Richard Gresham

CPSC 375-01

September 15, 2022

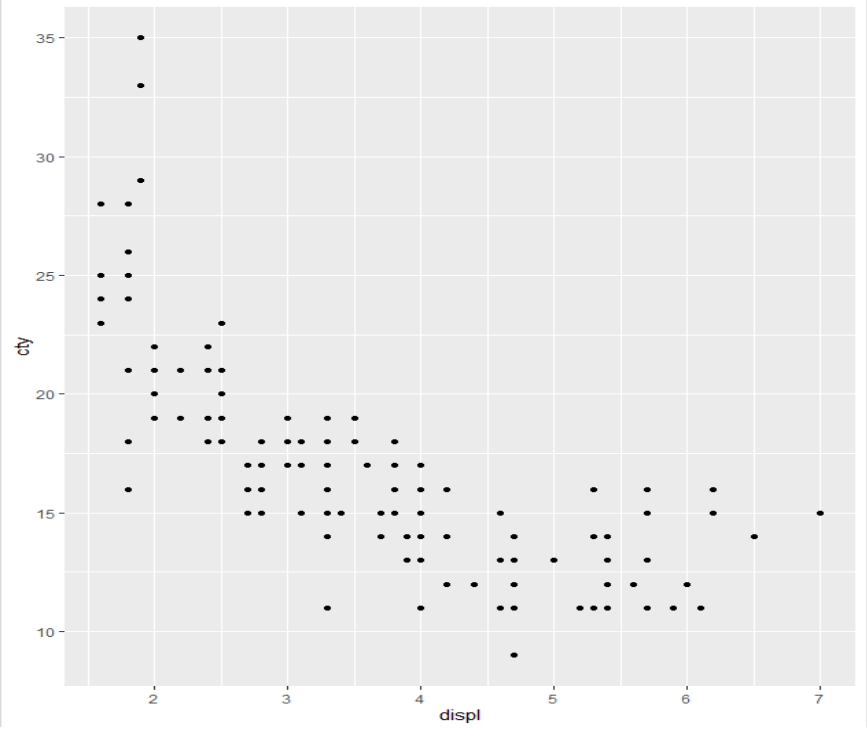
Homework 2

1. Installing ggplot2 also installs some datasets, including the mpg dataset (see help(mpg) for a description of the data). Generate the following graphs from the mpg dataset. All plots should use **ggplot**. Include **both** the R code and paste the plot as an image.

a. Plot a scatterplot of variables displ and cty.

Input: > ggplot(data = mpg) + geom_point(mapping = aes(x = displ, y = cty))

Output:

