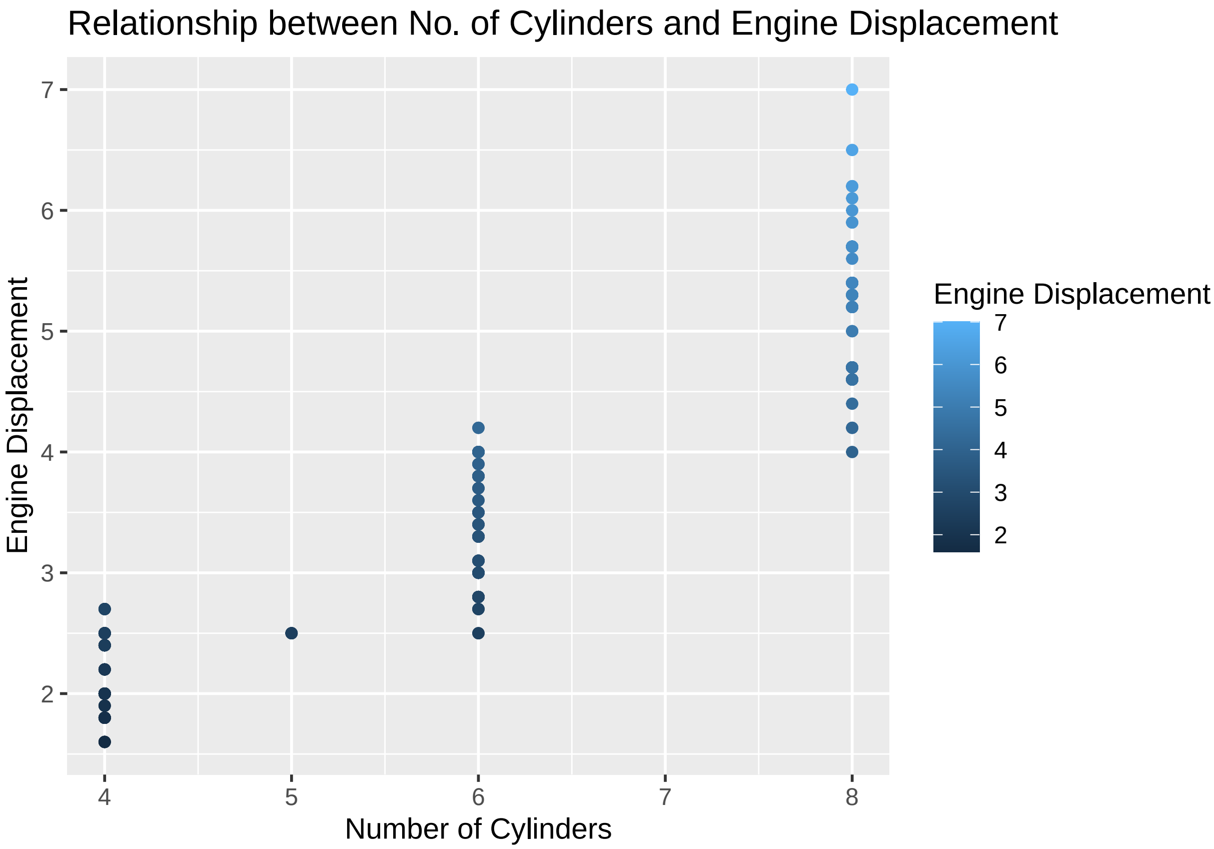
#5

```r
# Plot the relationship between cyl - number of cylinders and displ - engine displacement using geom_po

library(ggplot2)
ggplot(mpg, aes(x = cyl, y = displ, color = displ)) +
  geom_point() +
  labs(title = "Relationship between No. of Cylinders and Engine Displacement",
       x = "Number of Cylinders",
       y = "Engine Displacement") +
  scale_color_continuous(name = "Engine Displacement")
```



#5a

```
# How would you describe its relationship? Show the codes and its result.

library(ggplot2)
ggplot(mpg, aes(x = cyl, y = displ, color = displ)) +
  geom_point() +
  labs(title = "Relationship between No. of Cylinders and Engine Displacement",
       x = "Number of Cylinders",
       y = "Engine Displacement") +
  scale_color_continuous(name = "Engine Displacement")
```

