Class 5: Data Visualization
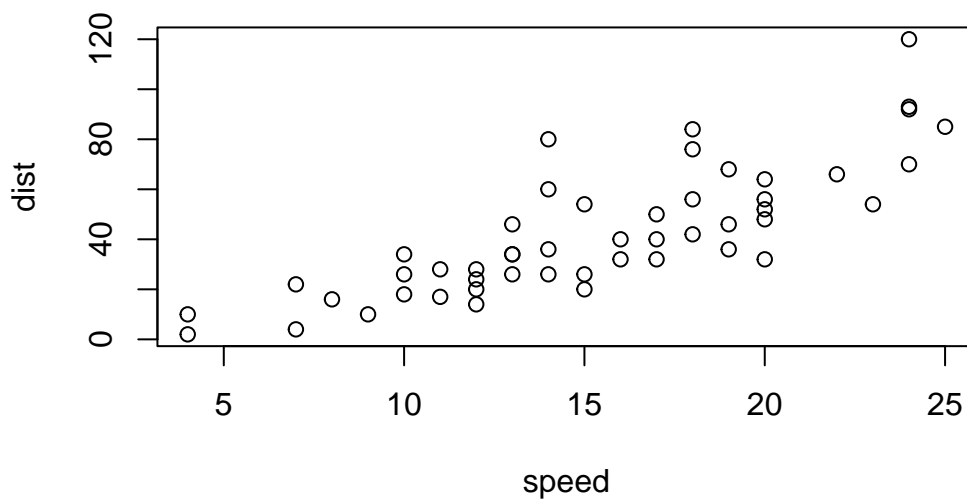
Patrick

Plotting in R

R has multiple plotting and graphics systems. The most popular of which is **ggplot2**

We have already played with "base" R graphics. This comes along with R "out of the box".

```
plot(cars)
```


Compared to base R plots ggplot is much more verbose - I need to write more code to get simple plots like the above.
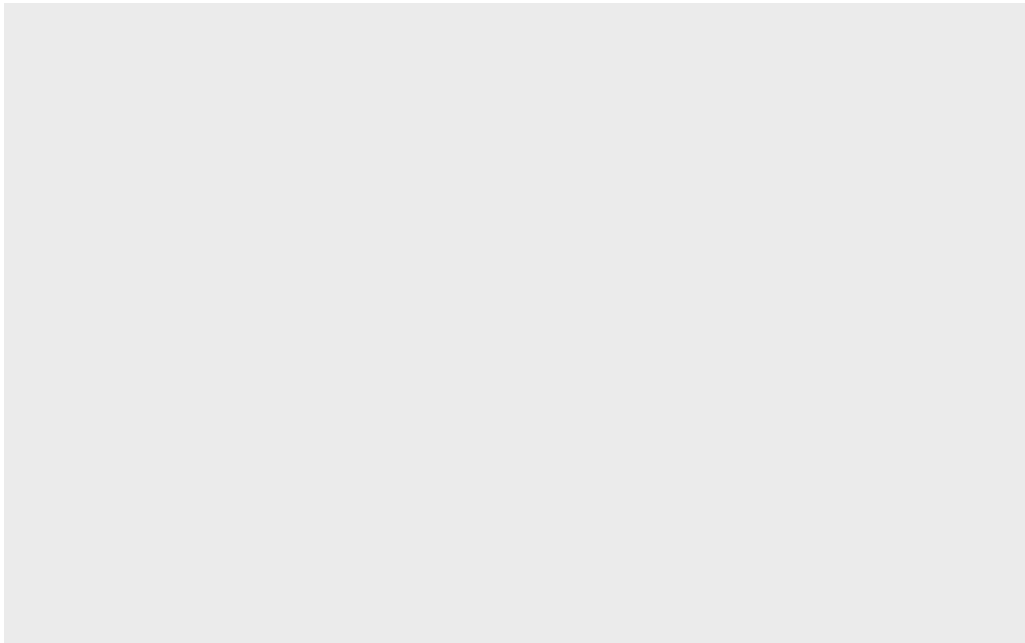
To use ggplot I need to first install the ggplot2 package. To install any package in R I use the `install.packages()` command along with the package name

The install is a one time only requirement. The package is now on our computer. I don't need to re-install it.

However, I can't just use it without loading it up with a `library()` call.

```
library(ggplot2)
```

```
ggplot(cars)
```

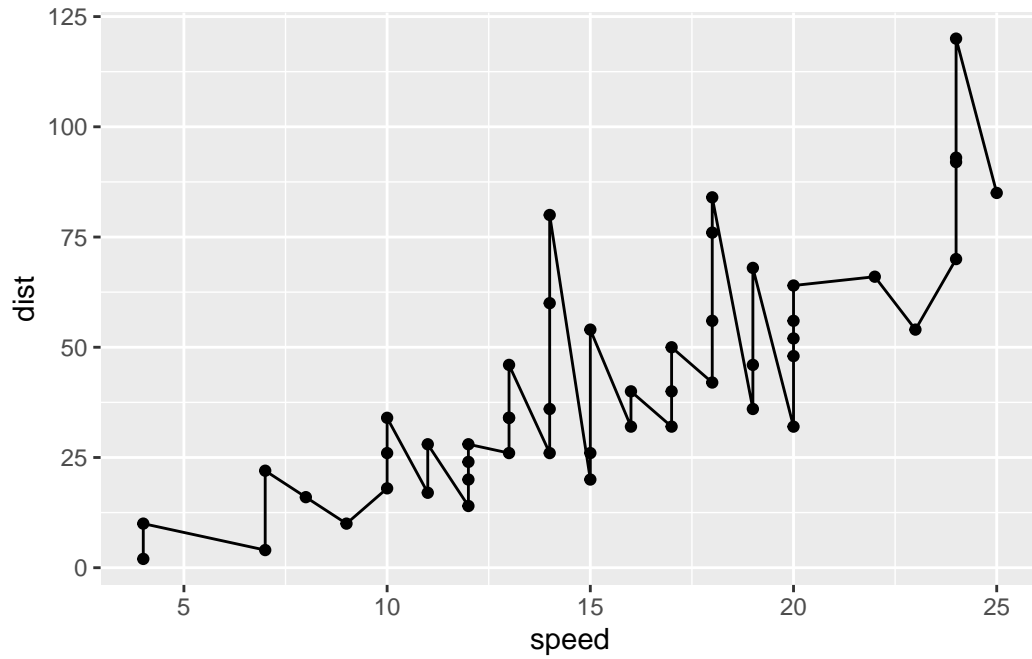All ggplot figures need at least 3 things:

- data (this is the data.frame with our numbers)
- aesthetics ("aes", how our data maps to the plot)
- geoms (do want lines, points, columns, etc...)

```
ggplot(data=cars) +
    aes(x=speed, y=dist) +
  geom_point()
```

