# Untitled

2024-11-27

## R Markdown

This is an 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.

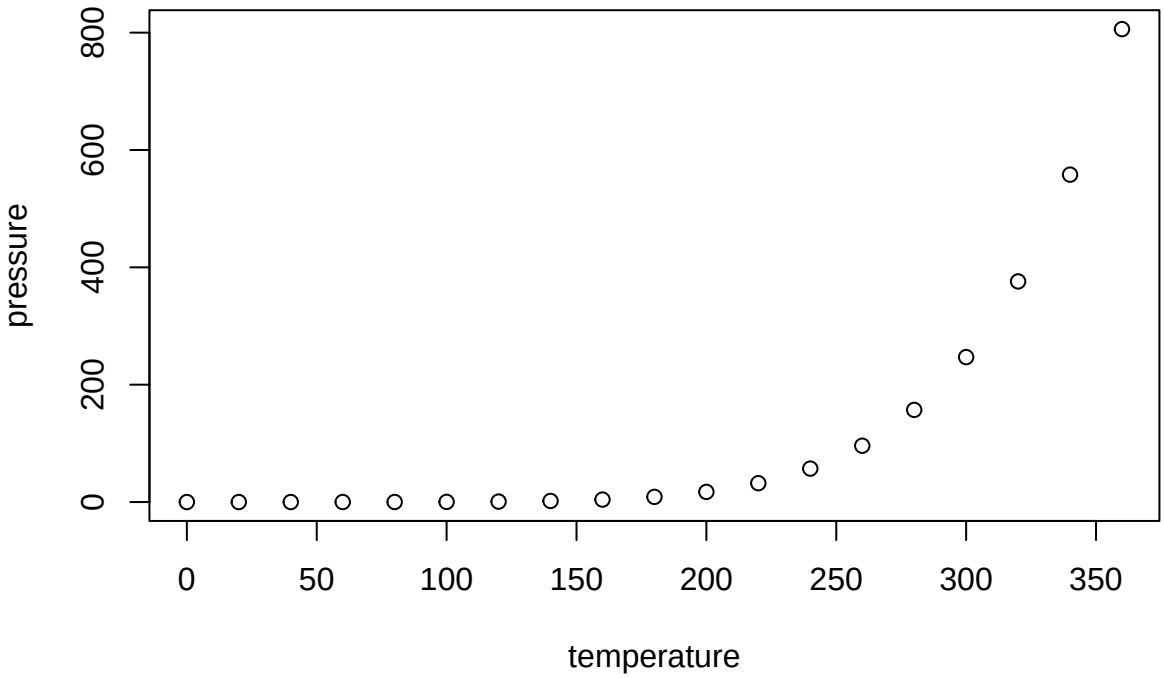
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(cars)
```

```
##      speed           dist       
##  Min.   : 4.0   Min.   :  2.00  
##  1st Qu.:12.0   1st Qu.: 26.00  
##  Median :15.0   Median : 36.00  
##  Mean   :15.4   Mean   : 42.98  
##  3rd Qu.:19.0   3rd Qu.: 56.00  
##  Max.   :25.0   Max.   :120.00
```

## Including Plots

You can also embed plots, for example:




Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

