

# Assignment 1

## Car\_viz.R

Copy from car\_viz.R

```
library(tidyverse)

## -- Attaching packages ----- tidyverse 1.3.1 --

## v ggplot2 3.3.5      v purrr  0.3.4
## v tibble  3.1.4      v dplyr  1.0.7
## v tidyr   1.1.3      v stringr 1.4.0
## v readr   2.0.1      v forcats 0.5.1

## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()     masks stats::lag()

# call built-in data mtcars.
data(mtcars)

# Select only car models where mpg<20
mtcars_mpg2 <- mtcars[mtcars$mpg < 20,]

# Reduce the variables to mpg, cyl, disp, hp, gears
mtcars_mpg2 <- mtcars_mpg2[, c(1,2,3,4,10)]

# read the R file hand_functions.R so that it can be used
# notice that with echo = TRUE
source(file = "hand_functions.R", echo = TRUE)

##
## > sum_special <- function(df_x) {
## +   try(if (!is.data.frame(df_x))
## +     stop("Input data must be a data frame."))
## +   sp_means <- apply(df_ .... [TRUNCATED]

# Now use the function from hand_functions.R

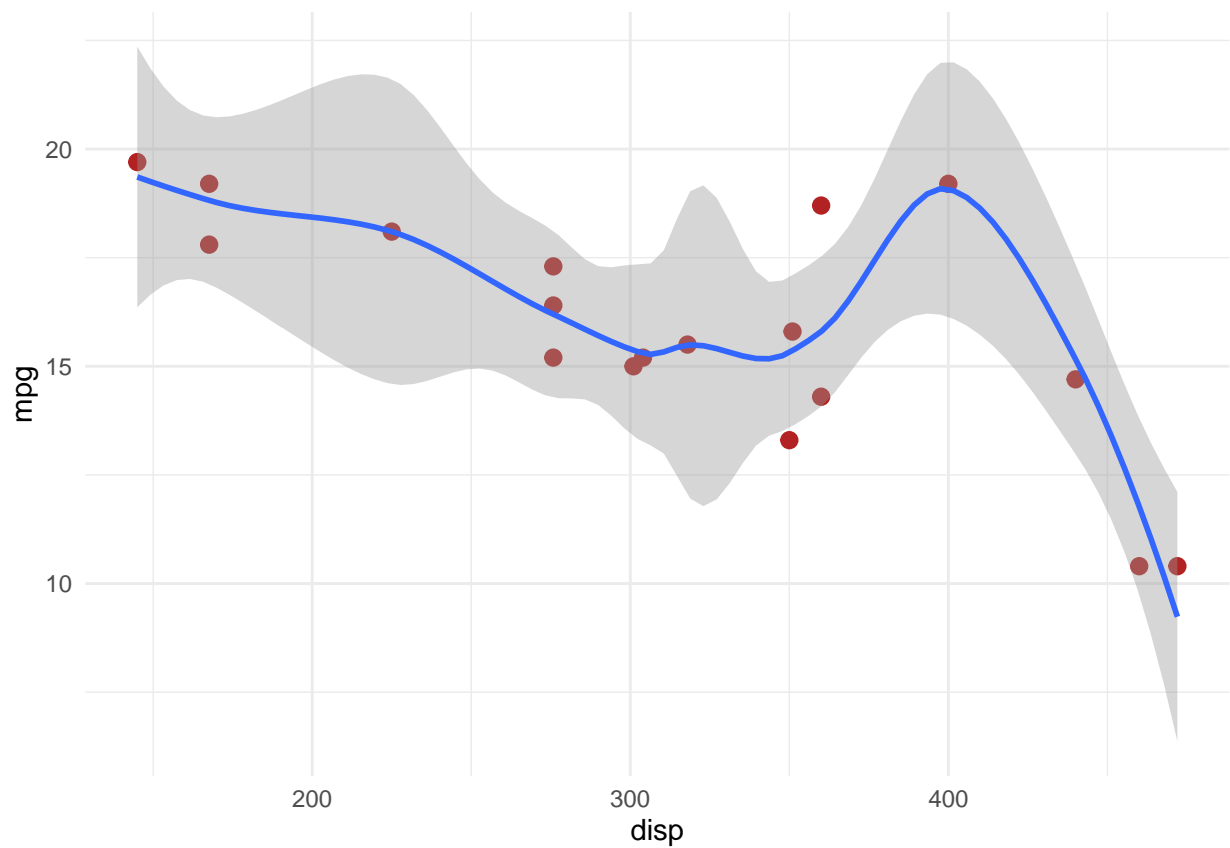
sp_out <- sum_special(mtcars_mpg2)

# library(esquisse)
```

```
#
# esquisser(data = mtcars_mpg2, viewer = "browser")

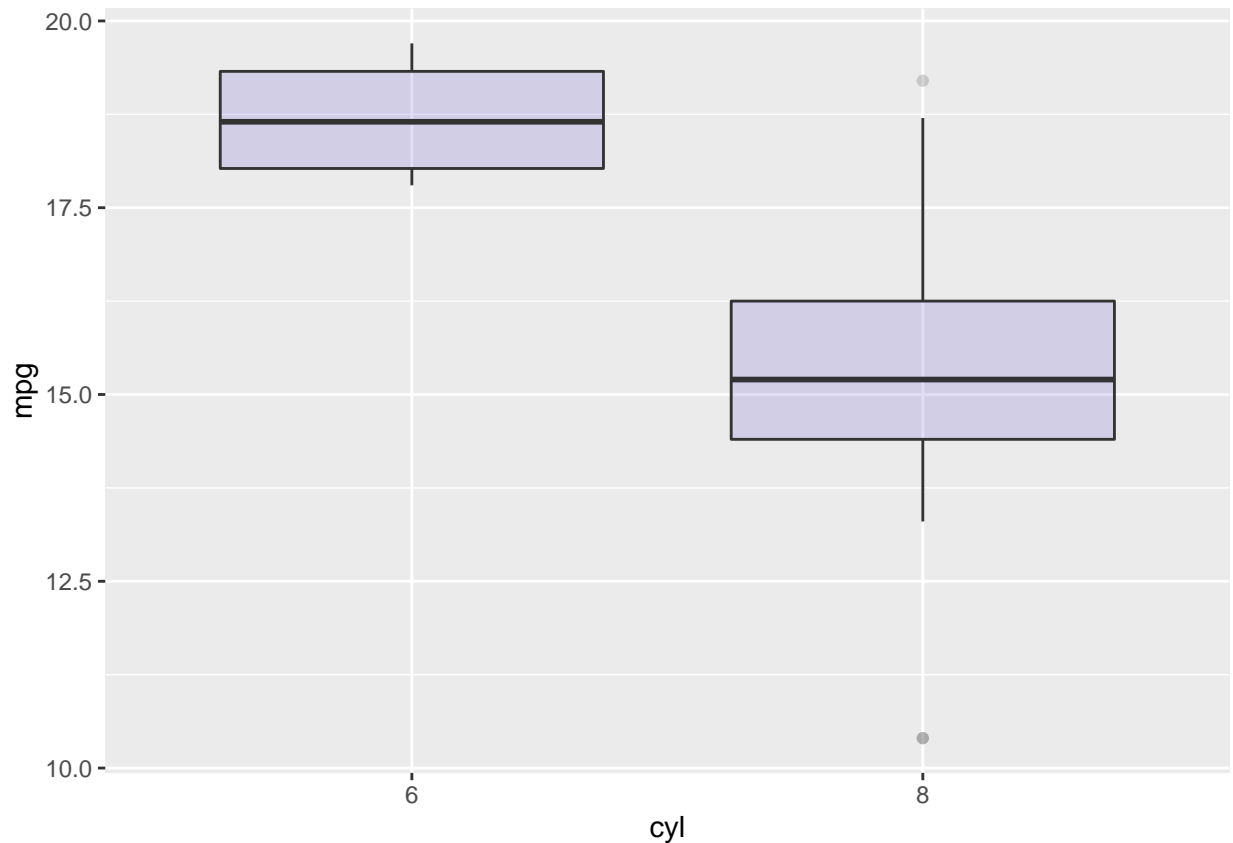
ggplot(mtcars_mpg2) +
  aes(x = disp, y = mpg) +
  geom_point(shape = "bullet", size = 4L, colour = "#B22222") +
  geom_smooth(span = 0.5) +
  theme_minimal()
```

