Unit 3 Homework 2: Probability Theory

1. Gas Station Analytics

(a) Probability that the next customer will request regular gas and fill the tank

Probability that the next customer use reulgar gas: 40% Probability that will fill the tank: 30%

```
(q1a <- 0.4 * 0.3)
```

```
## [1] 0.12
```

12%

(b) Probability that the next customer will fill the tank

Regular gas and fill the tank

Probability that the next customer use reulgar gas: 40% Probability that will fill the tank: 30%

```
reg <- 0.4 * 0.3
```

Mid-grade gas and fill the tank

Probability that the next customer use mid-grade gas: 35% Probability that will fill the tank: 60%

```
mid <- 0.35 * 0.6
```

Premium gas and fill the tank

Probability that the next customer use premium gas: 25% Probability that will fill the tank: 50%

```
premium <- 0.25 * 0.5
```

```
(q1b <- reg + mid + premium)
```

```
## [1] 0.455
```

45.5%

(c) Conditional probability given the next customer fills the tank, they use regular gas

We know the probabilities of the next customer using regular gas and filling the tank and the total probability of the next customer filling the tank from (a) and (b).

```
q1c <- q1a/q1b
```

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.

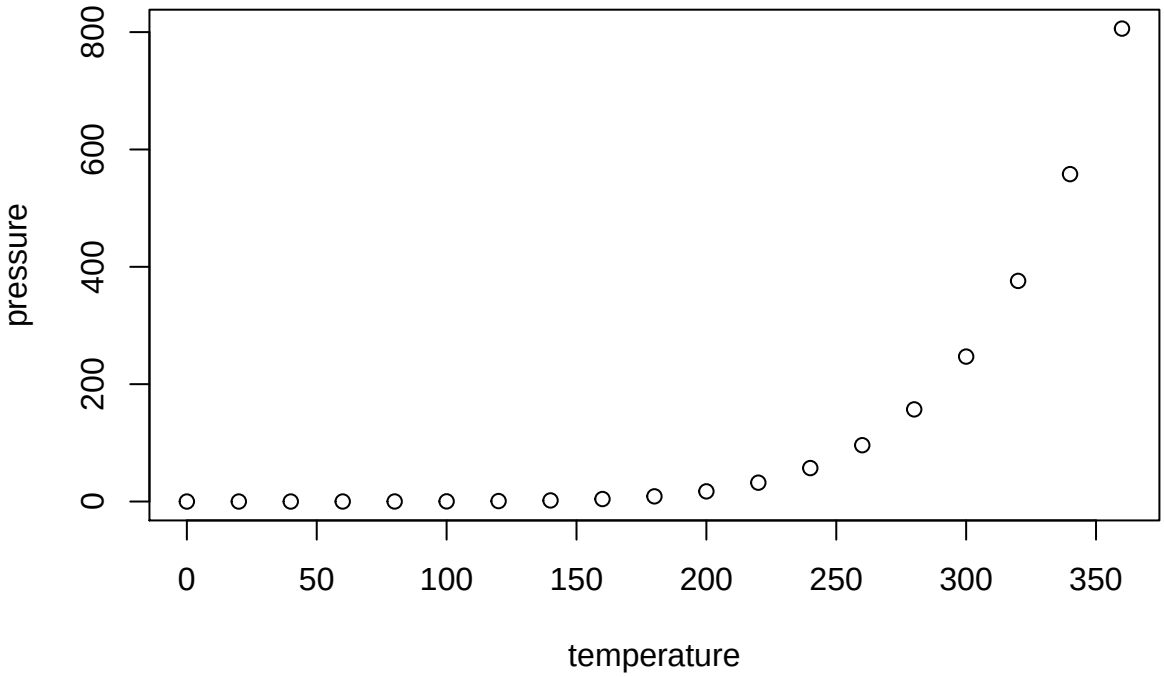
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
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.