```r
library(vctrs)
```

```r
library(tidyverse)
```

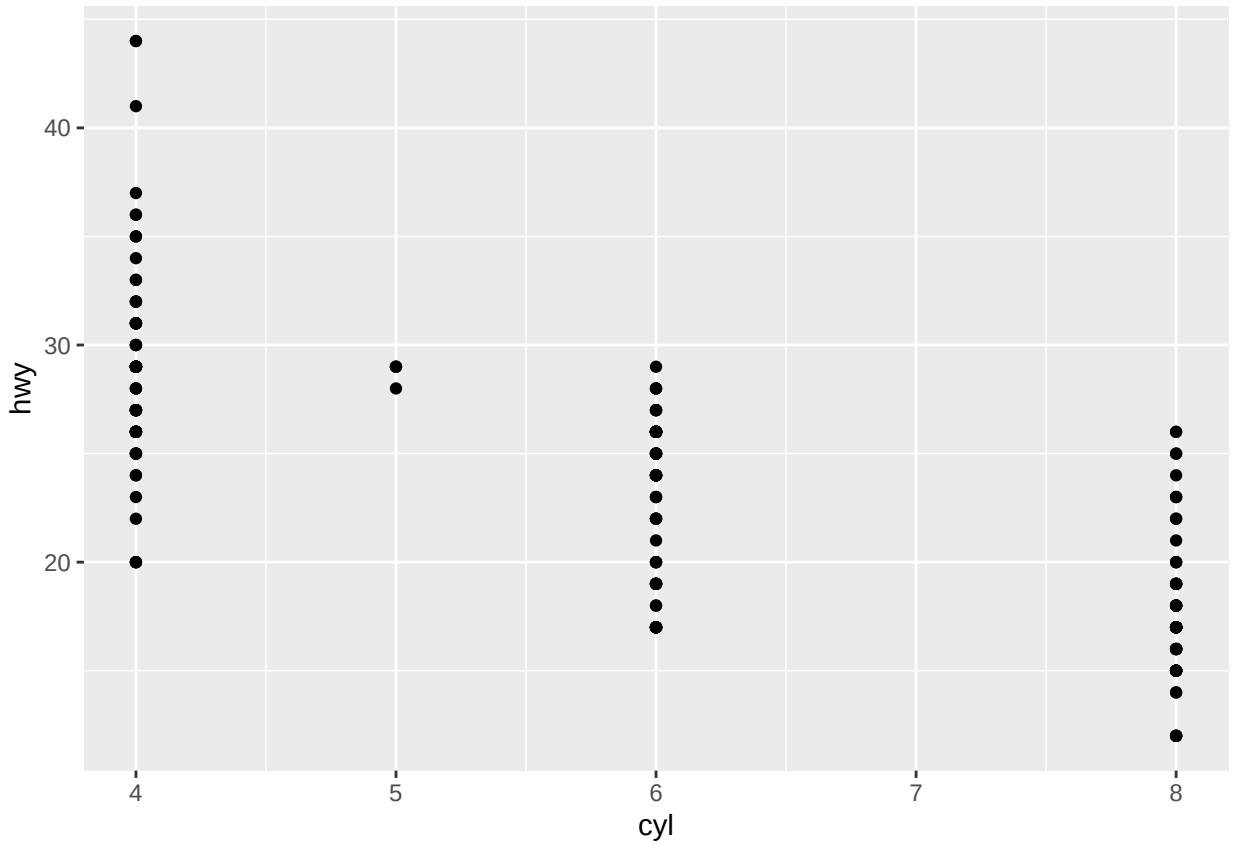
```
## -- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
## v dplyr     1.1.4     v readr     2.1.5
## v forcats   1.0.0     v stringr   1.5.1
## v ggplot2   3.5.1     v tibble    3.2.1
## v lubridate 1.9.3     v tidyr     1.3.1
## v purrr     1.0.2
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::data_frame() masks tibble::data_frame(), vctrs::data_frame()
## x dplyr::filter()     masks stats::filter()
## x dplyr::lag()        masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```r
head(mpg)
```

```
## # A tibble: 6 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(l5)   f        18    29 p     compa~
## 2 audi         a4      1.8  1999     4 manual(m5) f        21    29 p     compa~
## 3 audi         a4      2    2008     4 manual(m6) f        20    31 p     compa~
## 4 audi         a4      2    2008     4 auto(av)   f        21    30 p     compa~
## 5 audi         a4      2.8  1999     6 auto(l5)   f        16    26 p     compa~
## 6 audi         a4      2.8  1999     6 manual(m5) f        18    26 p     compa~
```