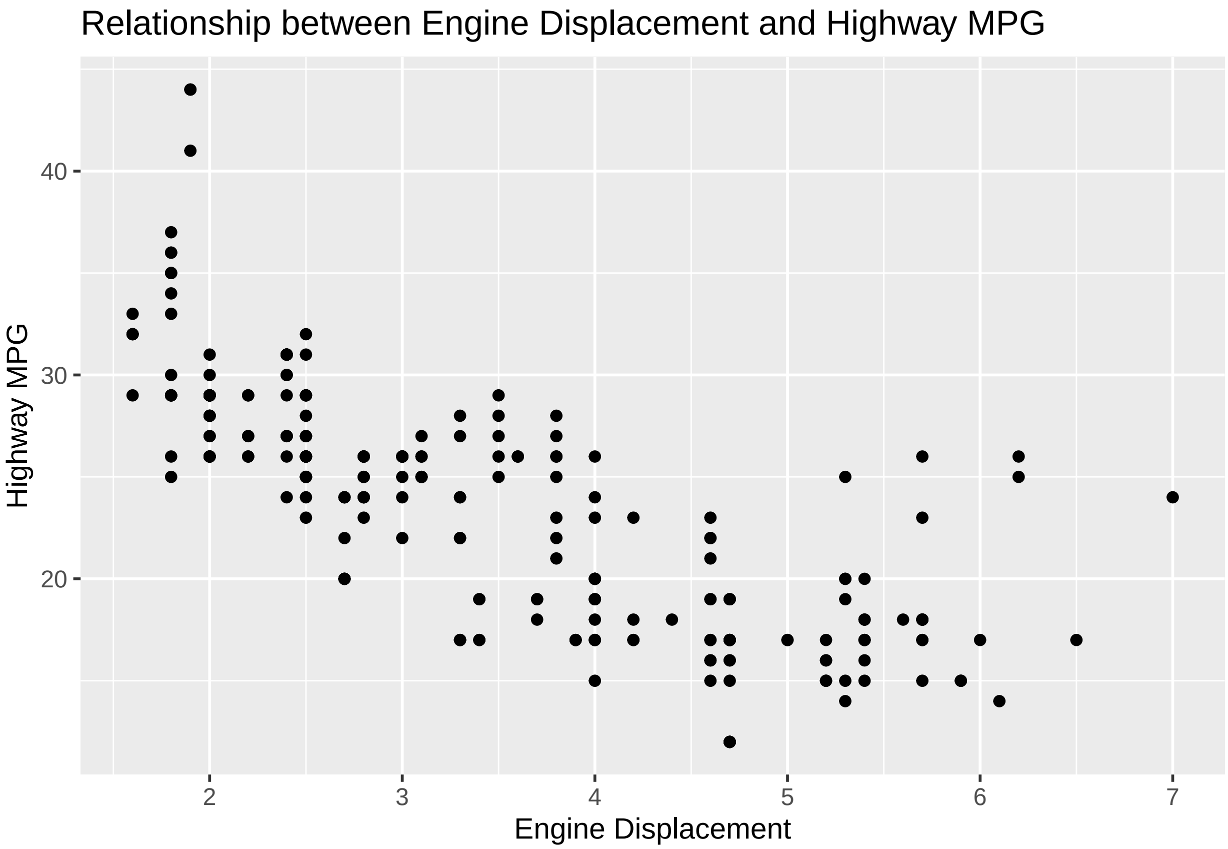


#6

```r
# Plot the relationship between displ (engine displacement) and hwy(highway miles per gallon). Mapped i

library(ggplot2)
continuous_variable <- mpg$your_continuous_variable
```

```
## Warning: Unknown or uninitialised column: `your_continuous_variable`.
```

```r
ggplot(mpg, aes(x = displ, y = hwy, color = continuous_variable)) +
  geom_point() +
  labs(title = "Relationship between Engine Displacement and Highway MPG",
       x = "Engine Displacement",
       y = "Highway MPG") +
  scale_color_continuous(name = "Your Continuous Variable")
```



#6.1

```
library(readr)
traffic <- read_csv("traffic.csv",show_col_types = FALSE)
traffic
```

```
## # A tibble: 48,120 x 4
##    DateTime            Junction Vehicles          ID
##    <dttm>                 <dbl>    <dbl>       <dbl>
##  1 2015-11-01 00:00:00        1       15 20151101001
##  2 2015-11-01 01:00:00        1       13 20151101011
##  3 2015-11-01 02:00:00        1       10 20151101021
##  4 2015-11-01 03:00:00        1        7 20151101031
##  5 2015-11-01 04:00:00        1        9 20151101041
##  6 2015-11-01 05:00:00        1        6 20151101051
##  7 2015-11-01 06:00:00        1        9 20151101061
##  8 2015-11-01 07:00:00        1        8 20151101071
##  9 2015-11-01 08:00:00        1       11 20151101081
## 10 2015-11-01 09:00:00        1       12 20151101091
## # i 48,110 more rows
```

