Create Data Visualization in R

2023-12-02 (By Koravit P.)

Using Fuel Economy data (MPG) from “ggplot2” library

By loading following library

```
library(tidyverse)
library(ggplot2)
library(patchwork)
library(dplyr)
head(mpg)
```

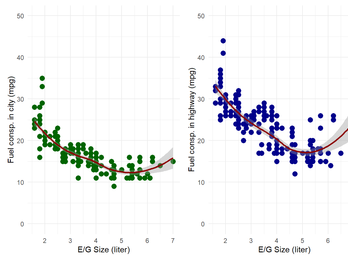
```
## # A tibble: 6 × 11
##   manufacturer model displ  year   cyl trans      drv     cty   hwy fl    class
##   <chr>        <chr> <dbl> <int> <int> <chr>      <chr> <int> <int> <chr> <chr>
## 1 audi         a4      1.8  1999     4 auto(l5)   f        18    29 p     compa…
## 2 audi         a4      1.8  1999     4 manual(m5) f        21    29 p     compa…
## 3 audi         a4      2    2008     4 manual(m6) f        20    31 p     compa…
## 4 audi         a4      2    2008     4 auto(av)   f        21    30 p     compa…
## 5 audi         a4      2.8  1999     6 auto(l5)   f        16    26 p     compa…
## 6 audi         a4      2.8  1999     6 manual(m5) f        18    26 p     compa…
```

1. Compare E/G size v.s. fuel consumption (city & highway)

```
h1 <- ggplot(mpg,aes(displ,cty)) +
       geom_point(color="darkgreen",size=3) +
       geom_smooth(color="darkred") +
       scale_x_continuous("E/G Size (liter)") +
       scale_y_continuous("Fuel consp. in city (mpg)",limits = c(0,50)) +
       theme_minimal()

h2 <- ggplot(mpg,aes(displ,hwy)) +
       geom_point(color="darkblue",size=3) +
       geom_smooth(color="darkred") +
       scale_x_continuous("E/G Size (liter)") +
       scale_y_continuous("Fuel consp. in highway (mpg)",limits = c(0,50)) +
       theme_minimal()

(h1+h2)
```



Analysis Graph 1. :

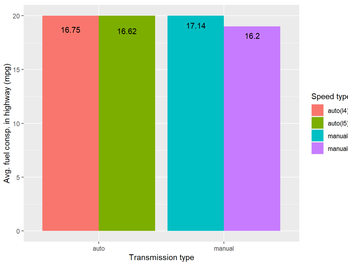
- In city will have fuel consumption more than highway

- E/G size also have effect to fuel consumption (large E/G size, More consumption rate)

2. Compare T/M type v.s. fuel consumption on highway for pickup class

```
mpg$trans_group <- ifelse(grepl("auto",mpg$trans)=="TRUE","auto","manual")

ggplot(mpg%>%filter(class=="pickup"),aes(x=trans_group,y=hwy,fill=trans))+
  geom_col(position = position_dodge())+
  stat_summary(fun ="mean",geom = "text",aes(label=after_stat(round(y,2))),position=position_dodge(width=0.9),vjust=-3)+
  scale_y_continuous(limits = c(0,20)) +
  labs(x="Transmission type",
       y="Avg. fuel consp. in highway (mpg)",
       fill="Speed type")
```



Analysis Graph 2. :

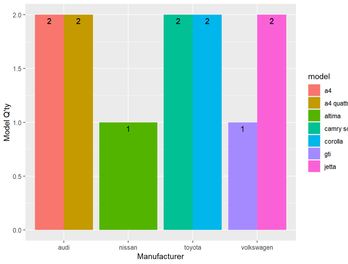
- In theory Gear speed should effect to Fuel consumption rate (5 speed should have fuel consumption rate better than 4 speed)

- From graph, Automatic T/M have consumption rate stable than Mannual T/M

3. Popular model quantity on year 1999 for compact class

```
mpg$trans_group <- ifelse(grepl("auto",mpg$trans)=="TRUE","auto","manual")
m3 <- mpg%>% filter(year==1999 & class=="compact" & trans_group=="auto") %>% add_count(model,name="c_dup")
countm3 <- n_distinct(m3$model)

ggplot(m3,aes(manufacturer,c_dup,fill=model)) +
  geom_col(position=position_dodge()) +
  geom_text(label=m3$c_dup,position=position_dodge(width=0.9),vjust=1.5) +
  labs(x="Manufacturer",
       y="Model Q'ty")
```

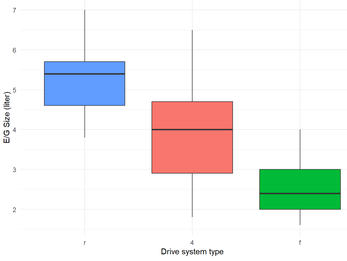


Analysis Graph 3. :

- Only 4 manufacturer have popular model in compact class

4. Compare E/G size v.s. Drive system

```
ggplot(mpg,aes(x=factor(drv,level=c("r","4","f")),displ,fill=drv)) +
  geom_boxplot(outlier.shape = NA,show.legend = FALSE) +
  theme_minimal() +
  labs(x="Drive system type",
       y="E/G Size (liter)")
```



Analysis Graph 4. :

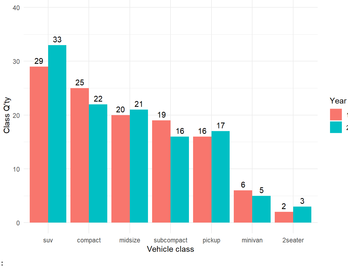
- Front wheel drive have smallest E/G size and mainly are for compact/sub-compact class

- Rear wheel drive have largest E/G size and mainly this type specify for performance car such as sport car

- 4 wheel drive mainly are for pickup/SUV require E/G to be larger than compact/sub-compact class

5. Most popular vehicle class Y1999 v.s. Y2008

```
ggplot(mpg,aes(x=factor(class,level=c("suv","compact","midsize","subcompact","pickup","minivan","2seater")),fill=factor(year))) +
  geom_bar(position = position_dodge()) +
  geom_text(aes(label = ..count..), stat = "count",position=position_dodge(width=0.9),vjust=-0.5)+
  scale_y_continuous(limits=c(0,40)) +
  theme_minimal() +
  labs(x="Vehicle class",
       y="Class Q'ty",
       fill="Year")
```



Analysis Graph 5. :

- From Y1999 to Y2008 SUV trend star to grow up while compact/subcompact have trend decrease