Worksheet-6

Angel Janica Marie De Jesus

2022-11-24

#1. How many columns are in mpg dataset? How about the number of rows? Show the codes and its result.

```
library(ggplot2)
```

```
## Warning: package 'ggplot2' was built under R version 4.2.2
```

```
library(dplyr)
```

```
## Warning: package 'dplyr' was built under R version 4.2.2
```

```
##
## 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
```

```
data(mpg)
datampg <- glimpse(mpg)
```

```
## Rows: 234
## Columns: 11
## $ manufacturer <chr> "audi", "audi", "audi", "audi", "audi", "audi", "audi", "~
## $ model        <chr> "a4", "a4", "a4", "a4", "a4", "a4", "a4", "a4 quattro", "~
## $ displ        <dbl> 1.8, 1.8, 2.0, 2.0, 2.8, 2.8, 3.1, 1.8, 1.8, 2.0, 2.0, 2.~
## $ year         <int> 1999, 1999, 2008, 2008, 1999, 1999, 2008, 1999, 1999, 200~
## $ cyl          <int> 4, 4, 4, 4, 6, 6, 6, 4, 4, 4, 4, 6, 6, 6, 6, 6, 6, 8, 8, ~
## $ trans        <chr> "auto(l5)", "manual(m5)", "manual(m6)", "auto(av)", "auto~
## $ drv          <chr> "f", "f", "f", "f", "f", "f", "f", "4", "4", "4", "4", "4~
## $ cty          <int> 18, 21, 20, 21, 16, 18, 18, 18, 16, 20, 19, 15, 17, 17, 1~
## $ hwy          <int> 29, 29, 31, 30, 26, 26, 27, 26, 25, 28, 27, 25, 25, 25, 2~
## $ fl           <chr> "p", "p", "p", "p", "p", "p", "p", "p", "p", "p", "p", "p~
## $ class        <chr> "compact", "compact", "compact", "compact", "compact", "c~
```

```
nrow(mpg)
```

```
## [1] 234
```

```
ncol(mpg)
```

```
## [1] 11
```

#2. Which manufacturer has the most models in this data set? Which model has the most variations? Ans:

```
#dodge has 37 modelss
totalno <- mpg %>%
  group_by(manufacturer) %>%
  tally(sort = TRUE)
```

#a. Group the manufacturers and find the unique models. Copy the codes and result.

```
datampg <- mpg
uniqMods <- datampg %>% group_by(manufacturer, model) %>%
  distinct() %>% count()
uniqMods
```

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

```
colnames(uniqMods) <- c("Manufacturer", "Model","Counts")
uniqMods
```

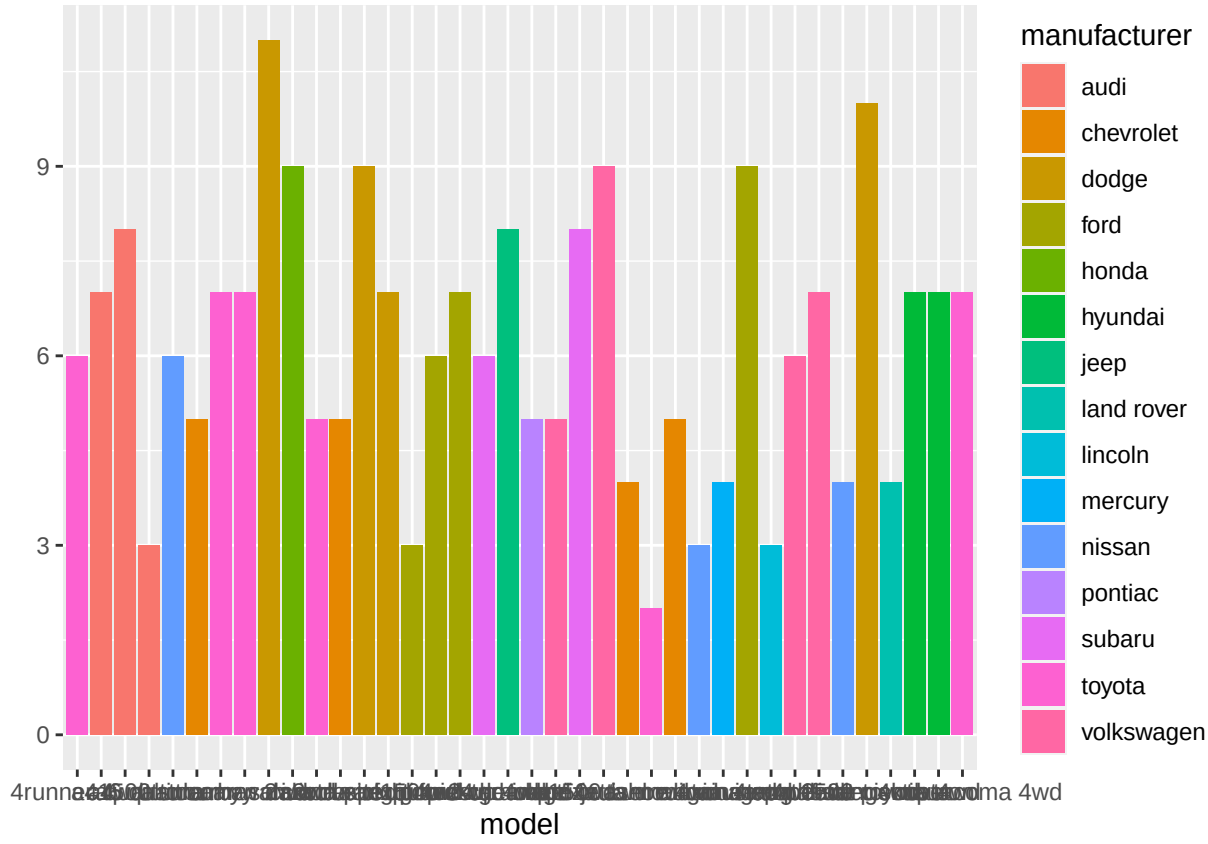
```
## # A tibble: 38 x 3
## # Groups:   Manufacturer, Model [38]
##    Manufacturer Model              Counts
##    <chr>        <chr>               <int>
##  1 audi         a4                      7
##  2 audi         a4 quattro              8
##  3 audi         a6 quattro              3
##  4 chevrolet    c1500 suburban 2wd      4
##  5 chevrolet    corvette                5
```

```
##  6 chevrolet    k1500 tahoe 4wd         4
##  7 chevrolet    malibu                  5
##  8 dodge        caravan 2wd             9
##  9 dodge        dakota pickup 4wd       8
## 10 dodge        durango 4wd             6
## # ... with 28 more rows
```

