

Methods Camp 2025: Day 2

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Data Visualization

Types of Data Visualizations

- What types of plots have you all seen?
- What types of information do they convey?

ggplot2

There are several ways to produce figures in R!

- Base R has options
- `plotly` has advanced options

We teach `ggplot` since it's relatively intuitive and works well with tidyverse!

R Basics: Code-along

Exercise/Live Demo:

1. Open up the [day2_afternoon_codealong.qmd](#)
2. Practice annotating your code!

My AI of the day: Claude helped me brainstorm the layering of the exercises I am showing you now!

Back to `mtcars`

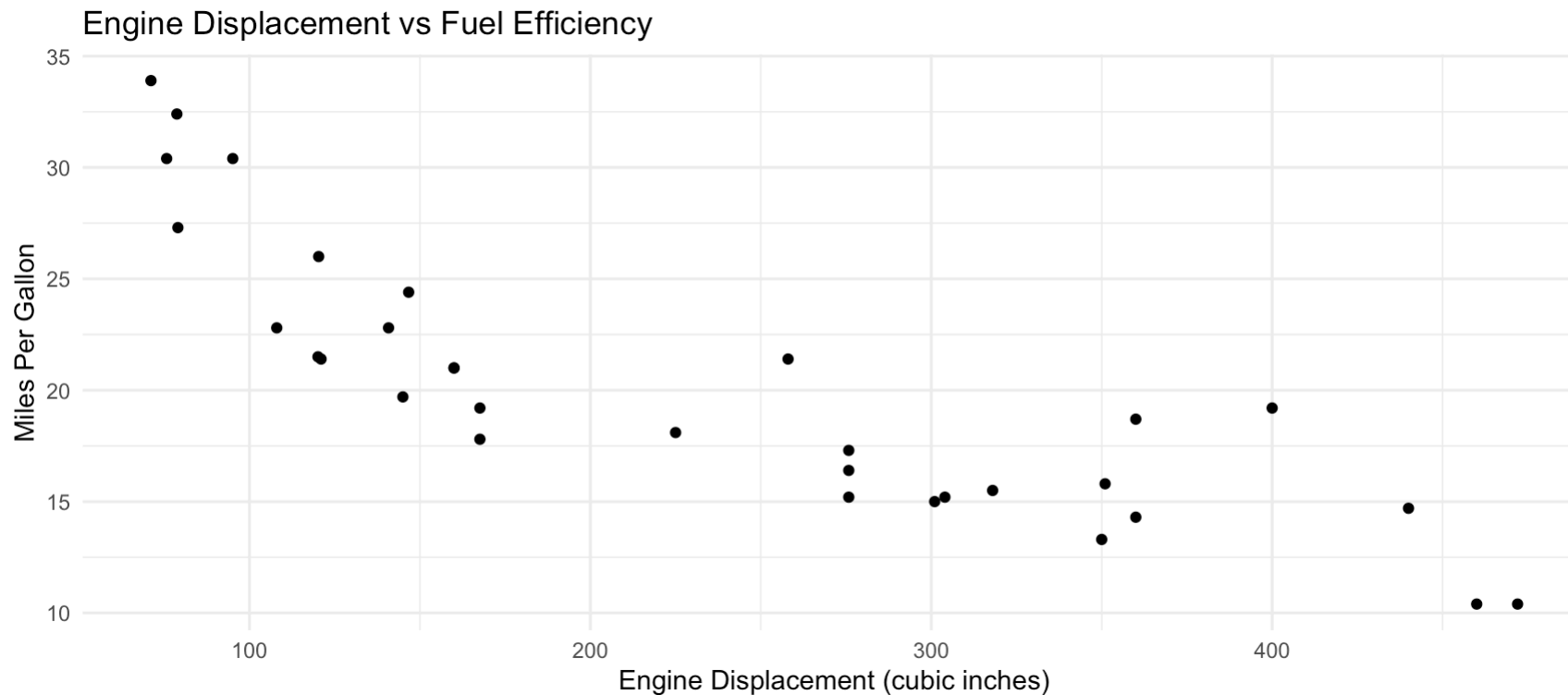
Load back in the `mtcars` data and load `ggplot2`

```
1 library(ggplot2)
2 data("mtcars")
3
4 head(mtcars)
```