#6a

```
observations <- nrow(traffic)
observations
```

```
## [1] 48120
```

```
columns <- ncol(traffic)
columns
```

```
## [1] 4
```

#6b

```
junction1 <- subset(traffic, Junction ==1)
junction1
```

```
## # A tibble: 14,592 x 4
##    DateTime            Junction Vehicles          ID
##    <dttm>                 <dbl>    <dbl>       <dbl>
##  1 2015-11-01 00:00:00        1       15 20151101001
##  2 2015-11-01 01:00:00        1       13 20151101011
##  3 2015-11-01 02:00:00        1       10 20151101021
##  4 2015-11-01 03:00:00        1        7 20151101031
##  5 2015-11-01 04:00:00        1        9 20151101041
##  6 2015-11-01 05:00:00        1        6 20151101051
##  7 2015-11-01 06:00:00        1        9 20151101061
##  8 2015-11-01 07:00:00        1        8 20151101071
##  9 2015-11-01 08:00:00        1       11 20151101081
## 10 2015-11-01 09:00:00        1       12 20151101091
## # i 14,582 more rows
```

```
junction2 <- subset(traffic, Junction ==2)
junction2
```

```
## # A tibble: 14,592 x 4
##    DateTime            Junction Vehicles          ID
##    <dttm>                 <dbl>    <dbl>       <dbl>
##  1 2015-11-01 00:00:00        2        6 20151101002
##  2 2015-11-01 01:00:00        2        6 20151101012
##  3 2015-11-01 02:00:00        2        5 20151101022
##  4 2015-11-01 03:00:00        2        6 20151101032
##  5 2015-11-01 04:00:00        2        7 20151101042
##  6 2015-11-01 05:00:00        2        2 20151101052
##  7 2015-11-01 06:00:00        2        4 20151101062
##  8 2015-11-01 07:00:00        2        4 20151101072
##  9 2015-11-01 08:00:00        2        3 20151101082
## 10 2015-11-01 09:00:00        2        3 20151101092
## # i 14,582 more rows
```

```
junction3 <- subset(traffic, Junction ==3)
junction3
```