```r
mpg %>% ggplot()
```

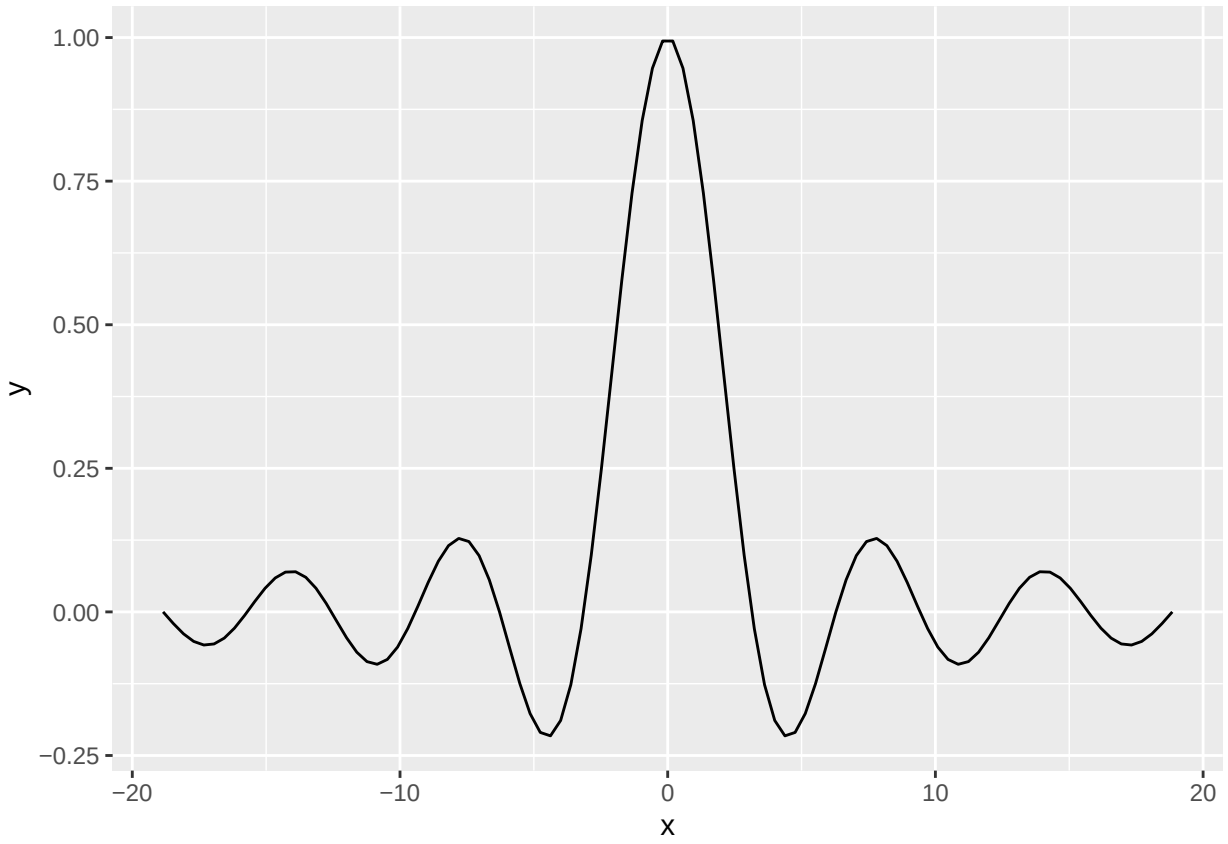
```
mpg %>%
  ggplot(aes(x = cyl, y = hwy)) + geom_point()
```




```r
x <- seq(-6 * pi, 6 * pi, length.out = 100)
dat <- data.frame(x = x, y = sin(x)/x)
head(dat)
```

```
##           x             y
## 1 -18.84956 -3.898172e-17
## 2 -18.46876 -2.012385e-02
## 3 -18.08796 -3.815130e-02
## 4 -17.70716 -5.137086e-02
## 5 -17.32636 -5.765016e-02
## 6 -16.94556 -5.576687e-02
```

```r
ggplot(data = dat, mapping = aes(x = x, y = y)) + geom_line()
```

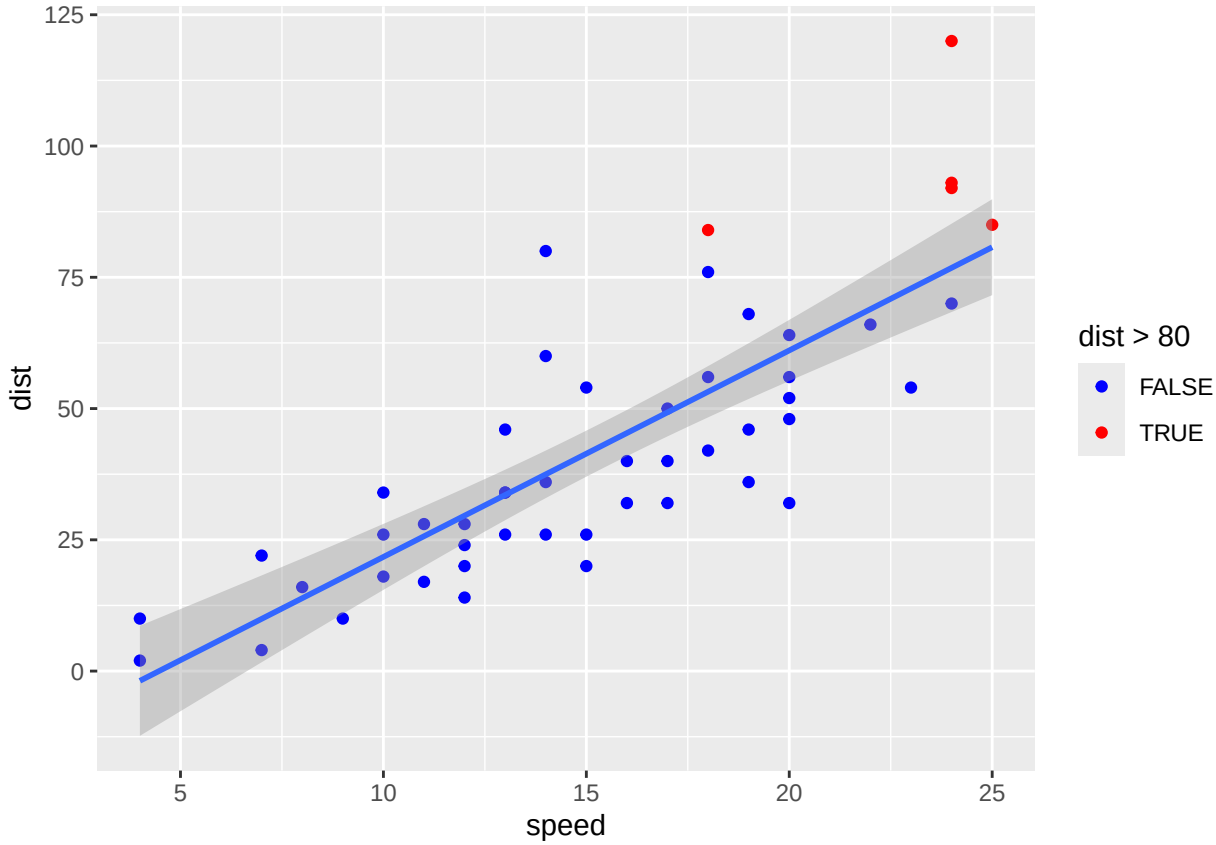



