Class 5: Data Visualization with GGPlot

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Our first ggplot

To use the ggplot2 package I first need to have it installed on my computer.

To install any package we use the 'install.packages()' commands.

Now can I use it? NO! first we need to call 'library(ggplot2)'.

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

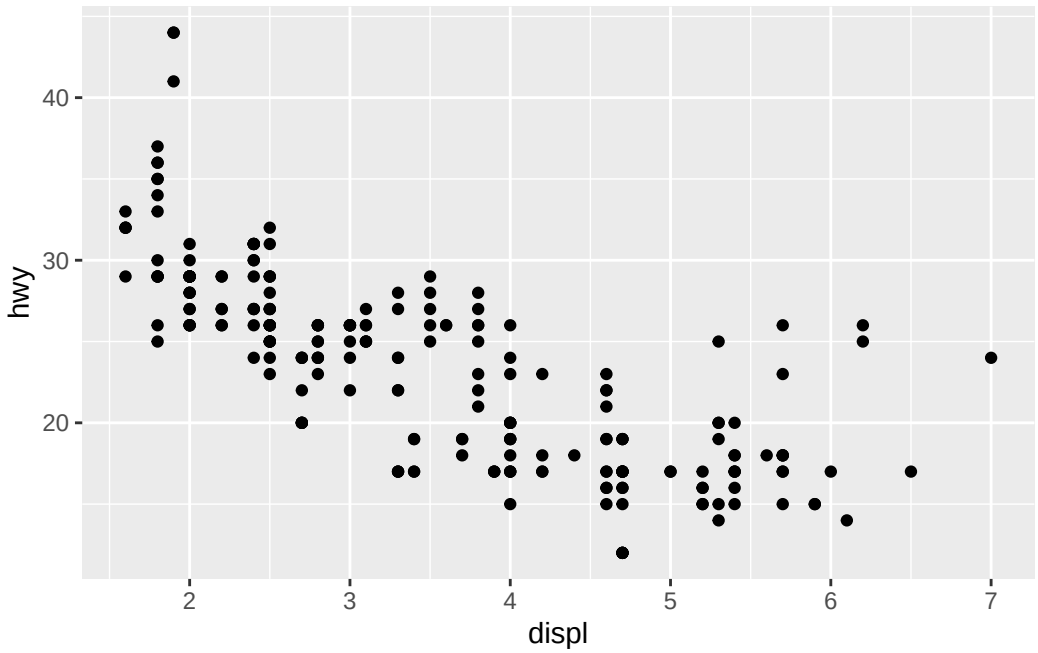
```
mpg
```

```
# A tibble: 234 x 11
   manufacturer model      displ  year   cyl trans drv     cty   hwy fl    class
   <chr>        <chr>      <dbl> <int> <int> <chr> <chr> <int> <int> <chr> <chr>
 1 audi         a4           1.8  1999     4 auto~ f        18    29 p     comp~
 2 audi         a4           1.8  1999     4 manu~ f        21    29 p     comp~
 3 audi         a4           2    2008     4 manu~ f        20    31 p     comp~
 4 audi         a4           2    2008     4 auto~ f        21    30 p     comp~
 5 audi         a4           2.8  1999     6 auto~ f        16    26 p     comp~
 6 audi         a4           2.8  1999     6 manu~ f        18    26 p     comp~
 7 audi         a4           3.1  2008     6 auto~ f        18    27 p     comp~
 8 audi         a4 quattro   1.8  1999     4 manu~ 4        18    26 p     comp~
 9 audi         a4 quattro   1.8  1999     4 auto~ 4        16    25 p     comp~
10 audi         a4 quattro   2    2008     4 manu~ 4        20    28 p     comp~
# ... with 224 more rows
```

Our first plot of displ vs hwy All ggplot() graphs are made in the same way.