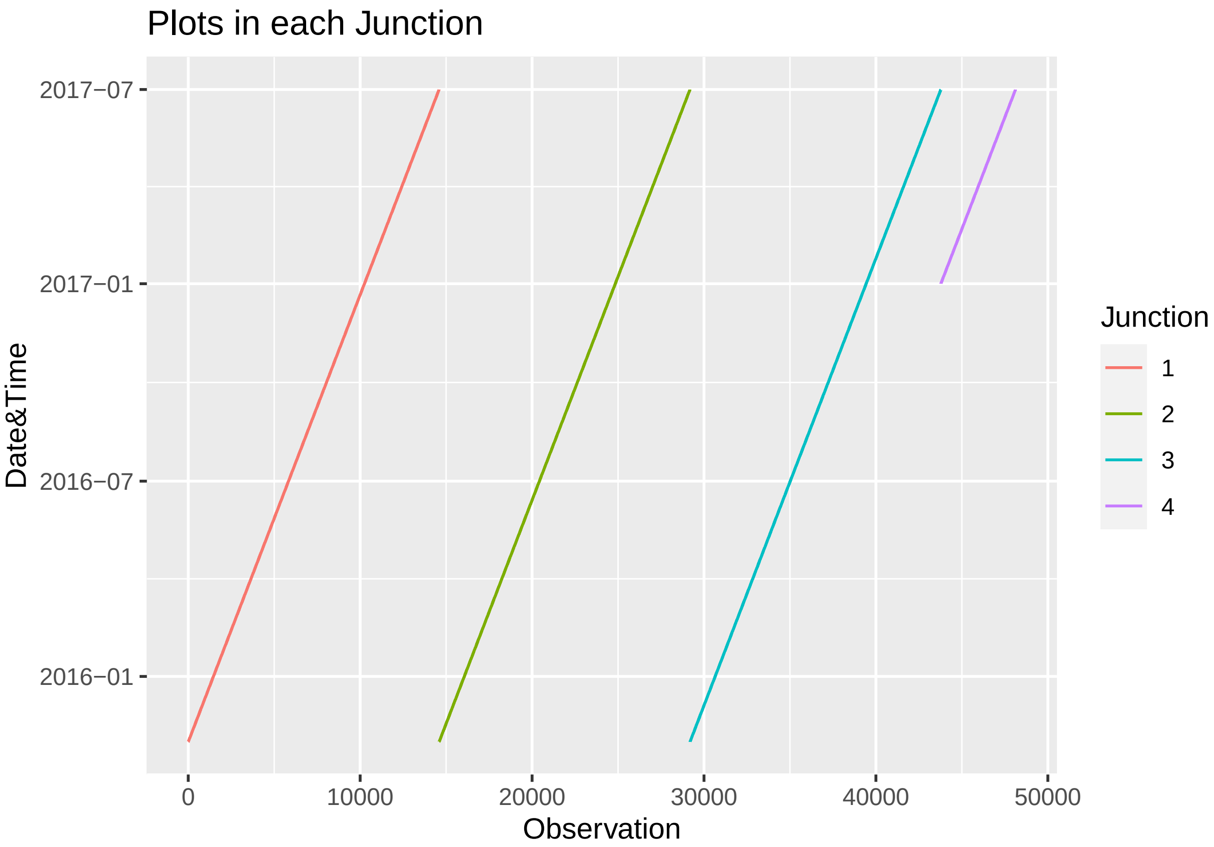
```
## # A tibble: 14,592 x 4
##    DateTime            Junction Vehicles          ID
##    <dttm>                 <dbl>    <dbl>       <dbl>
##  1 2015-11-01 00:00:00        3        9 20151101003
##  2 2015-11-01 01:00:00        3        7 20151101013
##  3 2015-11-01 02:00:00        3        5 20151101023
##  4 2015-11-01 03:00:00        3        1 20151101033
##  5 2015-11-01 04:00:00        3        2 20151101043
##  6 2015-11-01 05:00:00        3        2 20151101053
##  7 2015-11-01 06:00:00        3        3 20151101063
##  8 2015-11-01 07:00:00        3        4 20151101073
##  9 2015-11-01 08:00:00        3        3 20151101083
## 10 2015-11-01 09:00:00        3        6 20151101093
## # i 14,582 more rows
```

```r
junction4 <- subset(traffic, Junction ==4)
junction4
```

```
## # A tibble: 4,344 x 4
##    DateTime            Junction Vehicles          ID
##    <dttm>                 <dbl>    <dbl>       <dbl>
##  1 2017-01-01 00:00:00        4        3 20170101004
##  2 2017-01-01 01:00:00        4        1 20170101014
##  3 2017-01-01 02:00:00        4        4 20170101024
##  4 2017-01-01 03:00:00        4        4 20170101034
##  5 2017-01-01 04:00:00        4        2 20170101044
##  6 2017-01-01 05:00:00        4        1 20170101054
##  7 2017-01-01 06:00:00        4        1 20170101064
##  8 2017-01-01 07:00:00        4        4 20170101074
##  9 2017-01-01 08:00:00        4        4 20170101084
## 10 2017-01-01 09:00:00        4        2 20170101094
## # i 4,334 more rows
```

#6c

```r
# Assuming 'traffic' is your dataset
library(ggplot2)

# Plot each junction using geom_line()
ggplot(traffic, aes(x = seq_along(Junction), y = DateTime, group = Junction, color = factor(Junction)))
  geom_line() +
  labs(title = "Plots in each Junction",
       x = "Observation",
       y = "Date&Time") +
  scale_color_discrete(name = "Junction")
```



