Writing custom geoms for ggplot2

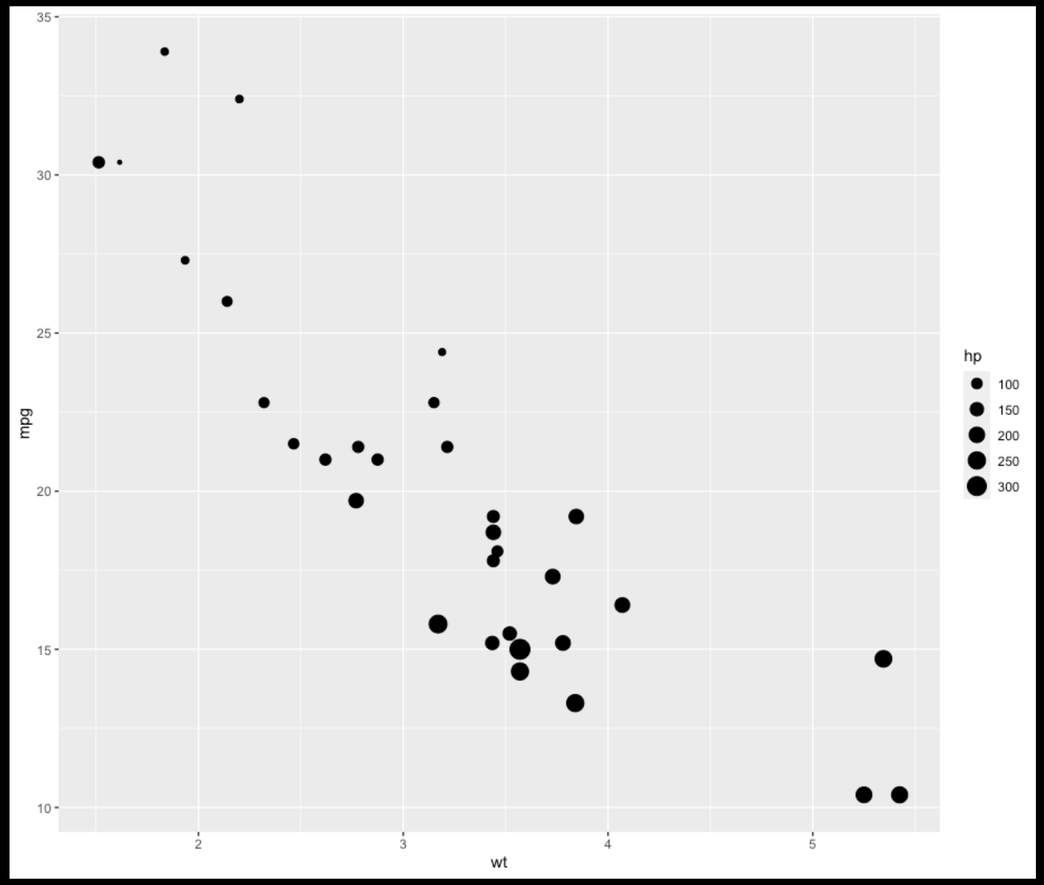
Chris Woodard, May 26, 2020 - Tampa R Meetup

Why?

To get a look at how ggplot2 aesthetics and parameters interact…

	wt	mpg	hp	cyl
Mazda RX4	2.620	21.0	110	6
Mazda RX4 Wag	2.875	21.0	110	6
Datsun 710	2.320	22.8	93	4
Hornet 4 Drive	3.215	21.4	110	6
Hornet Sportabout	3.440	18.7	175	8
Valiant	3.460	18.1	105	6
Duster 360	3.570	14.3	245	8
Merc 240D	3.190	24.4	62	4
				...

```
ggplot( data = mtcars, aes(wt, mpg, size=hp)) +
  geom_point()
```



