

Sweave Cheat Sheet

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June 26, 2009

R's Sweave function takes a \LaTeX `.Rnw` file as an argument to generate a `.tex` file that can be used to get a `pdf`. The steps below take one through the entire process of generating the `.Rnw` file in \LaTeX , using the Sweave function to obtain the `.tex` file and finally generating the `pdf`.

Step 1. Obtaining the `.Rnw` file

The `.Rnw` file is a normal \LaTeX file but saved as an `.Rnw` file. So assuming that one has been using \LaTeX or has \LaTeX installed on the computer, all you have to do is to create a new file in \LaTeX the normal way and even begin writing out your document like you used to. For example, create a new file and type the code below.

```
\documentclass{article}

\begin{document}

Basics of using Sweave with \LaTeX.

\end{document}
```

The only thing to learn here, is how to embed R code in the body of the `.tex` file you are creating. The R code is embedded in a code chunk which begins with: `<<>=` and ends with the `@` sign. For example

```
<<>=
R code goes here
@
```

Code chunks have arguments that control the usage and output of their contents. These include `label`, `fig`, `include`, `echo` among others. We will see these in the examples. Update the file you created with the code chunk inserted as below.

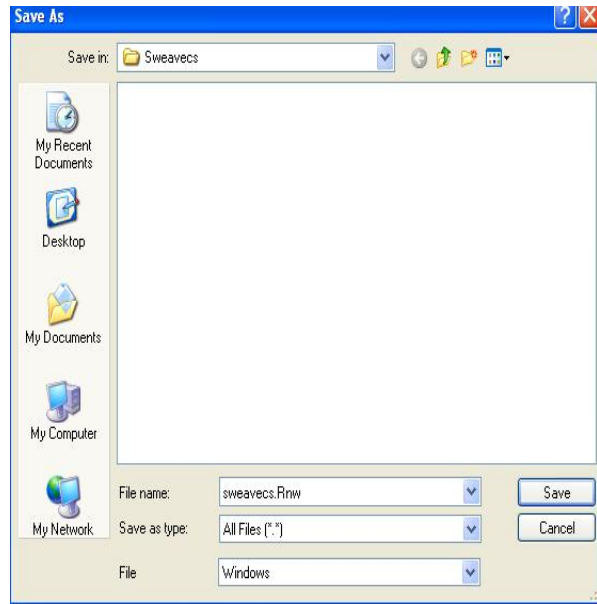
```
\documentclass{article}

\begin{document}

Basics of using Sweave with \LaTeX.

<<label=chunk1>>=
2+2
@
\end{document}
```

A code chunk has been inserted with a label of chunk1. This is important for code chunk reuse. Now you can save the file as a `.Rnw` file. This sometimes gets tricky. Ensure that Save as type has the *All Files* option as below. Attach the `.Rnw` extension to whatever name you choose your `.Rnw` file to be. Here it's sweavecs.



Step 2. Using R's Sweave Function

Armed with the `.Rnw` file proceed to R. It is convenient to set the R's working directory to the special folder in which you saved your `.Rnw` file. But before you can do that, you may wish to first save the current working directory for later recovery. The R code is as

```
cdird<-getwd() # This saves the working directory in cdird
setwd("C:/Documents and Settings/ACER/desktop/sweavecs")
# This is on my computer, change the path as necessary
```

The reason for changing the directory is that many files will be created and ofcourse one would wish project files to be in a unique folder. After using Sweave, one then goes back to the previous working directory by typing,

```
setwd(cdird)
```

After setting the working directory, and assuming that the `.Rnw` file is in the same folder as the set working directory, you can then proceed by typing in R,

```
Sweave("C:/Documents and Settings/ACER/desktop/sweavecs/sweavecs.Rnw")
```

This generates a `.tex` file, which in this case is `sweavecs.tex`. The pdf is generated by the `texi2dvi` function which resides in the R's `tools` library.

```
library(tools)
texi2dvi("sweavecs.tex",pdf=TRUE)
```

To view the pdf that has been generated, check the folder which you set as R's cuurent working directory. The place where the code chunk resided in the `.Rnw` file has been replaced with

```
> 2 + 2
```

```
[1] 4
```