#7

```
#install.packages("readxl")
library(readxl)
alexafile <- read_excel("alexa_file.xlsx")
alexafile
```

```
## # A tibble: 3,150 x 5
##    rating date                variation          verified_reviews      feedback
##     <dbl> <dttm>              <chr>              <chr>                    <dbl>
##  1      5 2018-07-31 00:00:00 Charcoal Fabric    Love my Echo!                1
##  2      5 2018-07-31 00:00:00 Charcoal Fabric    Loved it!                    1
##  3      4 2018-07-31 00:00:00 Walnut Finish      Sometimes while play~        1
##  4      5 2018-07-31 00:00:00 Charcoal Fabric    I have had a lot of ~        1
##  5      5 2018-07-31 00:00:00 Charcoal Fabric    Music                        1
##  6      5 2018-07-31 00:00:00 Heather Gray Fabric I received the echo ~       1
##  7      3 2018-07-31 00:00:00 Sandstone Fabric   Without having a cel~        1
##  8      5 2018-07-31 00:00:00 Charcoal Fabric    I think this is the ~        1
##  9      5 2018-07-30 00:00:00 Heather Gray Fabric looks great                 1
## 10      5 2018-07-30 00:00:00 Heather Gray Fabric Love it! I've listen~       1
## # i 3,140 more rows
```

#7a

```
num_rows <- nrow(alexafile)
num_columns <- ncol(alexafile)
num_rows
```

```
## [1] 3150
```

```
num_columns
```

```
## [1] 5
```

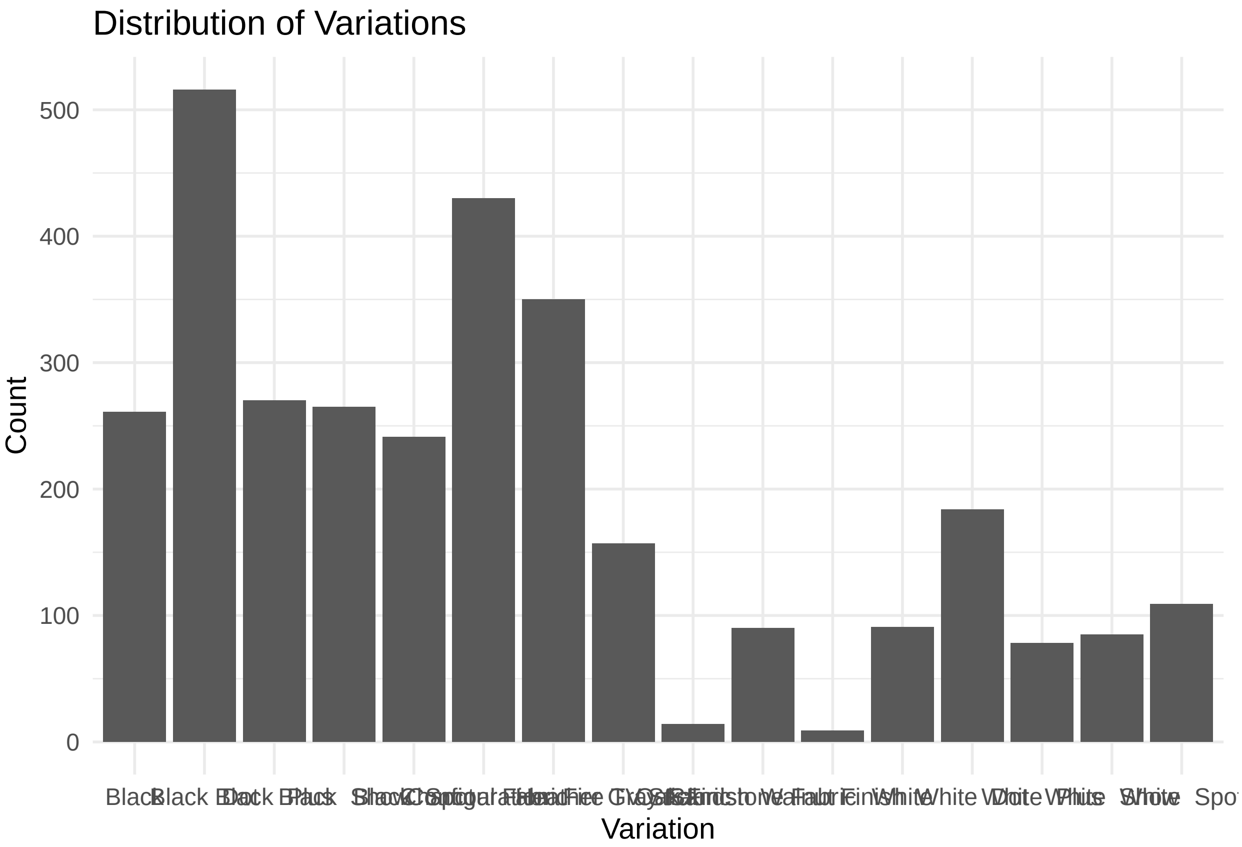
#7b

```
library(dplyr)

output <- alexafile %>%
  group_by(variation) %>%
  summarize(total_count = n())

print(output)
```

```
## # A tibble: 16 x 2
##    variation                    total_count
##    <chr>                              <int>
##  1 Black                                261
##  2 Black  Dot                           516
##  3 Black  Plus                          270
##  4 Black  Show                          265
##  5 Black  Spot                          241
##  6 Charcoal Fabric                      430
##  7 Configuration: Fire TV Stick         350
##  8 Heather Gray Fabric                  157
##  9 Oak Finish                            14
## 10 Sandstone Fabric                      90
## 11 Walnut Finish                          9
## 12 White                                 91
## 13 White  Dot                           184
## 14 White  Plus                           78
## 15 White  Show                           85
## 16 White  Spot                          109
```