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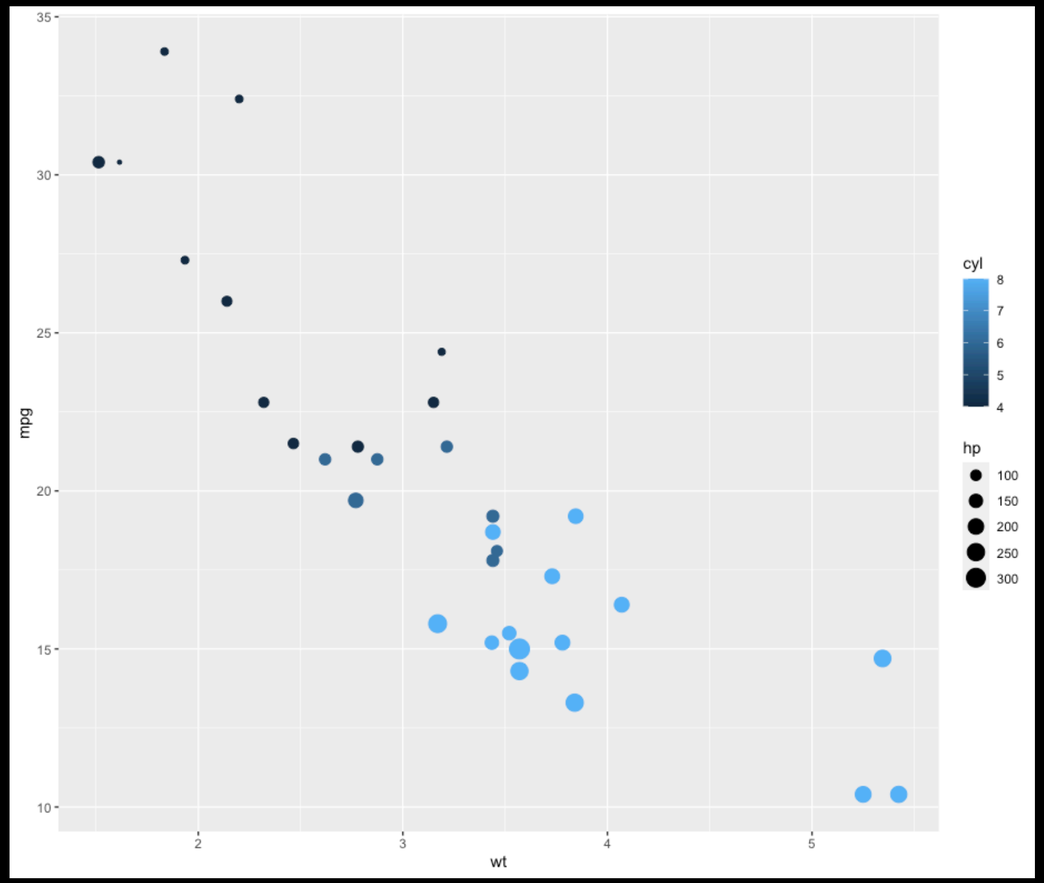

