RWorksheet_Olivo#4c

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1. Use the dataset mpg Download and open the mpg file. Upload it to your OWN environment

1a. Show your solutions on how to import a csv file into the environment.

```
library(readr)

mpg_file <- read.csv("mpg.csv")
```

1b.Which variables from mpg dataset are categorical?

```
str(mpg_file)
```

```
## 'data.frame':    234 obs. of  12 variables:
##  $ X           : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ manufacturer: chr  "audi" "audi" "audi" "audi" ...
##  $ model       : chr  "a4" "a4" "a4" "a4" ...
##  $ displ       : num  1.8 1.8 2 2 2.8 2.8 3.1 1.8 1.8 2 ...
##  $ year        : int  1999 1999 2008 2008 1999 1999 2008 1999 1999 2008 ...
##  $ cyl         : int  4 4 4 4 6 6 6 4 4 4 ...
##  $ trans       : chr  "auto(l5)" "manual(m5)" "manual(m6)" "auto(av)" ...
##  $ drv         : chr  "f" "f" "f" "f" ...
##  $ cty         : int  18 21 20 21 16 18 18 18 16 20 ...
##  $ hwy         : int  29 29 31 30 26 26 27 26 25 28 ...
##  $ fl          : chr  "p" "p" "p" "p" ...
##  $ class       : chr  "compact" "compact" "compact" "compact" ...
```

```
# manufacturer, model, trans, drv, fl, class variables are categorical
```

1c. Which are continuous variables?

```
str(mpg_file)
```

```
## 'data.frame':    234 obs. of  12 variables:
##  $ X           : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ manufacturer: chr  "audi" "audi" "audi" "audi" ...
##  $ model       : chr  "a4" "a4" "a4" "a4" ...
##  $ displ       : num  1.8 1.8 2 2 2.8 2.8 3.1 1.8 1.8 2 ...
##  $ year        : int  1999 1999 2008 2008 1999 1999 2008 1999 1999 2008 ...
##  $ cyl         : int  4 4 4 4 6 6 6 4 4 4 ...
##  $ trans       : chr  "auto(l5)" "manual(m5)" "manual(m6)" "auto(av)" ...
##  $ drv         : chr  "f" "f" "f" "f" ...
##  $ cty         : int  18 21 20 21 16 18 18 18 16 20 ...
##  $ hwy         : int  29 29 31 30 26 26 27 26 25 28 ...
##  $ fl          : chr  "p" "p" "p" "p" ...
##  $ class       : chr  "compact" "compact" "compact" "compact" ...
```

```
# X, displ, year, cyl, cty, hwy are continuous variables
```

2. Which manufacturer has the most models in this data set? Which model has the most variations? Show your answer.

```
manufacturer_asTable <- table(mpg_file$manufacturer)
manufacturer_most_models <- names(manufacturer_asTable)[which.max(manufacturer_asTable)]

manufacturer_most_models
```

```
## [1] "dodge"
```

```
# dodge manufacturer has the most models


model_asTable <- table(mpg_file$model)
model_most_vars <- names(model_asTable)[which.max(model_asTable)]

model_most_vars
```

```
## [1] "caravan 2wd"
```

```
# caravan 2wd has the most variations
```

2a. Group the manufacturers and find the unique models. Show your codes and result.

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

```
manufacturers_models <- data.frame(Manufacturer = mpg_file$manufacturer, Model = mpg_file$model)
manufacturers_models
```

```
##     Manufacturer                 Model
## 1           audi                    a4
## 2           audi                    a4
## 3           audi                    a4
## 4           audi                    a4
## 5           audi                    a4
## 6           audi                    a4
## 7           audi                    a4
## 8           audi             a4 quattro
## 9           audi             a4 quattro
## 10          audi             a4 quattro
## 11          audi             a4 quattro
## 12          audi             a4 quattro
## 13          audi             a4 quattro
## 14          audi             a4 quattro
## 15          audi             a4 quattro
```

```
## 16          audi             a6 quattro
## 17          audi             a6 quattro
## 18          audi             a6 quattro
## 19     chevrolet     c1500 suburban 2wd
## 20     chevrolet     c1500 suburban 2wd
## 21     chevrolet     c1500 suburban 2wd
## 22     chevrolet     c1500 suburban 2wd
## 23     chevrolet     c1500 suburban 2wd
## 24     chevrolet               corvette
## 25     chevrolet               corvette
## 26     chevrolet               corvette
## 27     chevrolet               corvette
## 28     chevrolet               corvette
## 29     chevrolet        k1500 tahoe 4wd
## 30     chevrolet        k1500 tahoe 4wd
## 31     chevrolet        k1500 tahoe 4wd
## 32     chevrolet        k1500 tahoe 4wd
## 33     chevrolet                 malibu
## 34     chevrolet                 malibu
## 35     chevrolet                 malibu
## 36     chevrolet                 malibu
## 37     chevrolet                 malibu
## 38         dodge            caravan 2wd
## 39         dodge            caravan 2wd
## 40         dodge            caravan 2wd
## 41         dodge            caravan 2wd
## 42         dodge            caravan 2wd
## 43         dodge            caravan 2wd
## 44         dodge            caravan 2wd
## 45         dodge            caravan 2wd
## 46         dodge            caravan 2wd
## 47         dodge            caravan 2wd
## 48         dodge            caravan 2wd
## 49         dodge      dakota pickup 4wd
## 50         dodge      dakota pickup 4wd
## 51         dodge      dakota pickup 4wd
## 52         dodge      dakota pickup 4wd
## 53         dodge      dakota pickup 4wd
## 54         dodge      dakota pickup 4wd
## 55         dodge      dakota pickup 4wd
## 56         dodge      dakota pickup 4wd
## 57         dodge      dakota pickup 4wd
## 58         dodge            durango 4wd
## 59         dodge            durango 4wd
## 60         dodge            durango 4wd
## 61         dodge            durango 4wd
## 62         dodge            durango 4wd
## 63         dodge            durango 4wd
## 64         dodge            durango 4wd
## 65         dodge    ram 1500 pickup 4wd
## 66         dodge    ram 1500 pickup 4wd
## 67         dodge    ram 1500 pickup 4wd
## 68         dodge    ram 1500 pickup 4wd
## 69         dodge    ram 1500 pickup 4wd
```

```
## 70         dodge    ram 1500 pickup 4wd
## 71         dodge    ram 1500 pickup 4wd
## 72         dodge    ram 1500 pickup 4wd
## 73         dodge    ram 1500 pickup 4wd
## 74         dodge    ram 1500 pickup 4wd
## 75          ford         expedition 2wd
## 76          ford         expedition 2wd
## 77          ford         expedition 2wd
## 78          ford           explorer 4wd
## 79          ford           explorer 4wd
## 80          ford           explorer 4wd
## 81          ford           explorer 4wd
## 82          ford           explorer 4wd
## 83          ford           explorer 4wd
## 84          ford        f150 pickup 4wd
## 85          ford        f150 pickup 4wd
## 86          ford        f150 pickup 4wd
## 87          ford        f150 pickup 4wd
## 88          ford        f150 pickup 4wd
## 89          ford        f150 pickup 4wd
## 90          ford        f150 pickup 4wd
## 91          ford                mustang
## 92          ford                mustang
## 93          ford                mustang
## 94          ford                mustang
## 95          ford                mustang
## 96          ford                mustang
## 97          ford                mustang
## 98          ford                mustang
## 99          ford                mustang
## 100        honda                  civic
## 101        honda                  civic
## 102        honda                  civic
## 103        honda                  civic
## 104        honda                  civic
## 105        honda                  civic
## 106        honda                  civic
## 107        honda                  civic
## 108        honda                  civic
## 109      hyundai                 sonata
## 110      hyundai                 sonata
## 111      hyundai                 sonata
## 112      hyundai                 sonata
## 113      hyundai                 sonata
## 114      hyundai                 sonata
## 115      hyundai                 sonata
## 116      hyundai                tiburon
## 117      hyundai                tiburon
## 118      hyundai                tiburon
## 119      hyundai                tiburon
## 120      hyundai                tiburon
## 121      hyundai                tiburon
## 122      hyundai                tiburon
## 123         jeep     grand cherokee 4wd
```

```
## 124         jeep     grand cherokee 4wd
## 125         jeep     grand cherokee 4wd
## 126         jeep     grand cherokee 4wd
## 127         jeep     grand cherokee 4wd
## 128         jeep     grand cherokee 4wd
## 129         jeep     grand cherokee 4wd
## 130         jeep     grand cherokee 4wd
## 131   land rover            range rover
## 132   land rover            range rover
## 133   land rover            range rover
## 134   land rover            range rover
## 135      lincoln          navigator 2wd
## 136      lincoln          navigator 2wd
## 137      lincoln          navigator 2wd
## 138      mercury        mountaineer 4wd
## 139      mercury        mountaineer 4wd
## 140      mercury        mountaineer 4wd
## 141      mercury        mountaineer 4wd
## 142       nissan                altima
## 143       nissan                altima
## 144       nissan                altima
## 145       nissan                altima
## 146       nissan                altima
## 147       nissan                altima
## 148       nissan                maxima
## 149       nissan                maxima
## 150       nissan                maxima
## 151       nissan         pathfinder 4wd
## 152       nissan         pathfinder 4wd
## 153       nissan         pathfinder 4wd
## 154       nissan         pathfinder 4wd
## 155      pontiac             grand prix
## 156      pontiac             grand prix
## 157      pontiac             grand prix
## 158      pontiac             grand prix
## 159      pontiac             grand prix
## 160       subaru           forester awd
## 161       subaru           forester awd
## 162       subaru           forester awd
## 163       subaru           forester awd
## 164       subaru           forester awd
## 165       subaru           forester awd
## 166       subaru            impreza awd
## 167       subaru            impreza awd
## 168       subaru            impreza awd
## 169       subaru            impreza awd
## 170       subaru            impreza awd
## 171       subaru            impreza awd
## 172       subaru            impreza awd
## 173       subaru            impreza awd
## 174       toyota            4runner 4wd
## 175       toyota            4runner 4wd
## 176       toyota            4runner 4wd
## 177       toyota            4runner 4wd
```

```
## 178       toyota            4runner 4wd
## 179       toyota            4runner 4wd
## 180       toyota                  camry
## 181       toyota                  camry
## 182       toyota                  camry
## 183       toyota                  camry
## 184       toyota                  camry
## 185       toyota                  camry
## 186       toyota                  camry
## 187       toyota           camry solara
## 188       toyota           camry solara
## 189       toyota           camry solara
## 190       toyota           camry solara
## 191       toyota           camry solara
## 192       toyota           camry solara
## 193       toyota           camry solara
## 194       toyota                corolla
## 195       toyota                corolla
## 196       toyota                corolla
## 197       toyota                corolla
## 198       toyota                corolla
## 199       toyota land cruiser wagon 4wd
## 200       toyota land cruiser wagon 4wd
## 201       toyota      toyota tacoma 4wd
## 202       toyota      toyota tacoma 4wd
## 203       toyota      toyota tacoma 4wd
## 204       toyota      toyota tacoma 4wd
## 205       toyota      toyota tacoma 4wd
## 206       toyota      toyota tacoma 4wd
## 207       toyota      toyota tacoma 4wd
## 208   volkswagen                   gti
## 209   volkswagen                   gti
## 210   volkswagen                   gti
## 211   volkswagen                   gti
## 212   volkswagen                   gti
## 213   volkswagen                 jetta
## 214   volkswagen                 jetta
## 215   volkswagen                 jetta
## 216   volkswagen                 jetta
## 217   volkswagen                 jetta
## 218   volkswagen                 jetta
## 219   volkswagen                 jetta
## 220   volkswagen                 jetta
## 221   volkswagen                 jetta
## 222   volkswagen             new beetle
## 223   volkswagen             new beetle
## 224   volkswagen             new beetle
## 225   volkswagen             new beetle
## 226   volkswagen             new beetle
## 227   volkswagen             new beetle
## 228   volkswagen                 passat
## 229   volkswagen                 passat
## 230   volkswagen                 passat
## 231   volkswagen                 passat
```

```
## 232   volkswagen                 passat
## 233   volkswagen                 passat
## 234   volkswagen                 passat
```

```
unique_mods <- unique(manufacturers_models)
unique_mods
```