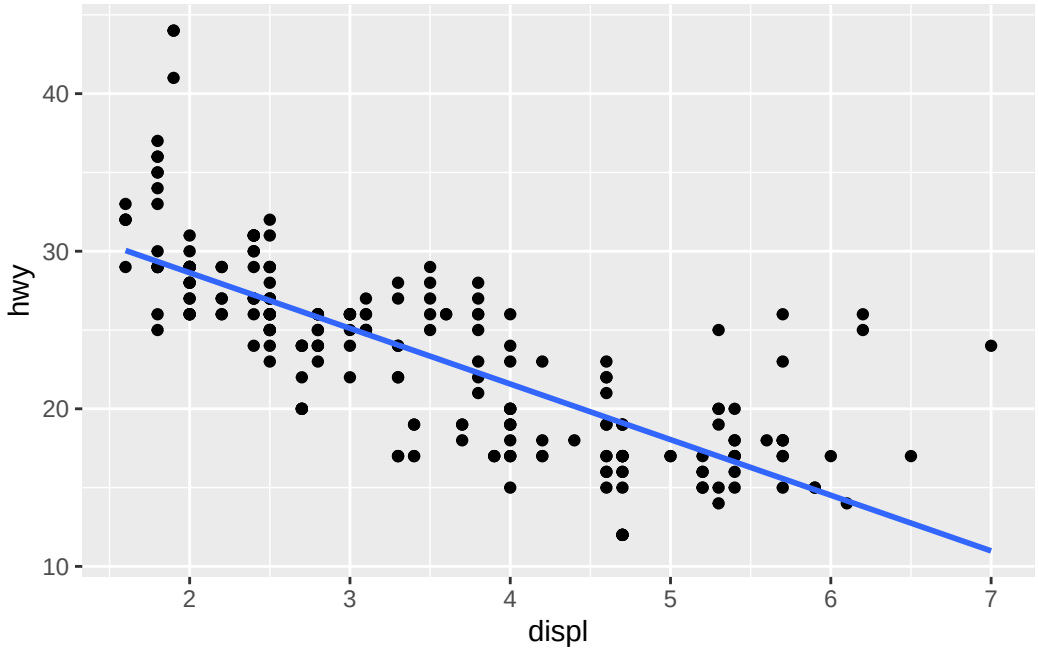
- data + aes + geoms

```
ggplot(mpg) +
  aes(x = displ, y = hwy) +
  geom_point()
```



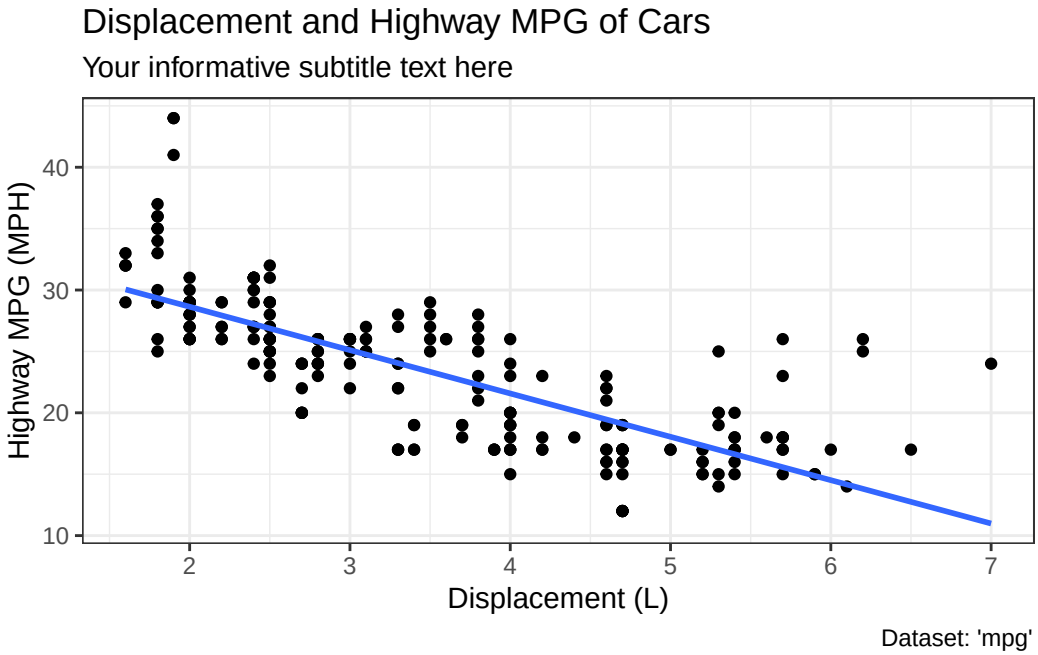

```
ggplot(mpg) +
  aes(x = displ, y = hwy) +
  geom_point() +
  geom_smooth(method = lm, se = FALSE)
```