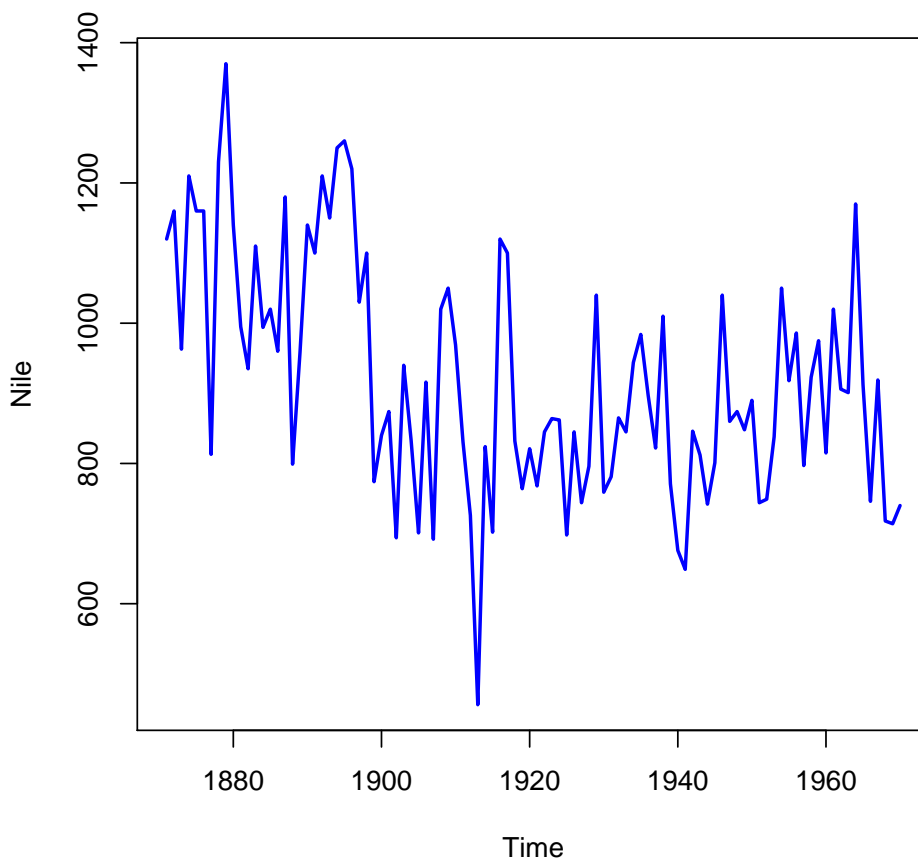
in the pdf. If you only want the output of the computation then use the echo argument.

```
<<label=chunk1,echo=FALSE>>=  
2+2  
@  
to obtain
```

```
[1] 4
```

Within a code chunk, one can even access some data sets for graphical analysis. To see this, edit your code chunk as below or create another code chunk with a different label.

```
<<label=chunk1,fig=TRUE,include = TRUE, echo=FALSE>>=  
library(datasets)  
plot.ts(Nile,col="blue",lwd=2)  
@
```



Since this is a figure, one may wish to be able to attach a caption, later on control its size. This is done by writing the code chunk in the figure environment(in your `.Rnw` file)

```

\begin{figure}[h]
\begin{center}

<<label=chunk1,fig=TRUE,include = TRUE, echo=FALSE>>=
library(datasets)
plot.ts(Nile,col="blue",lwd=2)
@
\end{center}
\caption{Flow of the River Nile}
\label{fig:fig1}
\end{figure}

