Lab 5 - Data Visualization with ggplot2

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Using GGPLOT

The ggplot2 package needs to be installed as it does not come with R "out of the box".
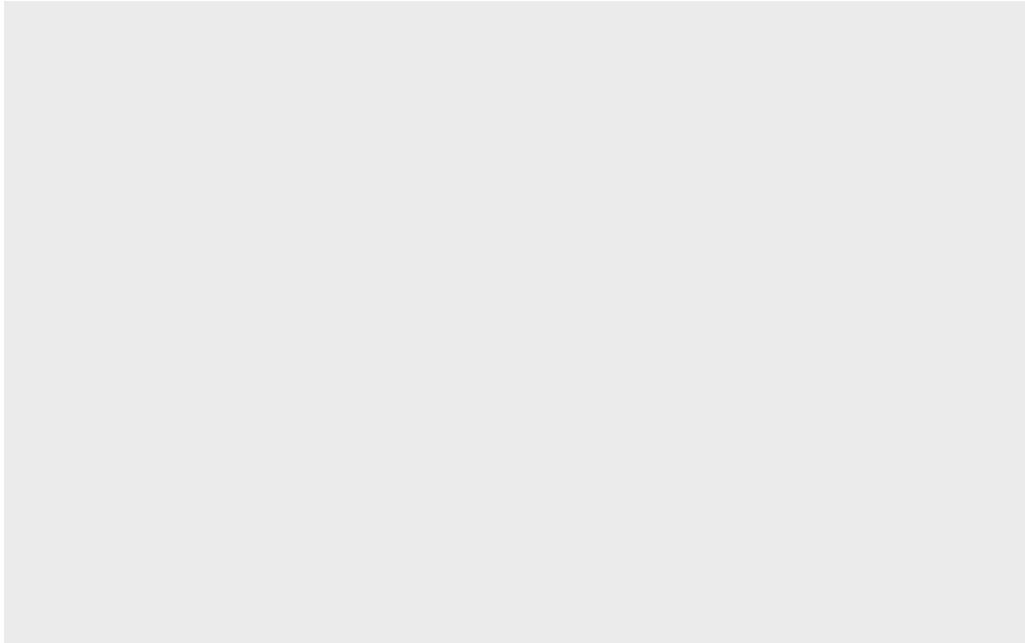
We use the `install.packages()` function to do this

```
head(cars)
```

```
  speed dist
1     4    2
2     4   10
3     7    4
4     7   22
5     8   16
6     9   10
```

To use ggplot I need to load it up before I can call any of the functions in the package. I do this with the `library()` function.
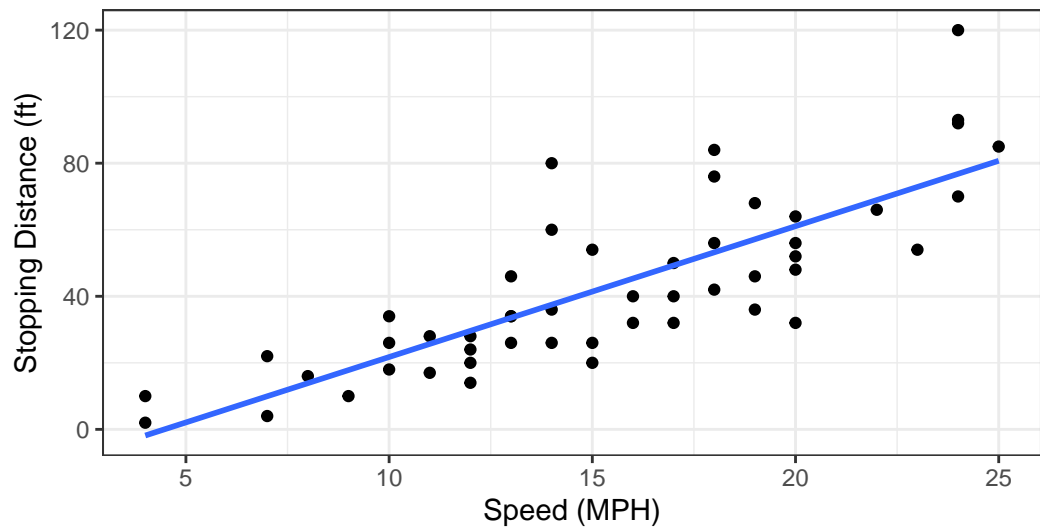
```
library(ggplot2)
ggplot()
```

All ggplot figures have at least 3 things: - data (the stuff we want to plot) - aesthetic mapping (aes values) - geoms (geometrys)

```r
ggplot(cars) +
  aes(x=speed, y=dist) +
  geom_point() +
  labs(title="Speed and Stopping Distances of Cars",
       x="Speed (MPH)",
       y="Stopping Distance (ft)",
       subtitle = "Lauren Waters",
       caption="Dataset: 'cars'") +
  geom_smooth(method="lm", se=FALSE) +
  theme_bw()
```

`geom_smooth()` using formula = 'y ~ x'
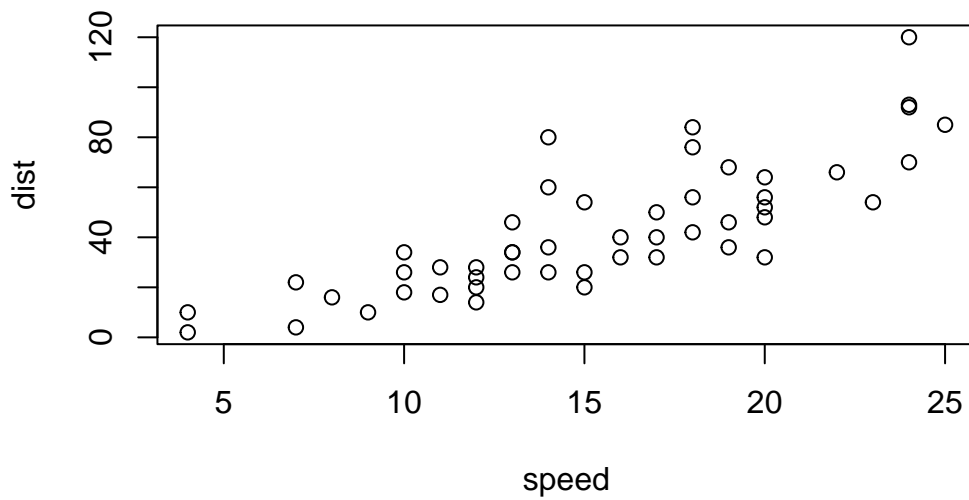
Speed and Stopping Distances of Cars

Lauren Waters

Dataset: 'cars'

ggplot is not the only graphing system in R there are lots of others. There is even "base R" graphics.

```
plot(cars)
```

```
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
```

```
nrow(genes)
```

```
[1] 5196
```

```
colnames(genes)
```

```
[1] "Gene"       "Condition1" "Condition2" "State"
```

```r
ncol(genes)
```

```
[1] 4
```

```r
sum(genes$State == "up")
```

```
[1] 127
```

```r
(127/5196) * 100
```

```
[1] 2.444188
```

```r
ggplot(genes) +
  aes(x=Condition1, y=Condition2, col=State) +
  geom_point() +
  scale_color_manual(values=c("pink", "gray", "yellow")) +
  labs(title= "Gene Expression Changes Upon Drug Treatment",
       x= "Control (no drug)",
       y= "Drug Treatment")
```