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




```
ggplot(mpg) +
  aes(x = displ, y = hwy) +
  geom_point() +
  labs(title="Displacement and Highway MPG of Cars",
       x="Displacement (L)",
       y="Highway MPG (MPH)",
       subtitle = "Your informative subtitle text here",
       caption="Dataset: 'mpg'") +
  geom_smooth(method="lm", se=FALSE) +
  theme_bw()
```

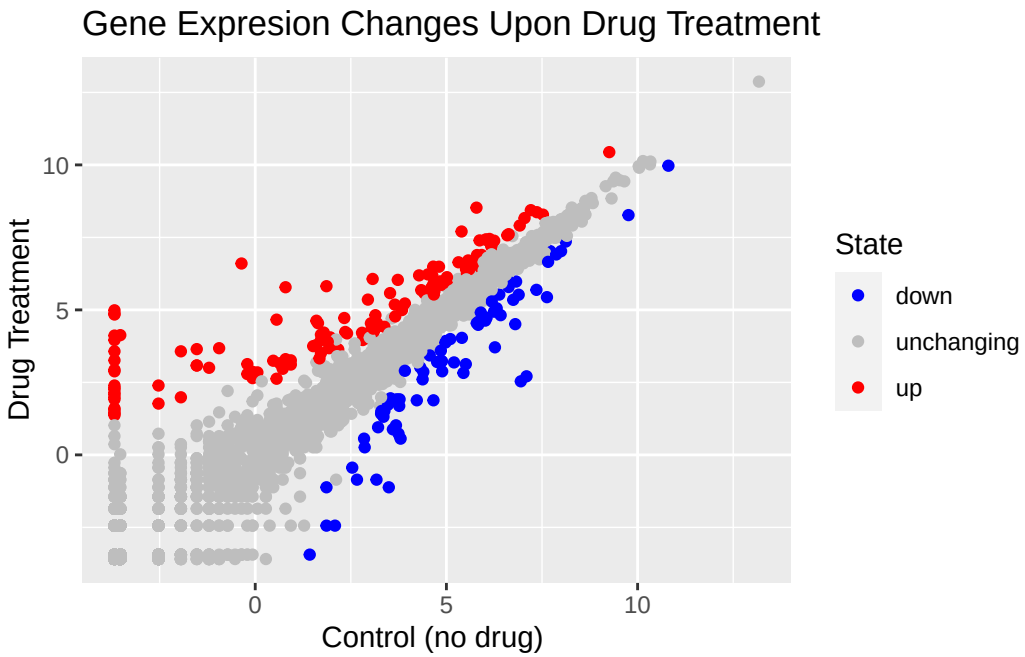
```
`geom_smooth()` using formula 'y ~ x'
```




```
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
```

```
ggplot(genes) +
  aes(x = Condition1, y = Condition2, col = State) +
  geom_point() +
  scale_colour_manual(values=c("blue","gray","red")) +
  labs(title="Gene Expresion Changes Upon Drug Treatment",
         x="Control (no drug) ",
         y="Drug Treatment")
```