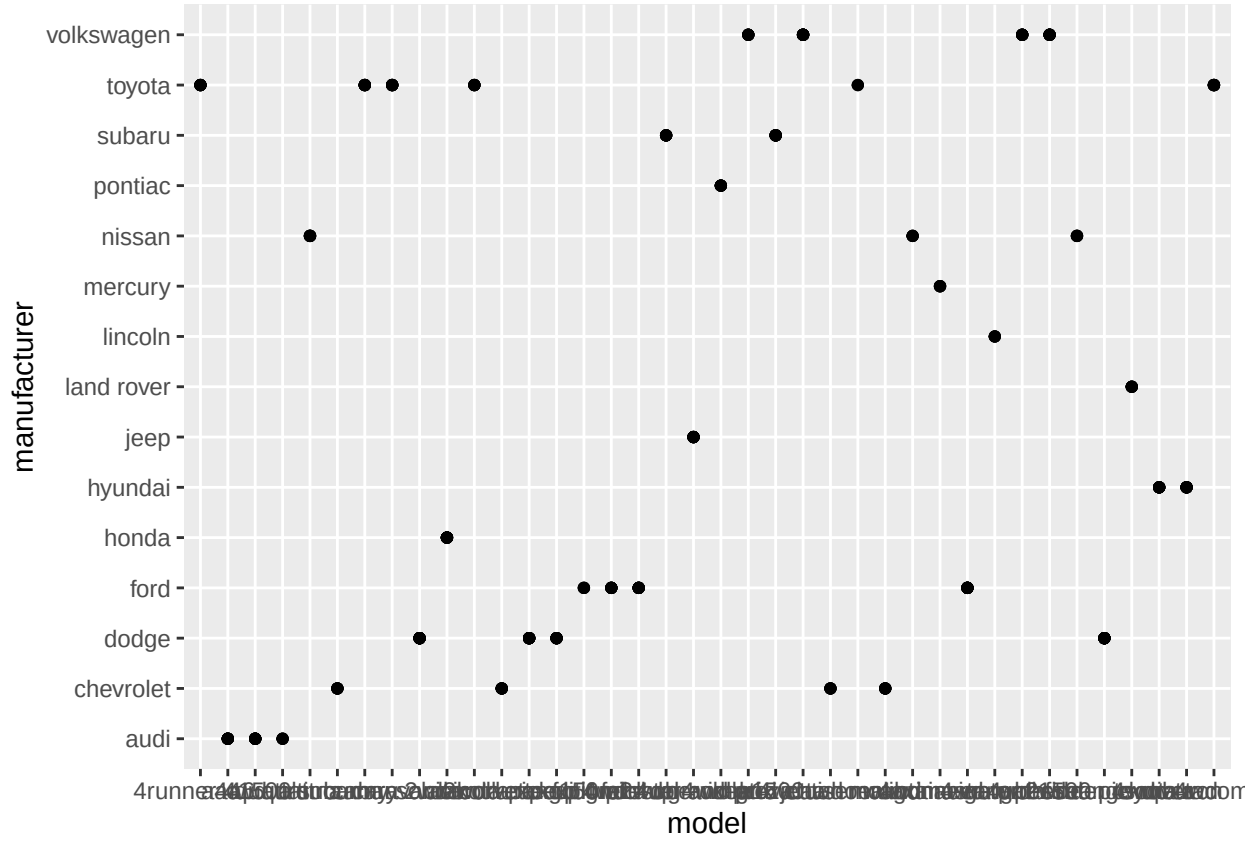
#b. Graph the result by using plot() and ggplot(). Write the codes and its result.

```
#plot
qplot(model, data = mpg,geom = "bar", fill=manufacturer)
```

```
## Warning: `qplot()` was deprecated in ggplot2 3.4.0.
```




```
#ggplot
ggplot(mpg, aes(model, manufacturer)) + geom_point()
```



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

```
datampg <- mpg
modfact <- datampg %>% group_by(manufacturer, model) %>%
  distinct() %>% count()
modfact
```