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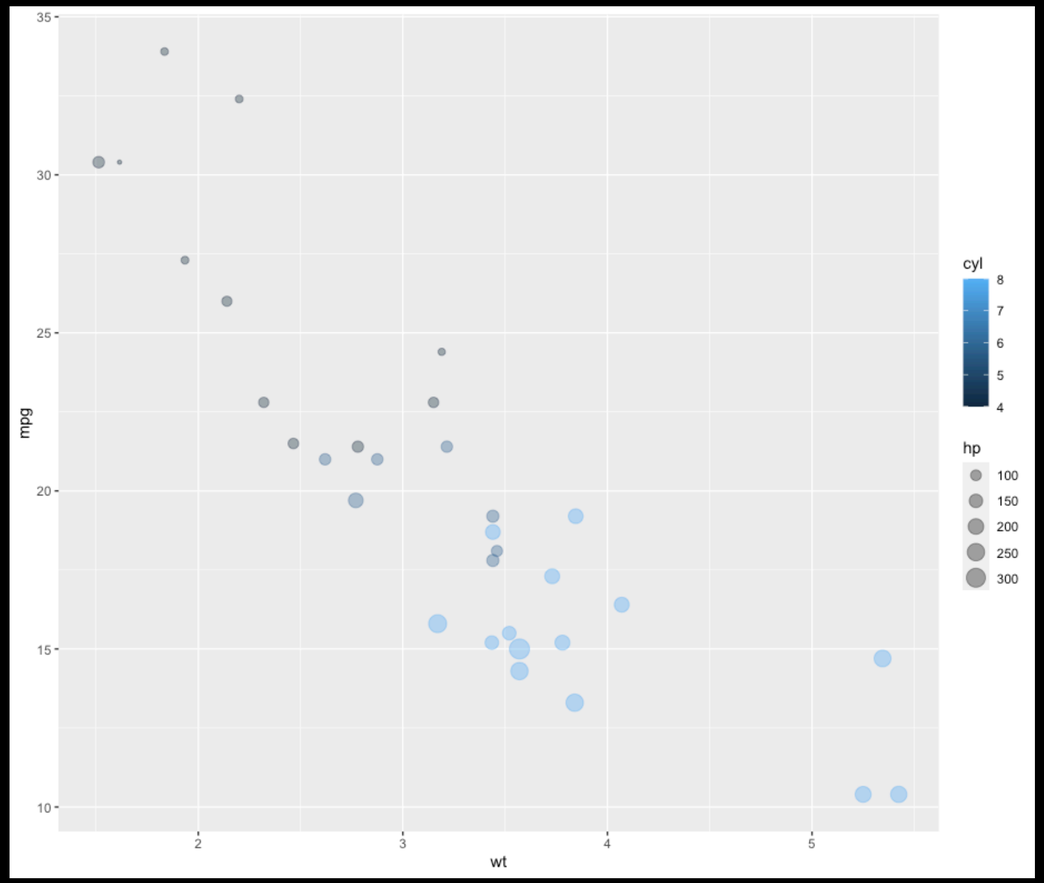
ggplot( data = mtcars, aes(wt, mpg, col = cyl, size=hp)) +
  geom_point(alpha = 0.4)
```



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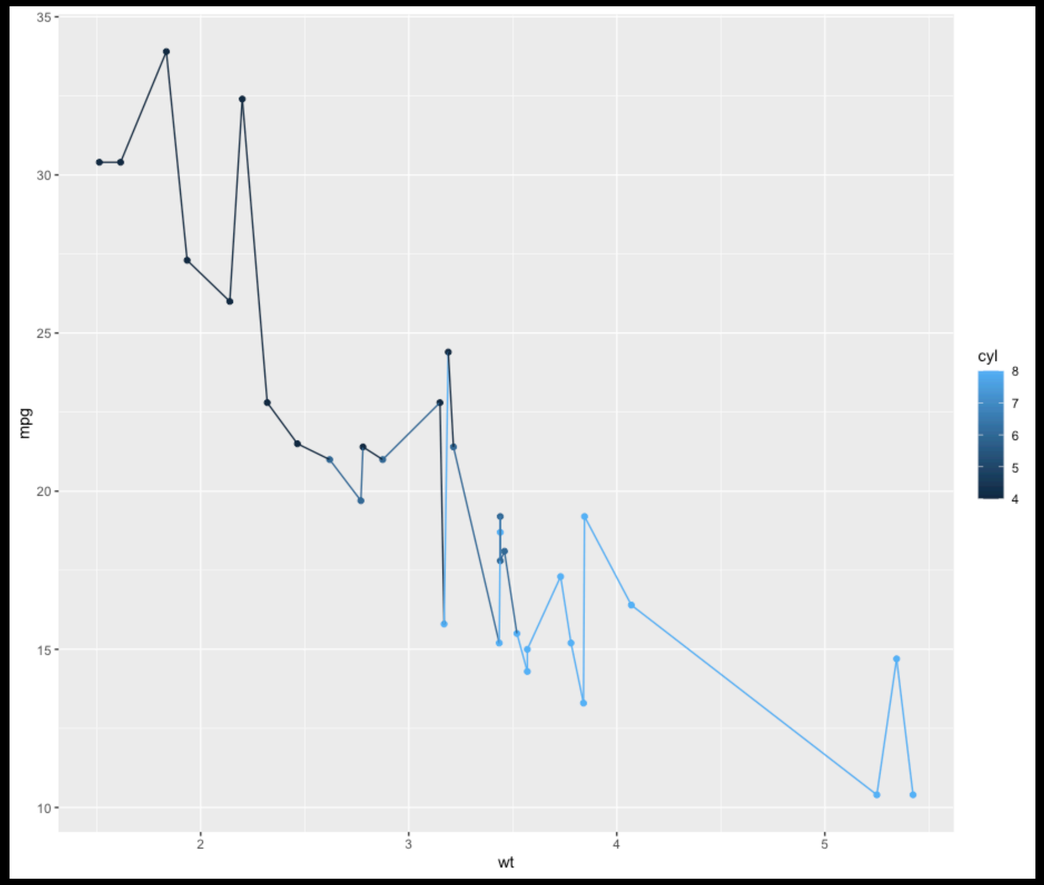

