

### Intro to ggplot2

The graphics package ggplot2 is powerful, aesthetically pleasing, and easy to use. The way ggplot2 works is by layering components of your plot on top of each other. You start a basic dataframe including x and y variables and then plot on top the customized layers.

Need help? Use

<http://docs.ggplot2.org/0.9.2.1/index.html> or  
<http://www.cookbook-r.com/Graphs> as references.

### Basic scatterplots

```
library(ggplot2)
```

```
library(gridExtra)
```

```
mtc <- mtcars
```

```
# Basic scatterplot
```

```
p1 <- ggplot(mtc, aes(x = hp, y = mpg))
```

```
# Print plot with default points
```

```
p1 + geom_point()
```

### Change color of points

```
#set one color for all points
```

```
p1 + geom_point(color="red")
```

```
#set color scale by a continuous variable
```

```
p1 + geom_point(aes(color = wt))
```

```
#set color scale by a factor variable
```

```
p1 + geom_point(aes(color=factor(am)))
```

### Change shape or size of points

```
#increase all points to size 5
```

```
p2 <- p1 + geom_point(size = 5)
```

```
#set point size by continuous variable
```

```
p3 <- p1 + geom_point(aes(size = wt))
```

```
#set point shape by factor variable
```

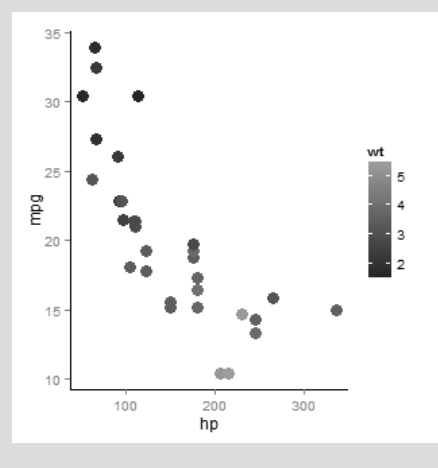
### Change shape or size of points (cont)

```
p4 <- p1 + geom_point(aes(shape = factor(am)))
```

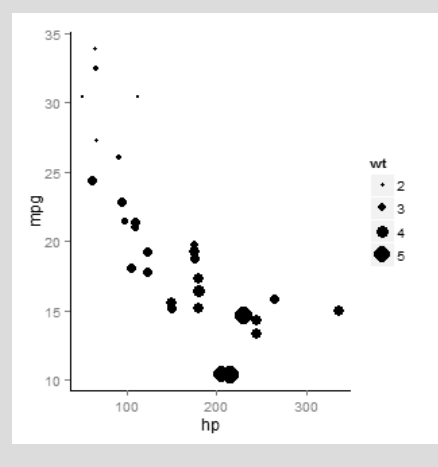
More options:

[http://docs.ggplot2.org/0.9.3.1/scale\\_manual.html](http://docs.ggplot2.org/0.9.3.1/scale_manual.html)

### Example - change color of points



### Example - change size of points

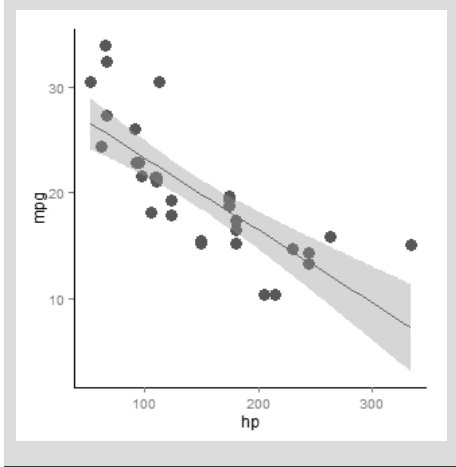


### Reference

See

<http://rforpublichealth.blogspot.dk/2013/11/ggplot2-cheatsheet-for-scatterplots.html> for the complete cheat sheet by Slawa Rokicki.

### Example - add lines to a scatterplot



### Add lines to scatterplot

```
#connect points with line
```

```
p1 + geom_point(color="blue") + geom_line()
```

```
#add regression line
```

```
p1 + geom_point(color="red") +  
geom_smooth(method = "lm", se = TRUE)
```

```
#add vertical line
```

```
geom_point() + geom_vline(xintercept = 100,  
color="red")
```

### Change axis labels

```
#label all axes at once
```

```
p2 + labs(x="Horsepower",  
y = "Miles per Gallon")
```

```
#label and change font size
```

```
p2 + theme(axis.title.x = element_text(face=  
"bold", size=20)) + labs(x="Horsepower")
```

```
#adjust axis limits and breaks
```

```
p2 + scale_x_continuous("Horsepower",  
limits=c(0,400), breaks=seq(0, 400, 50))
```