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

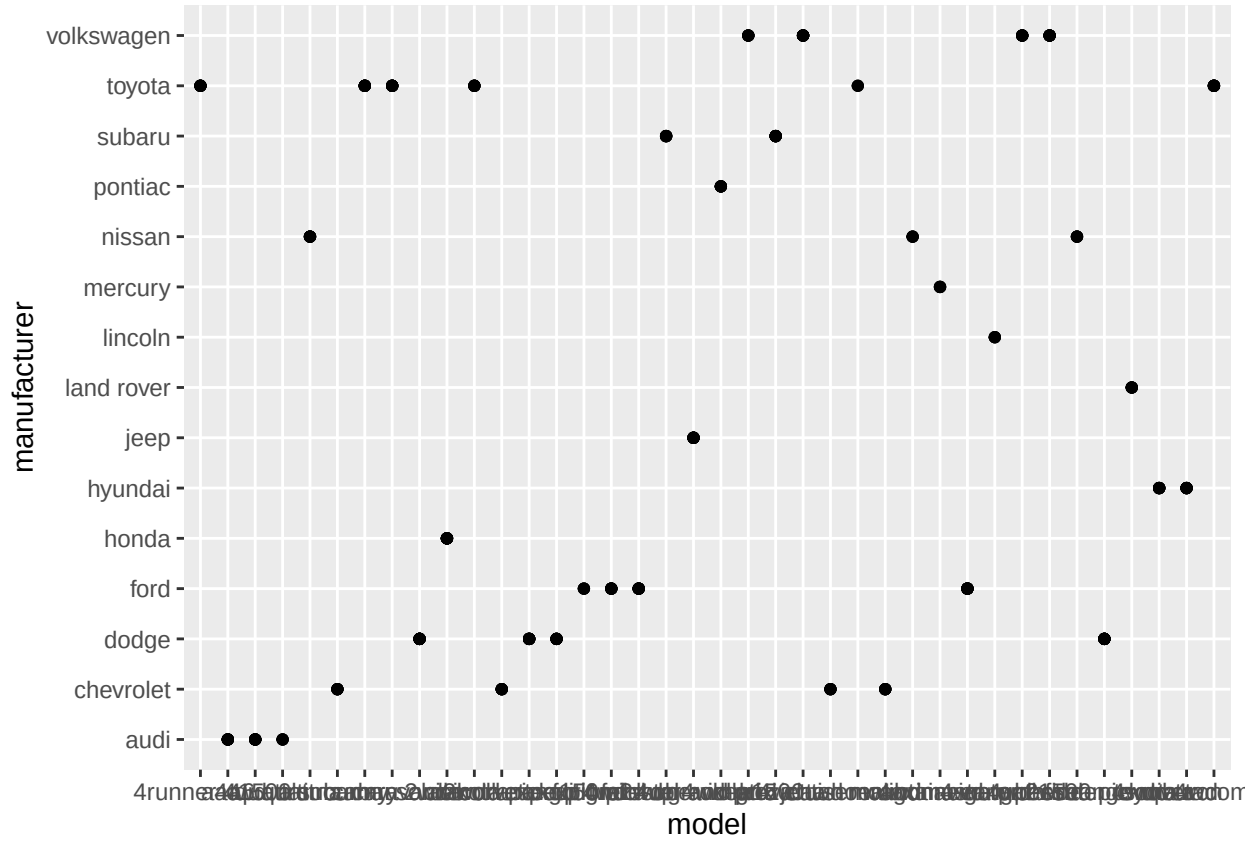
```
colnames(modfact) <- c("Manufacturer", "Model")
modfact
```

```
## # A tibble: 38 x 3
```

```
## # Groups:   Manufacturer, Model [38]
##    Manufacturer Model                 ``
##    <chr>        <chr>              <int>
##  1 audi         a4                     7
##  2 audi         a4 quattro             8
##  3 audi         a6 quattro             3
##  4 chevrolet    c1500 suburban 2wd     4
##  5 chevrolet    corvette               5
##  6 chevrolet    k1500 tahoe 4wd        4
##  7 chevrolet    malibu                 5
##  8 dodge        caravan 2wd            9
##  9 dodge        dakota pickup 4wd      8
## 10 dodge        durango 4wd            6
## # ... with 28 more rows
```

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

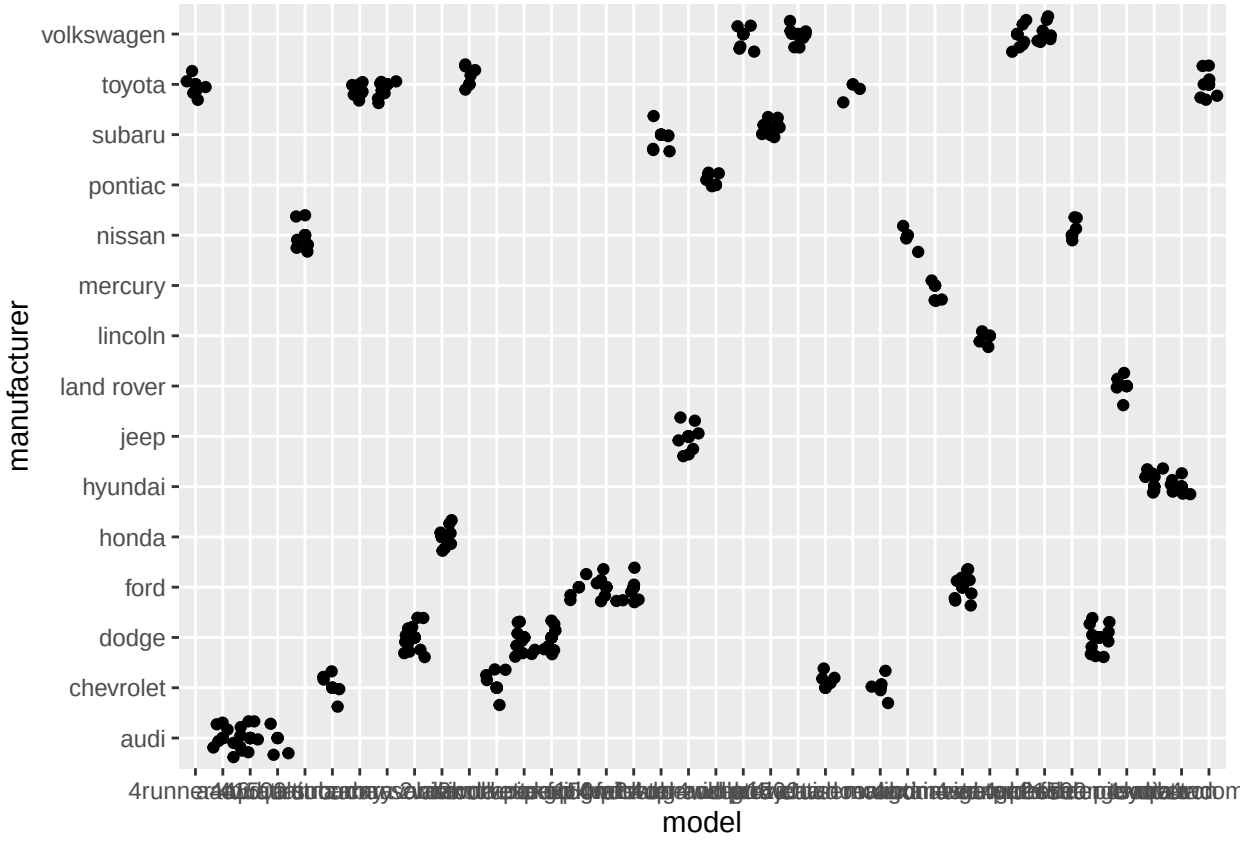
```
ggplot(mpg, aes(model, manufacturer)) + geom_point()
```




```
#geometric point graph of mpg(model and manufacturer)
```

#b. For you, is it useful? If not, how could you modify the data to make it more informative? : Yes, It is useful because you could trackdown the data of each model of the manufacturer

```
#to modify the data:
ggplot(mpg, aes(model, manufacturer)) +
  geom_point() +
  geom_jitter()
```



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

```
library(ggplot2)
library(dplyr)

datampg <- uniqMods %>% group_by(Model) %>% count()
datampg
```

