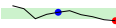


# Sparklines

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Updated 27 December 2016 (version 1.7)

## 1 What are sparklines?

Sparklines are intense, simple, wordlike graphics, so named by Edward Tufte. This is an example of sparkline:  (the stock price of Daimler Chrysler, for example). In lieu of a more detailed introduction, Professor Tufte's site has an early release of a chapter on sparklines, see [www.edwardtufte.com](http://www.edwardtufte.com). A PHP implementation can be found at <http://sparkline.sourceforge.net/>.

A sparkline can be added using the `sparkline`-environment. Also, you can add sparkling rectangles for the median and special sparkling dots in red or blue. If we want to add a sparkline, be careful not to leave an empty line between the text left of the sparkline and the environment itself, since otherwise the sparkline starts a new paragraph.

Sparklines do not appear within a dvi-file, they require either pdf $\text{\LaTeX}$  or conversion to postscript with dvips. The `sparklines` package requires the `pgf` package. This makes it incompatible with `pictex`: the combination both require too many dimension parameters. It is possible that the package `sparklines` can be used with `pictexwd`; they can at least be loaded together without using too many dimensions, but no other test was conducted.

## 2 Usage

**Sparkline environment** The sparkline at the beginning of the previous section was created with the following:

```
\begin{sparkline}{10}  
  \sparkrectangle 0.3 0.8  
  \sparkdot 0.5 0.62 blue
```

```

\sparkdot 1 0.2 red
\spark 0.1 0.95 0.2 0.8 0.3 0.3 0.4 0.52 0.5 0.62
        0.6 0.7 0.7 0.5 0.8 0.4 0.9 0.25 1 0.2 /
\end{sparkline}

```

The argument of the environment gives the width of the graphic as a multiple of the dimension unit `ex` (approximately the height of the lowercase ‘x’ in the current font). Within the environment,  $x$ -coordinates run from 0 (extreme left of the graphic) to 1 (extreme right).

The height of the graphic is given by the *macro* `\sparklineheight`, defined to produce 1.75 by default. The units are the same as for the width: the `ex` of the current font. You can redefine that macro (with `\renewcommand`) to force another height. Within the graphic, the  $y$ -coordinate runs from 0 (lowermost point) to 1 (uppermost).

Each pair of numbers after the macro `\spark` represents a coordinate pair, giving the location of a point in the above described coordinate system. The macro draws a line from each point to the next. Each number must be followed by a space, and the list is terminated by a `/`. Be careful that there are an even number of coordinates. The thickness of the line that is created is the value of the length `\sparklinethickness`, which the user may change (with `\setlength`). The default value is 0.2pt; the above example was created with the value 0.3pt.


**Sparkrectangle** The `\sparkrectangle` command produces a background rectangle. It must be followed by two numbers, each followed by a space or the end of the line. They are the  $y$ -coordinates of the bottom and top of the rectangle. This is supposed to show the ‘normal range’ of the  $y$ -data, so that a point outside that rectangle represents a departure from normal. The color of the rectangle is ‘`sparkrectanglecolor`’, which the user may redefine (with `\definecolor`). The initial definition is given by

```
\definecolor{sparkrectanglecolor}{gray}{0.9}
```

In the above example, it was first changed to a light green.

**Sparkdots** The colored dots are produced by `\sparkdot`, the diameter of the dot is the value of the length `\sparkdotwidth`, which the user may change (with `\setlength`). The default value is 1.2pt; the above example was created a value of 1.3pt. The command takes three parameters, each of which must be

followed by a space or the end of the line. The first two are the coordinates of the center of the dot, the third is the color.

**Bar graphs** Bar graphs can be drawn easily: . This was created by the code:

```
\begin{sparkline}{5}
  \sparkspike .083 .18
  \sparkspike .25 .55
  \sparkspike .417 1
  \sparkspike .583 .62
  \sparkspike .75 .42
  \sparkspike .917 .5
\end{sparkline}.
```

The macro `\sparkspike` must be followed by a pair of numbers, each followed by a space or the end of the line. The first of the pair is the horizontal location of the bar and the second is the height. The bars are drawn in color ‘`sparkspikecolor`’ which the user may redefine (with `\definecolor`). The default is `black`; the above example was drawn with it changed to `red`. The width of each bar is the value of the length `\sparkspikewidth`, which the user may change (with `\setlength`). The default is `2pt`.

You can combine bars and lines: . This was created with


```
\begin{sparkline}{5}
  \sparkspike .083 .18
  \sparkspike .25 .55
  \sparkspike .417 1
  \sparkspike .583 .62
  \sparkspike .75 .42
  \sparkspike .917 .5
  \spark 0.1 0.95 0.2 0.8 0.3 0.3 0.4 0.52 0.5 0.62
  0.6 0.7 0.7 0.5 0.8 0.4 0.9 0.25 1 0.2 /
  \sparkdot 1 0.2 blue
\end{sparkline}\space.
```

**Colors** In case you want to change colors use

```
\definecolor{sparkrectanglecolor}{gray}{0.9}
```

```
\definecolor{sparkspikecolor}{named}{red}
\definecolor{sparklinecolor}{named}{red}
```

before the sparkline environment (see a manual about defining colors in L<sup>A</sup>T<sub>E</sub>X if you do not understand the definition of *named* etc.).

**Bottom line** This adds a bottom line (the x-axis) which can be useful to visually separate different bar charts that are next to each other: . The code used was

```
\begin{sparkline}{5}
  \definecolor{sparkbottomlinecolor}{gray}{0.9}
  \sparkspike .15 .55
  \sparkspike .317 1
  \sparkspike .483 .62
  \sparkspike .65 .42
  \sparkspike .817 .5
  \sparkbottomline[0.9]
\end{sparkline}.
```


Changing the color of the bottom line is quite easy using the command like

```
\definecolor{sparkbottomlinecolor}{named}{red}
```

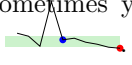
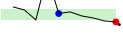
. You can change the thickness of the bottom line using command like

```
\setlength\sparkbottomlinethickness{1pt}
```

The optional argument of `\sparkbottomline` is the length of the bottom line (by default 1).

If you need to set both start and end of the bottomline, use `\sparkbottomlinex` command, which has two obligatory arguments: the start and the end, for example, . This was created with the code

```
\begin{sparkline}{5}
  \sparkspike .15 .55
  \sparkspike .317 1
  \sparkspike .483 .62
  \sparkspike .65 .42
  \sparkspike .817 .5
  \sparkbottomlinex 0.3 0.8
\end{sparkline}
```

**Clipping** Sometimes you may have sparklines outside the drawing region, for example, . You may want to clip them. The starred version `sparkline*` creates *clipped* sparklines: the graphics outside the rectangle (0,0) – (1,1) plus a thin border of the width `\sparklineclipsep` is clipped: . The first sparkline was created with

```
\begin{sparkline}{10}
  \sparkrectangle 0.3 0.8
  \sparkdot 0.5 0.62 blue
  \sparkdot 1 0.2 red
  \spark 0.1 0.95 0.2 0.8 0.3 0.3 0.4 2.52 0.5 0.62
          0.6 0.7 0.7 0.5 0.8 0.4 0.9 0.25 1 0.2 /
\end{sparkline}.
```

The second sparkline was created with

```
\begin{sparkline*}{10}
  \sparkrectangle 0.3 0.8
  \sparkdot 0.5 0.62 blue
  \sparkdot 1 0.2 red
  \spark 0.1 0.95 0.2 0.8 0.3 0.3 0.4 2.52 0.5 0.62
          0.6 0.7 0.7 0.5 0.8 0.4 0.9 0.25 1 0.2 /
\end{sparkline*}.
```

The clipping separation is set to 2 pt. You can change it with

```
\setlength\sparklineclipsep{...}.
```

## Version history

Dev 26, 2016

version 1.7: Boris Veytsman (borisv@lk.net). Added clipping, extensible bottom lines, some bug fixes.

Oct 19, 2014

version 1.6: Emiel van Miltenburg (emieli.van.miltenburg@vu.nl) - Adding a bottom line (the x-axis, this is useful to visually separate different bar charts that are next to each other) and changing the color of the bottom line.

Nov 21, 2009

version 1.5: Benno Puetz (puetz@mpipsykl.mpg.de) made change of colors possible.

Apr 20, 2009

version 1.4: Alexander Kowalski (Alexander.Kowarik@statistik.gv.at) found an error concerning spark-rectangles

Mar 21, 2007

version 1.3: User adjustable colors and parameters added by Dan Luecking (luecking@uark.edu)

Mar 19, 2007

version 1.2: Sparkbars added thanks to Harlan Harris (harlan@harris.name)

Apr 21, 2005

version 1.1: bug removed thanks to Mathias Hofmann (mathias.hofmann@web.de)

Dec 12, 2004

version 1.0: first version of sparklines