The `l3charts` package

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2022/07/01

Abstract

This package defines a few simple TikZ charts that can be drawn using LaTeX environments. This has mainly been developped as an experimentation of `expl3` for checking what LaTeX3 really brought to facilitate package developpement (expansion control, clist, seq, prop, ...).

Contents

1 About this documentation

In my opinion LaTeX literate programming is just an ugly hack that turns the code and the documentation unreadable. If you used modern tools like `cargo doc` which typeset index, and crossreference your code documentation without the need of inserting any command, you probably also feel that `docstrip` is perhaps the component of LaTeX which aged the most.

Perhaps the naming convention of LaTeX3 would one day allow to have more powerful tools for automatic documentation extraction, but in the meantime, I think that writing the doc separately is easier and more maintenable.

2 kiviat chart

The kiviat chart or *radar chart* allows to represent one or several set along several dimensions.

`kiviatchart`

`kiviatchart` `\begin{kiviatchart}[`⟨*clist*⟩`]`
...
`\end{kiviatchart}`

Environment that hold a kiviat chart. `[`⟨*clist*⟩`]` is a list of the following options

Key	Default value	Description
`radius`	`3.5cm`	maximal diagram radius
`labels-radius`	`3.5cm`	radius to put dimension labels
`units`	`5`	number of scale units
`*`		all other options are passed to `tikzpicture` (*env*)

A `kiviatchart` (*env*) should begin with a `dims` (*env*) followed by one or several `set` (*env*).

2.1 Dimensions

`dims` `\begin{dims}[`⟨*clist*⟩`]`
`\value[`⟨*clist*⟩`]{`⟨*label*⟩`}`
...
`\end{dims}`

`[`⟨*clist*⟩`]` is a list of the following options

Key	Default value	Description
`dim-options`	`{opacity=0.8}`	TikZ options for drawing dimensions axis
`unit-options`	`{opacity=0.3}`	TikZ options for drawing unit polygones
`label-options`	`{opacity=0.5, below}`	TikZ options drawing for unit labels
`label-cs`	`identity`	name of the cs used to format labels
`unit-cs`	`tinyt`	name of the cs used to format labels

`tinyt` Macro used to format unit labels

```
\cs_new:Npn \tinytt #1 {\tiny\texttt{#1}}
```

`value` Inside `dims` (*env*), `\value[`⟨*clist*⟩`]{`⟨*label*⟩`}` is used to add a dimension to the kiviat chart

2.2 Sets

`set` `\begin{set}[`⟨*clist*⟩`]`
`\value{`⟨*int*⟩`}`
...
`\end{set}`

`set` (*env*) is used to add a new set to the kiviat chart. `[`⟨*clist*⟩`]` is a list of the following options :

Key	Default value	Description
`dot-options`	`{fill, circle, inner sep=1pt}`	options for polygone node
`*`	`{color=black, line width=1.5pt, opacity=1, fill opacity=0.3, fill=gray}`	all other options are passed to `\draw` cs which draws the polygone

`value` Inside `set` (*env*), `\value{`⟨*int*⟩`}` is used to add a value to the set. There must be the same number of `\value` inside `set` (*env*) and `dims` (*env*), and each `\value` corresponds to the dimension in `dims` (*env*) at the same index.

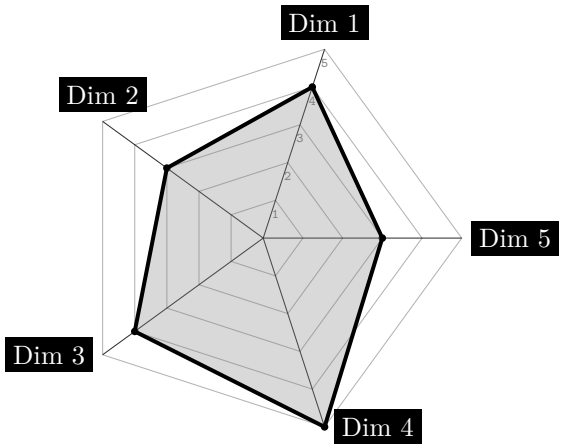
2.3 Examples

2.3.1 Simple

Use `label-cs` to call a `\textinv` to format the labels.

