

Using Sweave with TexWorks 0.4.5

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1 Setup

These instructions apply to the current version of TexWorks on Windows (0.4.5), available from <http://www.tug.org/texworks>. I expect some of the details are different in other platforms and other versions, but the same steps should be possible.

1.1 Telling TexWorks to handle Sweave documents

Sweave documents are typically named *.Rnw. You want TexWorks to recognize these documents and treat them as if they are LaTeX.

First, you need to tell Windows to associate them with TexWorks: In Explorer, right click on a *.Rnw file, and choose

Open with...|Choose program...

Check the “always use the selected program” checkbox, and pick TexWorks (possibly using Browse). Now, TexWorks will start whenever you double click on a Rnw file.

To tell TexWorks to treat .Rnw files as L^AT_EX, open the

Help | Settings and Resources...

menu item. Click on the file path that is listed there, and the Windows Explorer should open that directory. Go to the `configuration` subdirectory, and edit the file `texworks-config.txt`. For example, I use this setting:

```
# To override the built-in list of file types in the File/Open dialog,
# uncomment and customize these entries:
#
file-open-filter: Sweave and TeX documents (*.Rnw *.tex)
# file-open-filter: LaTeX documents (*.ltx)
# file-open-filter: BibTeX databases (*.bib)
# file-open-filter: Style files (*.sty)
# file-open-filter: Class files (*.cls)
# file-open-filter: Documented macros (*.dtx)
# file-open-filter: Auxiliary files (*.aux *.toc *.lot *.lof *.nav *.out *.snm *.i
# file-open-filter: Text files (*.txt)
file-open-filter: PDF documents (*.pdf)
file-open-filter: All files (*. *)
```

1.2 Telling TexWorks to use Sweave

Sweave needs to run before LaTeX runs. The simplest way to do this is to install a small package into R.

1.2.1 Installing the patchDVI package

This package is available on CRAN. Install it in the usual way, for example start R, and run the command

```
install.packages("patchDVI")
```

For more details about patchDVI, see the vignette included with the package by running

```
> library(patchDVI)
> vignette("patchDVI")
```

in R.

Development versions of the patchDVI package are available on R-forge.r-project.org. There, but not yet on CRAN is the ability to work with latex and dvipdfm, and the ability to patch log files and console logs (so error messages point to the .Rnw file).

1.2.2 Telling TexWorks to use patchDVI

I recommend adding a new SweavePDF command. In

Edit | Preferences | Typesetting

first make sure that the path to the `Rscript.exe` executable is on the list of “paths to TeX and related programs.” For example, I have the path to R’s `bin/i386` included there. (You can add paths by clicking on the “+” sign.)

Now add a new “processing tool” by clicking on the other “+” near the bottom of the page. Set the name of the tool to be SweavePDF. Set the program to Rscript.

Add two arguments, one per line:

1. `-e`
2. `patchDVI::SweavePDF('$fullname',stylepath=FALSE)`

It will also work to make this change to the `pdfLatex` command, but then you will lose direct access to `pdflatex`, which you might want if there’s a problem with R or `patchDVI`.

Whichever one you choose, I recommend setting it as the default typesetting method by choosing it in the drop-down list at the bottom of the preferences dialog.

1.3 Telling the previewer to jump back to the editor

It is handy to be able to click on a line in the previewer, and go to that line in the source document.

The TexWorks previewer does this with a context menu: right click on a line in the preview, and choose “Jump to source”.

1.4 Jumping to the .Rnw file, not the .tex file

Texworks uses information encoded in the `.synctex` file produced by `pdflatex` to know where to jump. LaTeX puts information about the `.tex` file that comes out of Sweave, not the `.Rnw` file that went in. The `patchDVI` package can convert the information.

To do so, put the lines

```
\usepackage{Sweave}
```

```
\SweaveOpts{concordance=TRUE}
```

early in your .Rnw file.

2 Embedding R code in your document

2.1 Basics of Sweave

The Sweave manual gives a much more complete description; I'll just give a very short one here.

The idea of Sweave is that your document corresponds to a session of R. You embed text like

```
<<fig=TRUE>>=
```

```
set.seed(123)
x <- 1:10
y <- rnorm(10)
y
plot(x, y)
```

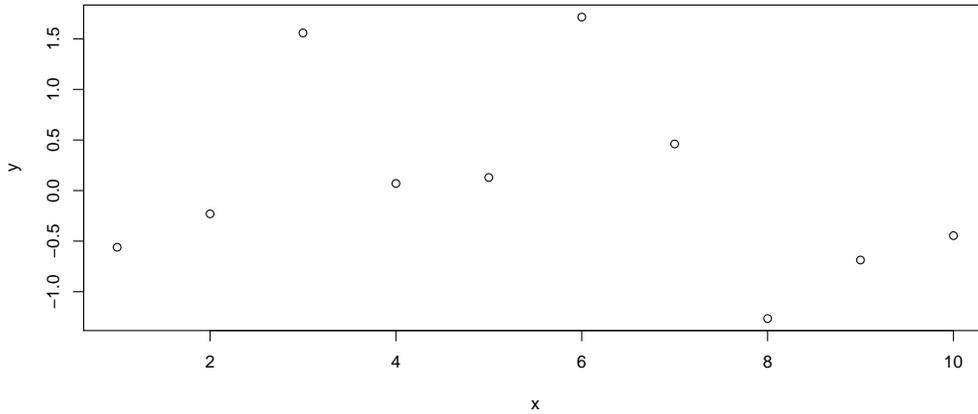
@

into your .Rnw file, and Sweave converts it into this:

```
> set.seed(123)
> x <- 1:10
> y <- rnorm(10)
> y
```

```
[1] -0.56047565 -0.23017749  1.55870831  0.07050839
[5]  0.12928774  1.71506499  0.46091621 -1.26506123
[9] -0.68685285 -0.44566197
```

```
> plot(x, y)
```



You don't need to worry about the details of importing the code, the results or the figure; Sweave does that for you, by producing the figure in both EPS and PDF format, and generating LaTeX code like this:

```

\begin{Schunk}
\begin{Sinput}
> set.seed(123)
> x <- 1:10
> y <- rnorm(10)
> y
\end{Sinput}
\begin{Soutput}
 [1] -0.56047565 -0.23017749  1.55870831  0.07050839
 [5]  0.12928774  1.71506499  0.46091621 -1.26506123
 [9] -0.68685285 -0.44566197
\end{Soutput}
\begin{Sinput}
> plot(x, y)
\end{Sinput}
\end{Schunk}
\includegraphics{figs/-002}

```

The Schunk, Sinput and Soutput macros can be customized if you want fancy colours or other things in your document.

2.2 Recommended Sweave options

We've already seen the line `\SweaveOpts{concordance=TRUE}` above. There are other Sweave options I often use:

height=5, width=10 These allow you to specify the height and width of plots produced by R. I tend to choose values slightly larger than I want the plot to appear, because I like a slight reduction in the font sizes that results when LaTeX shrinks it.

keep.source=TRUE If you don't choose this, then R will reformat all of your carefully written source code.

prefix.string=figs/ This says to store all the figures (and the concordance) in a subdirectory called figs, so they don't mess up your main directory. You need to create that subdirectory or this will fail.

These can all be combined into one `\SweaveOpts{}` call, by separating them with commas.

I also set some options to the `graphicx` package, so my figures look consistent:

```
\setkeys{Gin}{width=\textwidth}
```

This says that figures should be resized so that they fit the full width of the text.

And finally, an option to R:

```
options(width=60)
```

will shorten the output lines that R produces, so they look nicer in a document. To get this to execute without showing up in your document, include it as

```
<<echo=FALSE>>=
```

```
options(width=60)
```

@

early in your document.