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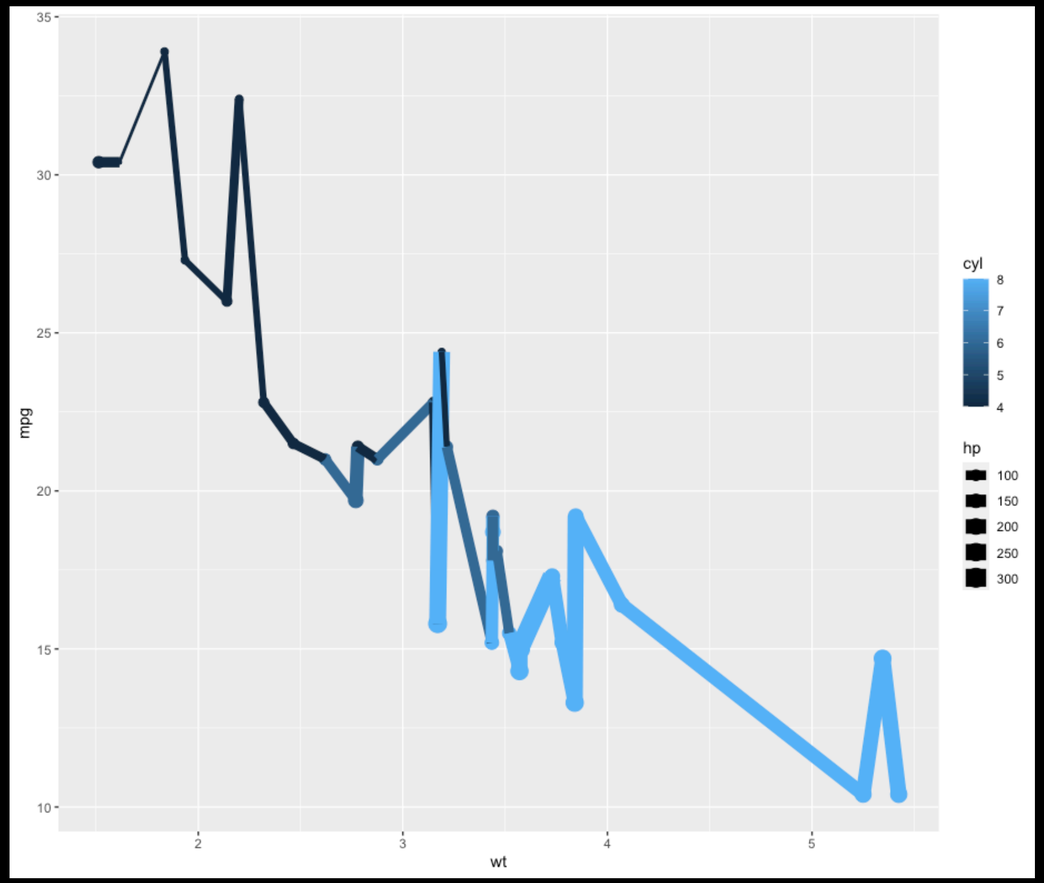

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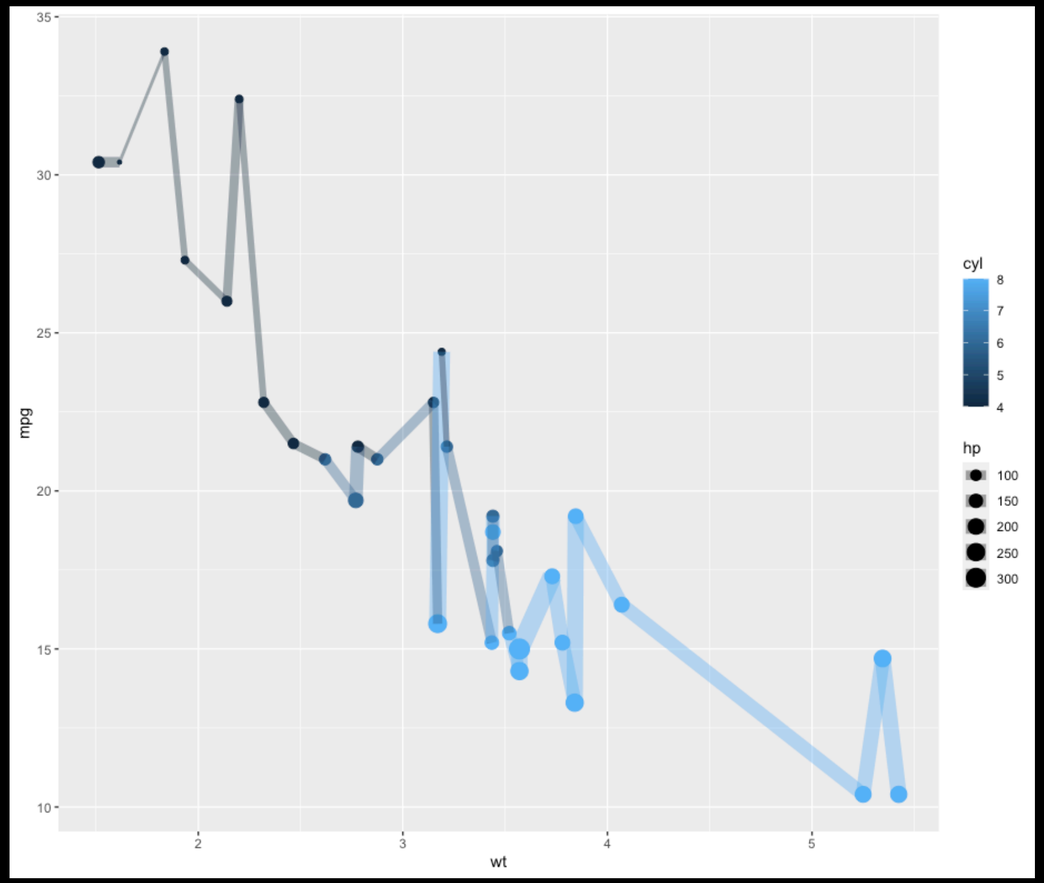

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ggplot( data = mtcars, aes(wt, mpg, col = cyl, size=hp)) +
  geom_point() +
  geom_line(alpha = 0.4, size = 0.5)
```