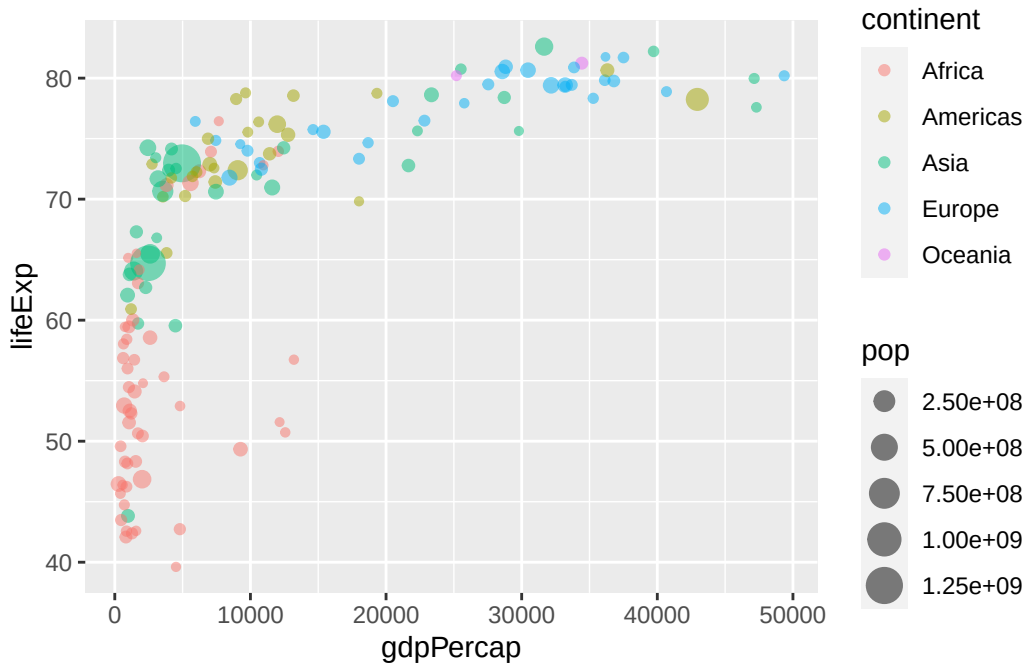



```
url <- "https://raw.githubusercontent.com/jennybc/gapminder/master/inst/extdata/gapminder.

gapminder <- read.delim(url)

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

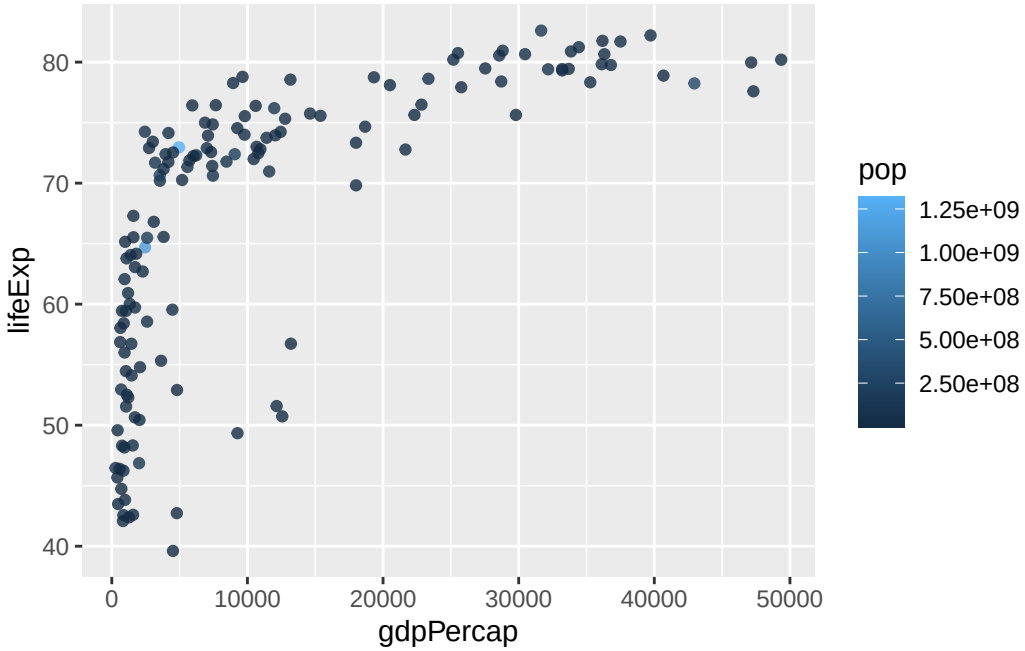
```
Attaching package: 'dplyr'