`textinv`
```
\NewDocumentCommand\textinv{m}{\colorbox{black}{\textcolor{white}{#1}}}
```

```
\begin{kiviatchart}[scale=0.75]
  \begin{dims}[label-cs=textinv]
    \value[above]{Dim 1}
    \value[above]{Dim 2}
    \value[left]{Dim 3}
    \value[right]{Dim 4}
    \value[right]{Dim 5}
  \end{dims}
  \begin{set}
    \value{4}
    \value{3}
    \value{4}
    \value{5}
    \value{3}
  \end{set}
\end{kiviatchart}
```

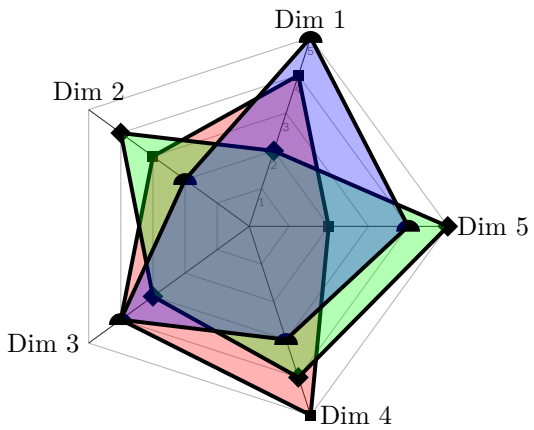


2.3.2 Multi-set

Each set set its own color and point shape.

```
\begin{kiviatchart}[scale=0.75]
  \begin{dims}
    \value[above]{Dim 1}
    \value[above]{Dim 2}
    \value[left]{Dim 3}
    \value[right]{Dim 4}
    \value[right]{Dim 5}
  \end{dims}
  \begin{set}[fill=red,dot-options={fill,rectangle,inner sep=2pt}]
```

```
      \value{4}
      \value{3}
      \value{4}
      \value{5}
      \value{2}
    \end{set}
    \begin{set}[fill=green,dot-options={fill,diamond,inner sep=2pt}]
      \value{2}
      \value{4}
      \value{3}
      \value{4}
      \value{5}
    \end{set}
    \begin{set}[fill=blue,dot-options={fill,semicircle,inner sep=2pt}]
      \value{5}
      \value{2}
      \value{4}
      \value{3}
      \value{4}
    \end{set}
\end{kiviatchart}
```



2.4 Todo

At the moment the environments are not user friendly. We could provide basic sanity checks, with error messages when they failed.

- one and only one `dims` (*env*) declared before any `set` (*env*)
- `set` (*env*) has the same number of `\value` than `dims` (*env*)
- `\value` in `set` (*env*) is between 0 and `units`

3 ball chart

3.1 Definition

`ballchart` `\begin{ballchart}[`⟨*clist*⟩`]`
...
`\end{ballchart}`

Environment that hold a ball chart. `[`⟨*clist*⟩`]` is a list of the following keyval

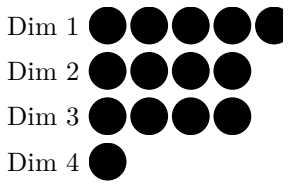
Key	Default value	Description
`n`		the number of circles (**required**)
`v-sep`	`0.1`	vertical separator
`h-sep`	`0.5`	horizontal separator (circle)
`radius`	`0.25`	radius
`gap`	`0.05`	gap between circle
`label-cs`	`identity`	cs name to format labels
`fill-options`	`{fill=black}`	options to fill balls with
`draw-options`	`{draw=black!30}`	options to draw balls with
`label-options`	`{left}`	options for dimensions axis
`*`		all other options are passed to `tikzpicture` (*env*)

`value` Inside `ballchart` (*env*), `\value{`⟨*label*⟩`}{`⟨*percent*⟩`}` is used to add a new bar.

3.2 Examples

3.2.1 Simple

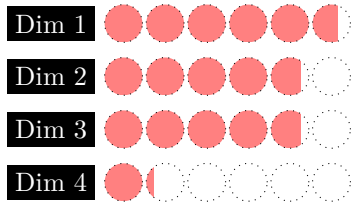
```
\begin{ballchart}[n=5, draw-options={draw=none}]
  \value{Dim 1}{95}
  \value{Dim 2}{80}
  \value{Dim 3}{80}
  \value{Dim 4}{20}
\end{ballchart}
```