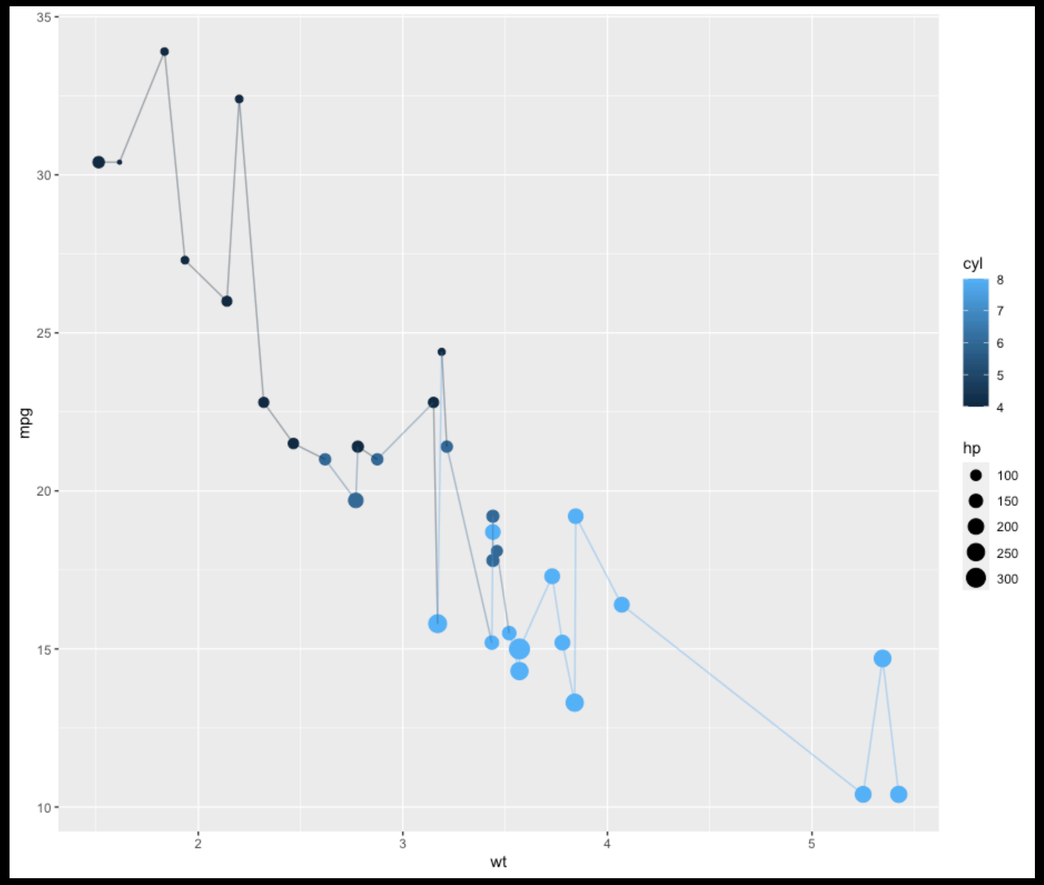

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