

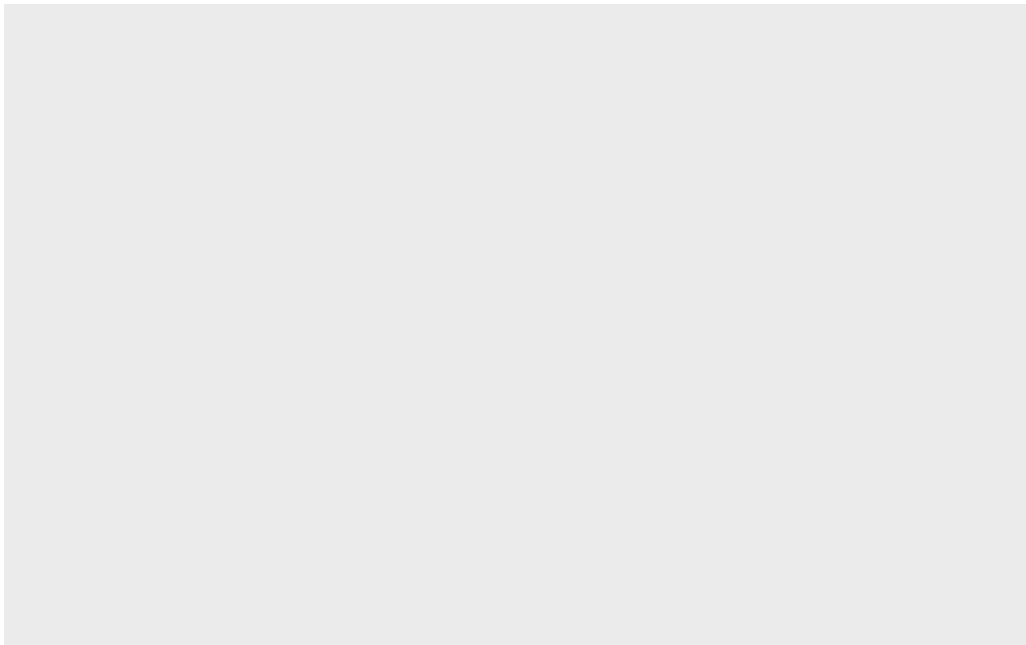
Class 5: Data Visualization with ggplot

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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)
```

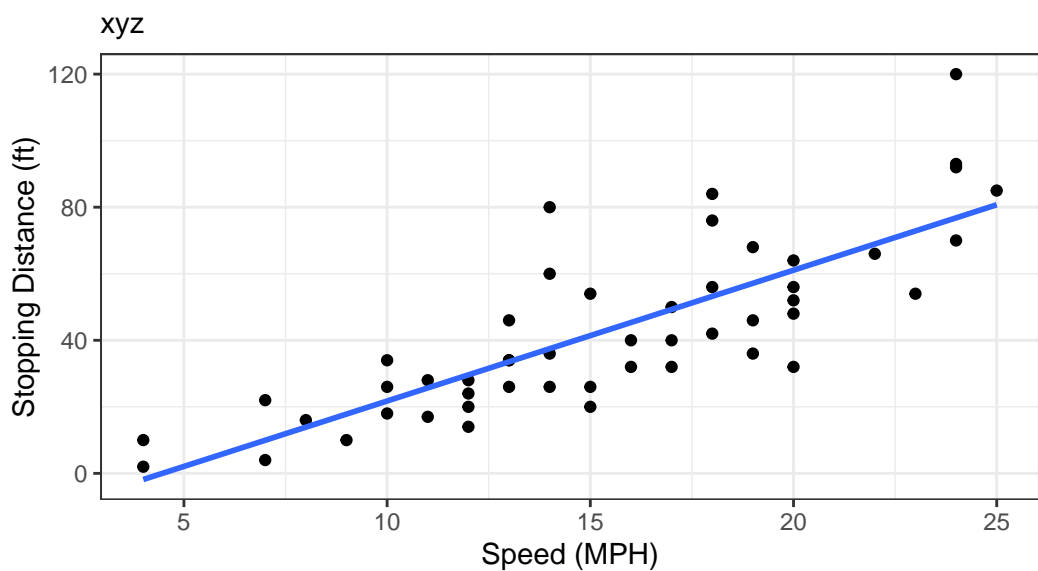


To use ggplot, you need 1. Data (data.frame) 2. aesthetics (aes()) values - how the data maps to the plot) 3. geoms (how I want things drawn)

```
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



Dataset: '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"
```

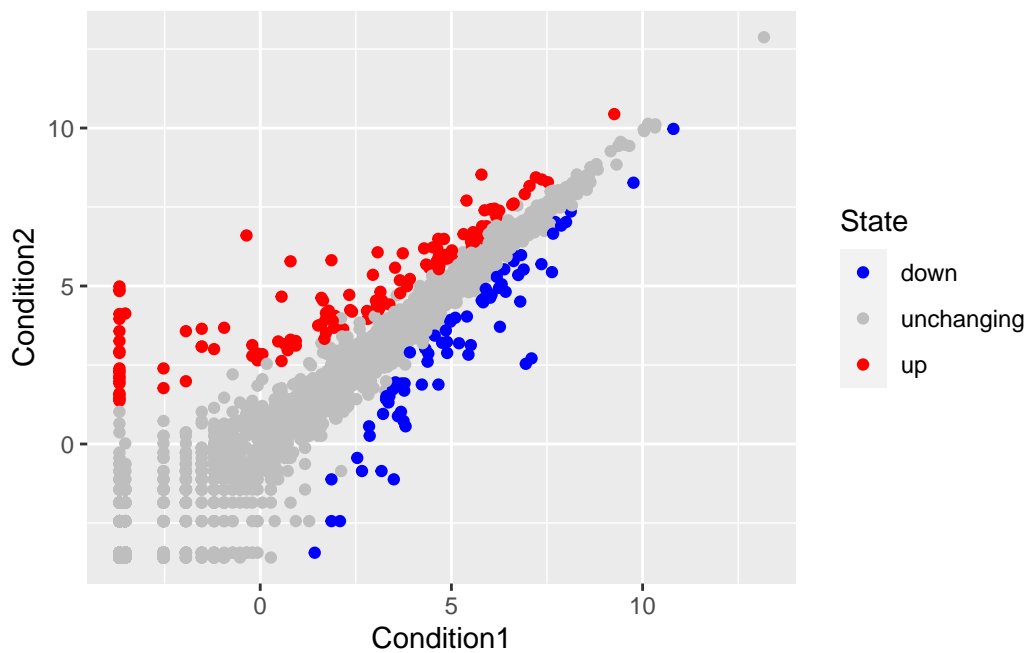
```
table(genes$State)
```

| 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'

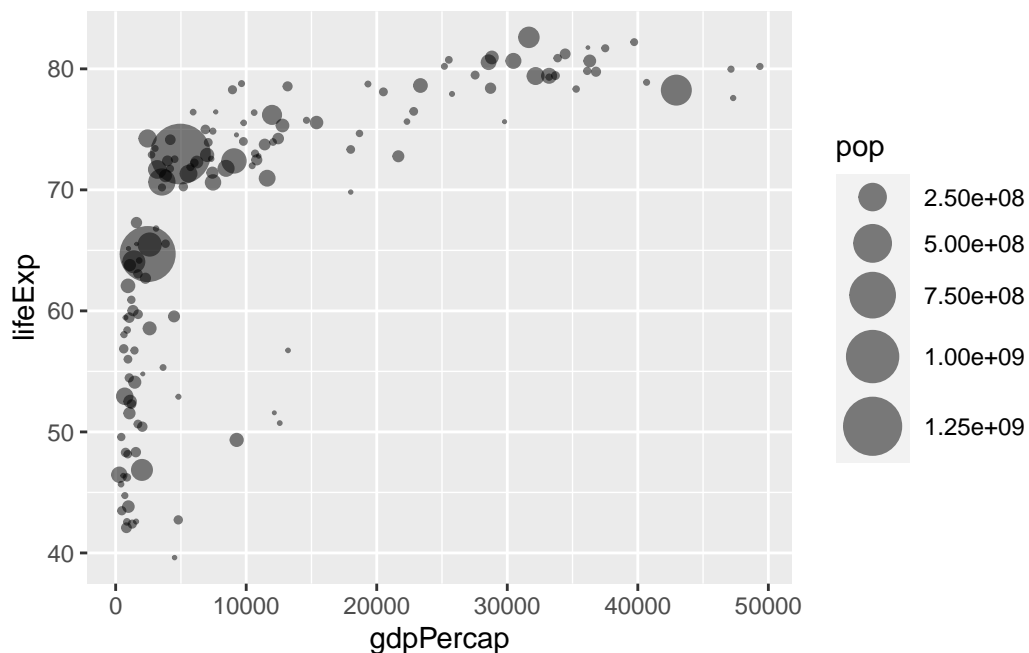
The following objects are masked from 'package:stats':

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)
```