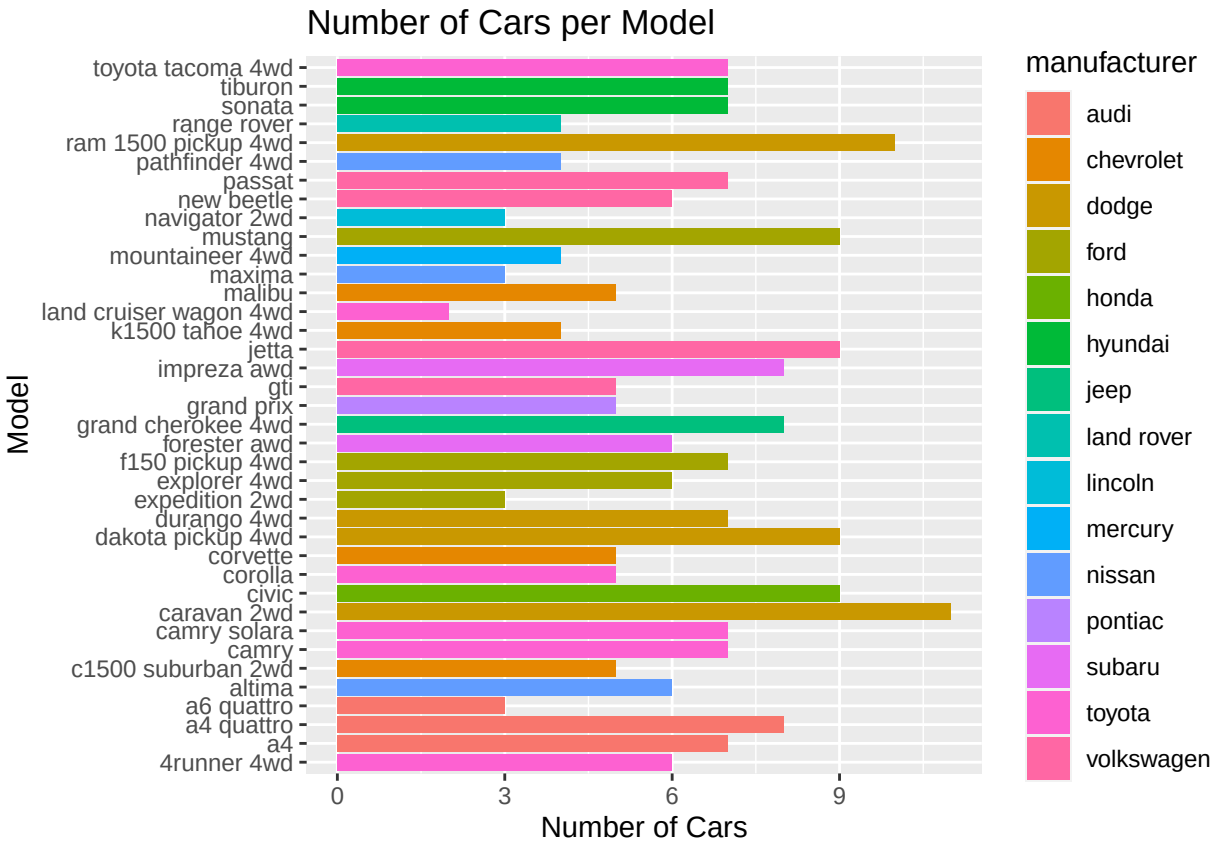
```
## # A tibble: 38 x 2
## # Groups:   Model [38]
##    Model                  n
##    <chr>              <int>
##  1 4runner 4wd            1
##  2 a4                     1
##  3 a4 quattro             1
##  4 a6 quattro             1
##  5 altima                 1
##  6 c1500 suburban 2wd     1
##  7 camry                  1
##  8 camry solara           1
```

```
##  9 caravan 2wd            1
## 10 civic                  1
## # ... with 28 more rows
```

```
colnames(datampg) <- c("Model","Counts")
```

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

```
qplot(model,data = mpg,main = "Number of Cars per Model", xlab = "Model",ylab = "Number of Cars", geom =
```



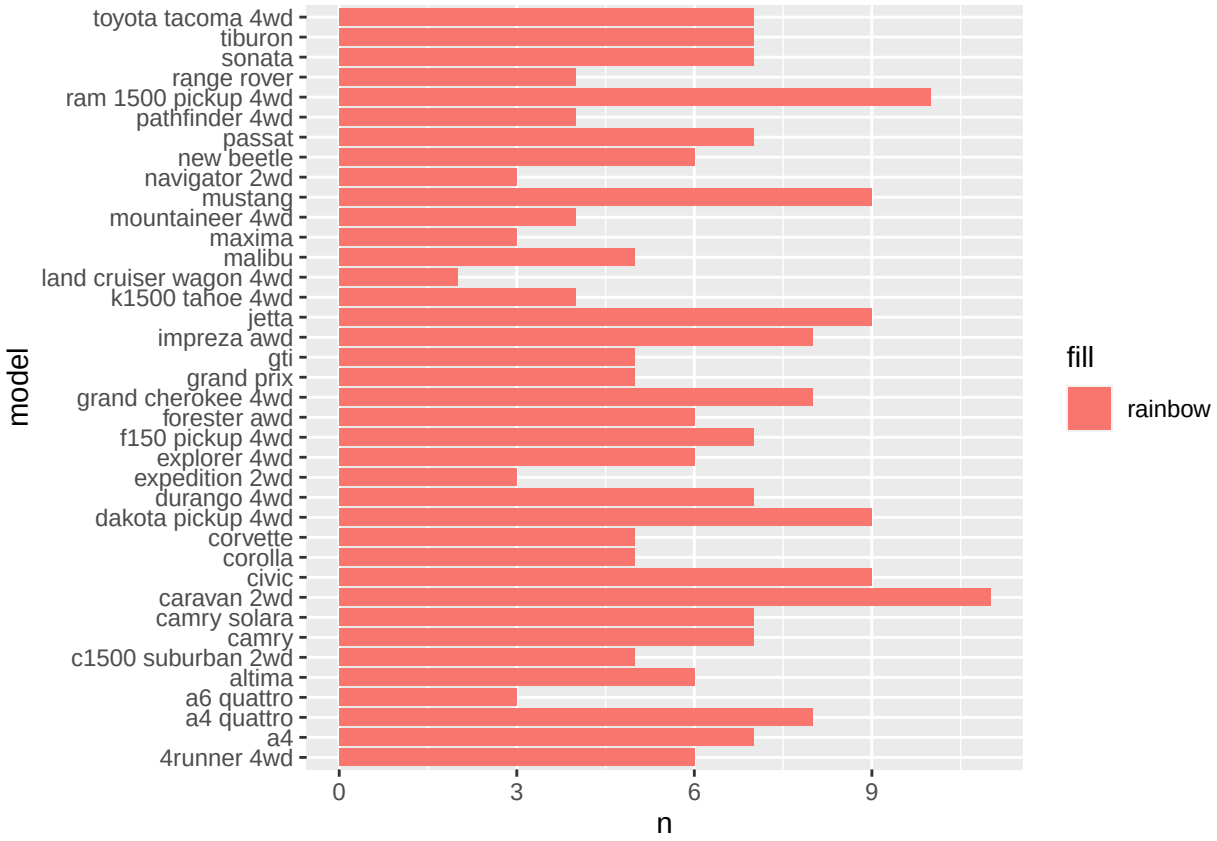
#b. Use only the top 20 observations. Show code and results.

```
cars_Model <- mpg %>%
  group_by(model) %>%
  tally(sort = TRUE)
cars_Model
```

```
## # A tibble: 38 x 2
##    model                 n
##    <chr>             <int>
##  1 caravan 2wd          11
##  2 ram 1500 pickup 4wd  10
##  3 civic                 9
##  4 dakota pickup 4wd     9
##  5 jetta                 9
```

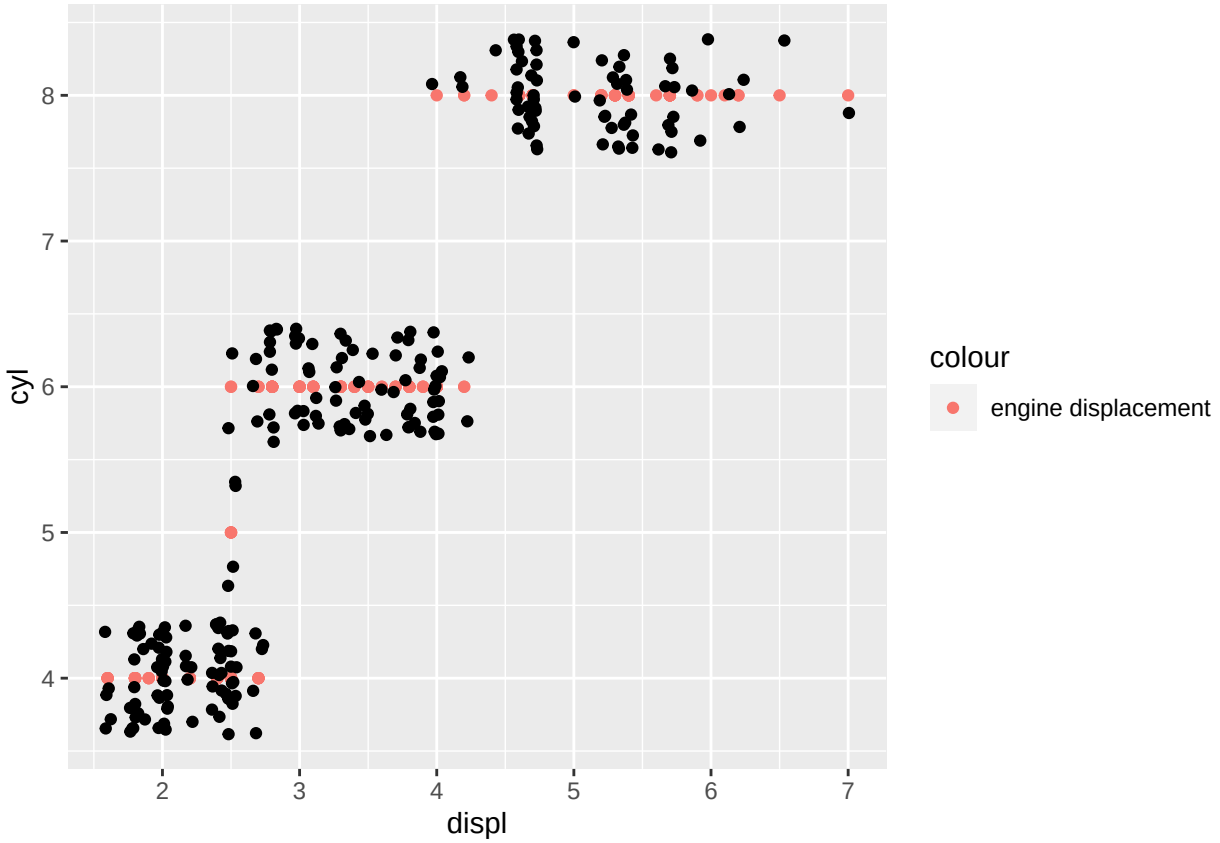
```
##  6 mustang                 9
##  7 a4 quattro              8
##  8 grand cherokee 4wd      8
##  9 impreza awd             8
## 10 a4                      7
## # ... with 28 more rows
```

```
ggplot(cars_Model, aes(x = model, y = n, fill = "rainbow")) +
  geom_bar(stat = "identity") + coord_flip()
```



#5. Plot the relationship between cyl - number of cylinders and displ - engine displacement using geom_point with aesthetic colour = engine displacement. Title should be "Relationship between No. of Cylinders and Engine Displacement". #a. Show the codes and its result.

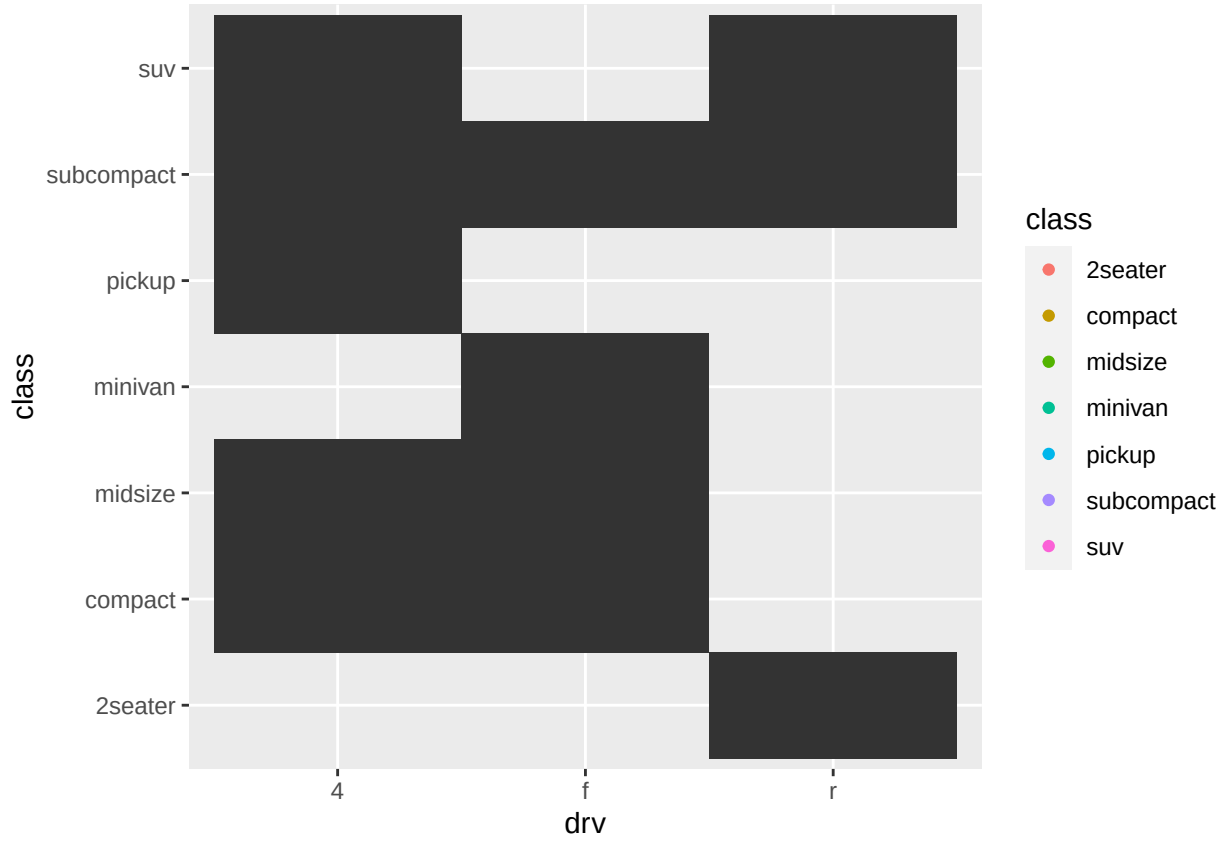
```
ggplot(data = mpg , mapping = aes(x = displ, y = cyl, main = "Relationship between No of Cylinders and
```



#I would say according to my data of making cyl the y, the graph is jittered. the pink color indicates the engine displacement and you can see that it is in a straight horizontal position.

#6.Get the total number of observations for drv - type of drive train (f = front-wheel drive, r = rear wheel drive, 4 = 4wd) and class - type of class (Example: suv, 2seater, etc.) Plot using the geom_tile() where the number of observations for class be used as a fill for aesthetics. #a. Show the codes and its result for the narrative in #6.

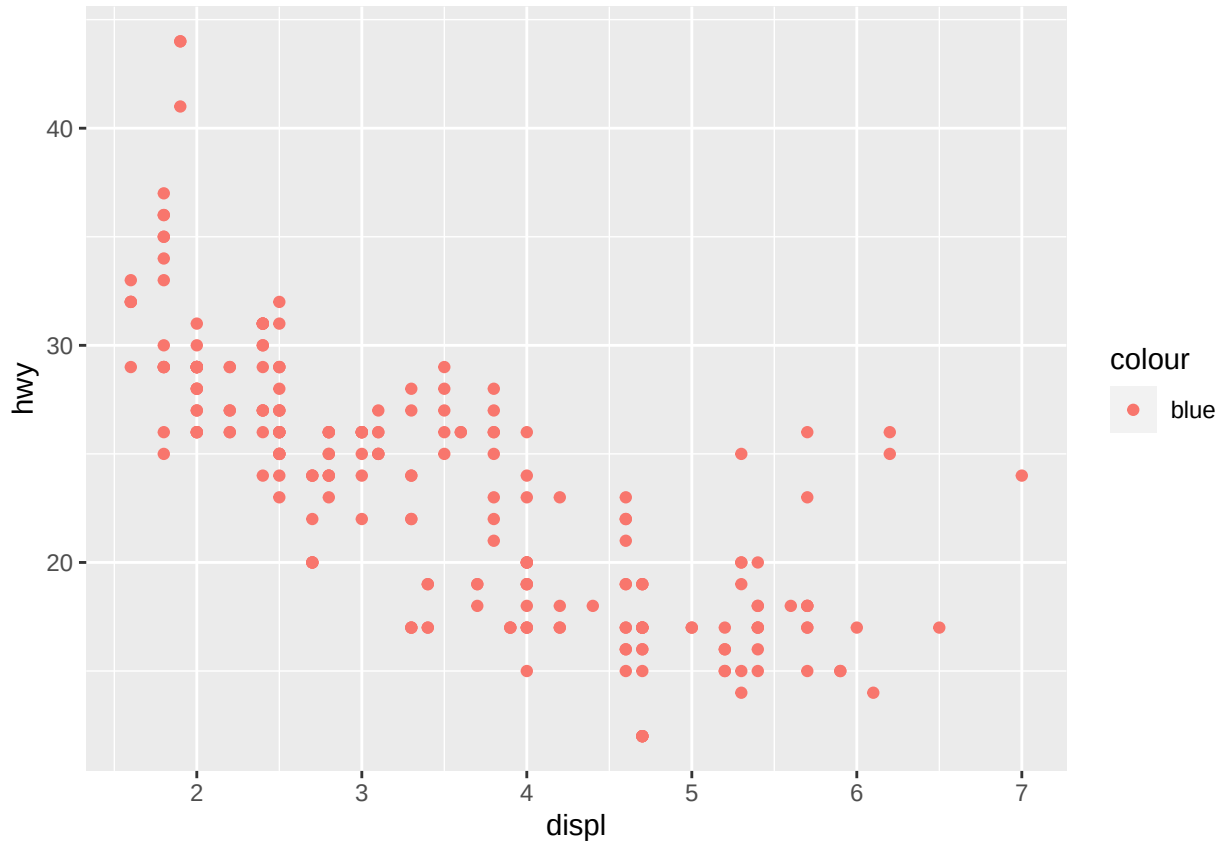
```
ggplot(data = mpg, mapping = aes(x = drv, y = class)) + geom_point(mapping=aes(color=class)) +
  geom_tile()
```