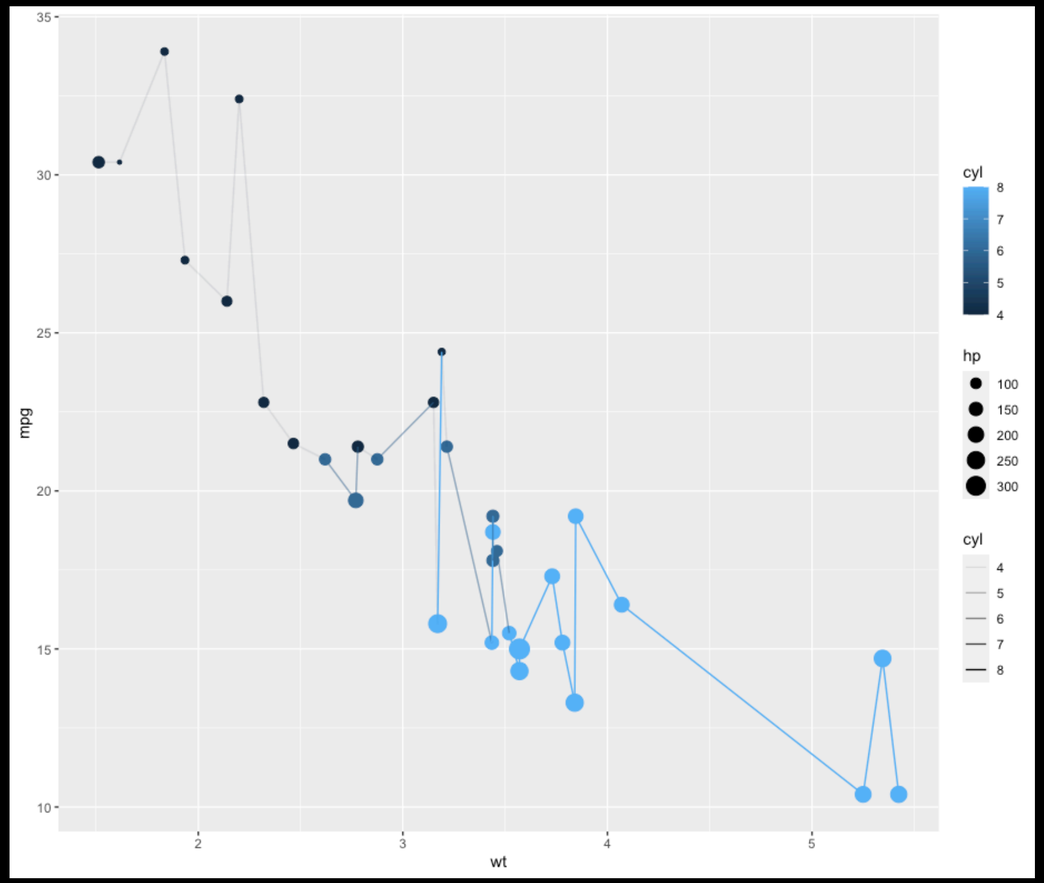
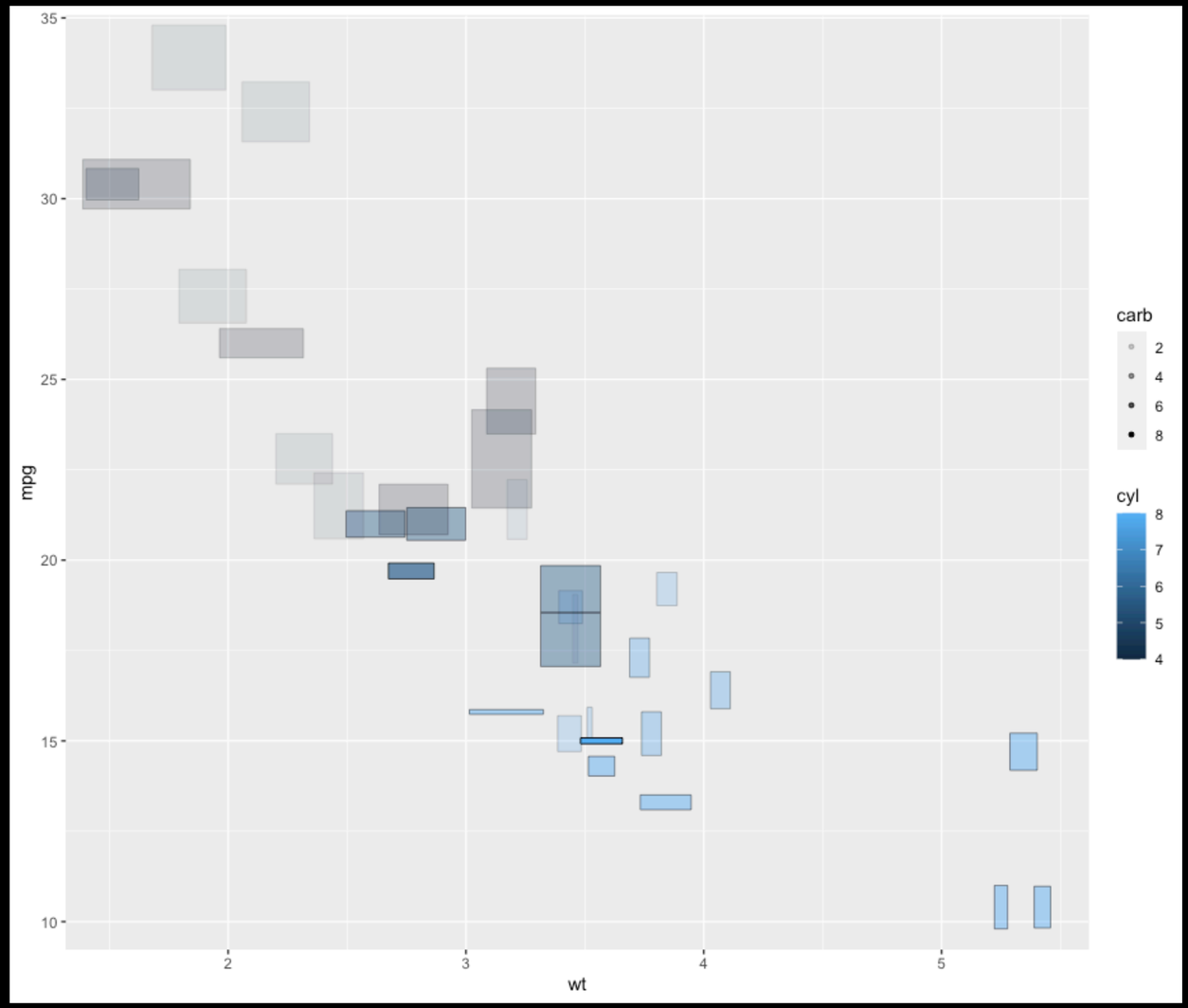