```

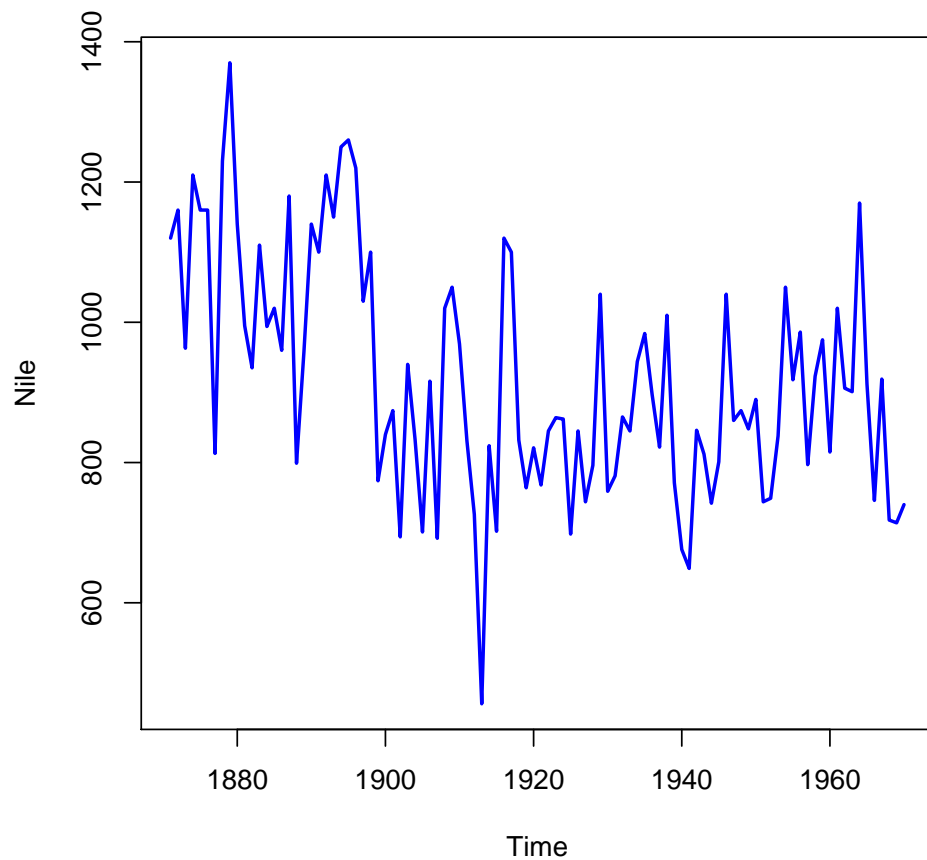


Figure 1: Flow of the River Nile

To adjust the figure size, one needs to put the code snippet below at the beginning of the .Rnw file or at the point one wants the figure sizes to be different.

```

\setkeys{Gin}{width=.7\textwidth}

```

The default size is 0.8. Now for a final view of our .Rnw file.

```
\documentclass{article}

\setkeys{Gin}{width=0.4\textwidth} %This is to change the size of the figure.
\begin{document}

Basics of using Sweave with \LaTeX.

<<label=chunk1>>=
2+2
@
\begin{figure}[h]
\begin{center}

<<label=chunk2,fig=TRUE,include = TRUE, echo=FALSE>>=
library(datasets)
plot.ts(Nile,col="blue",lwd=2)
@
\end{center}
\caption{Flow of the River Nile}
\label{fig:fig1}
\end{figure} \end{document}
```

Notice that the code chunks have unique labels. The figure generated is smaller than the one above.

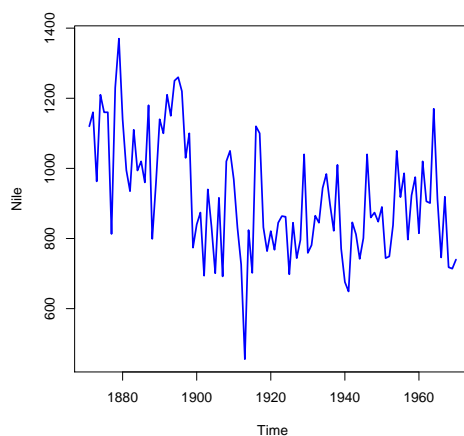


Figure 2: Flow of the River Nile

Suppose that you carry out some computation in the code chunk and wish to use the results in the document write-up, then the `\texttt{\code{}}\code{}` command comes in handy. For example, given the code chunk below,

```
<<chunk3,echo=FALSE>>=
x<-rnorm(50,0,1)
```

```
y<-mean(x)
@
```

one may wish to access `y` for example. This can be done by using the command `\Sexpr` to obtain -0.0097591522813977. The number of decimal places can be reduced by passing `round(y,no_of_dec_places)` to `\Sexpr` to obtain -0.01. Note that the mean of 50 randomly chosen normal random variables keeps on changing everytime you Sweave and build the pdf.