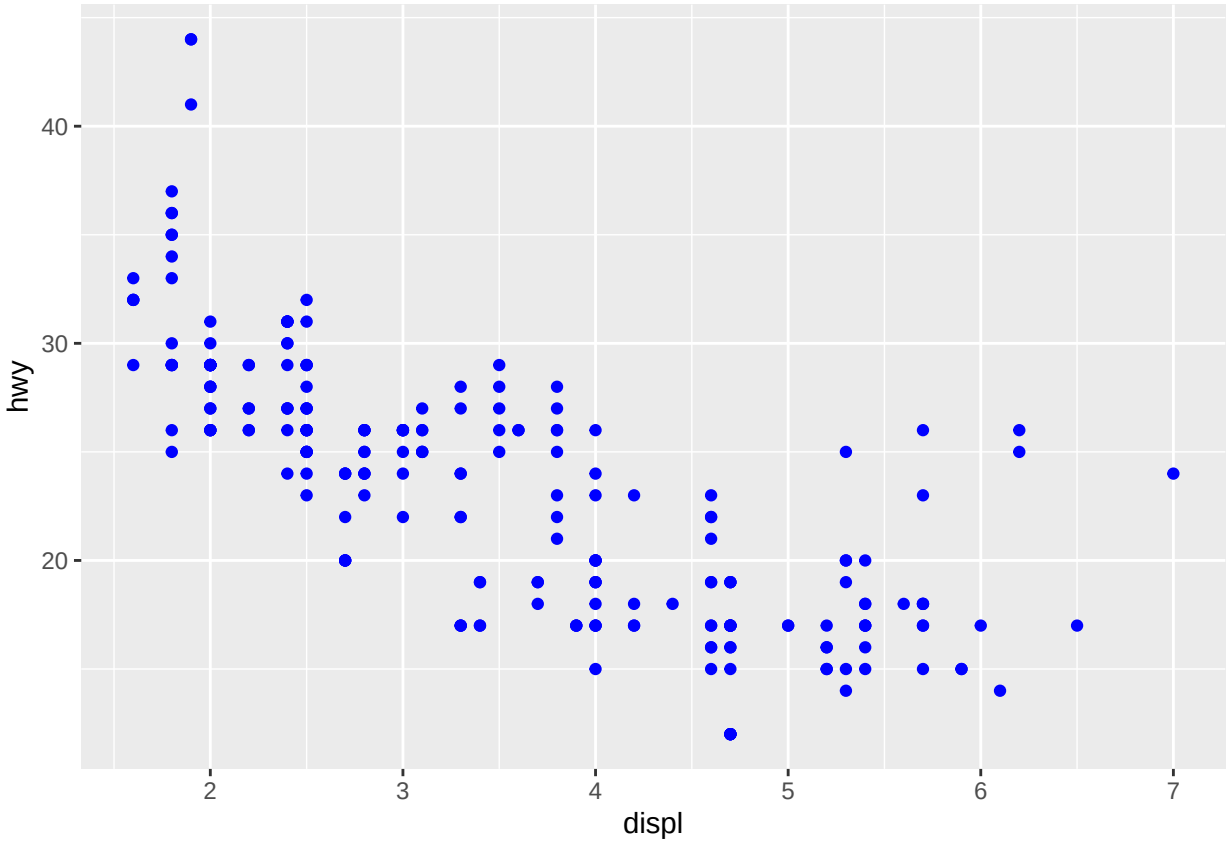
#b. Interpret the result: Areas covered with black are "mapped" using the mapping geometric point graph. y as class and x as drv.

#7. Discuss the difference between these codes. Its outputs for each are shown below.

```
#Code #1
ggplot(data = mpg) +
  geom_point(mapping = aes(x = displ, y = hwy, colour = "blue"))
```




```
#+ Code #2
ggplot(data = mpg) +
  geom_point(mapping = aes(x = displ, y = hwy), colour = "blue")
```



#8. Try to run the command ?mpg. What is the result of this command?

```
?mpg
```

```
## starting httpd help server ... done
```

#a. Which variables from mpg dataset are categorical?

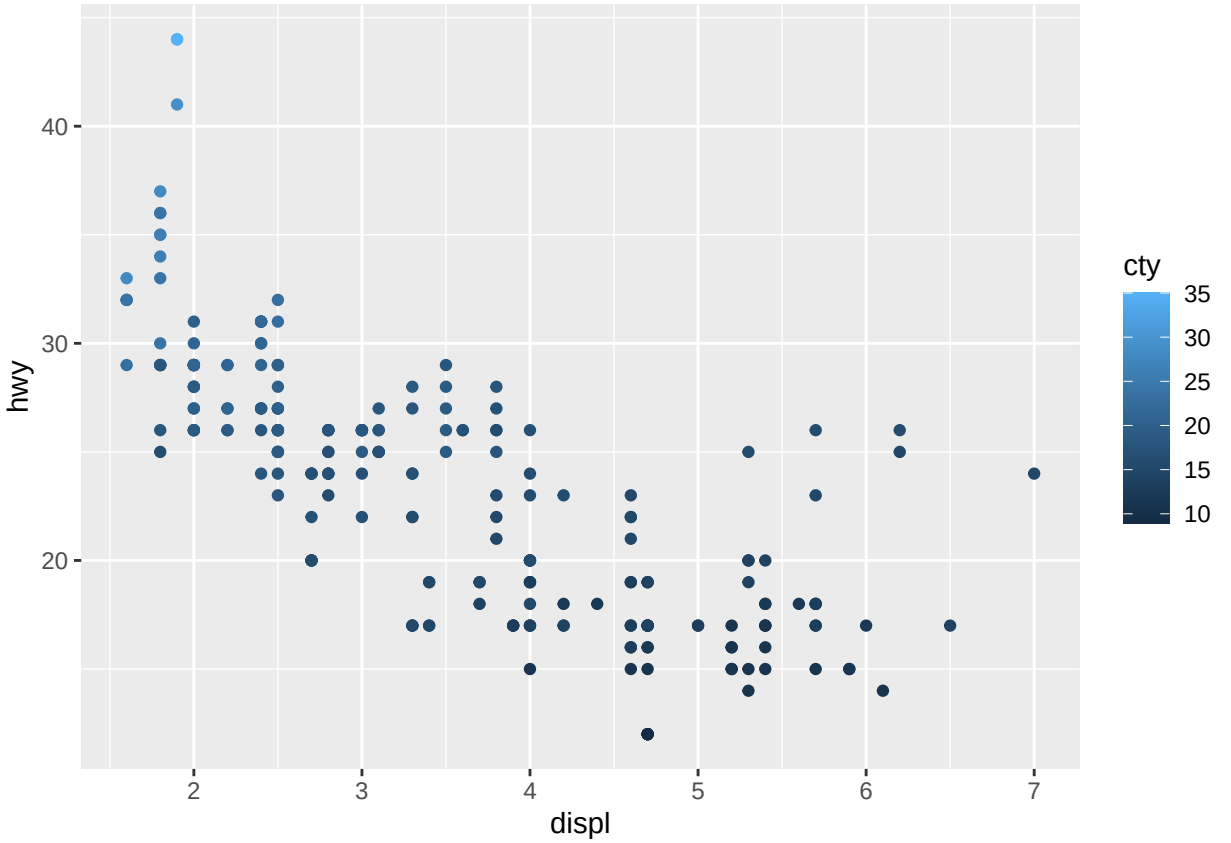
```
#Categorical variables in mpg include: manufacturer, model, trans (type of transmission), drv (front-wh
```

