

The signchart Package^{*}

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Released 2016/01/29

Abstract

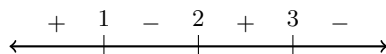
The signchart package provides you with the ability to create beautifully typeset sign charts.

1 Introduction

The `signchart` package provides the command

`\signchart[⟨options⟩]{⟨values⟩}{⟨signs⟩}`

for typesetting sign charts. For example, `\signchart{1,2,3}{+,-,+,-}` will produce



This process is achieved using the `tikz` and `xstring` packages to extract the `⟨values⟩` and `⟨signs⟩` and place them on a number line.

2 Future Development Goals

- Create option for placing `⟨values⟩` or `⟨signs⟩` underneath the number line.

3 Usage

`signchart`

`\signchart[⟨options⟩]{⟨values⟩}{⟨signs⟩}` The `\signchart` command produces a signchart—a number line with evenly spaced ticks, with `⟨values⟩` placed over each tick mark and `⟨signs⟩` placed between each value.

This command takes two arguments along with a few optional key-value options. For the `⟨value⟩` argument, the user should enter the values that will be placed above the tick marks in a comma separated list. For the `⟨signs⟩` argument, the user should enter the signs that will be placed between each of the `⟨values⟩`. **It is important to note** that the number of signs should

^{*}This file describes version v1.0, last revised 2016/01/29.

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be at most one more than the number of values. Any additional signs will give undesired results.

The width, placement of $\langle signs \rangle$, and the arrows can be adjusted with $\langle options \rangle$.

width The option $\langle width \rangle = \langle number \rangle$ can be used to specify the width of the sign chart using the default `tikzpicture` units (cm). If no option is given, then $\langle width \rangle = 5$ is used.

height The option $\langle height \rangle = \langle number \rangle$ can be used to specify the distance between the number line and the signs using the default `tikzpicture` units (cm). If no option is given, then $\langle height \rangle = 0.3$ is used.

arrows The option $\langle arrows \rangle = \langle arrow style \rangle$ can be used to specify the arrow head shape used on the number line. If no option is given, then $\langle arrows \rangle = <->$ is used.

4 Implementation

```

1  \*package
2  \RequirePackage{tikz}
3  \RequirePackage{pgfplots}
4  \pgfplotsset{compat = 1.10}
5  \RequirePackage{xstring}
6  \RequirePackage{xkeyval}
7  \DeclareOption*{\PackageWarning{examplepackage}{Unknown option ‘\CurrentOption’.
8    This package does not accept any options.}}
9  \ProcessOptions\relax
10 \define@key{signchart}{height}[0.3]{\def\signHeight{#1}}
11 \define@key{signchart}{width}[5]{\def\signChartWidth{#1}}
12 \define@key{signchart}{arrows}[<->]{\def\theArrow{#1}}
13 \makeatother
14 \newcommand{\signchart}[3][]{
15   \setkeys{signchart}{height, width, arrows, #1}
16   \begin{center}
17     \begin{tikzpicture}
18       \pgfmathsetmacro{\snht}{\signHeight}
19       \pgfmathsetmacro{\wid}{\signChartWidth}
20       \def\vals{#2}
21       \def\signs{#3}
22       \def\valsarray{{\vals}}
23       \StrCount{\vals}{,}[\len]
24       \draw[\theArrow,thick] (0,0) -- (\wid,0);
25       \def\thisVal{-0}
26       \foreach \i in {0,...,\len} {
27         \pgfmathtruncatemacro{\k}{\i + 1}
28         \ifnum \i < \len
29           \StrPosition[\k]{\vals}{,}[\pos]
30           \StrBefore[\k]{\vals}{,}[\leftParti]
31         \ifnum \i = 0
32           \def\thisVal{\leftParti}
33         \else

```

```

34     \StrBehind[\i]{\leftParti}{,}[\thisVal]
35     \fi
36     \else
37     \StrBehind[\i]{\vals}{,}[\thisVal]
38     \fi
39     \pgfmathtruncatemacro{\j}{\i + 1}
40     \StrBehind[\j]{\signs}{,}[\rightPart]
41     \StrLen{\rightPart}[\aLength]
42     \pgfmathtruncatemacro{\cutAmount}{\aLength + 1}
43     \StrGobbleRight{\signs}{\cutAmount}[\leftPartii]
44     \StrBehind[\j]{, \leftPartii}{,}[\s]
45     \pgfmathsetmacro{\valpos}{(\wid/(\len+2))*(\i+1)}
46     \pgfmathsetmacro{\signpos}{(\wid/(\len+2))*(\i+0.5)}
47     \draw (\valpos,-0.15) -- (\valpos,0.15) node[anchor=south] {\thisVal};
48     \node at (\signpos,\snht) {$\s$};
49     \ifnum \i = \len
50     \pgfmathsetmacro{\signpos}{(\wid/(\len+2))*(\len+1.5)}
51     \pgfmathtruncatemacro{\j}{\len + 1}
52     \StrBehind[\j]{\signs}{,}[\s]
53     \node at (\signpos,\snht) {$\s$};
54     \fi
55     }
56     \end{tikzpicture}
57     \end{center}
58     }
59     \end{package}

```

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Numbers written in *italic* refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in *roman* refer to the code lines where the entry is used.

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