```
head(cars)
```

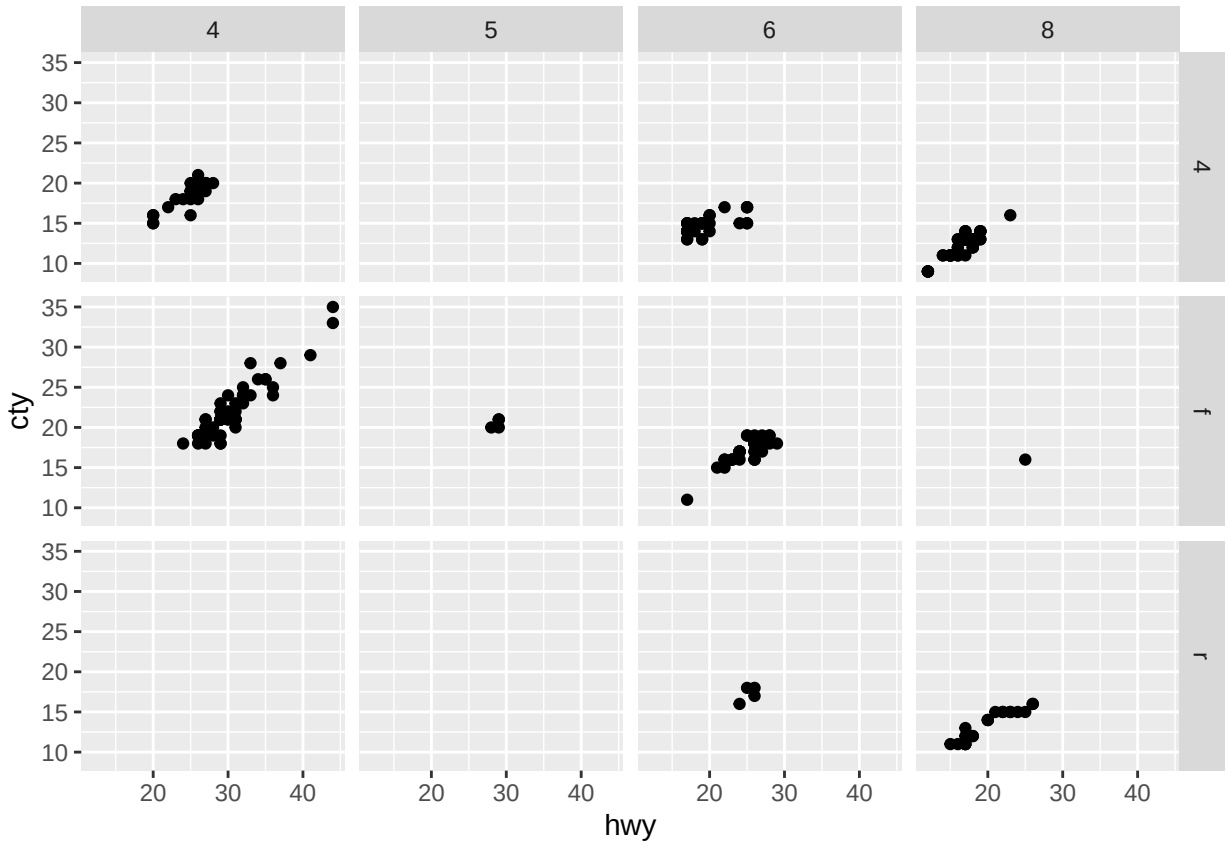
```
##   speed dist
## 1     4    2
## 2     4   10
## 3     7    4
## 4     7   22
## 5     8   16
## 6     9   10
```