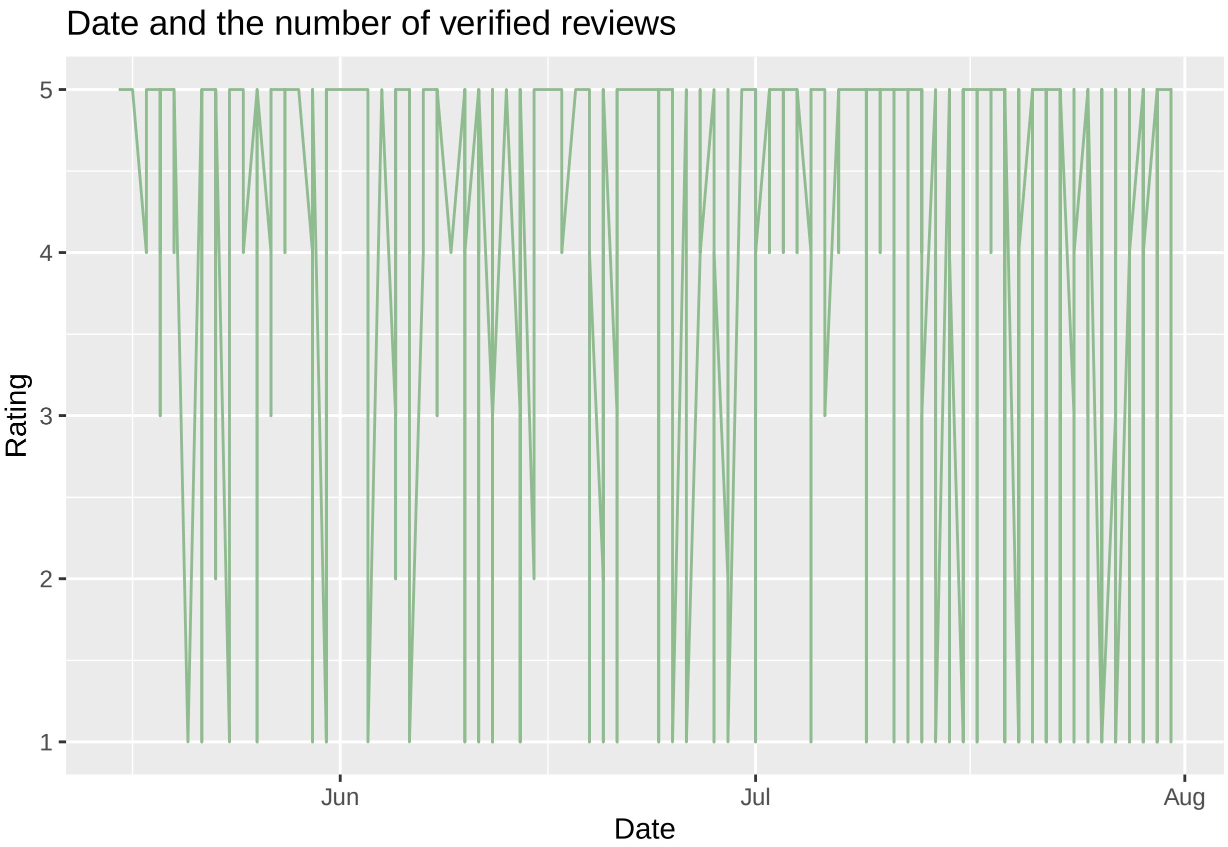
#7c

```
library(ggplot2)

ggplot(alexafile, aes(x = variation)) +
  geom_bar() +
  labs(title = "Distribution of Variations", x = "Variation", y = "Count") +
  theme_minimal()
```