#b. Which are continuous variables?

```
#Continuous varibles in R are called doubles or integers.
```

#c. Plot the relationship between displ (engine displacement) and hwy(highway miles per gallon). Mapped it with a continuous variable you have identified in #5-b.

```
ggplot(mpg, aes(x = displ, y = hwy, colour = cty)) + geom_point()
```

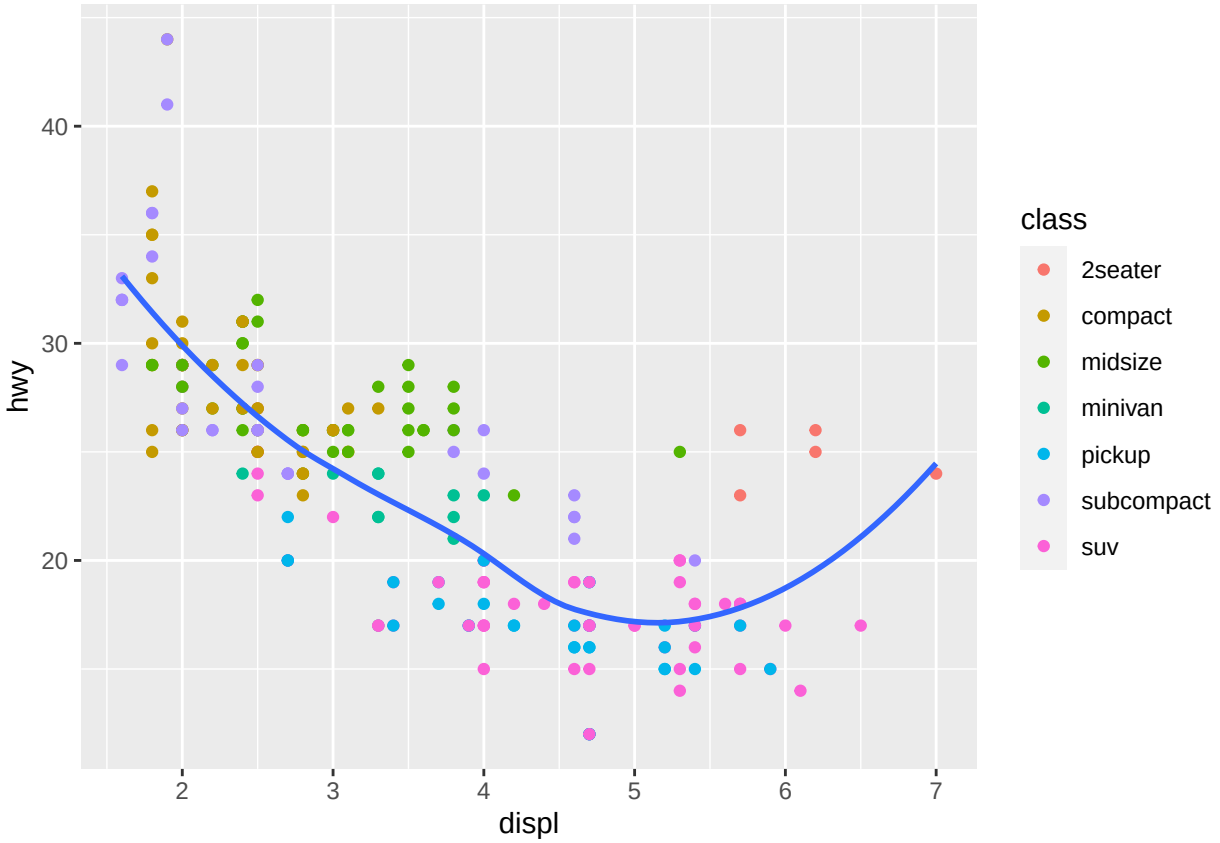



```
#What is its result? Why it produced such output? : data tracks the cty by placing cty(city miles per g
```

#9.Plot the relationship between displ (engine displacement) and hwy(highway miles per gallon) using geom_point(). Add a trend line over the existing plot using geom_smooth() with se = FALSE. Default method is "loess".

```
ggplot(data = mpg, mapping = aes(x = displ, y = hwy)) +
  geom_point(mapping=aes(color=class)) +
  geom_smooth(se = FALSE)
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



#10.Using the relationship of displ and hwy, add a trend line over existing plot. Set the se = FALSE to remove the confidence interval and method = lm to check for linear modeling

```
ggplot(data = mpg, mapping = aes(x = displ, y = hwy, color = class)) +
  geom_point() +
  geom_smooth(se = FALSE)
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : span too small. fewer data values than degrees of freedom.

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : pseudoinverse used at 5.6935

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : neighborhood radius 0.5065

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : reciprocal condition number 0

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : There are other near singularities as well. 0.65044

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : pseudoinverse used at 4.008
```

```
## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : neighborhood radius 0.708

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : reciprocal condition number 0

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : There are other near singularities as well. 0.25
```