To do graphs that might not be easy to do with existing geoms…

```
dc <- mtcars[,c("wt", "mpg", "drat", "qsec", "carb", "cyl")]
ggplot(dc, aes(x=wt, y=mpg, width=drat, height=qsec)) +
  geom_boxes(aes(alpha = carb, fill = cyl))
```

More than two dimensions

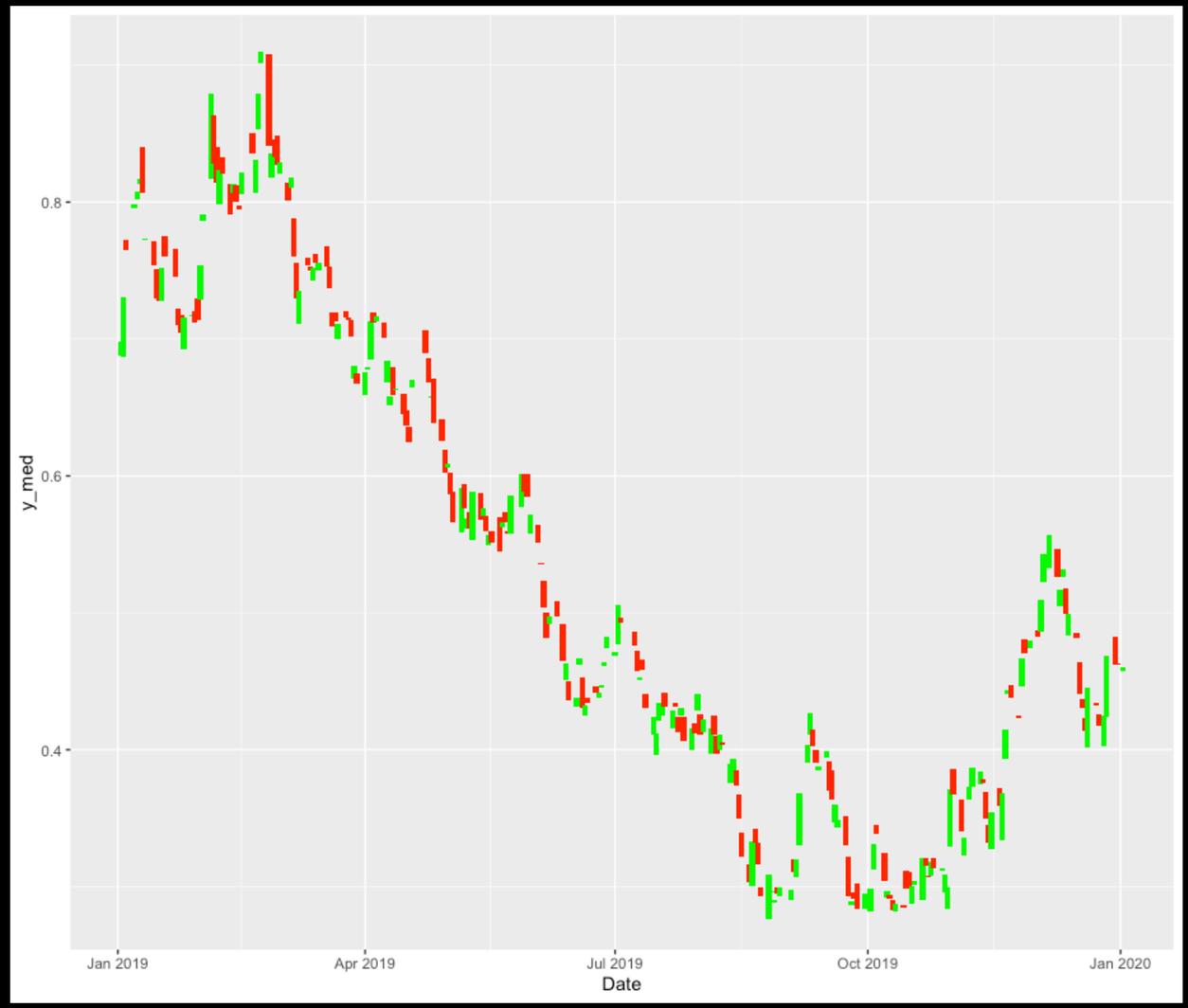
Width represents *drat*, height represents *qsec*



```
lhsif <- read_csv("LHSIF.csv") %>% mutate(y_med = Low + (High - Low)/2)
ggplot(lhsif, aes(x = Date, y = y_med, open = Open, high = High, close = `Adj Close`, low = Low)) +
  geom_candlesticks()
```