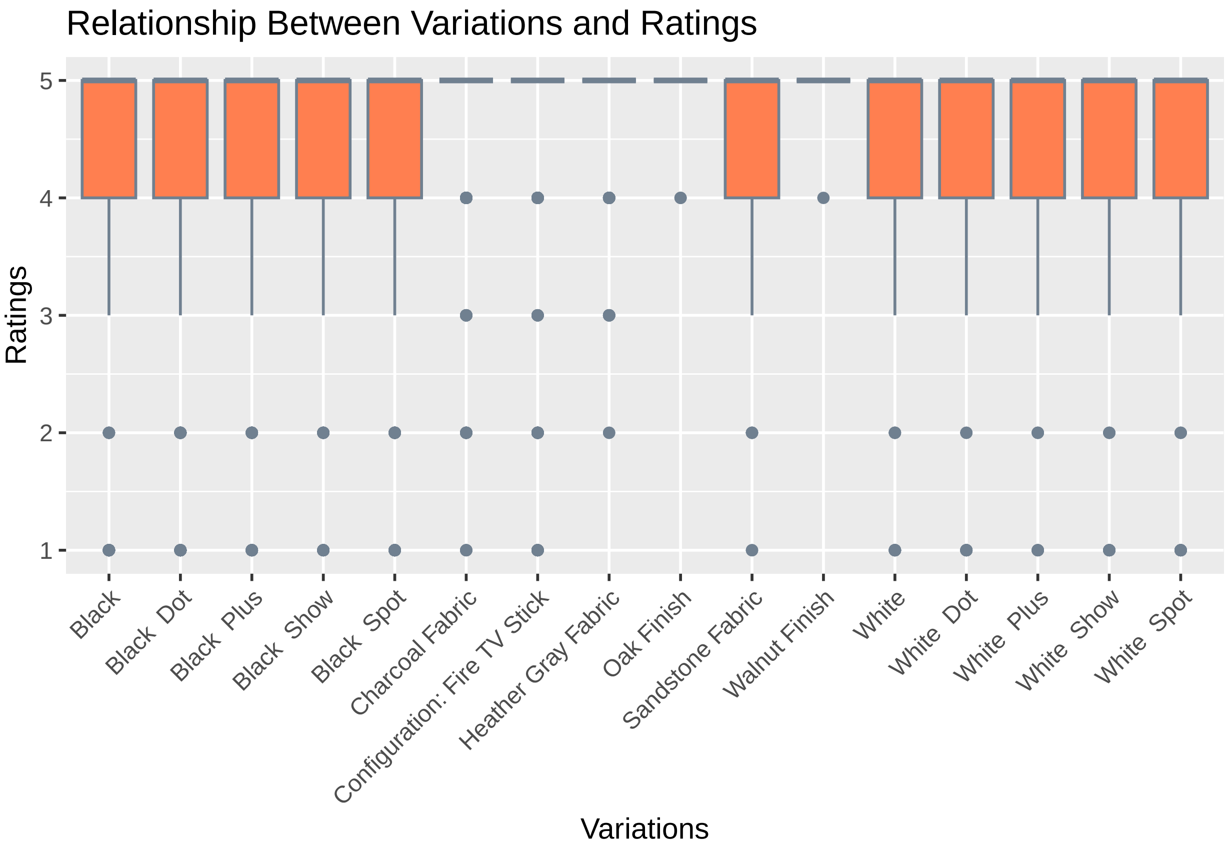
#7d

```r
ggplot(alexafile, aes(x = date, y= rating)) +
  geom_line(color= "darkseagreen") +
  labs (title = "Date and the number of verified reviews",
        x = "Date",
        y = "Rating")
```



#7e

```
ggplot(alexafile, aes(x = variation, y = rating)) +
  geom_boxplot(fill = "coral", color = "slategray") +
  labs(title = "Relationship Between Variations and Ratings",
       x = "Variations",
       y = "Ratings") +
  theme(axis.text.x = element_text(angle = 45, hjust = 1))
```


Relationship Between Variations and Ratings
Ratings
5
4
3
2
1
Black
Black Dot
Black Plus
Black Show
Black Spot
Charcoal Fabric
Configuration: Fire TV Stick
Heather Gray Fabric
Oak Finish
Sandstone Fabric
Walnut Finish
White
White Dot
White Plus
White Show
White Spot
Variations