I want a trend line to show the relationship between speed and stopping distance.
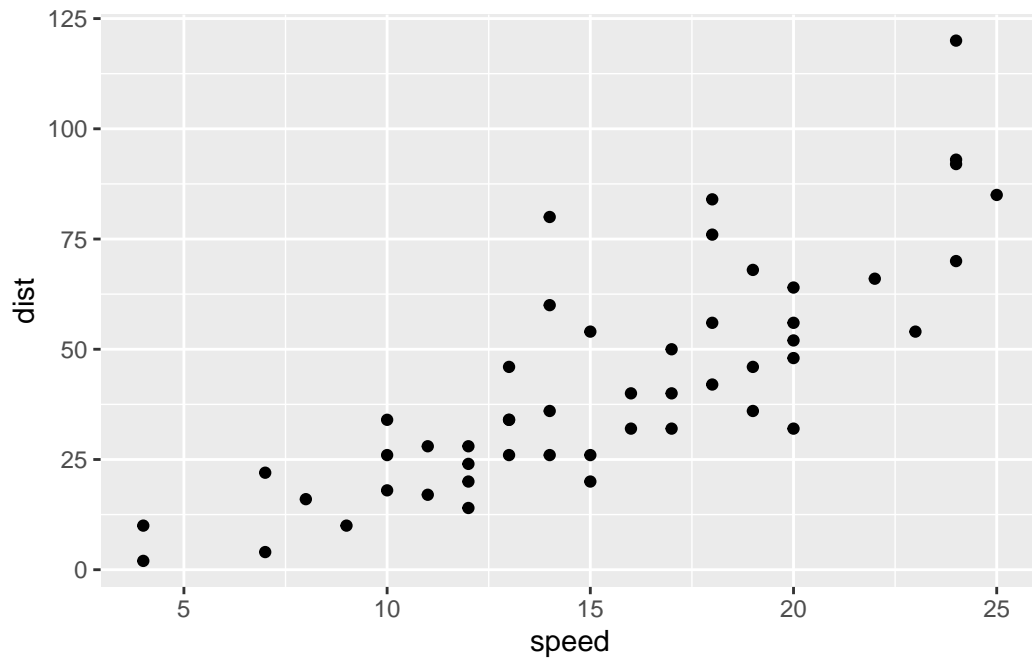
```
ggplot(data=cars) +
    aes(x=speed, y=dist) +
  geom_point() +
  geom_line()
```
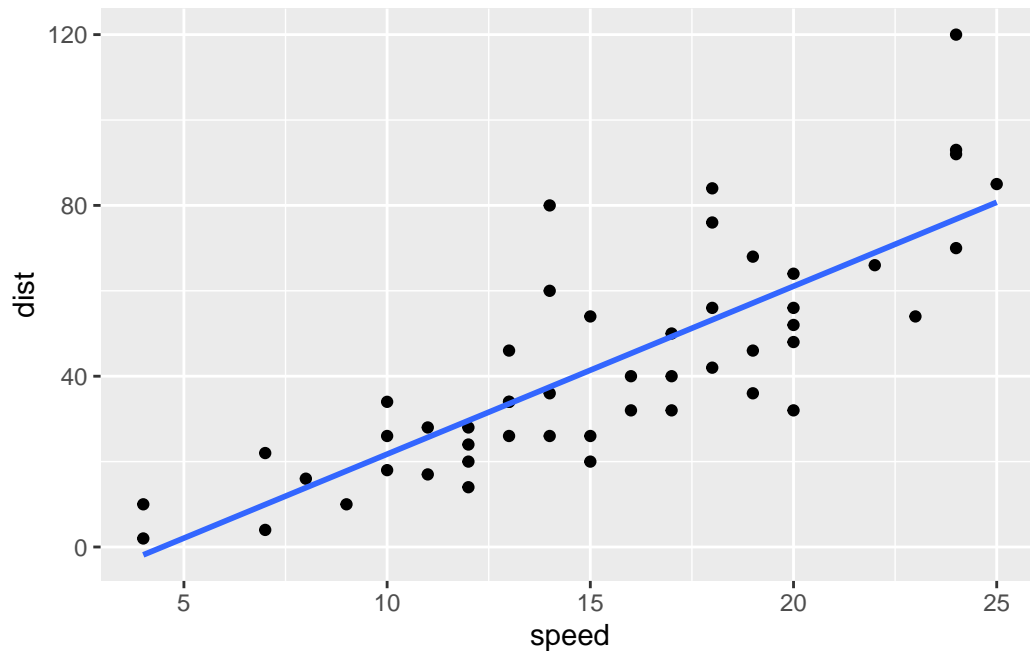
That is not what we want

```r
bb <- ggplot(data=cars) +
    aes(x=speed, y=dist) +
  geom_point()

bb
```

```
bb+geom_smooth(method="lm", se=FALSE)
```

`geom_smooth()` using formula = 'y ~ x'

```
url <- "https://bioboot.github.io/bimm143_S20/class-material/up_down_expression.txt"
genes <- read.delim(url)
head(genes)
```

```
        Gene Condition1 Condition2        State
1       A4GNT -3.6808610 -3.4401355 unchanging
2        AAAS  4.5479580  4.3864126 unchanging
3       AASDH  3.7190695  3.4787276 unchanging
4        AATF  5.0784720  5.0151916 unchanging
5        AATK  0.4711421  0.5598642 unchanging
6 AB015752.4 -3.6808610 -3.5921390 unchanging
```

The `head()` function will print out just the first few rows (6 by default).

```
head(genes)
```

```
        Gene Condition1 Condition2        State
1       A4GNT -3.6808610 -3.4401355 unchanging
2        AAAS  4.5479580  4.3864126 unchanging
3       AASDH  3.7190695  3.4787276 unchanging
```

```
4       AATF  5.0784720  5.0151916 unchanging
5       AATK  0.4711421  0.5598642 unchanging
6 AB015752.4 -3.6808610 -3.5921390 unchanging
```

```
nrow(genes)
```

```
[1] 5196
```

```
table(genes$State)
```

```
      down unchanging         up
        72       4997        127
```

```
p<- ggplot(genes)+
  aes(Condition1, Condition2, color=State) +
  geom_point() +
  labs(title="Some Plot",
       subtitle="With a subtitle")

p + scale_colour_manual( values=c("blue","gray","red") )
```

Some Plot
With a subtitle