

PrettyPlots in L^AT_EX

EDA group

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1 Introduction

This package provides tools for creating easy-to-read plots in LaTeX. To use it, include

```
\usepackage{prettyplots}
```

in your preamble. Then, you can use it together with the pgfplots package,

```
\usepackage{tikz}
\usepackage{pgfplots}
\pgfplotsset{compat=1.18}
```

where it is recommended to specify a version using `compat` to avoid backward compatibility issues with `pgfplots` features. It will be useful to have some basic familiarity with `pgfplots` ¹.

Basic Usage

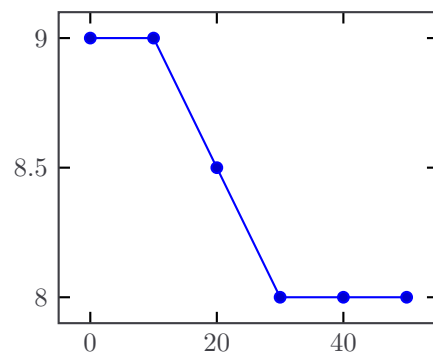
Let's say you want to create a line plot from a dataset of the following shape,

```
/data/line.tsv
```

%Metric	Method
x	y1
0	9
10	9
20	8.5
...	

Using `pgfplots`, you can generate a line plot as follows.

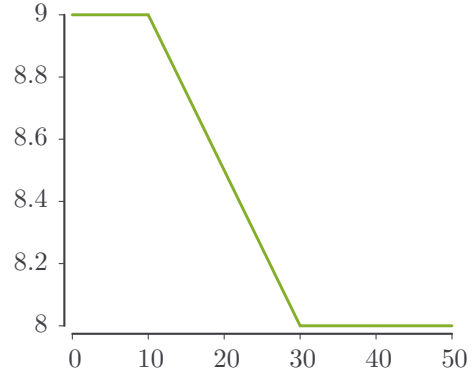
```
\begin{tikzpicture}
  \begin{axis}[]
    \addplot table [x=x, y=y1] {data/line.tsv};
  \end{axis}
\end{tikzpicture}
```



¹<https://pgfplots.sourceforge.net/pgfplots.pdf>

To turn this into a pretty plot, add the `pretty line` command to the pgf axis keys,

```
%preamble
\usepackage{prettyplots}
%
\begin{tikzpicture}
  \begin{axis}[pretty line]
    \addplot table [x=x, y=y1] {data/line.tsv};
  \end{axis}
\end{tikzpicture}
```



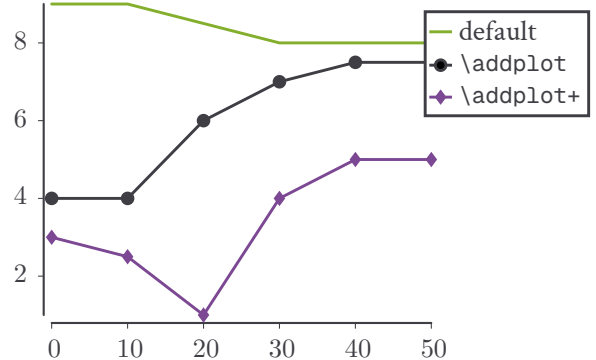
Basic Customization

You can keep using the common pgfplots keys to change the appearance of plots. The two main ways to do this are passing keys to `axis` to change the global appearance of the axis environment, or passing keys to `addplot` to change the appearance of specific lines or plots.

- **axis keys:** There are many axis keys you can find in pgfplots. For example, you can set colors and line style to iterate through using a `cycle list`, such as `cycle list=pr-line` which is set by default.
- **addplot keys:** arguments you pass to `addplot` change the appearance of each plot that you add to the axis. This overwrites any style defined in the global axis environment, so use `addplot+` if you want to preserve the default style defined in the axis environment.