	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
Mazda RX4	21.0	6	160	110	3.90	2.620	16.46	0	1	4	4
Mazda RX4 Wag	21.0	6	160	110	3.90	2.875	17.02	0	1	4	4
Datsun 710	22.8	4	108	93	3.85	2.320	18.61	1	1	4	1
Hornet 4 Drive	21.4	6	258	110	3.08	3.215	19.44	1	0	3	1
Hornet Sportabout	18.7	8	360	175	3.15	3.440	17.02	0	0	3	2
Valiant	18.1	6	225	105	2.76	3.460	20.22	1	0	3	1

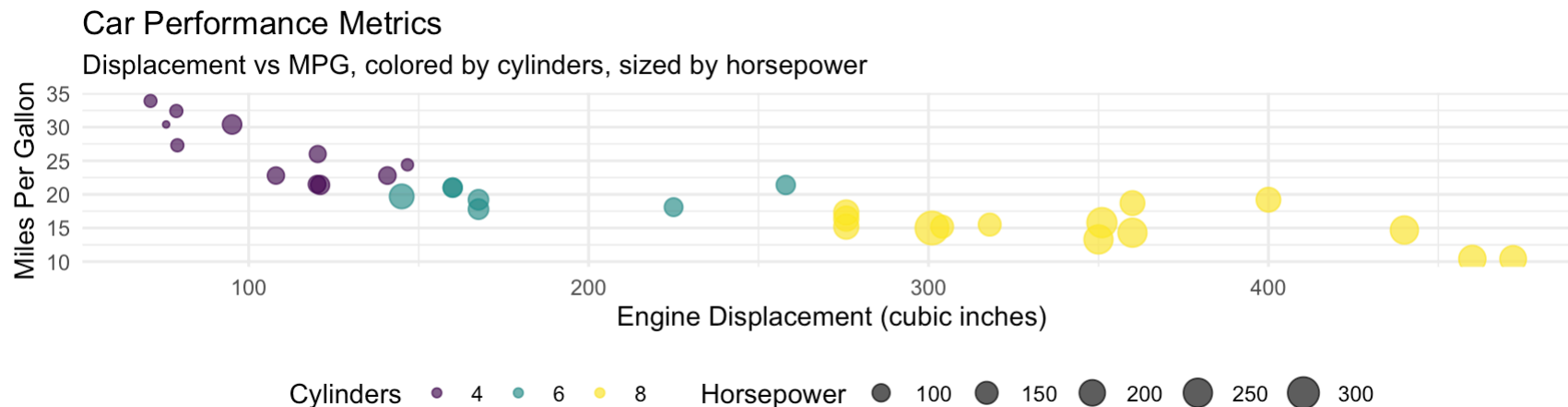
Scatter plot

```
1 ggplot(data = mtcars, aes(x = disp, y = mpg)) +  
2   geom_point() +  
3   labs(title = "Engine Displacement vs Fuel Efficiency",  
4         x = "Engine Displacement (cubic inches)",  
5         y = "Miles Per Gallon") +  
6   theme_minimal()
```