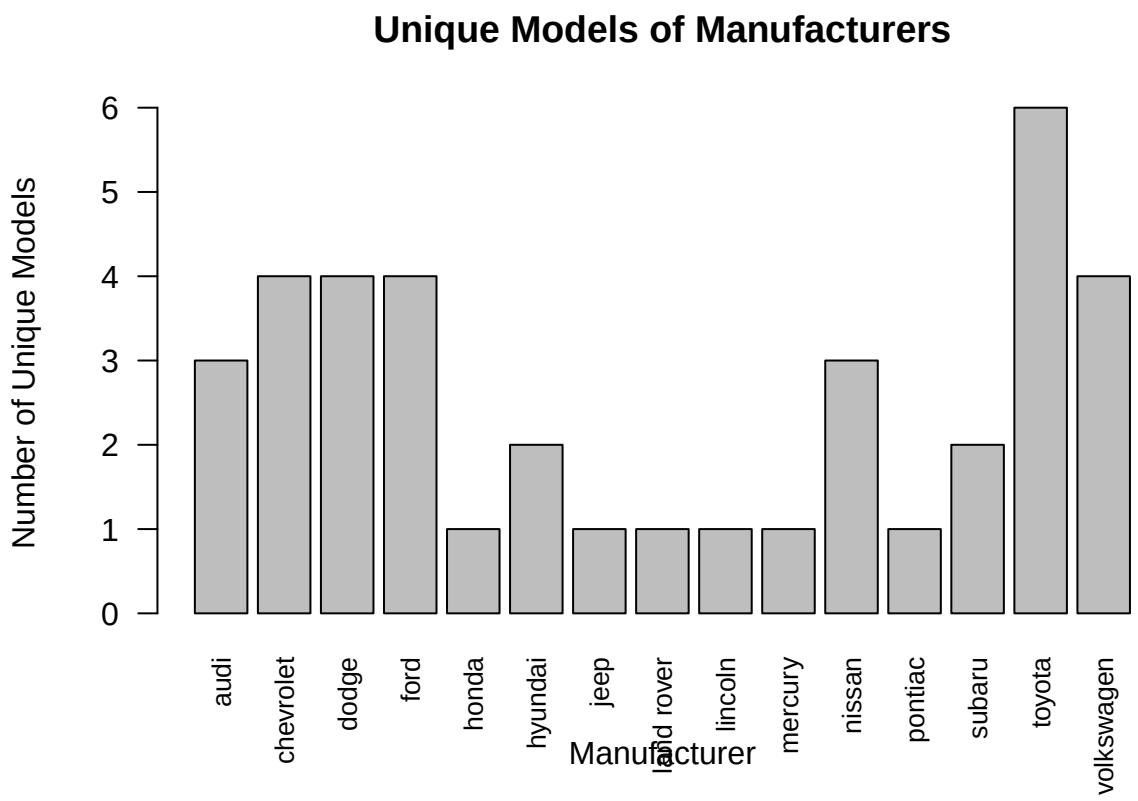
```
##     Manufacturer                  Model
## 1           audi                     a4
## 8           audi              a4 quattro
## 16          audi              a6 quattro
## 19     chevrolet     c1500 suburban 2wd
## 24     chevrolet               corvette
## 29     chevrolet        k1500 tahoe 4wd
## 33     chevrolet                 malibu
## 38         dodge            caravan 2wd
## 49         dodge      dakota pickup 4wd
## 58         dodge            durango 4wd
## 65         dodge    ram 1500 pickup 4wd
## 75          ford         expedition 2wd
## 78          ford           explorer 4wd
## 84          ford        f150 pickup 4wd
## 91          ford                mustang
## 100        honda                  civic
## 109      hyundai                 sonata
## 116      hyundai                tiburon
## 123         jeep     grand cherokee 4wd
## 131   land rover            range rover
## 135      lincoln          navigator 2wd
## 138      mercury        mountaineer 4wd
## 142       nissan                altima
## 148       nissan                maxima
## 151       nissan         pathfinder 4wd
## 155      pontiac             grand prix
## 160       subaru           forester awd
## 166       subaru            impreza awd
## 174       toyota            4runner 4wd
## 180       toyota                 camry
## 187       toyota           camry solara
## 194       toyota                corolla
## 199       toyota land cruiser wagon 4wd
## 201       toyota      toyota tacoma 4wd
## 208   volkswagen                   gti
## 213   volkswagen                 jetta
## 222   volkswagen             new beetle
## 228   volkswagen                 passat
```

```
unique_mods_factor <- factoredManufacturer <- as.factor(unique_mods$Manufacturer)
```

2b. Graph the result by using plot() and ggplot(). Write the codes and its result.

```
#install.packages("ggplot2")
library(ggplot2)

#install.packages("dplyr")
library(dplyr)
```

```
unique_plot <- plot(as.factor(factoredManufacturer),
                    main = "Unique Models of Manufacturers",
                    xlab = "Manufacturer",
                    ylab = "Number of Unique Models",
                    cex.names = 0.8, las = 2)
```

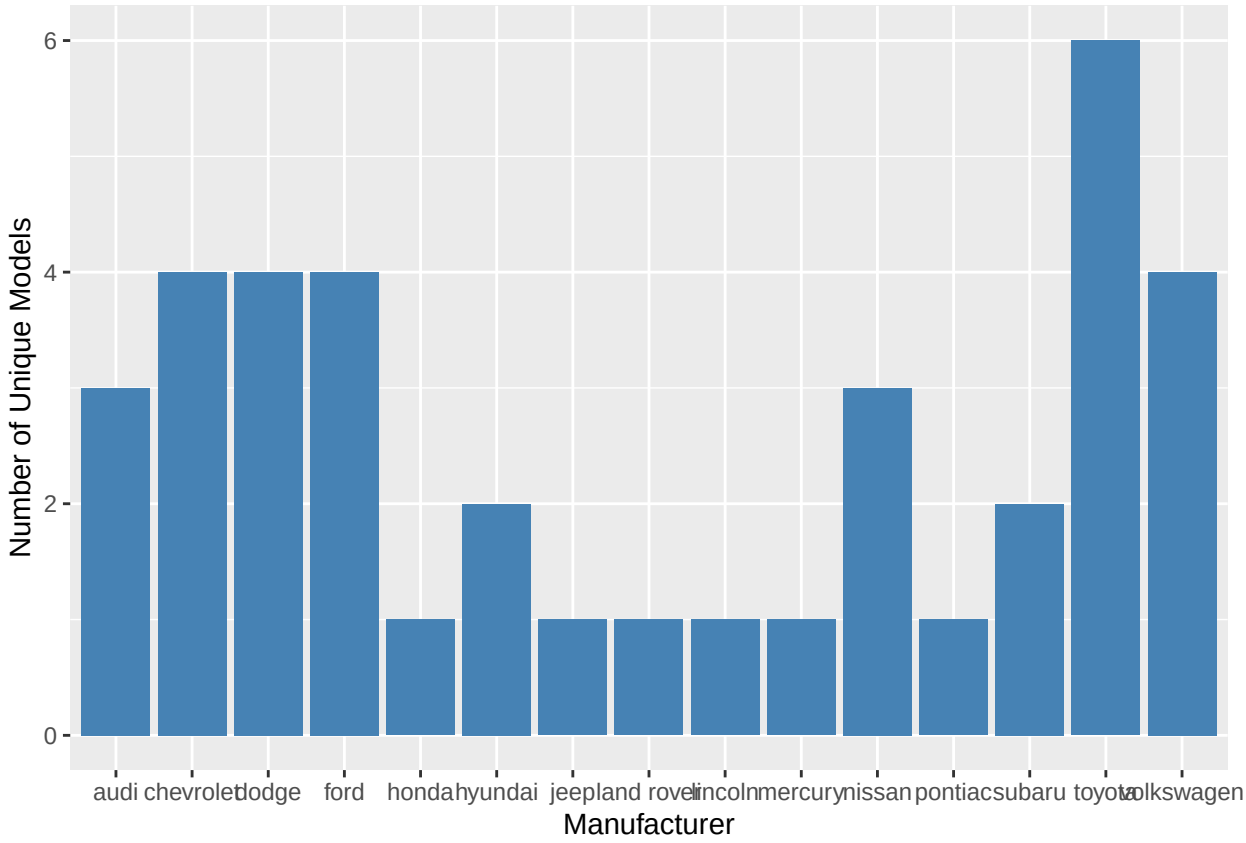



```
unique_count <- unique_mods %>%
  count(unique_mods$Manufacturer)
unique_count
```

```
##    unique_mods$Manufacturer n
## 1                      audi 3
## 2                 chevrolet 4
## 3                     dodge 4
## 4                      ford 4
## 5                     honda 1
## 6                   hyundai 2
## 7                      jeep 1
## 8                land rover 1
## 9                   lincoln 1
## 10                  mercury 1
## 11                   nissan 3
## 12                  pontiac 1
## 13                   subaru 2
## 14                   toyota 6
## 15               volkswagen 4
```

```
ggplot(unique_count, aes(x = `unique_mods$Manufacturer`, y = n)) +
geom_bar(stat = "identity", fill = "steelblue") +
```

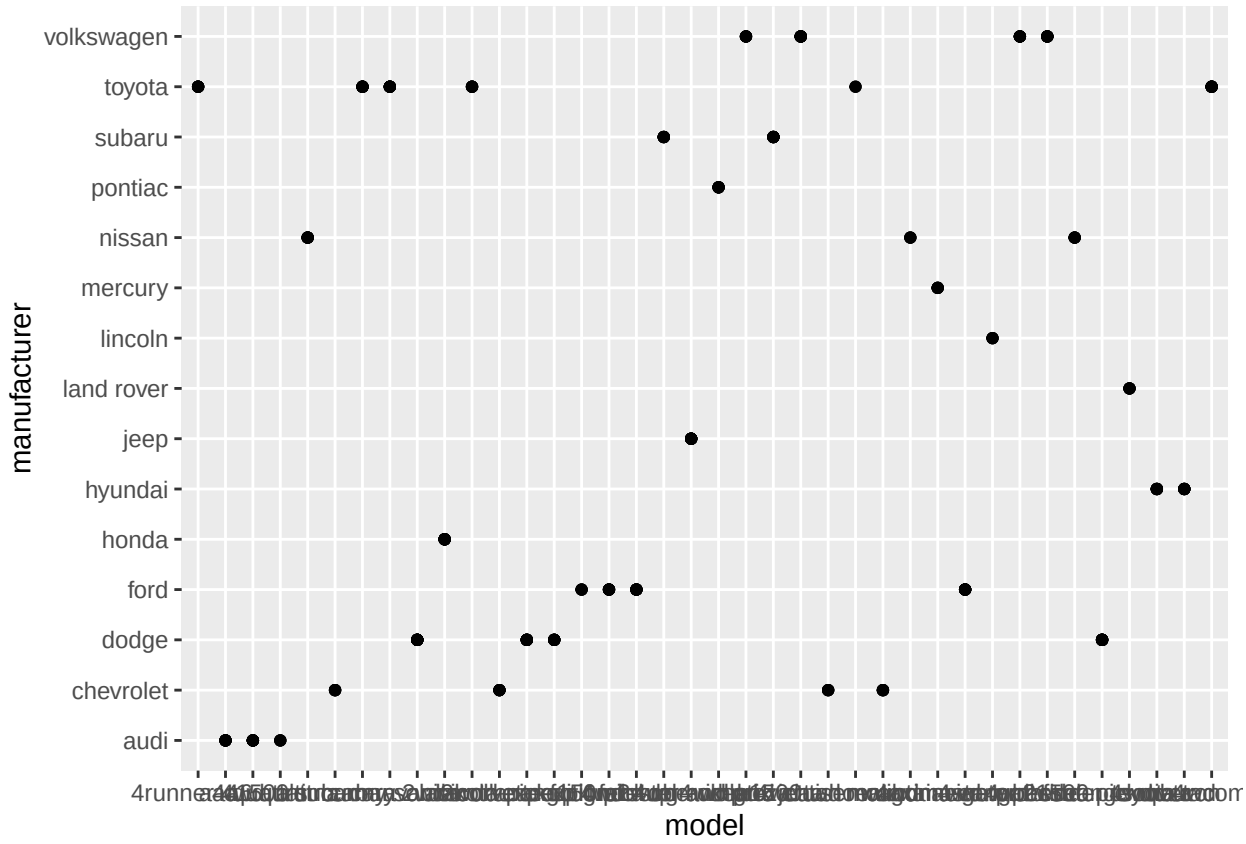
```
  labs(x = "Manufacturer", y = "Number of Unique Models")
```



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

2a. What does ggplot(mpg, aes(model, manufacturer)) + geom_point() show?

```
ggplot(mpg_file, aes(model, manufacturer)) + geom_point()
```



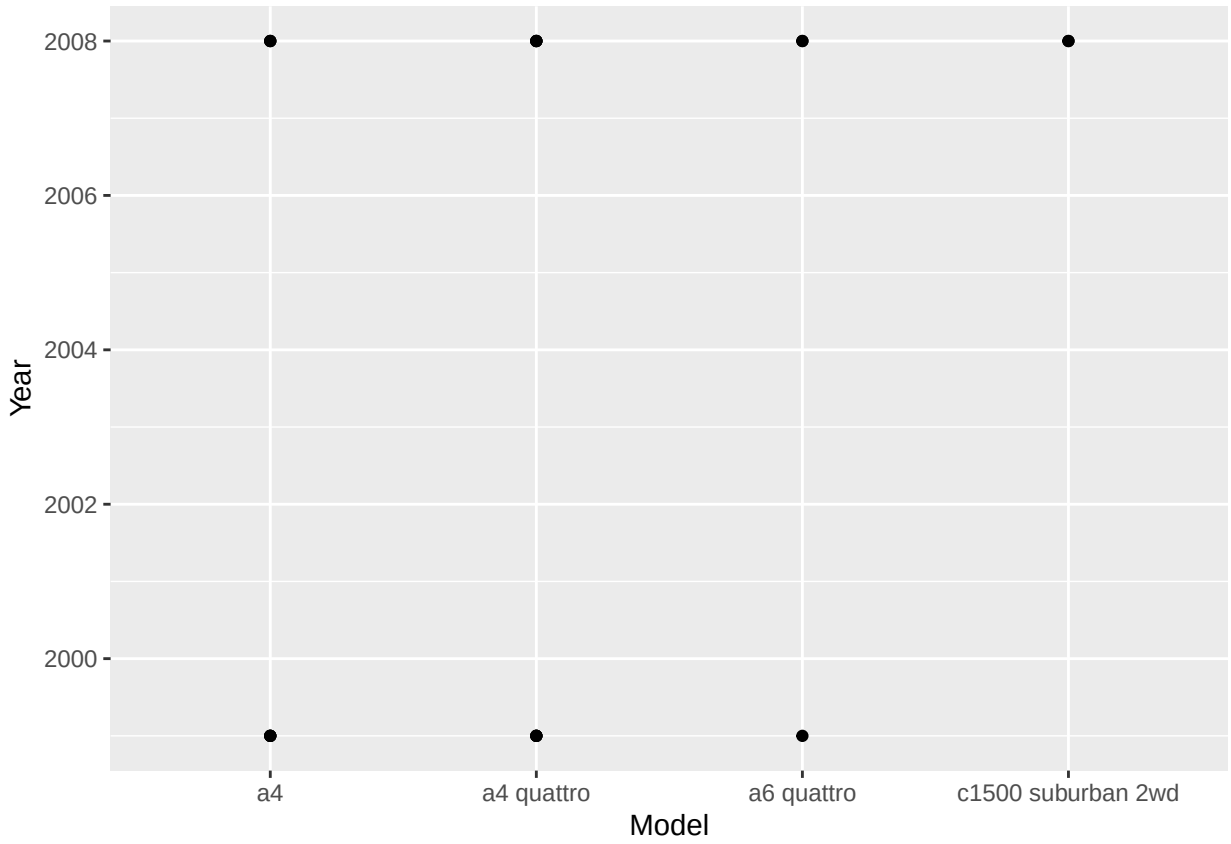

```
# It creates ascatterplot of the mpg dataset with model on the x-axis and manufacturer on the y-axis.
# In this plot,  Each point on the plot represents a specific model and its corresponding manufacturer.
```

2b.For you, is it useful? If not, how could you modify the data to make it more informative?

```
# It is useful if you want to know how many models each manufacturer have.

# I can make it more informative by color coding each points by the class variable and add a label to e
```

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

```
top20 <- head(mpg_file,20)

top20Plot <- ggplot(top20, aes(x = model, y = year)) + geom_point() + labs(x = "Model", y = "Year")
top20Plot
```



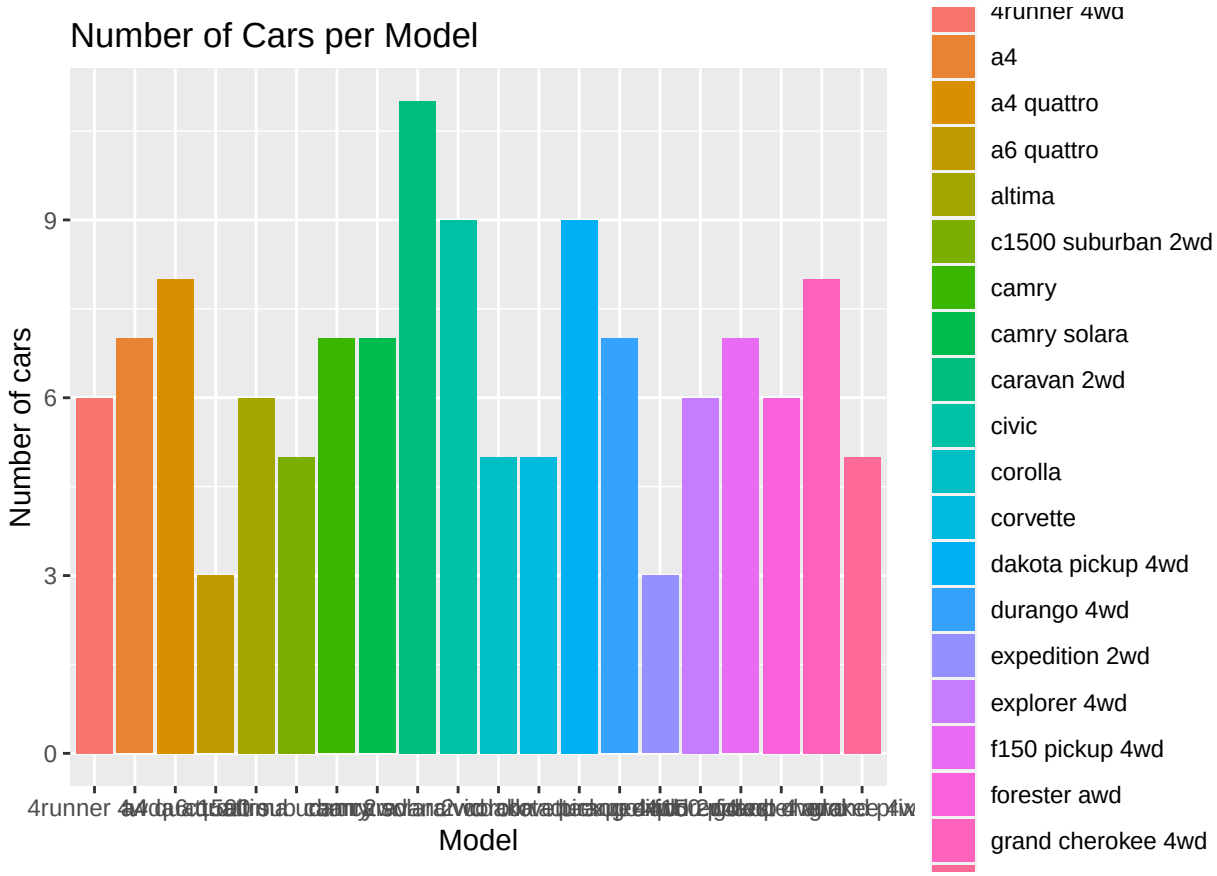
4. Using the pipe (%>%), group the model and get the number of cars per model. Show codes and its result

```
library(dplyr)

model_car_count <- mpg_file %>%
  group_by(model) %>%
  summarize(number_of_cars = n())

model_car_count
```

```
## # 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
```

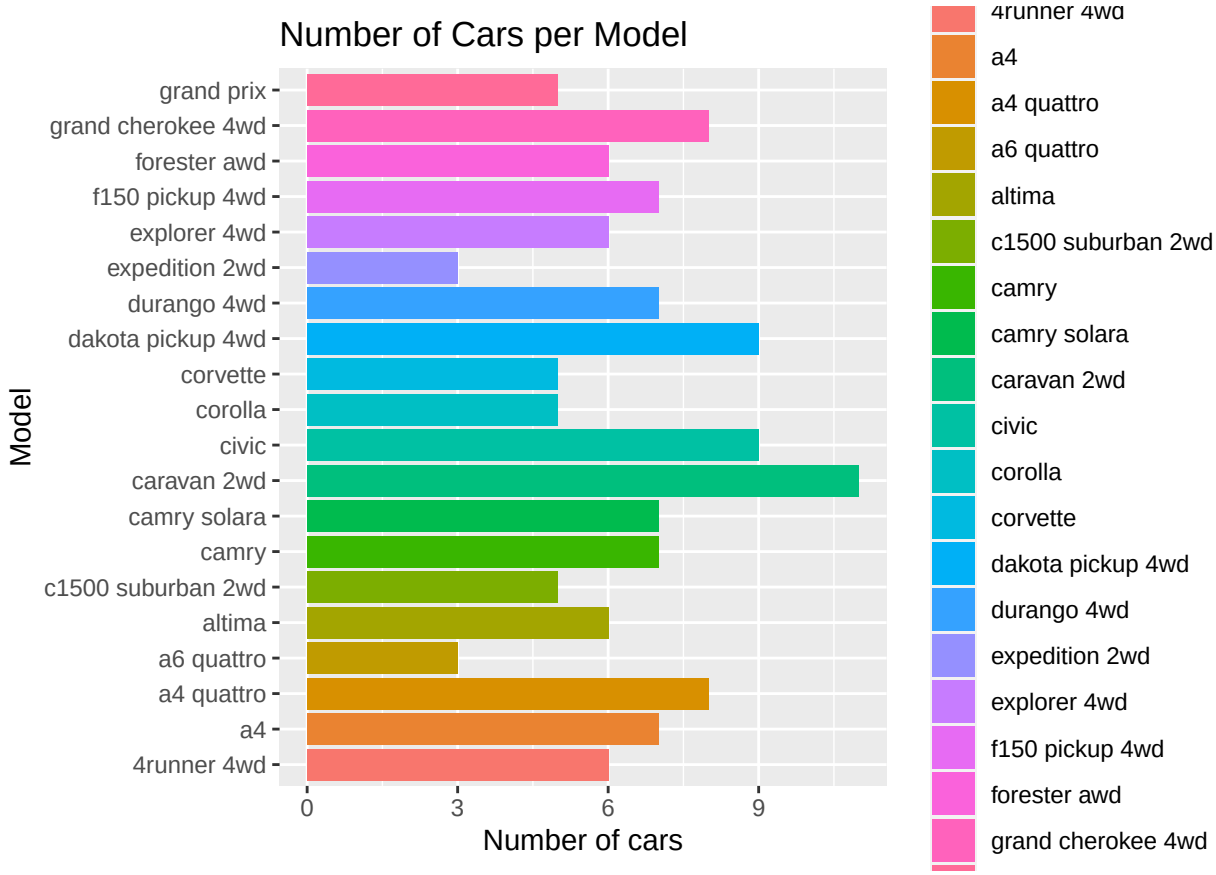
4a. Plot using geom_bar() using the top 20 observations only. The graphs shoudl have a title, labels and colors. Show code and results

```
obs_20 <- head(model_car_count, 20)

top_20 <- ggplot(obs_20, aes(x = model, y = number_of_cars, fill = model)) + geom_bar(stat = "identity"

top_20
```



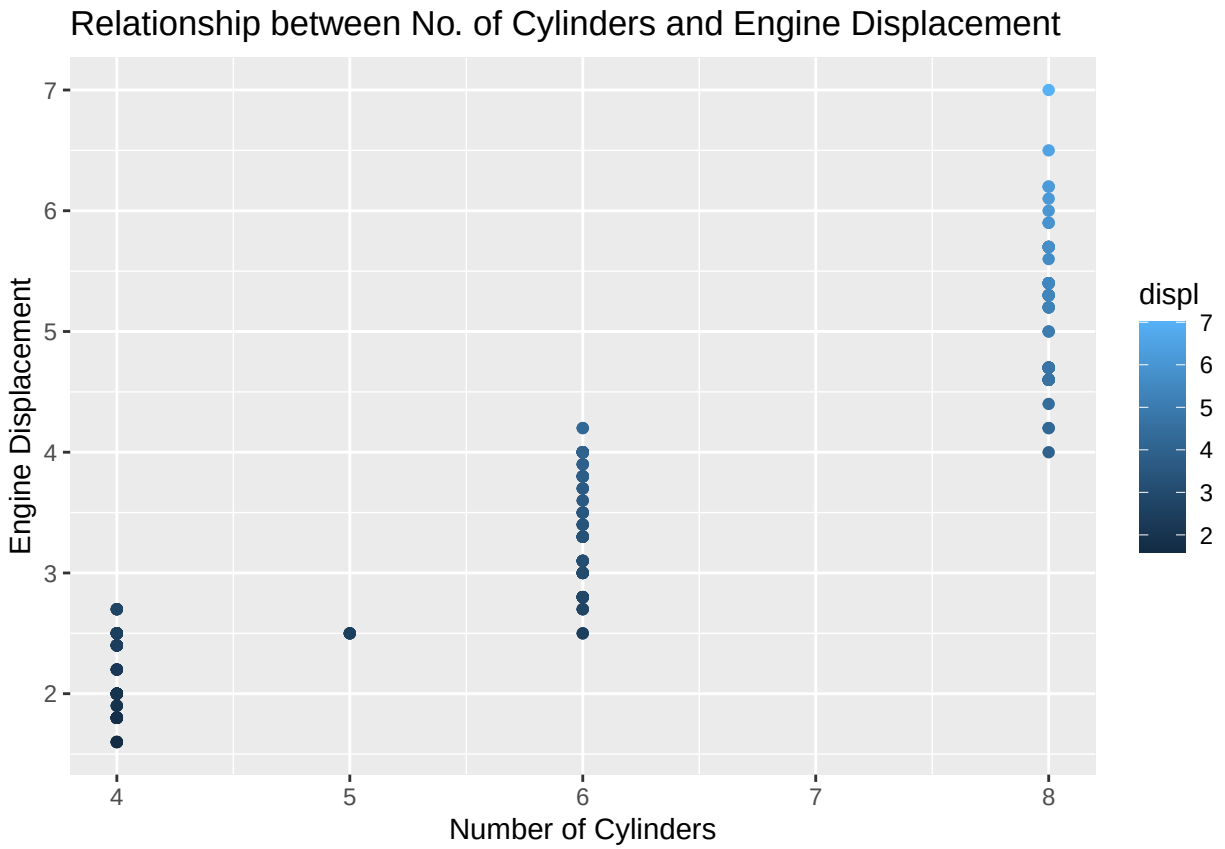
4b. b. Plot using the geom_bar() + coord_flip() just like what is shown below. Show codes and its result.

```
flipped_top_20 <- ggplot(obs_20, aes(x = model, y = number_of_cars, fill = model)) + geom_bar(stat = "i

flipped_top_20
```



5. Plot the relationship between cyl - number of cylinders and displ - engine displacement using geom_point with aesthetic color = engine displacement. Title should be "Relationship between No. of Cylinders and Engine Displacement".

```
cyl_displ_plot <- ggplot(mpg_file, 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")

cyl_displ_plot
```

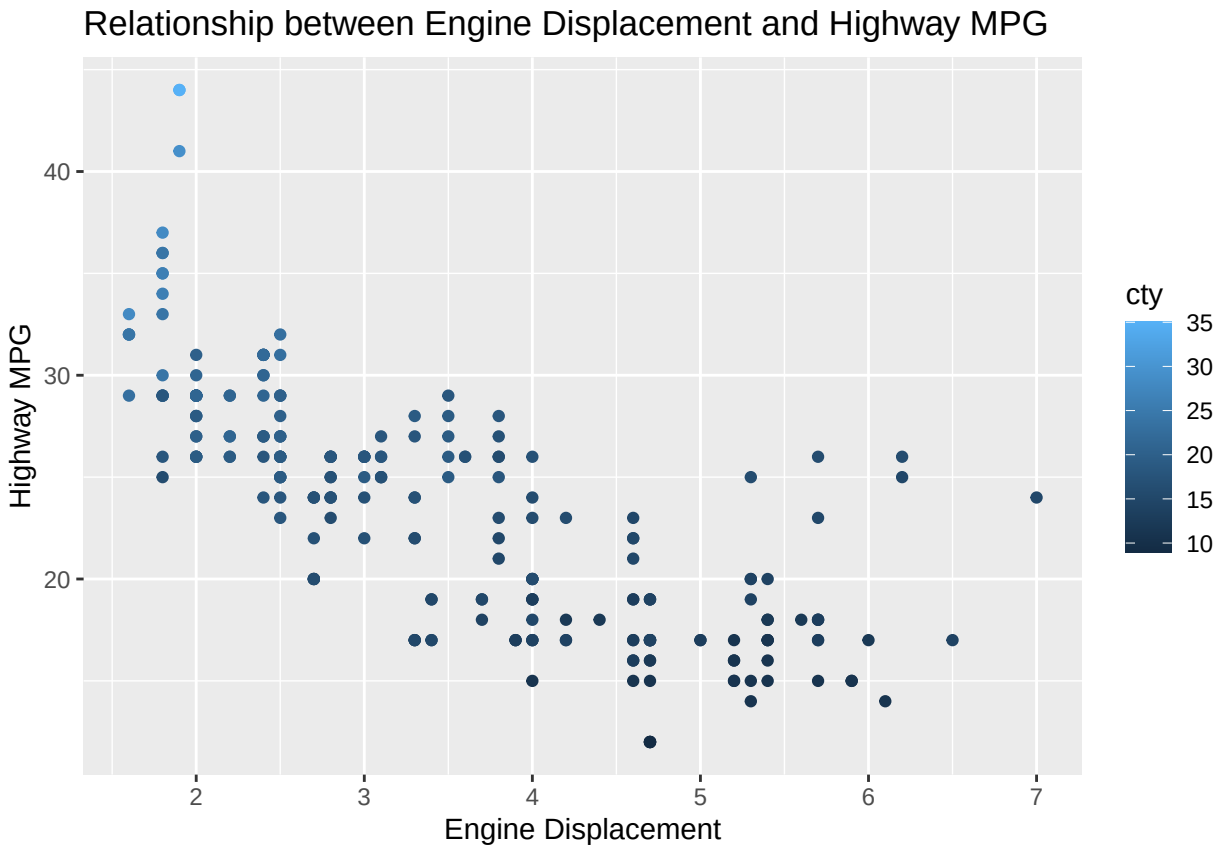


5a. How would you describe its relationship? Show the codes and its result.

```
# It will generate a scatter plot showing the relationship between the number of cylinders and engine d

# As the number of cylinders increases, the engine displacement tends to increase as well. This suggest
```

6. Plot the relationship between displ (engine displacement) and hwy(highway miles per gallon). Mapped it with a continuous variable you have identified in #1-c. What is its result? Why it produced such output?

```
displ_hwy_plot <- ggplot(mpg_file, aes(x = displ, y = hwy, color = cty)) +
  geom_point() +
  labs(title = "Relationship between Engine Displacement and Highway MPG",
       x = "Engine Displacement",
       y = "Highway MPG")

displ_hwy_plot
```




```
# This is a scatterplot with engine displacement on the x-axis and highway miles per gallon on the y-ax

# Using this plot, we can understand the relationship between the displ, hwy, and cty. By mapping the c

# This can provide understanding of the fuel efficiency of vehicle with different engine sizes
```

6. Import the traffic.csv onto your R environment.

6a. How many numbers of observation does it have? What are the variables of the traffic dataset the Show your answer.

```
library(readr)
traffic <- read.csv("traffic.csv")

num_obs <- nrow(traffic)
num_obs
```

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

```
num_vars <- ncol(traffic)
num_vars
```

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

```
vars <- colnames(traffic)
vars
```

```
## [1] "DateTime" "Junction" "Vehicles" "ID"
```

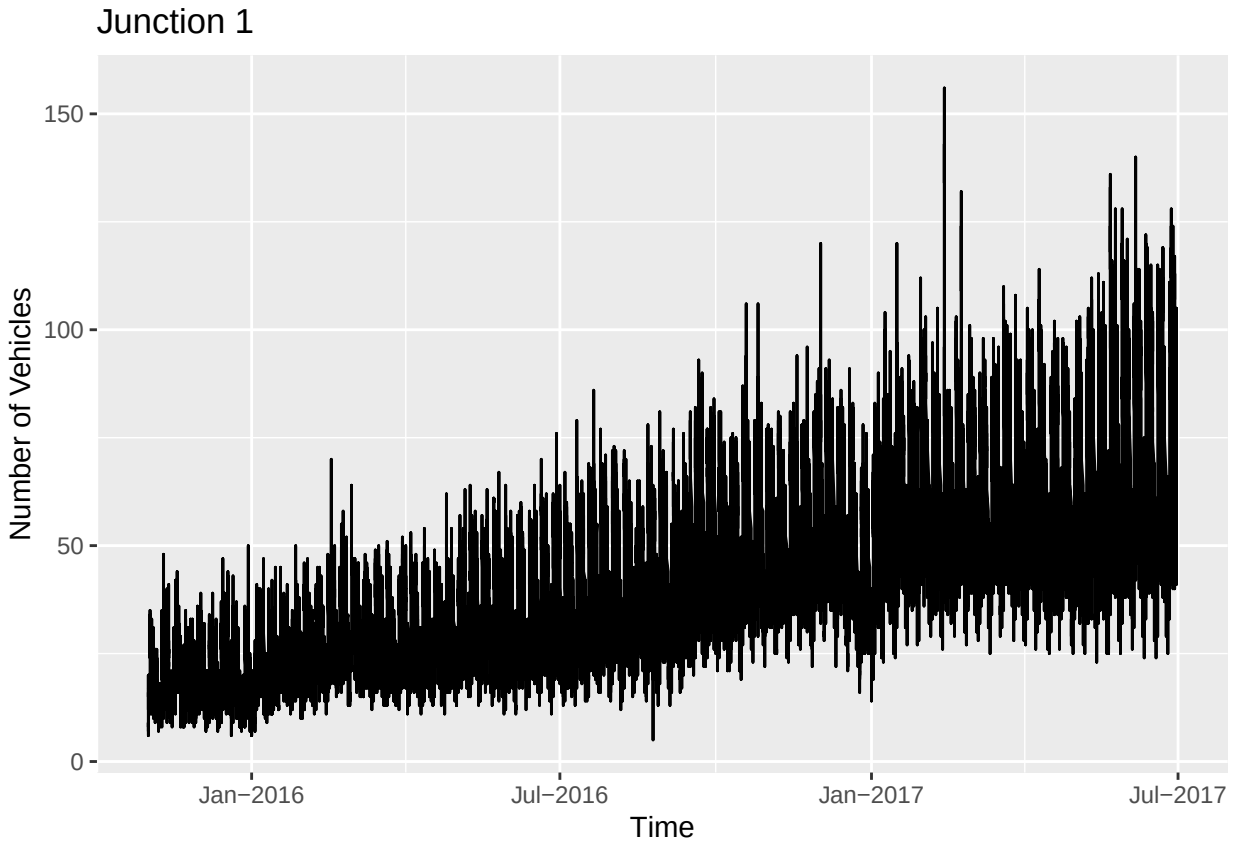
6b. subset the traffic dataset into junctions. What is the R codes and its output?

```r
junctions_subset_1 <- subset(traffic, Junction == 1)

junctions_subset_2 <- subset(traffic, Junction == 2)

junctions_subset_3 <- subset(traffic, Junction == 3)

junctions_subset_4 <- subset(traffic, Junction == 4)
```

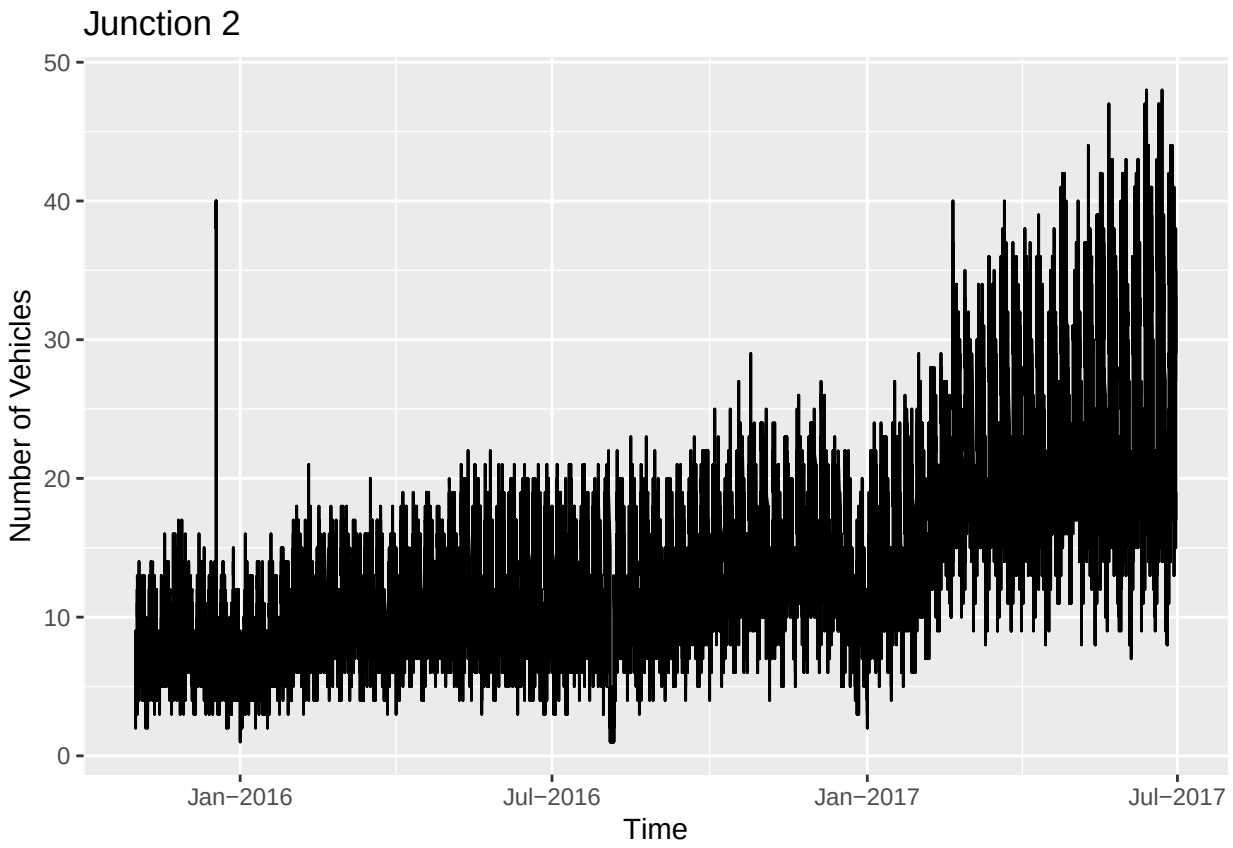
6c. Plot each junction in a using geom_line(). Show your solution and output.

```r
junction_1_plot <- ggplot(junctions_subset_1, aes(x = as.Date(junctions_subset_1$DateTime), y = Vehicles
  geom_line() +
  scale_x_date(date_labels = "%b-%Y") + theme(legend.position = "none") +
  labs(title = "Junction 1", x = "Time", y = "Number of Vehicles")

junction_1_plot
```

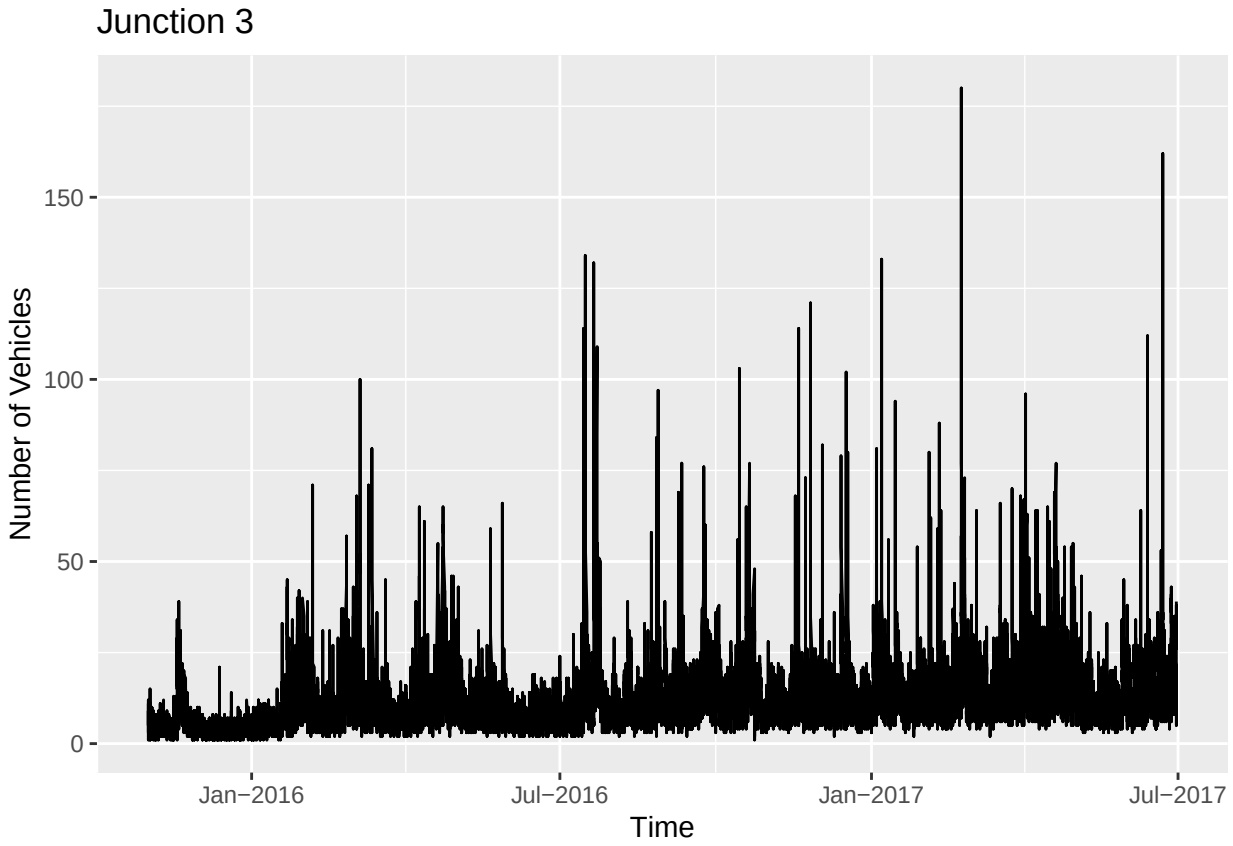
```
## Warning: Use of `junctions_subset_1$DateTime` is discouraged.
## i Use `DateTime` instead.
```



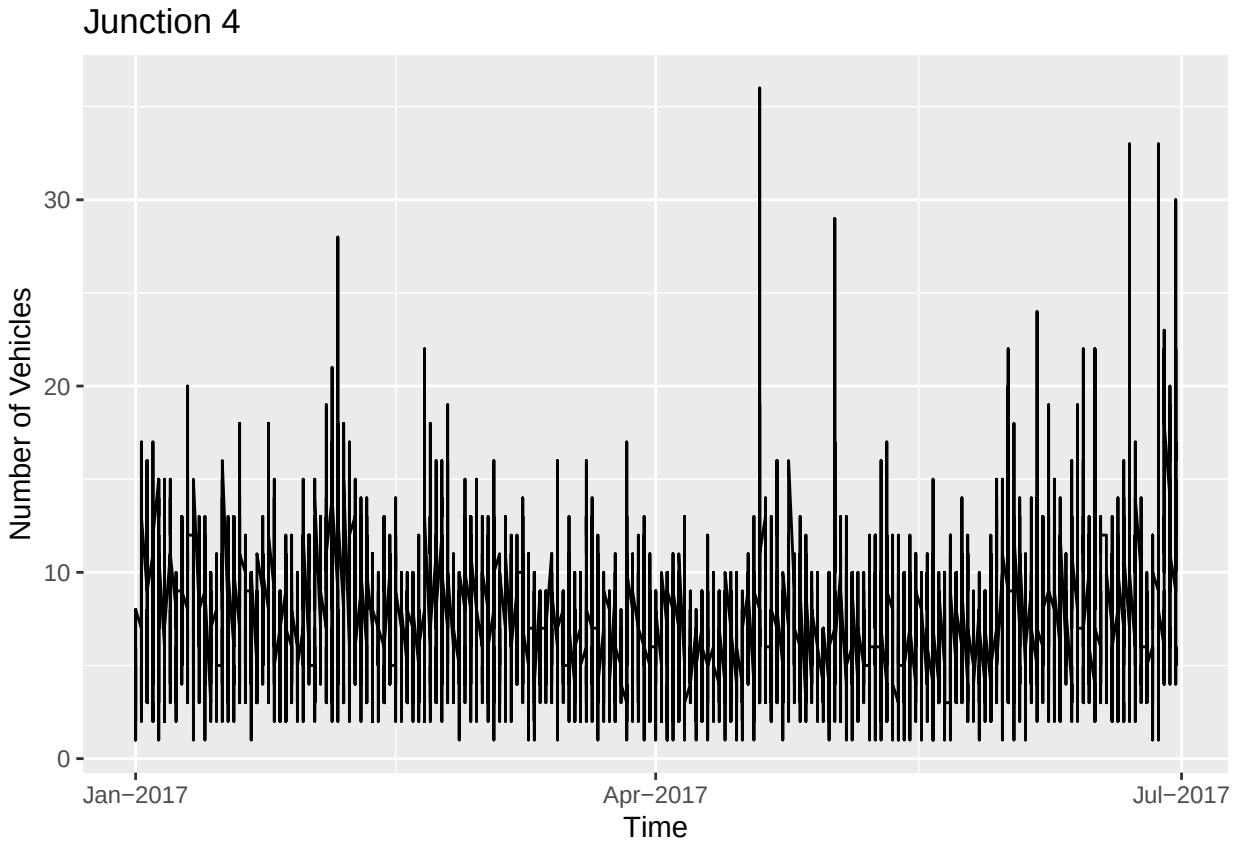

```r
junction_2_plot <- ggplot(junctions_subset_2, aes(x = as.Date(junctions_subset_2$DateTime), y = Vehicles
  geom_line() +
  scale_x_date(date_labels = "%b-%Y") + theme(legend.position = "none") +
  labs(title = "Junction 2", x = "Time", y = "Number of Vehicles")

junction_2_plot
```




```
junction_3_plot <- ggplot(junctions_subset_3, aes(x = as.Date(junctions_subset_3$DateTime), y = Vehicles
  geom_line() +
  scale_x_date(date_labels = "%b-%Y") + theme(legend.position = "none") +
  labs(title = "Junction 3", x = "Time", y = "Number of Vehicles")

junction_3_plot
```




```
junction_4_plot <- ggplot(junctions_subset_4, aes(x = as.Date(junctions_subset_4$DateTime), y = Vehicles
  geom_line() +
  scale_x_date(date_labels = "%b-%Y") + theme(legend.position = "none") +
  labs(title = "Junction 4", x = "Time", y = "Number of Vehicles")

junction_4_plot
```



7. From alexa_file.xlsx, import it to your environment

7a. How many observations does alexa_file has? What about the number of columns? Show your solution and answer.

```
library(readxl)

alexa_data <- read_excel("/cloud/project/worksheet#4/Worksheet4c/alexa_file.xlsx")

num_obs <- nrow(alexa_data)
num_obs
```

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

```
num_cols <- ncol(alexa_data)
num_cols
```

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

7b. group the variations and get the total of each variations. Use dplyr package. Show solution and answer