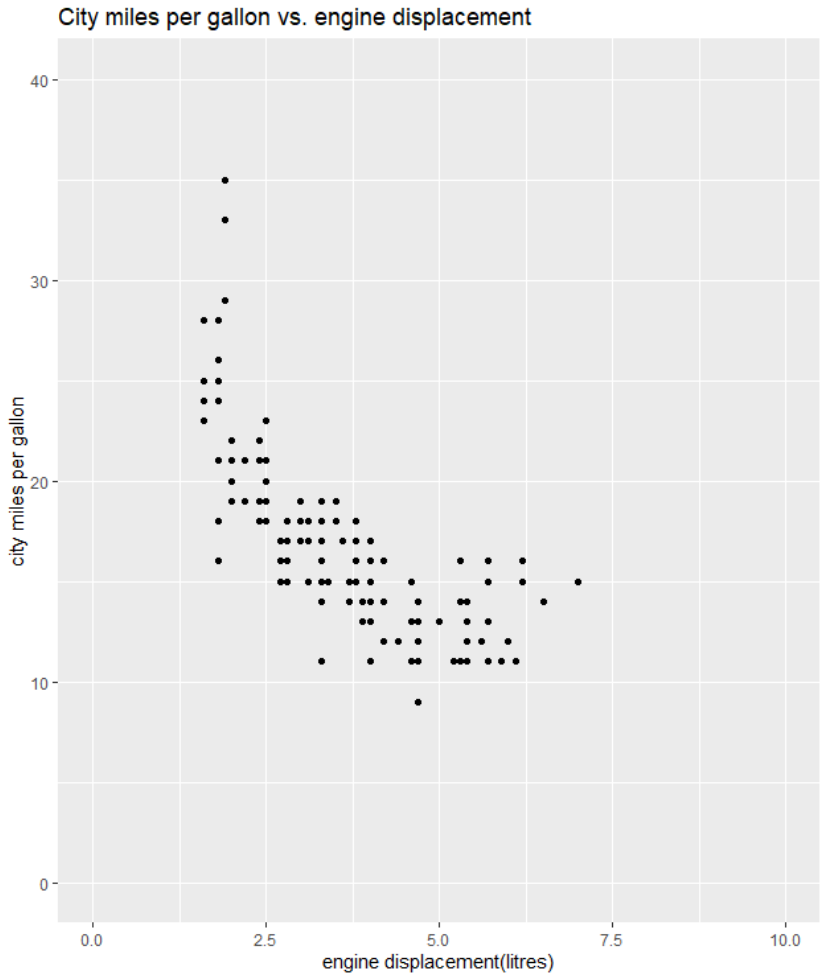


b. Redraw the previous scatterplot but also add all these:

- more descriptive x and y-axis labels,
- a title that should be the names of all group members, and
- set cty limits to (0,40) and displ limits to (0,10).

Input: ggplot(data = mpg) + geom_point(mapping = aes(x = displ, y = cty)) + xlim(c(0,10)) + ylim(c(0,40)) + xlab("engine displacement(litres)") + ylab("city miles per gallon") + ggtitle("City miles per gallon vs. engine displacement")

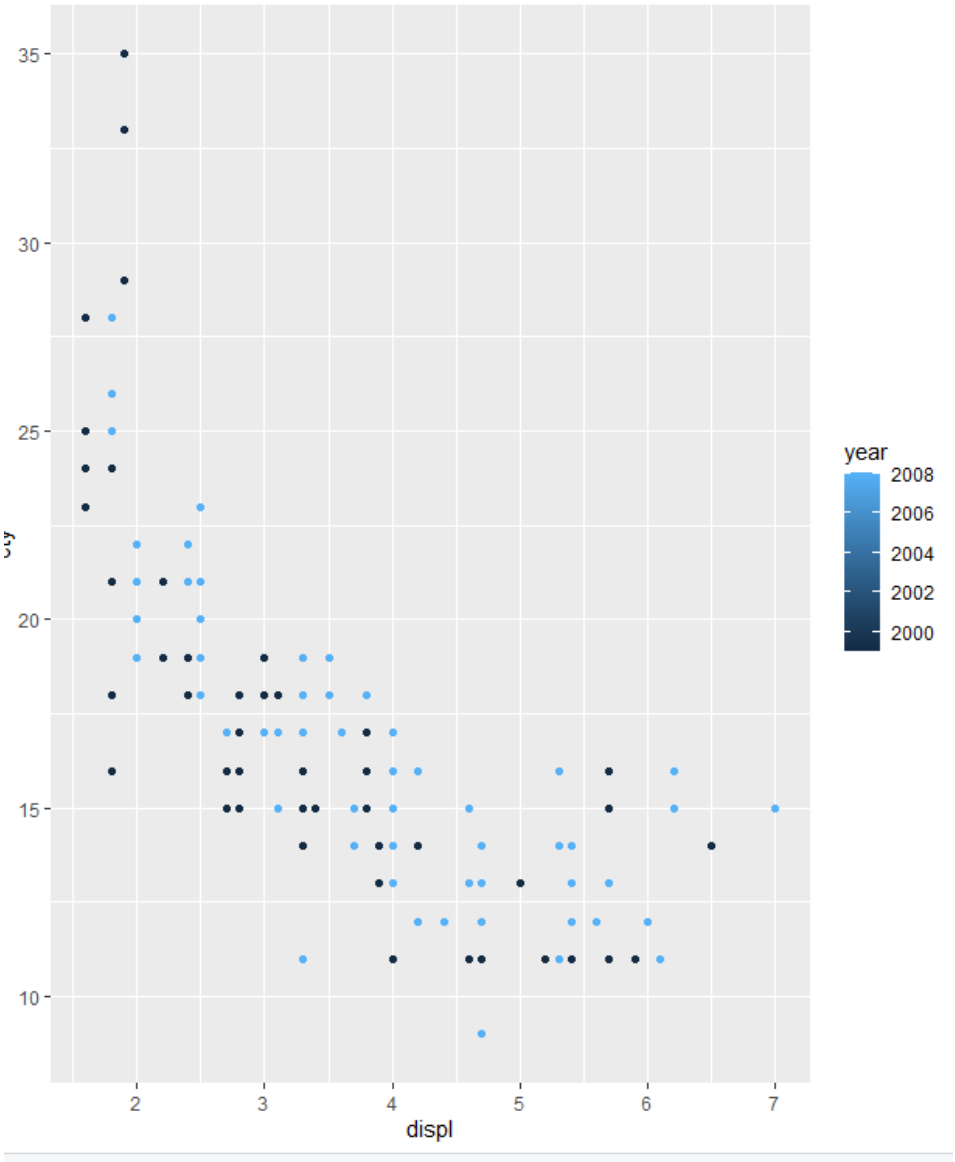
Output:



c. Plot a scatterplot of variables displ and cty. Show variable year also.

Input: ggplot(data = mpg) + geom_point(mapping = aes(x = displ, y = cty, color = year))

Output:

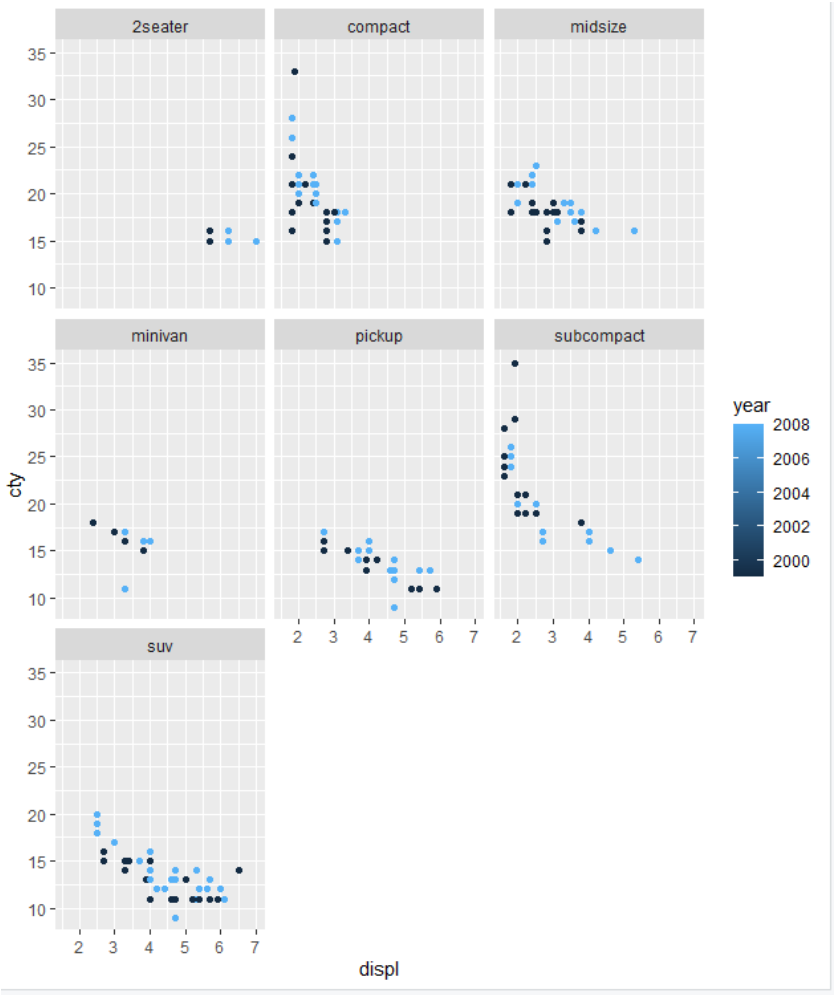


d. Plot a scatterplot of variables displ and cty. Show variables year and class also.