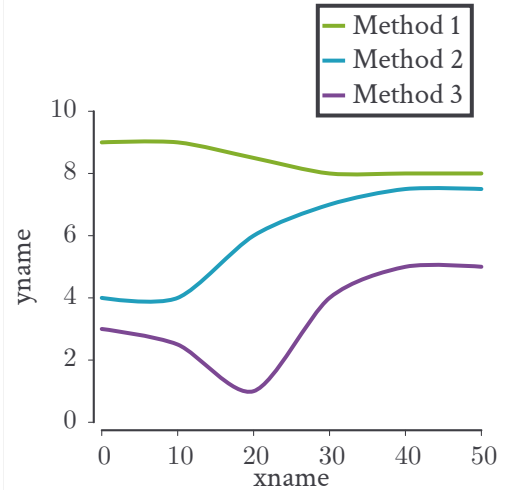
For example, we can add a line using default style, another with markers, and another that keeps colors unchanged from the default cycle list `pr-colors`.

```
\begin{tikzpicture}
  \begin{axis}[
    pretty line,
    cycle list name = pr-colors,
    legend style = {anchor=north west}
  ]
  \addplot table [x=x, y=y1] {data/line.tsv};
  \addlegendentry{default};
  \addplot[mark=*, mark size=2pt]
  table [x=x, y=y2] {data/line.tsv};
  \addlegendentry{\texttt{\tbs addplot}};
  \addplot+[mark=diamond*, mark size=2pt]
  table [x=x, y=y3] {data/line.tsv};
  \addlegendentry{\texttt{\tbs addplot+}};
  \end{axis}
\end{tikzpicture}
```



Here is a larger example using some common pgfplots axis keys to customize sizes, positioning, and labels.

```
\begin{tikzpicture}
  \begin{axis}[
    pretty line,
    width = \textwidth,
    xlabel = {xname},
    ylabel = {yname},
    ytick = {0,2,4,6,8,10},
    ymin = 0, ymax = 10,
    legend style = {anchor=south east},
    legend entries =
      {Method 1, Method 2, Method 3},
    smooth,
    line width = 1.5pt,
  ]
    \foreach \i in {1,2,3} {
      \addplot table [x=x, y=y\i] {data/line.tsv};
    }
  \end{axis}
\end{tikzpicture}
```



To create a different type of plot, modify the command depending on the type using `pretty <plotname>`. The main axis environments are shown in Section 3, color schemes in Section 4, and macros in Section 5.

2 Quick Reference

Prettyplots

Table 1: Plot styles in prettyplots

Style Name	Use Case
<code>pretty line</code>	Line plots
<code>pretty boxplot</code>	Box plots for distributions
<code>pretty xbar</code>	Horizontal bar plots
<code>pretty ybar</code>	Vertical bar plots
<code>pretty ybar stacked</code>	Stacked bar plots
<code>pretty scatter</code>	Scatter plots, style for discrete labels
<code>pretty scatter colormap</code>	Scatter plots, style for continuous labels
<code>pretty axis</code>	Base style (sizing, placement, ticks, etc.)

Pgplots

Table 2: Useful pgplots axis keys

Category	Key	Description
Size & Layout	width=\textwidth height=6cm scale only axis=true enlargelimits=0.1 clip=false	Set plot width Optional: set plot height Prevent label size from scaling axis Add margin around data Allow overflow (e.g., annotations)
Labels	xlabel={X label} ylabel={Y label} title={Plot Title} label style={font=\bfseries}	Label for x-axis Label for y-axis Optional: add plot title Bold axis labels
Ticks	xtick={0, 1, ... , 10} yticklabels={Low, Mid, High} tick align=outside tick label style={font=\small} xticklabel style={rotate=45} minor tick num=1	Set specific x-tick positions Custom y-axis tick labels Align ticks outside the axis Style tick label appearance Rotate x-axis tick labels Add minor ticks between major ticks
Axis Range	xmin=0, xmax=10 ymin=0, ymax=10	Set visible x-axis range Set visible y-axis range
Legend	legend entries={A, B, C} legend pos=north east legend style={anchor=south east} legend cell align=left	Set legend items manually Quick legend placement Custom placement/formatting Align legend text to the left
Line & Style	smooth line width=1.5pt mark options={fill=white, size=2pt} cycle list name=pr-colors cycle list={red, blue, green} every axis plot/.append style=...	Smooth lines between data points Control line thickness Customize markers Use a predefined style/color cycle Manual color/style cycle Apply style to all plots
Grid & Axis	grid=major minor grid style={dashed, gray!30} axis lines=left axis on top=true	Enable major gridlines Style minor gridlines Axes only on bottom/left (math-style) Draw axes over data/background
Log Axes	xmode=log, ymode=log log basis x=10 scaled x ticks=base 10:3	Logarithmic axis scaling Base of logarithm (x-axis) Scientific notation (e.g., 10^3)

3 Plots

This section shows examples for each main plot type.

