Sample Sweave file

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The beginning of this text is automatically generated by RStudio when you create a new R Markdown file and is adapted here to Sweave. You can edit this text to customize the title, author, and date of the document. Sweave documents are normally rendered as PDFs.

R Sweave

This is an R Sweave document. Sweave is a tool that allows to embed R code in a LaTeX document. When the document is compiled, the R code is executed and the output is included in the final document. This allows to create dynamic reports that automatically update when the data changes.

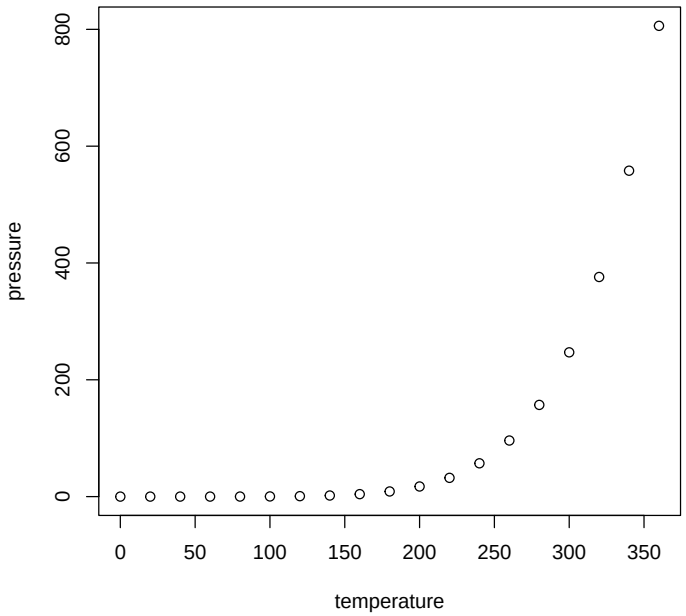
When you click the **Compile PDF** button, a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
> 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.

Including mathematical expressions

LaTeXis an advanced text language that is the go-to typesetting software in mathematics, statistics, physics and (to a large extent) computer science. You can include mathematical expressions both inline $e^{i\pi} + 1 = 0$ and displayed:

$$\int_{-\infty}^{\infty} e^{-x^2}\,dx = \sqrt{\pi}.$$

Formatting mathematical text is done using LaTeXsyntax. For example, the code `$e^{i\pi} + 1 = 0$` is rendered as $e^{i\pi} + 1 = 0$.

Including R code in the text

It is also possible to include R code in the text by using the command . So I can for example write that the `cars` dataset has 50 rows and 2 columns.

1 One important remark: .Rmd $\neq$ .R

This is in particular addressed to (from experience) Computer Science students: **code blocks** are not meant for you to paste your entire R code! When marking assignments, we will be looking for a notebook feel, not just code that runs. This means that you should include text, explanations, and interpretations of your results as part of a coherent Sweave narrative, not stuff everything in code blocks (regardless of how much commenting of your code you do).

1.1 Solution worth $\lim_{x\to 0} x$ marks

```
> # Generate the matrix
> M = matrix(c(1,2,3,
+              4,5,6,
+              7,8,9),
+            nrow=3, ncol=3, byrow=TRUE)
> # Compute the determinant
> det(M)

[1] 6.661338e-16

> # We observe that the determinant is zero (within numerical tolerance), the matrix is not
```

1.2 Solution worth a positive number of marks

We generate the matrix

```
> M = matrix(c(1,2,3,
+              4,5,6,
+              7,8,9),
+            nrow=3, ncol=3, byrow=TRUE)
```

and compute its determinant, finding det(M)=6.66133814775094e-16. We observe that the determinant is zero (within numerical tolerance), which means that the matrix is not invertible.