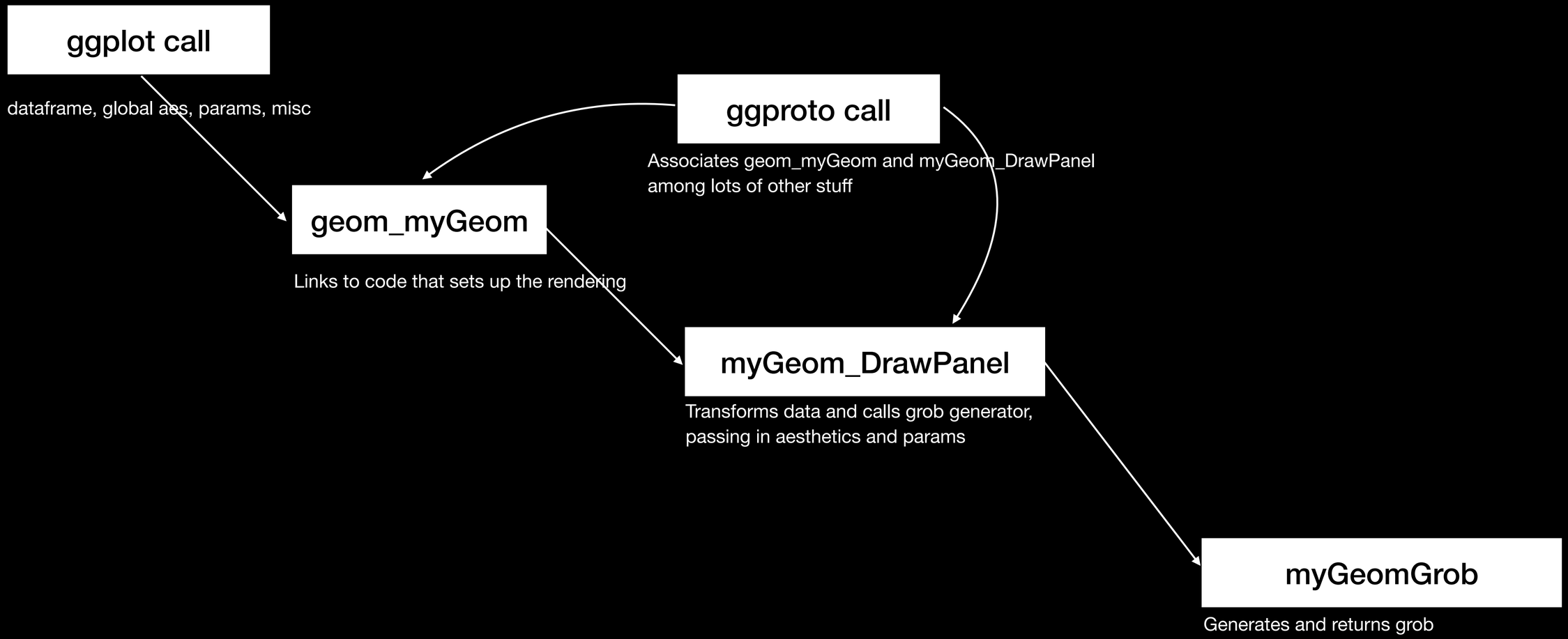
Conditional

Fill with green if close > open, fill with red if close > open



How?

Parts of a Geom



“Grob”?

- “Grob” == GRaphical OBject.
- Rendering primitive used by grid graphics
  - linesGrob
  - segmentsGrob
  - polygonGrob
  - circleGrob
  - rectangleGrob
  - gList
  - gTree
  - …

Code

Resources

- https://www.rdocumentation.org/packages/grid/versions/3.6.2/topics/grid.raster
- https://ggplot2-book.org/programming.html
- https://cran.r-project.org/web/packages/ggplot2/vignettes/extending-ggplot2.html
- https://rud.is/books/creating-ggplot2-extensions/demystifying-ggplot2.html
- https://ggplot2.tidyverse.org/reference/ggplot2-ggproto.html
- https://bookdown.org/rdpeng/RProgDA/building-new-graphical-elements.html
- https://www.rdocumentation.org/packages/grid/versions/3.6.2/topics/gpar
- https://stackoverflow.com/questions/57072096/passing-an-extra-parameter-to-a-custom-geom-in-ggplot2
- https://ggplot2.tidyverse.org/reference/layer.html
- https://www.stat.auckland.ac.nz/~paul/RGraphics/rgraphics.html
- https://stat.ethz.ch/R-manual/R-devel/library/grid/html/00Index.html