3.1 Line

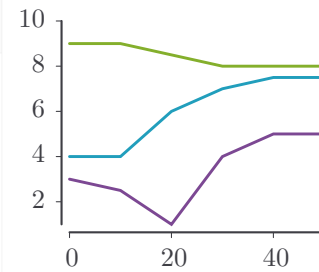
For basic line plots, you can pass pretty line to the axis keys.

```
/data/line.tsv
```

```
%Metric    Method1 ... MethodN
x    y1    y2    y3
0    9    4    3
...
```

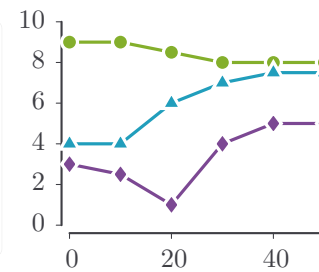
```
/examples/line.tex
```

```
\begin{axis}[ pretty line ]
  \pgfplotsinvokeforeach{1, ...,3}{
    \addplot table[x=x, y=y#1] {data/line.tsv};
  }
\end{axis}
```



The default color scheme pr-colors, you can find others in Section 4. For example,

```
\begin{axis}[pretty line, cycle list name=pr-colors]
  \pgfplotsinvokeforeach{1, ...,3}{
    \addplot+ table[x=x, y=y#1] {data/line.tsv};
  }
\end{axis}
```



3.2 Box

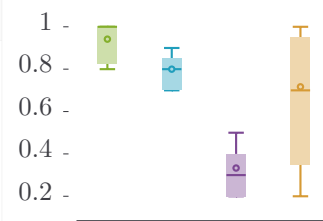
For box plots, you can use pretty boxplot.

```
/data/box.tsv
```

%method1	...	methodM	
y1	y2	y3	y4
0.10	0.15	0.12	0.18
...			
0.95	0.98	0.93	0.97

```
/examples/box.tex
```

```
\begin{axis}[ pretty boxplot ]
  \foreach \col in {y1, y2, y3, y4}{
    \addplot table[y=\col] {data/box.tsv};
  }
\end{axis}
```



Here is a different look [Tufte(2001)].

```
\begin{axis}[ pretty boxplot simple ]
\foreach \col in {y1,y2,y3,y4,y5,y6,y7,y8}{
  \addplot table[y=\col] {data/boxes.tsv};
}
\end{axis}
```



3.3 Bar

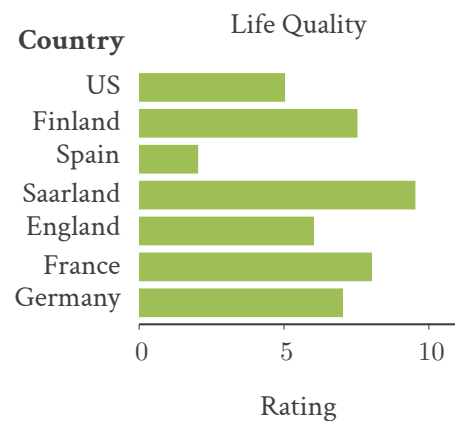
You can create bar plots using `pretty xbar` for horizontal and `pretty ybar` for vertical bars.

/data/countries.tsv

```
%id    country    lifeq    foodq
id     country    life    food
1      Germany    8       2
...
5      US        1       7
```

/examples/bar.tex

```
\begin{axis}[
  pretty xbar,
  yticklabels = {Germany,France,England,
    Saarland,Spain,Finland,US},
  xmax = 10,
  xlabel = {Rating},
  ylabel = {\textbf{Country}},
  title = {Life Quality},
]
  \addplot table[x=life,y=id] {data/countries.tsv};
\end{axis}
```



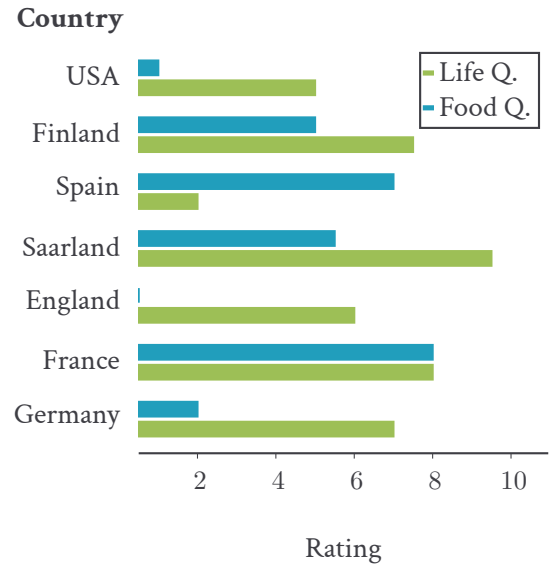
To obtain a vertical bar plot, swap `xbar` with `ybar`. You can also add a white grid [Tufte(2001)],

```
\begin{axis}[
  pretty ybar,
  pretty grid ybar,
  xticklabels = {DE,FR,EN,Saar,ES,FI,US},
  xlabel = {Rating},
  ylabel = {Country},
  title = {Food Quality},
]
  \addplot[pr-color1b, fill=pr-color1b]
    table[x=life,y=id] {data/countries.tsv};
\end{axis}
```