- Hint: There are different ways of doing this using the multiple “aesthetics” of geom_point

Input: ggplot(data = mpg) + geom_point(mapping = aes(x = displ, y = cty, color = year)) + facet_wrap(class)

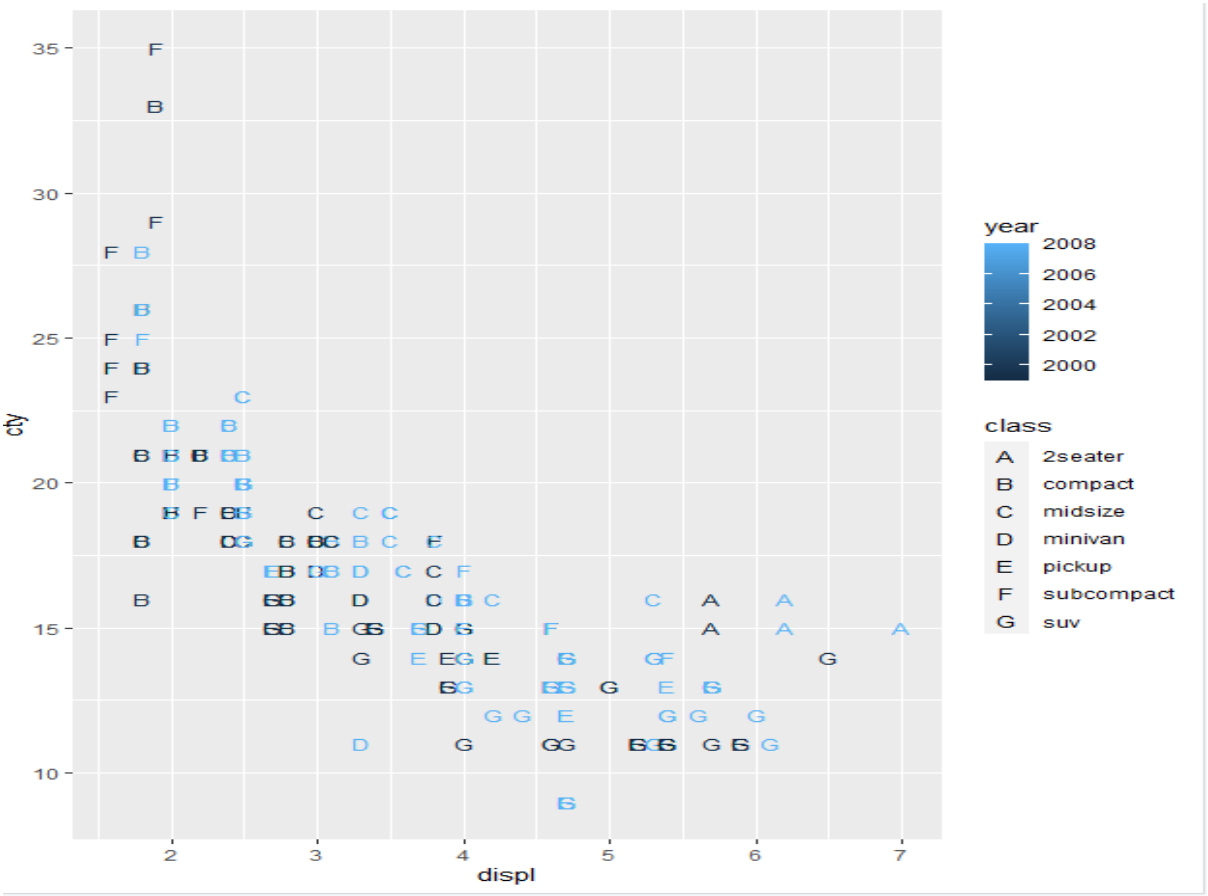
Output:



Edit: I decided to showcase a second example of doing it other than splitting it up via facet wrap by using the shape aesthetic. Shape only has 6 inherent shapes and thus I had to create my own shapes via scale_shape_manual in order to display all 7 car types.

Input: ggplot(data = mpg) + geom_point(mapping = aes(x = displ, y = cty, color = year, shape = class), size = 3) + scale_shape_manual(values=LETTERS[1:10])

Output:



e. Plot a bar chart of variable class. Hint: use geom_bar().

Input: ggplot(data = mpg) + geom_bar(mapping = aes(x = class))

Output: