

# Examples for `ltxsparklines` package

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## 1 Setting up

The package *ltxsparklines* uses L<sup>A</sup>T<sub>E</sub>X package *sparklines* [Löfller and Luecking, 2014] for drawing sparklines in T<sub>E</sub>X documents: probably prepared with Sweave or *knitr* (but you are, of course, may choose other methods to generate T<sub>E</sub>X documents). Accordingly, many parameters that determine how do sparklines look are defined in the T<sub>E</sub>X file rather than in *R*.

Here are some global parameters with the values chosen for this document:

```
% The height of the sparklines in ex units
\renewcommand\sparklineheight{1.75}
% The line width
\setlength\sparklinethickness{0.4pt}
% The color of the sparkline
\definecolor{sparklinecolor}{named}{blue}
% The color of the sparkline rectangle when present
\definecolor{sparkrectanglecolor}{gray}{0.8}
% The dot width
\setlength\sparkdotwidth{2pt}
% The color of the spikes
\definecolor{sparkspikecolor}{named}{red}
% The color of the bottom line when present
\definecolor{bottomlinecolor}{gray}{0.2}
```

Now we call the library and setting the options.

```
> library(ltxsparklines)
```

The most important option is `ltxsparklines.output`. The package produces a string to be included in the  $\text{\TeX}$  file. Being a  $\text{\TeX}$  command, the string contains many backslashes. Unfortunately the ways *knitr* and *Sweave* treat backslashes are different. Moreover, *Sweave* uses different techniques in inline expressions (those within  $\text{\Sexpr}$ ) and chunks created with `results=tex` option. To make the long story short,

1. Use `output='inlineSweave'` for *Sweave*  $\text{\Sexpr}$ .
2. Use `output='knitr'` everywhere else, *including Sweave chunks!*


This document was created in *Sweave*, since the line


```
> options(ltxsparklines.output='inlineSweave') # Comment out
>                                              # if using knitr
```

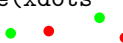
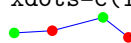
The other options are mostly self-explanatory; try `help(ltxsparklines)` for more details:




```
> options(
+   ltxsparklines.width = 10,
+   ltxsparklines.na.rm = TRUE,
+   ltxsparklines.bottomline = FALSE,
+   ltxsparklines.startdotcolor = NA,
+   ltxsparklines.enddotcolor = NA,
+   ltxsparklines.dotcolor='blue')
```


## 2 Some simple examples


The package can take quite versatile input data. You can give it two vectors, one for  $x$ , another for  $y$  coordinates of the sparkline:  $\text{\Sexpr{sparkline}(x=c(1,4,8,10), y=c(5,6,12,3), enddotcolor='red')}$  



If you use `xspikes` and `yspikes` instead, you will have a small bar chart (or *spike chart*):  $\text{\Sexpr{sparkline}(xspikes=c(1,4,8,10), yspikes=c(5,6,12,3), width=3)} \dots \text{\Sexpr{sparkline}(xspikes=c(1,4,8,10), yspikes=c(5,6,12,3), width=3)}$  

You can even make a sort of a scatter plot with dots:  $\text{\Sexpr{sparkline}(xdots=c(1,4,8,10), ydots=c(5,6,12,3), dotcolor=c('green', 'red'))}$    
In most cases, however, you probably want to combine dots and lines:  $\text{\Sexpr{sparkline}(x=c(1,4,8,10), y=c(5,6,12,3), xdots=c(1,4,8,10), ydots=c(5,6,12,3), dotcolor=c('green', 'red'))}$  

Instead of a pair of vectors you can use a matrix; in this case  $x$  and  $y$  are assumed to be the *columns*:  $\text{\Sexpr{mat <- matrix}(c(1, 2, 3, 4, 5, 17, 10, 12, 11, 10), ncol=2, byrow=F); sparkline(mat, rectangle=c(10,16), startdotcolor='blue')}$  . You can also try a data frame. Here is the famous *cars* data set:  $\text{\Sexpr{sparkline}(yspikes=cars, width=20)}$   This plot shows stopping distance vs. speed; to reverse the axis do just  $\text{\Sexpr{sparkline}(yspikes=cars[,c(2,1)], width=20)}$  

If you have just one vector, it is assumed to be the  $y$  coordinates, and the  $x$  coordinates are 1, 2, ...: `\Sexpr{sparkline(c(1,8,-5,10), startdotcolor='green', bottomline=TRUE)}` .

If you have a time series, it will be recognized as well: here are the measurements of the annual flow of the river Nile at Aswan (formerly 'Assuan'), 1871-1970: `\Sexpr{sparkline(Nile, width=30)}` .

The parameter `na.rm` selects whether to remove the NA values and connect the data over them: compare `\Sexpr{sparkline(c(3,5,4,NA,12,9), na.rm=TRUE)}` , and the similar command with `na.rm` set to FALSE `\Sexpr{sparkline(c(3,5,4,NA,12,9), na.rm=FALSE)}` .

### 3 A more complex example

The Nile data in the previous section show a very long graph. It is interesting to look how did the flow change from a decade to decade. To do this we will make a table with decades in one column and sparklines in another. To compare the data, we will use the same vertical limits and plot a rectangle showing the span between 25% and 75% of the total data (the interquartile range). The table is completely constructed in an *R* chunk.

There are differences between the ways such chunks are constructed in *Sweave* and *knitr*: the former uses `<<results=tex>>` chevron, while the latter uses `<<results='asis'>>` chevron. You may use the same chevron if you define `tex <- 'asis'`, but *knitr* will still issue warnings. In both cases you need to set the output to '*knitr*' to get the correct output.

The construction is rather involved, so we do it step by step.

We create the vector `decadeStarts` with first year of the decade, and store the range and interquartile range of the total:











```
> decadeStarts <- seq(min(time(Nile)), max(time(Nile)),
+                      by=10)
> rangeNile <- range(Nile)
> iqrNile <- quantile(Nile, c(0.25, 0.75))
```

The function `printDecade` outputs a line like 1871--1880 & SPARKLINE\:

```
> printDecade <- function (start) {
+   end <- start+9
+   paste0(start, "--", end, " & ",
+          sparkline(window(Nile, start, end),
+                        width=20,
+                        xlim=c(start, end),
+                        ylim=rangeNile,
+                        rectangle=iqrNile,
+                        output='knitr'),
+          "\\\\")
+ }
```

Now we can print the table

```
> # Table header
> result <- paste("\\begin{tabular}{ll}",
+               "\\toprule",
+               "Decade & Annual flow\\",
+               "\\midrule",
+               sep="\n")
> # Table body
> result <- paste(result,
+               paste(sapply(decadeStarts, printDecade),
+                     collapse="\n"),
+               sep="\n")
> # Table footer
> result <- paste(result,
+               "\\bottomrule",
+               "\\end{tabular}",
+               sep="\n")
> # Printing table
> cat(result)
```

Decade	Annual flow
1871–1880	
1881–1890	
1891–1900	
1901–1910	
1911–1920	
1921–1930	
1931–1940	
1941–1950	
1951–1960	
1961–1970	

## References

Andreas Löffler and Dan Luecking. *Sparklines*, October 2014. URL <http://www.ctan.org/pkg/sparklines>.