

RMarkdown Introduction

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R Markdown

This is my first R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

Material from tonight's workshop can be found on our [GitHub](#) page.

When analysing data, a starting point is to examine the characteristics of each individual variable in the data set. The way to proceed depends upon the type of variable being examined. The variables can be one of two broad types:

1. **Attribute variable:** has its outcomes described in terms of its characteristics or attributes;
2. **Measured variable:** has the resulting outcome expressed in numerical terms.

Including R Code

When you click the Knit button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(mtcars)
```

```
##           mpg           cyl           disp           hp
##  Min.       :10.40   Min.       :4.000   Min.       : 71.1   Min.       : 52.0
##  1st Qu.:15.43   1st Qu.:4.000   1st Qu.:120.8   1st Qu.: 96.5
##  Median :19.20   Median :6.000   Median :196.3   Median :123.0
##  Mean   :20.09   Mean   :6.188   Mean   :230.7   Mean   :146.7
##  3rd Qu.:22.80   3rd Qu.:8.000   3rd Qu.:326.0   3rd Qu.:180.0
##  Max.   :33.90   Max.   :8.000   Max.   :472.0   Max.   :335.0
##           drat           wt           qsec           vs
##  Min.       :2.760   Min.       :1.513   Min.       :14.50   Min.       :0.0000
##  1st Qu.:3.080   1st Qu.:2.581   1st Qu.:16.89   1st Qu.:0.0000
##  Median :3.695   Median :3.325   Median :17.71   Median :0.0000
##  Mean   :3.597   Mean   :3.217   Mean   :17.85   Mean   :0.4375
##  3rd Qu.:3.920   3rd Qu.:3.610   3rd Qu.:18.90   3rd Qu.:1.0000
##  Max.   :4.930   Max.   :5.424   Max.   :22.90   Max.   :1.0000
##           am           gear           carb
##  Min.       :0.0000   Min.       :3.000   Min.       :1.000
##  1st Qu.:0.0000   1st Qu.:3.000   1st Qu.:2.000
##  Median :0.0000   Median :4.000   Median :2.000
##  Mean   :0.4062   Mean   :3.688   Mean   :2.812
##  3rd Qu.:1.0000   3rd Qu.:4.000   3rd Qu.:4.000
##  Max.   :1.0000   Max.   :5.000   Max.   :8.000
```

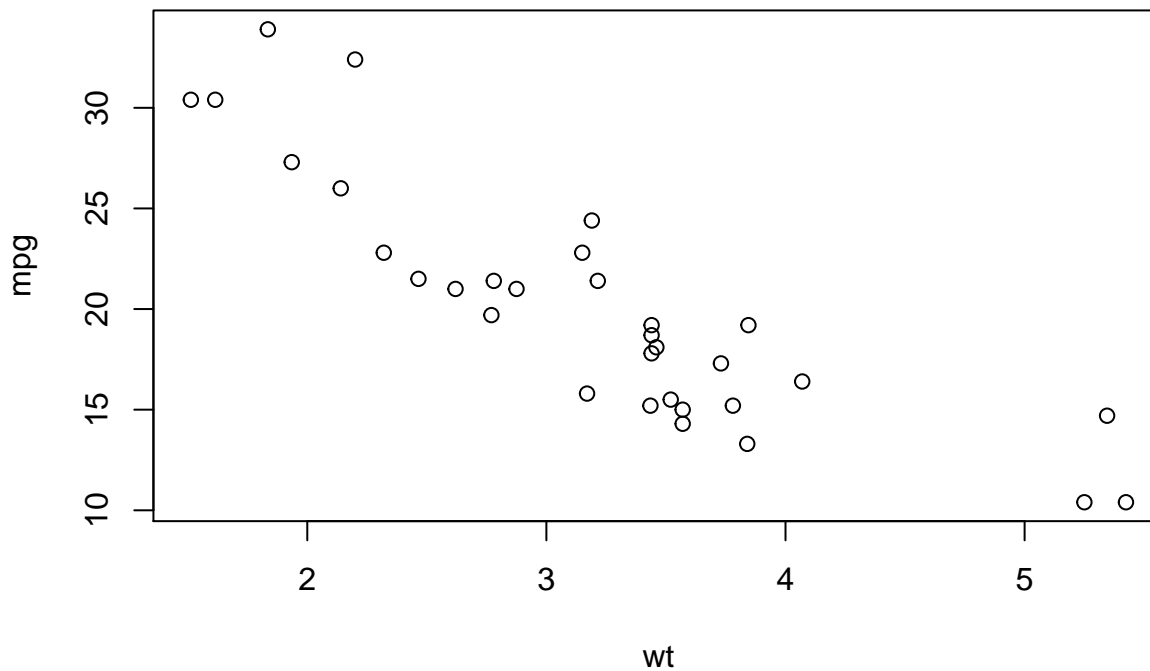
```
mtcars[1:10, ]
```

```
##           mpg cyl  disp  hp drat    wt  qsec vs am gear carb
## Mazda RX4      21.0   6 160.0 110 3.90 2.620 16.46 0  1    4    4
## Mazda RX4 Wag  21.0   6 160.0 110 3.90 2.875 17.02 0  1    4    4
```

```
## Datsun 710      22.8   4 108.0  93 3.85 2.320 18.61  1  1   4   1
## Hornet 4 Drive  21.4   6 258.0 110 3.08 3.215 19.44  1  0   3   1
## Hornet Sportabout 18.7   8 360.0 175 3.15 3.440 17.02  0  0   3   2
## Valiant        18.1   6 225.0 105 2.76 3.460 20.22  1  0   3   1
## Duster 360     14.3   8 360.0 245 3.21 3.570 15.84  0  0   3   4
## Merc 240D      24.4   4 146.7  62 3.69 3.190 20.00  1  0   4   2
## Merc 230       22.8   4 140.8  95 3.92 3.150 22.90  1  0   4   2
## Merc 280       19.2   6 167.6 123 3.92 3.440 18.30  1  0   4   4
```

Including Plots

You can also embed plots by setting `echo = FALSE` to the code chunk to prevent printing of the R code that generates the plot. For example:



Including Mathematical Equations

Let us fit the following model

$$mpg = b_0 + b_1 wt$$

which we write using the LaTeX.

```
m1 <- lm(mpg ~ wt, data = mtcars)
summary(m1)
```

```
##
## Call:
## lm(formula = mpg ~ wt, data = mtcars)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -4.5432 -2.3647 -0.1252  1.4096  6.8727
##
```

```
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  37.2851      1.8776  19.858 < 2e-16 ***
## wt          -5.3445      0.5591  -9.559 1.29e-10 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3.046 on 30 degrees of freedom
## Multiple R-squared:  0.7528, Adjusted R-squared:  0.7446
## F-statistic: 91.38 on 1 and 30 DF,  p-value: 1.294e-10
```

What do we think of this model?

Let's discuss it next time we meet up.