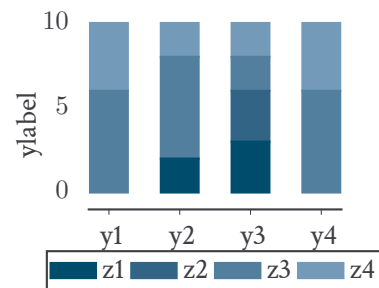


Here are some variations.

```
\begin{axis}[
  pretty xbar,
  yticklabels = {Germany,France,England,
    Saarland,Spain,Finland,US},
  xmax = 10,
  bar width = 0.5em,
  xlabel = {Rating},
  ylabel = {\textbf{Country}},
  legend entries = {Life Q., Food Q.},
]
\addplot table[x=life,y=id] {data/countries.tsv};
\addplot table[x=food,y=id] {data/countries.tsv};
\end{axis}
```



```
\begin{axis}[
  pretty ybar stacked,
  cycle list name = pr-box2,
  bar width = .5cm,
  ylabel = {ylabel},
  symbolic x coords= {y1,y2,y3,y4}
]
\addplot plot coordinates
  {(y1,0) (y2,2) (y3,3) (y4,0)};
\addplot plot coordinates
  {(y1,0) (y2,0) (y3,3) (y4,0)};
\addplot plot coordinates
  {(y1,6) (y2,6) (y3,2) (y4,6)};
\addplot plot coordinates
  {(y1,4) (y2,2) (y3,2) (y4,4)};
\legend{z1, z2, z3, z4}
\end{axis}
```



3.4 Scatter

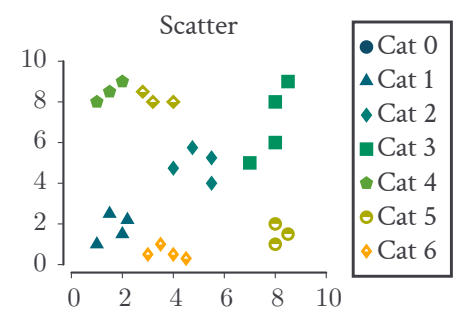
Use this plot type if you want color and style of markers to depend on a given class label as follows.

```
/data/classes.tsv
```

```
%x    y    scatter class
x      y    label
1      1    0
2      3    1
```

```
/examples/scatter.tex
```

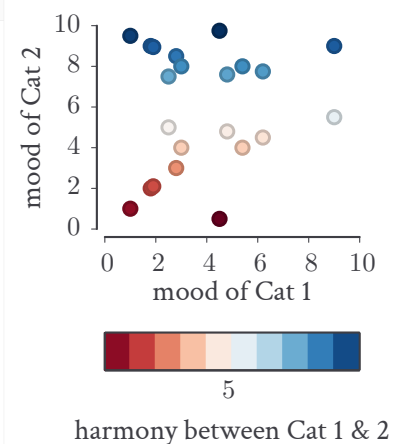
```
\begin{axis}[
  pretty scatter,
  title = {Scatter},
  legend entries = {Class 0,Class 1,Class 2,
    Class 3,Class 4,Class 5,Class 6},
  legend style={at={(1.1,1.2)}, anchor=north west},
]
\addplot+[pr-scatter] table[x=x, y=y, meta=label]
{data/classes.tsv};
\end{axis}
```



Have a look at Section 4 to change the scatter class colors.
If you have continuous color labels, use a colormap,

```
/examples/colormap.tex
```

```
\begin{axis}[
  pretty scatter colormap horizontal,
  colormap/RdBu-11, % default colormap
  colorbar style = { xlabel =
    {harmony between Cat 1 \& 2}, },
  xlabel          = {Cat 1's mood},
  ylabel          = {Cat 2's mood},
  mark size       = 2.5 pt
]
\addplot table[x=x, y expr=10-0.5*\thisrow{y}]
{data/marks.txt};
\addplot table[x=x, y=y] {data/marks.txt};
\end{axis}
```