```
cars %>%
  ggplot(aes(x = speed, y = dist)) + geom_point(mapping = aes(color = dist > 80)) + scale_color_manual(
```

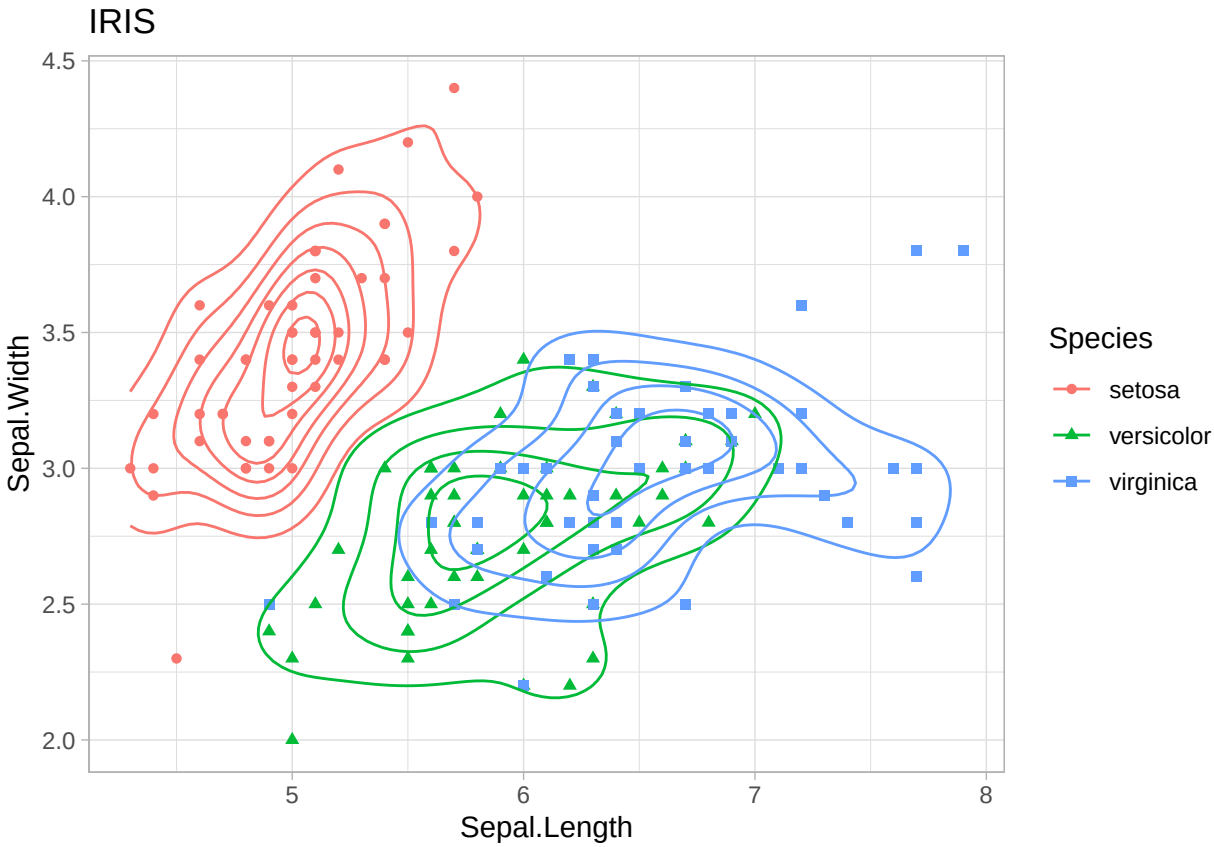
```
## `geom_smooth()` using formula = 'y ~ x'
```




```
mpg %>%
  ggplot() + geom_point(aes(x = hwy, y = cty)) + facet_grid(drv ~ cyl)
```




```
iris %>%
  ggplot(aes(x = Sepal.Length, y = Sepal.Width, color = Species, shape = Species)) + geom_point() + geo
```


IRIS
Sepal.Width
Sepal.Length
4.5
4.0
3.5
3.0
2.5
2.0
5
6
7
8
Species
setosa
versicolor
virginica