

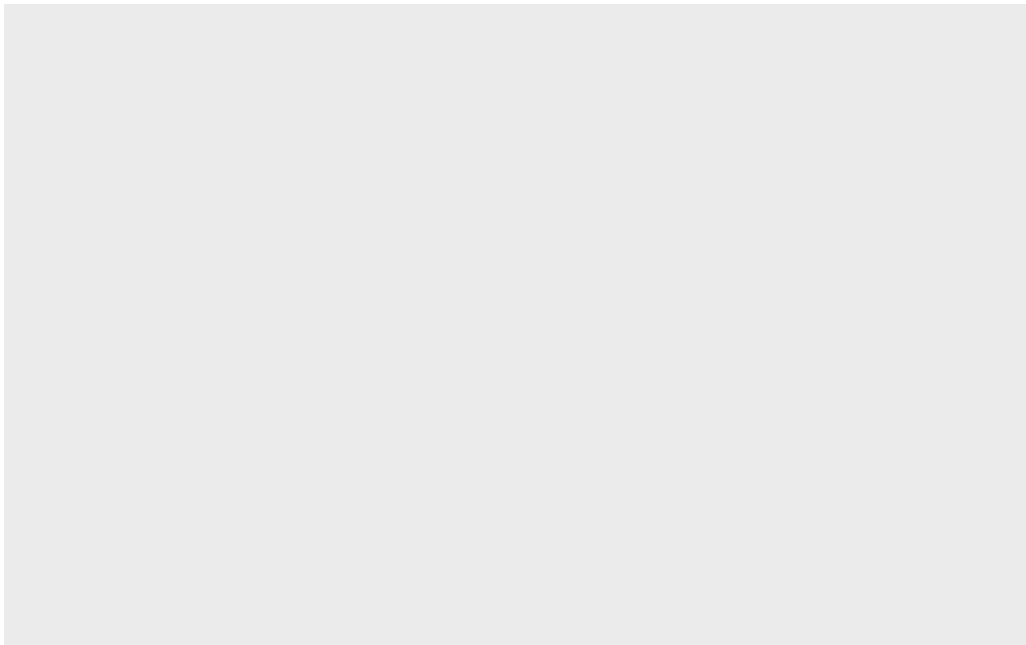
# Class 5: Data Visualization with ggplot

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## Using ggplot

Must download any package functions with “library()” call prior to using that package in a script

```
library(ggplot2)
# install.packages("farver")
ggplot(cars)
```



```
plot(cars)
```

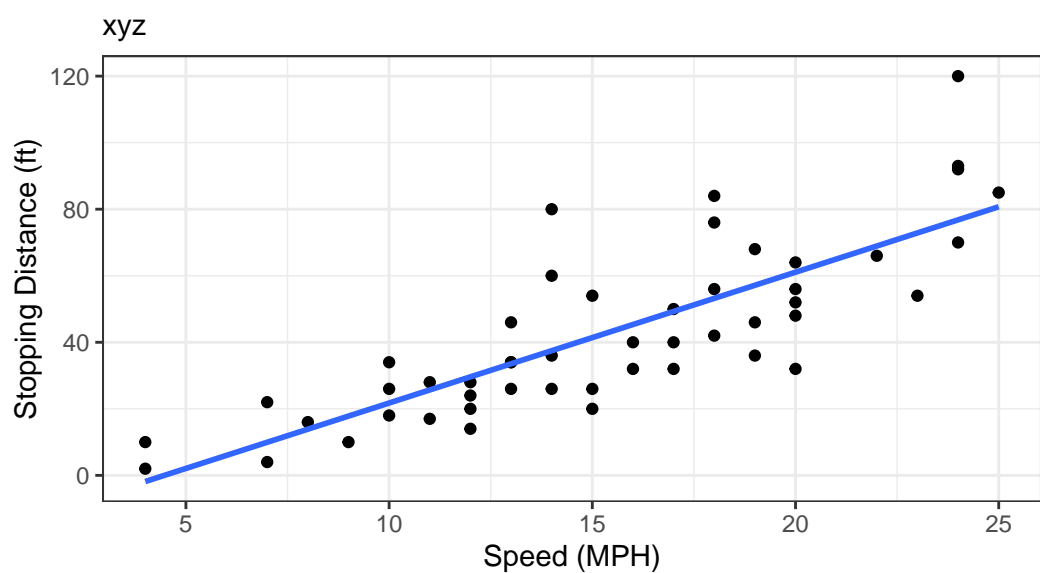


To use ggplot, you need 1. Data (data.frame) 2. aesthetics (aes()) values - how the data maps to the plot) 3. geoms (how I want things drawn)

```
ggplot(cars) +  
  aes(x=speed, y=dist) +  
  geom_point() +  
  labs(title="Speed and Stopping Distance of Cars", x="Speed (MPH)", y="Stopping Distance") +  
  geom_smooth(method="lm", se=FALSE) +  
  theme_bw()
```

`geom\_smooth()` using formula = 'y ~ x'