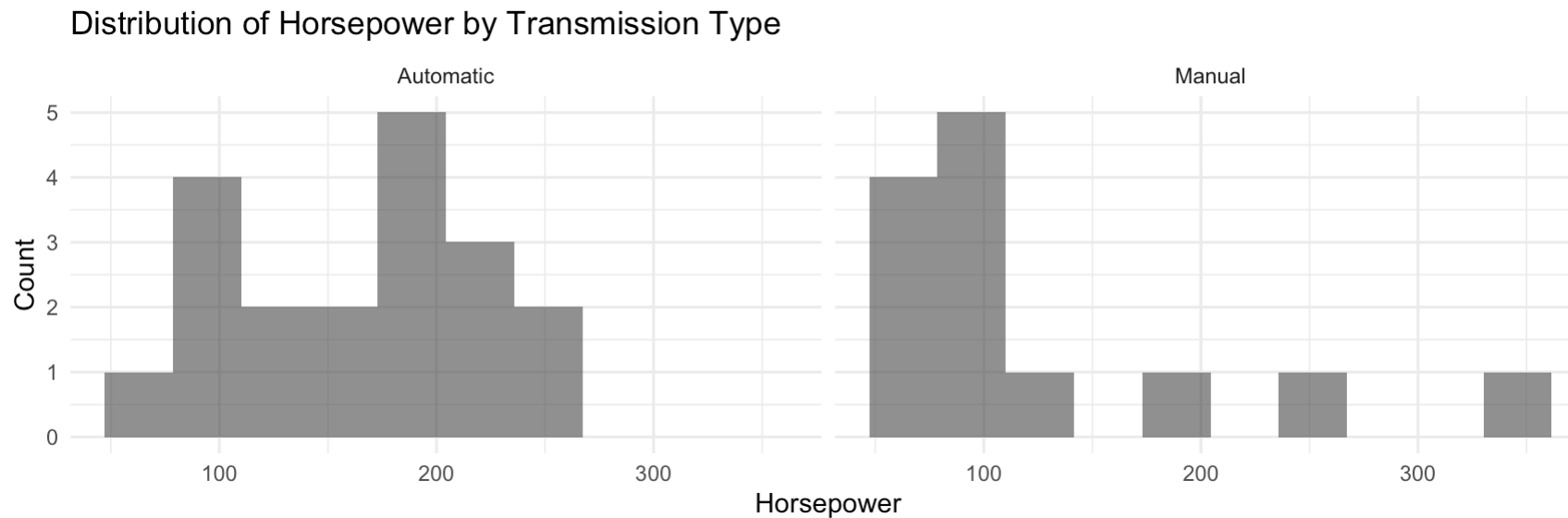
Adding additional features

```
1 ggplot(data = mtcars, aes(x = disp, y = mpg)) +  
2   geom_point(aes(color = factor(cyl), size = hp), alpha = 0.7) +  
3   labs(title = "Car Performance Metrics",  
4         subtitle = "Displacement vs MPG, colored by cylinders, sized by horsepower",  
5         x = "Engine Displacement (cubic inches)",  
6         y = "Miles Per Gallon",  
7         color = "Cylinders",  
8         size = "Horsepower") +  
9   theme_minimal() +  
10  theme(legend.position="bottom") +  
11  scale_color_viridis_d()
```



Facet wrap

```
1 ggplot(data = mtcars, aes(x = hp)) +  
2   geom_histogram(bins = 10, alpha = 0.7) +  
3   facet_wrap(~factor(am, labels = c("Automatic", "Manual"))) +  
4   labs(title = "Distribution of Horsepower by Transmission Type",  
5         x = "Horsepower",  
6         y = "Count") +  
7   theme_minimal()
```



Saving a plot

```
1 plot <- ggplot(data = mtcars, aes(x = hp)) +  
2   geom_histogram(bins = 10, alpha = 0.7) +  
3   facet_wrap(~factor(am, labels = c("Automatic", "Manual"))) +  
4   labs(title = "Distribution of Horsepower by Transmission Type",  
5         x = "Horsepower",  
6         y = "Count") +  
7   theme_minimal()  
8  
9 ggsave("sample_plot.png", plot)
```

Work with the person next to you!

Try the following tasks:

1. Make a scatter plot of any two other variables from `mtcars`.
Try changing the colors of the dots and change the theme of the plot.
2. Experiment with different `geom_` types! (e.g., a line plot, an area plot, a column plot with continuous data, a density plot, a violin plot, a box plot...)
3. Make a faceted horizontal bar chart and save it to your working directory.

Pair work!

Assignment

In today's assignment, we are going to combine for loops and data visualization.

We are going to count you off and send you into new pairs! Use your `day2_assignment.qmd` file to get started.