3.5 Error Line

If you want to plot confidence regions around your line, include them in your dataset as follows,

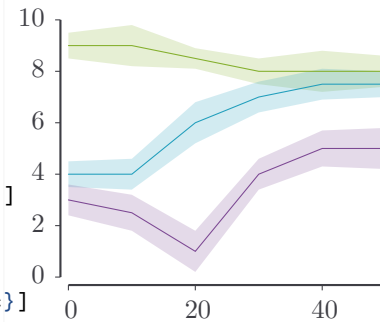
```
/data/line_conf.tsv
```

```
%Metric    Method1    Method1_conf ...    MethodN_conf
x    y1    y1_c    y1    y1_c    y3    y3_c
0    9    0.5    4    0.5    3    0.6
....
```

Then, add both the lines and the confidence bands as follows,

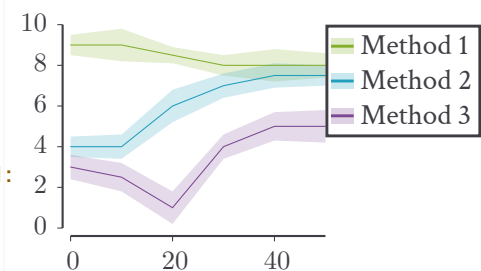
```
/examples/line_conf.tex
```

```
\begin{axis}[
  pretty line,
  % cycle list to skip the confidence regions:
  cycle list name = pr-colors-conf,
  \foreach \r in {1,2,3} {
    \addplot table[x=x, y=y\r] {data/line_conf.tsv};
    \addplot[forget plot, draw=none, name path=low]
      table [x=x, y expr=\thisrow{y\r} - \thisrow{y\r_c}]
        {data/line_conf.tsv};
    \addplot[forget plot, draw=none, name path=up]
      table [x=x, y expr= \thisrow{y\r} + \thisrow{y\r_c}]
        {data/line_conf.tsv};
    \addplot fill between[of=low and up];
  }
\end{axis}
```



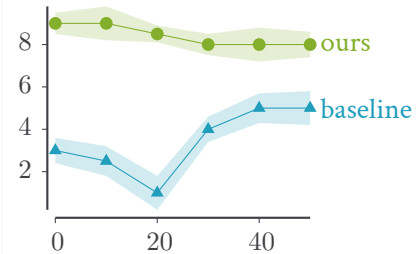
Note that the upper and lower confidence lines are each added using `addplot`, where `forget plot` makes sure that these lines are disregarded in the legend and cycle list. The last `fill-between` line is added without `forget plot` as we define its color in the cycle list. If you use a legend, skip these plots as follows.

```
\begin{axis}[
  pretty line,
  pretty fill legend,
  cycle list name = pr-colors-conf,
  % double ,, skips the confidence regions in the legend:
  legend entries = {Method 1,,Method 2,,Method 3},
] % ...
\end{axis}
```



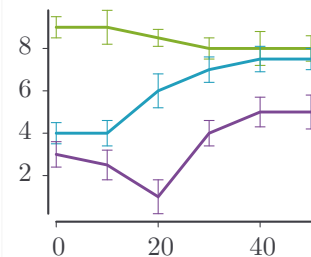
For lines with error regions, the cycle lists contain the colors of the confidence bands. You can look at the -conf cycle lists in `prettyplots.sty` for different styles. Here is an example with `pr-marks-conf`.

```
\begin{axis}[
  pretty line,
  cycle list name = pr-marks-conf
]
%% our plot
\addplot table[x=x, y=y1] {data/line_conf.tsv}
node[pos=1, right] (n) {ours};
\addplot[forget plot, draw=none, name path=low]
table [x=x, y expr=\thisrow{y1} - \thisrow{y1_c}]
{data/line_conf.tsv};
\addplot[forget plot, draw=none, name path=up]
table [x=x, y expr= \thisrow{y1} + \thisrow{y1_c}]
{data/line_conf.tsv};
\addplot fill between[of=low and up];
%% baseline plot
\addplot table[x=x, y=y1] {data/line_conf.tsv}
node[pos=1, right] (n) {baseline};
\addplot[forget plot, draw=none, name path=low]
table [x=x, y expr=\thisrow{y3} - \thisrow{y3_c}]
{data/line_conf.tsv};
\addplot[forget plot, draw=none, name path=up]
table [x=x, y expr= \thisrow{y3} + \thisrow{y3_c}]
{data/line_conf.tsv};
\addplot fill between[of=low and up];
\end{axis}
```