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)
```

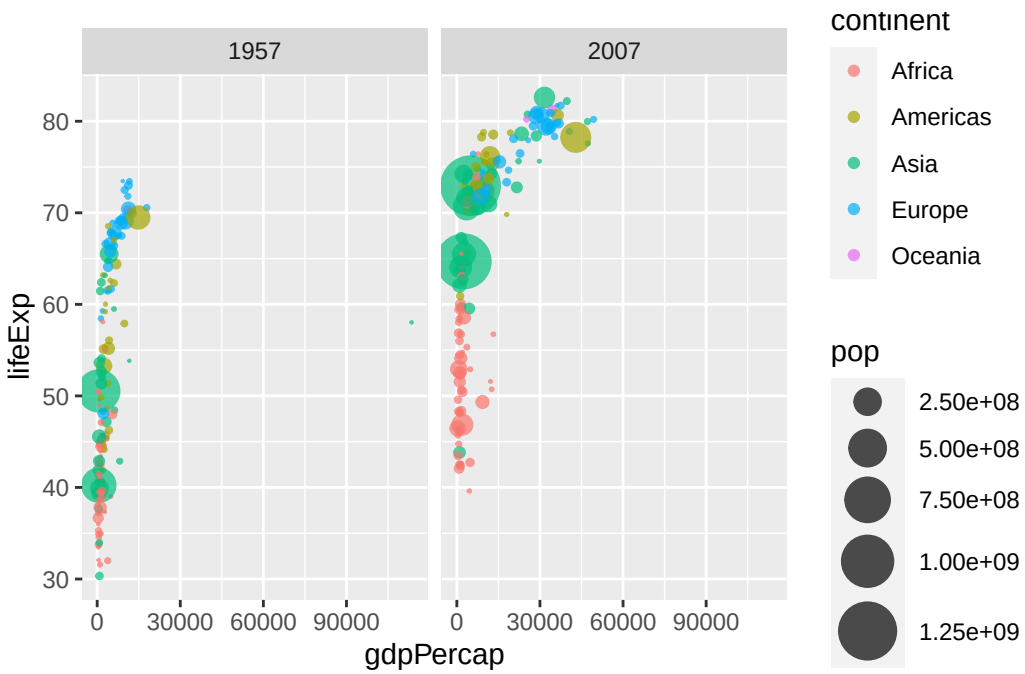
```
ggplot(gapminder_2007) +
  aes(x=gdpPercap, y=lifeExp, color=continent, size=pop) +
  geom_point(alpha=0.5)
```



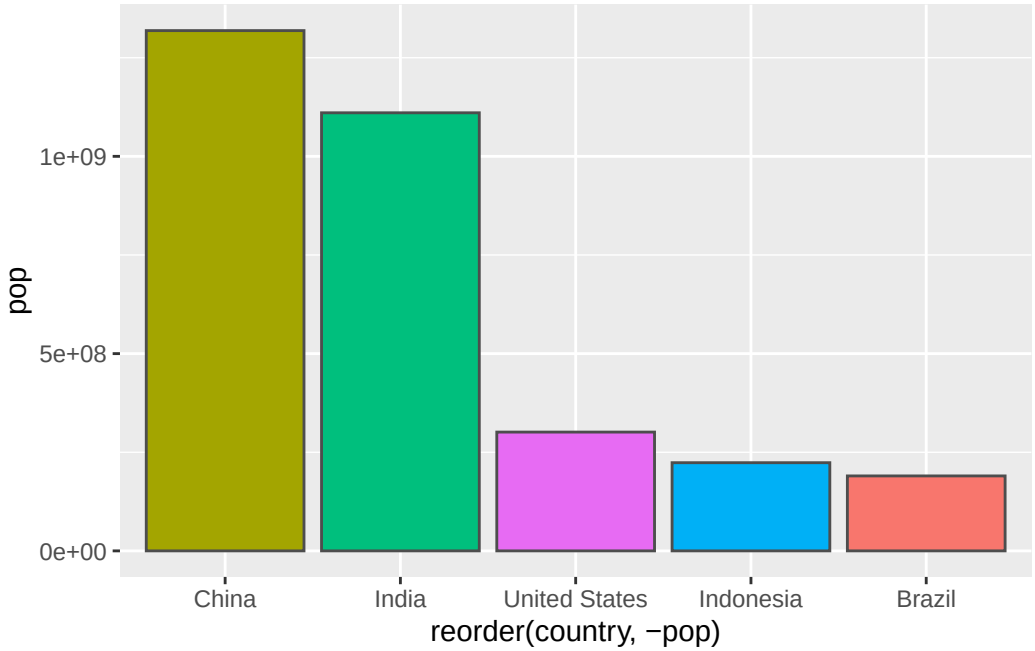

```
ggplot(gapminder_2007) +
  aes(x = gdpPercap, y = lifeExp, color = pop) +
  geom_point(alpha=0.8)
```




```
gapminder_1957 <- gapminder %>% filter(year==1957 | year==2007)

ggplot(gapminder_1957) +
  geom_point(aes(x = gdpPercap, y = lifeExp, color=continent,
                 size = pop), alpha=0.7) +
  scale_size_area(max_size = 10) +
  facet_wrap(~year)
```




```
gapminder_top5 <- gapminder %>%
  filter(year==2007) %>%
  arrange(desc(pop)) %>%
  top_n(5, pop)

ggplot(gapminder_top5) +
  aes(x=reorder(country, -pop), y=pop, fill=country) +
  geom_col(col="gray30") +
  guides(fill="none")
```


pop
1e+09
5e+08
0e+00
China
India
United States
Indonesia
Brazil
reorder(country, −pop)