3.2.2 Caped

Format labels, show circles, change color, add more circles.

```
\begin{ballchart}[n=5, draw-options={draw=black,dotted}]
  \value{Dim 1}{95}
  \value{Dim 2}{80}
  \value{Dim 3}{80}
  \value{Dim 4}{20}
\end{ballchart}
```



4 bar chart

4.1 Definition

`barchart` `\begin{barchart}[`⟨*clist*⟩`]`
...
`\end{barchart}`

Environment that hold a bar chart. `[`⟨*clist*⟩`]` is a list of the following keyval

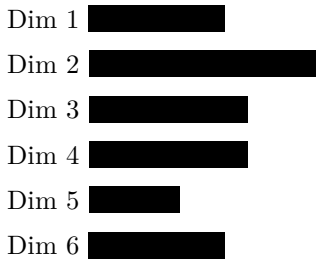
Key	Default value	Description
`width`		maximum width (**required**)
`height`	`0.35`	bar height
`gap`	`0.25`	
`fill-options`	`{fill=black}`	TikZ option to fill the bar with
`draw-options`	`{draw=black!20}`	TikZ option to draw the bar with
`label-cs`	`identity`	cs name to format labels
`*`		all other options are passed to `tikzpicture` (*env*)

`value` Inside `barchart` (*env*), `\value{`⟨*label*⟩`}{`⟨*percent*⟩`}` is used to add a new bar.

4.2 Examples

4.2.1 Simple

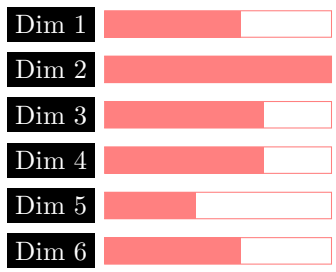
```
\begin{barchart}[width=3, draw-options={draw=none}]
  \value{Dim 1}{60}
  \value{Dim 2}{100}
  \value{Dim 3}{70}
  \value{Dim 4}{70}
  \value{Dim 5}{40}
  \value{Dim 6}{60}
\end{barchart}
```



4.2.2 Caped

Change color, show as a gauge.

```
\begin{barchart}[width=3, label-cs=textinv, fill-options={fill=red!50}, draw-options={draw=red!50}]
  \value{Dim 1}{60}
  \value{Dim 2}{100}
  \value{Dim 3}{70}
  \value{Dim 4}{70}
  \value{Dim 5}{40}
  \value{Dim 6}{60}
\end{barchart}
```



5 bubble chart

5.1 Definition

bubblechart `\begin{bubblechart}[`⟨*clist*⟩`]`
...
`\end{bubblechart}`

Environment that hold a bubble chart. `[`⟨*clist*⟩`]` is a list of the following keyval

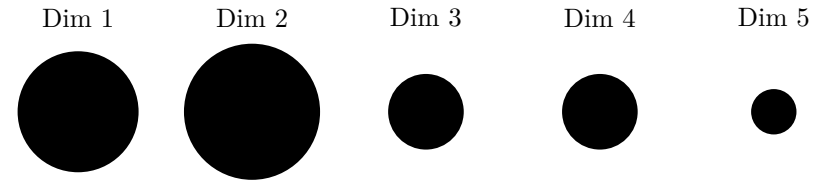
Key	Default value	Description
`radius`	`1`	max radius
`gap`	`0.3`	gap between bubbles
`fill-options`	`{fill=black}`	TikZ options to fill bubble with
`draw-options`	`{draw=black!30}`	TikZ options to draw bubble with
`label-cs`	`identity`	cs name to format labels
`*`		all other options are passed to `tikzpicture` (*env*)

value Inside `bubblechart` (*env*), `\value{`⟨*label*⟩`}{`⟨*percent*⟩`}` is used to add a new bubble.

5.2 Examples

5.2.1 Simple

```
\begin{bubblechart}[draw-options={draw=none}]
        \value{Dim 1}{80}
        \value{Dim 2}{90}
        \value{Dim 3}{50}
        \value{Dim 4}{50}
        \value{Dim 5}{30}
\end{bubblechart}
```



5.2.2 Caped

Format labels, change colors, show absolute limit (100%)

```
\begin{bubblechart}[label-cs=textinv, fill-options={fill=red!50}, draw-options={draw=red!50,dashed}]
  \value{Dim 1}{80}
  \value{Dim 2}{90}
  \value{Dim 3}{50}
  \value{Dim 4}{50}
  \value{Dim 5}{30}
\end{bubblechart}
```