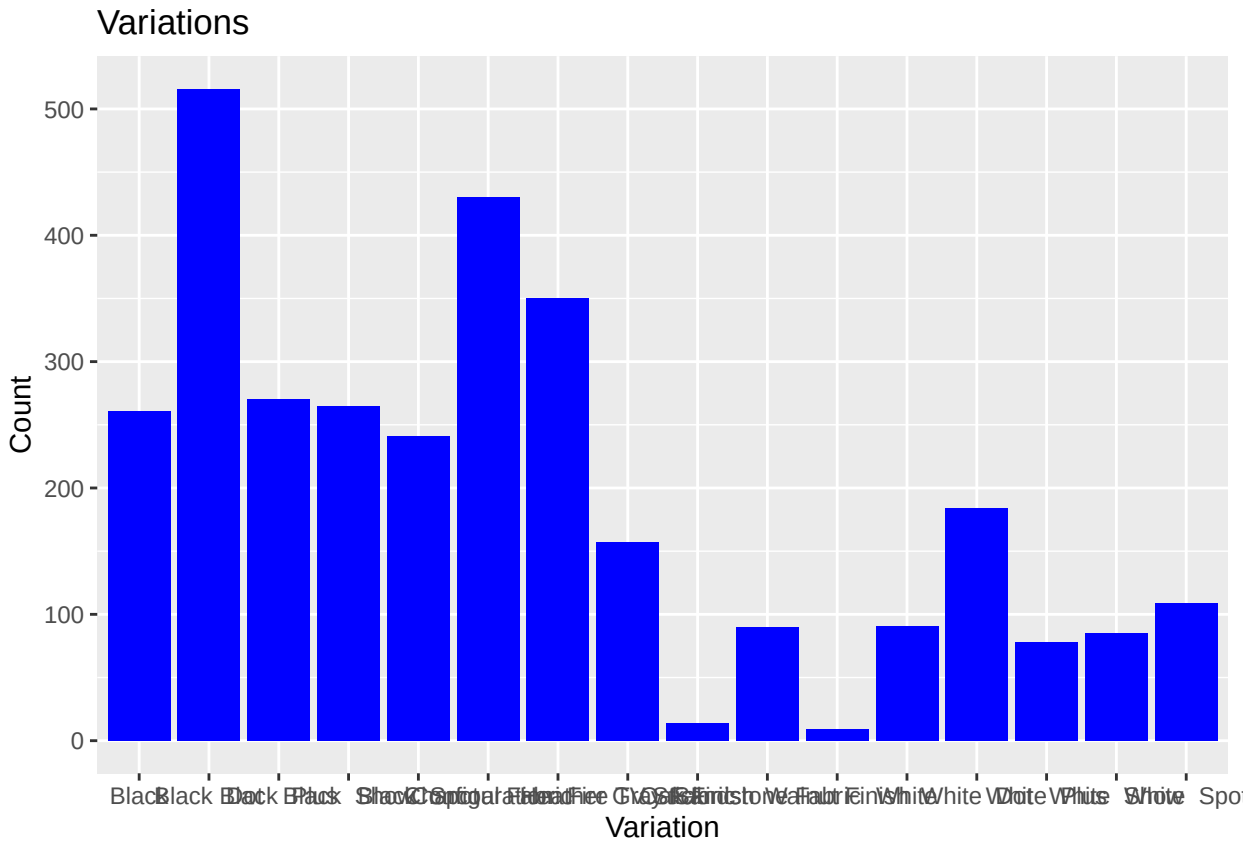
```
var_counts <- alexa_data %>%
  count(variation)

var_counts
```

```
## # A tibble: 16 x 2
##    variation                         n
##    <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. Plot the variations using the ggplot() function. What did you observe? Complete the details of the graph. Show solution and answer.

```
alexa_plot <- ggplot(alexa_data, aes(x = variation)) +
  geom_bar(fill = "blue") +
  labs(title = "Variations",
       x = "Variation",
       y = "Count")

alexa_plot
```



```
# The graph shows the distribution of variations and their respective counts. Each bar represents a spe
```

7d. Plot a geom_line() with the date and the number of verified reviews. Complete the details of the graphs. Show your answer and solution

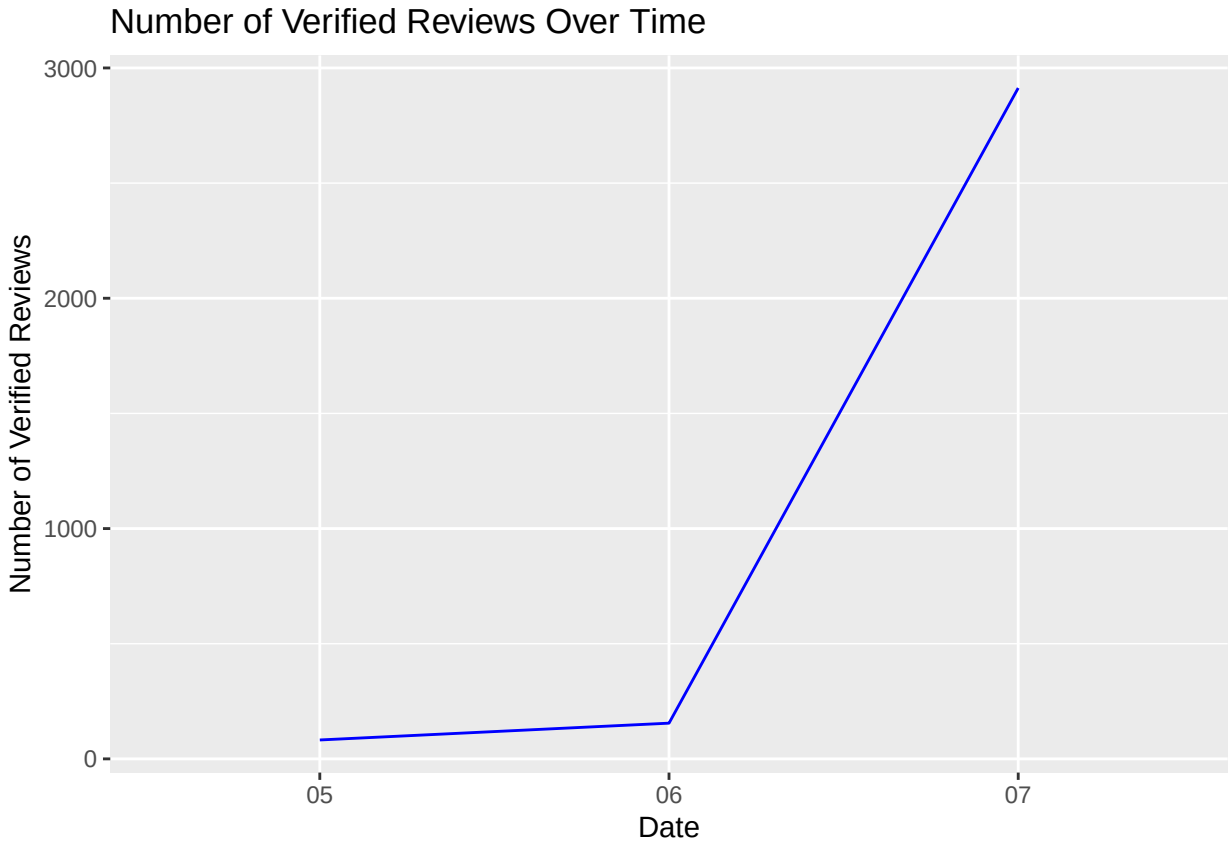
```
library(dplyr)

alexa_data$date <- as.Date(alexa_data$date)

alexa_data$month <- format(alexa_data$date, "%m")

countMonth <- alexa_data %>%
  count(month)
countMonth
```

```
## # A tibble: 3 x 2
##   month     n
##   <chr> <int>
## 1 05       82
## 2 06      155
## 3 07     2913
```

```
monthly_revCount <- table(countMonth)
monthly_revCount
```

```
##       n
## month 82 155 2913
##    05  1   0    0
##    06  0   1    0
##    07  0   0    1
```

```
alexa_line <- ggplot(countMonth, aes(x = month, y = n, group = 1)) +
  geom_line(color = "blue") +
  labs(title = "Number of Verified Reviews Over Time",
       x = "Date",
       y = "Number of Verified Reviews")

alexa_line
```



7e. Get the relationship of variations and ratings. Which variations got the most highest in rating? Plot a graph to show its relationship. Show your solution and answer.

```
variation_ratings <- alexa_data %>%
  group_by(variation) %>%
  summarise(avg_rating = mean(rating))

variation_ratings
```

```
## # A tibble: 16 x 2
##    variation                    avg_rating
##    <chr>                             <dbl>
##  1 Black                              4.23
##  2 Black  Dot                         4.45
##  3 Black  Plus                        4.37
##  4 Black  Show                        4.49
##  5 Black  Spot                        4.31
##  6 Charcoal Fabric                    4.73
##  7 Configuration: Fire TV Stick       4.59
##  8 Heather Gray Fabric                4.69
##  9 Oak Finish                         4.86
## 10 Sandstone Fabric                   4.36
## 11 Walnut Finish                      4.89
## 12 White                              4.14
## 13 White  Dot                         4.42
## 14 White  Plus                        4.36
## 15 White  Show                        4.28
## 16 White  Spot                        4.31
```

```r
highest_ratings <- variation_ratings %>%
  filter(avg_rating == max(avg_rating))

highest_ratings
```

```
## # A tibble: 1 x 2
##   variation     avg_rating
##   <chr>              <dbl>
## 1 Walnut Finish       4.89
```

```r
# The walnut finish variation has the highest rating

ggplot(variation_ratings, aes(x = variation, y = avg_rating)) +
  geom_bar(stat = "identity", fill = "blue") +
  labs(title = "Average Ratings by Variation",
       x = "Variation",
       y = "Average Rating")
```