## Speed and Stopping Distance of 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"
```

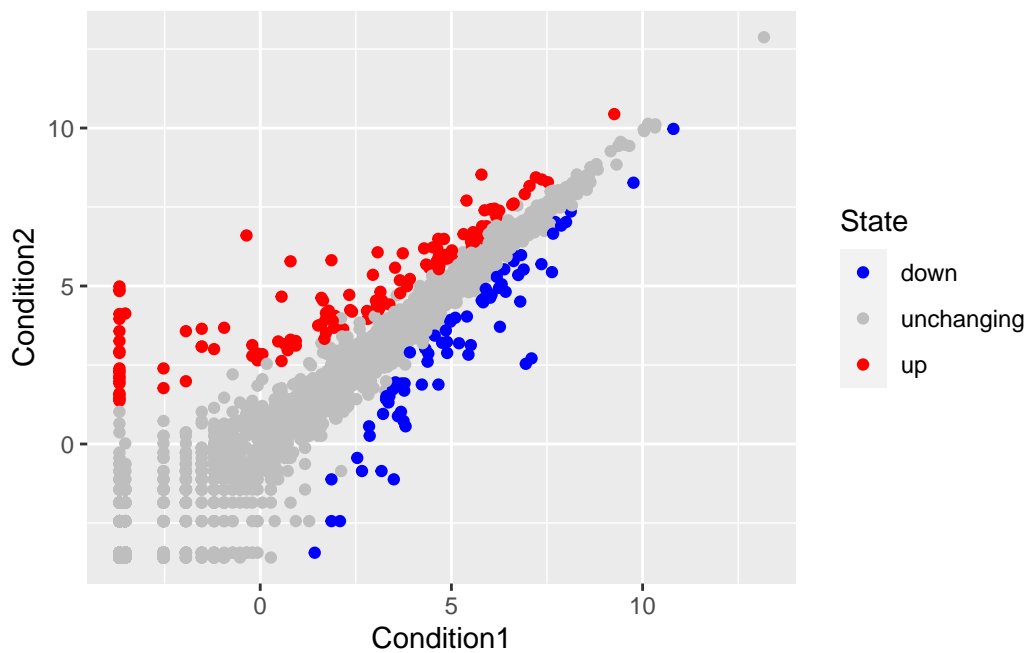
```
table(genes$State)
```

down	unchanging	up
72	4997	127

```
round(table(genes$State)/nrow(genes) * 100, 2)
```

down	unchanging	up
1.39	96.17	2.44

```
p <- ggplot(genes) +  
  aes(x = Condition1, y = Condition2, col=State) + geom_point()  
p + scale_colour_manual( values=c("blue","gray","red") )
```



```
# install.packages("gapminder")  
library(gapminder)
```

```
url <- "https://raw.githubusercontent.com/jennybc/gapminder/master/inst/extdata/gapminder.
gapminder <- read.delim(url)
# install.packages("dplyr")
library(dplyr)
```

Attaching package: 'dplyr'

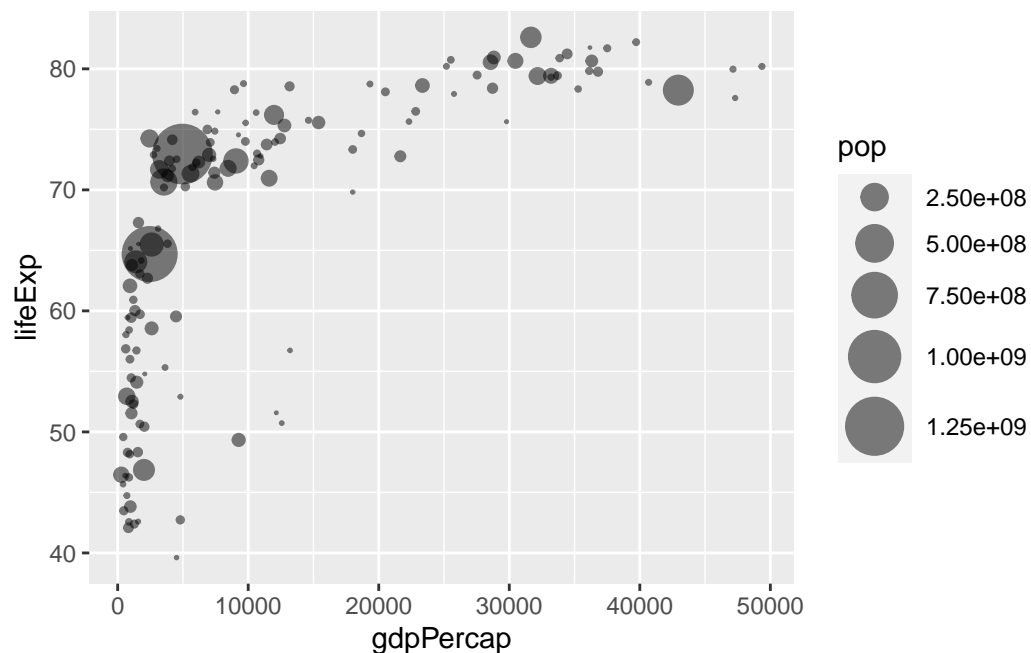
The following objects are masked from 'package:stats':

filter, lag

The following objects are masked from 'package:base':

intersect, setdiff, setequal, union

```
gapminder_2007 <- gapminder %>% filter(year==2007)
ggplot(gapminder_2007) +
  aes(x=gdpPercap, y=lifeExp, size=pop) +
  geom_point(alpha=0.5) +
  scale_size_area(max_size = 10)
```



```
gapminder_1957 <- gapminder %>% filter(year==1957 | year==2007)
ggplot(gapminder_1957) +
  aes(x=gdpPerCap, y=lifeExp, color=continent, size=pop) +
  geom_point(alpha=0.7) +
  scale_size_area(max_size=15) +
  facet_wrap(~year)
```