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



```
# note that this boxplot cannot be made with esquisse() unless
# the data is adjusted. What adjustment is needed?
```

```
ggplot(mtcars_mpg2, aes(x=as.factor(cyl), y=mpg)) +
  geom_boxplot(fill="slateblue", alpha=0.2) +
  xlab("cyl")
```



## Hand\_functions.R

Copy from hand\_functions.R

```
sum_special <- function(df_x){

  ## sum_special calculates data summary statistics
  ## the input param df_x is the data frame of input values

  # browser() # browser() will start the debugger
  # if the line is uncommented

  ## test the input data to assure that it is a data frame.
  try(if(!is.data.frame(df_x)) stop("Input data must be a data frame."))

  sp_means <- apply(df_x, MARGIN = 2, FUN = mean)
  sp_var <- apply(df_x, MARGIN = 2, FUN = var)
  sp_cov <- cov(df_x)
  sp_cor <- cor(df_x)

  ## Note that defining a list with the
  ## syntax list(list_name = list_content) produces
  ## named list items
```

```
sp_outputs <- list(sp_means=sp_means,  
                  sp_var = sp_var,  
                  sp_cov = sp_cov,  
                  sp_cor = sp_cor)  
  
return(sp_outputs)  
}
```

## learn from assignment

First, I know how to build a github repo as the assignment words.

Second, from these two R file, the car\_viz.R shows how to use ggplot and try it by myself. And hand\_functions.R is an example of building a function we need in the program.