To show error bars instead, use

```
\begin{axis}[pretty line]
  \foreach \r in {1,...,3}{
    \addplot+[error bars/.cd, y explicit, y dir=both]
    table[ x=x, y=y\r,
      y error plus expr=\thisrow{y\r_c},
      y error minus expr=\thisrow{y\r_c},
    ] {data/line_conf.tsv};
  }
\end{axis}
```

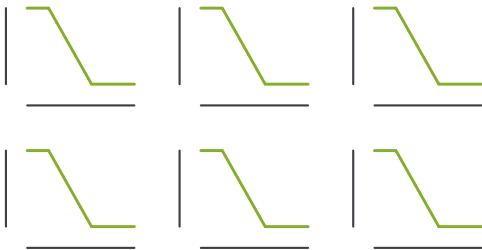


3.6 Group Plots

To place multiple axes side by side with easy alignment, replace `axis` by `groupplot` and create subfigures using `\nextgroupplot[⟨axis keys⟩]`. That is, pass your customizations to `\nextgroupplot` and then use `addplot` as usual.

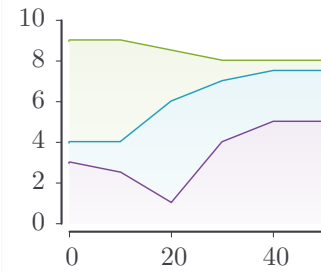
/examples/groupplots.tex

```
%preamble
\usetikzlibrary{pgfplots.groupplots}
%
\begin{tikzpicture}
\begin{groupplot}[
  group style={
    group size=3 by 2,
    horizontal sep=25pt,
    vertical sep=25pt},
  xtick align=center, ytick align=center,
  width=3cm
]
\nextgroupplot[pretty line] \addplot table {data/lines.tsv};
\nextgroupplot[pretty line] \addplot table {data/lines.tsv};
\nextgroupplot[pretty line] \addplot table {data/lines.tsv};
\nextgroupplot[pretty line] \addplot table {data/lines.tsv};
\nextgroupplot[pretty line] \addplot table {data/lines.tsv};
\nextgroupplot[pretty line] \addplot table {data/lines.tsv};
\end{groupplot}
\end{tikzpicture}
```



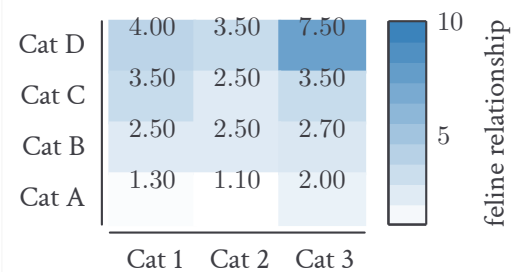
3.7 Examples

```
\begin{axis}[
  pretty line,
  cycle list name= pr-shade,
]
\foreach \r in {1,2,3} {
  \addplot table[x=x, y=y\r] {data/line.tsv};
  \addplot table[x=x, y=y\r] {data/line.tsv}
  \closedcycle;
}
\end{axis}
```

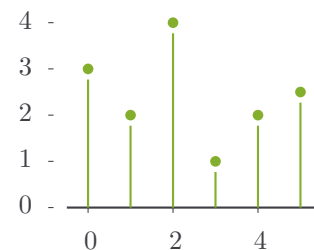


/examples/colorbar.tex

```
\begin{axis}[
  pretty heatmap,
  xticklabels = {Cat 1, Cat 2, Cat 3},
  yticklabels = {Cat D, Cat C, Cat B, Cat A},
  colorbar style = { ylabel = {feline relationship}, }
  point meta max = 10, % z range
  pretty labelshift
]
\addplot[pr-matrix, mesh/cols=3, % y
] table [meta=z] {data/colorbar.txt};
\end{axis}
```

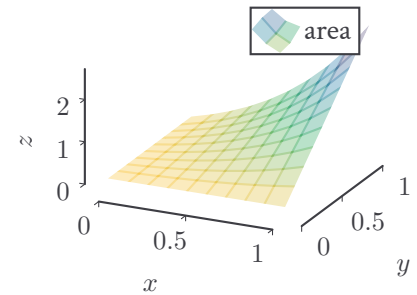


```
\begin{axis}[ pretty comb ]
\addplot+[ycomb, mark=white*] coordinates
{(\emptyset,3) (1,2) (2,4) (3,1) (4,2) (5,2.5)};
\end{axis}
```

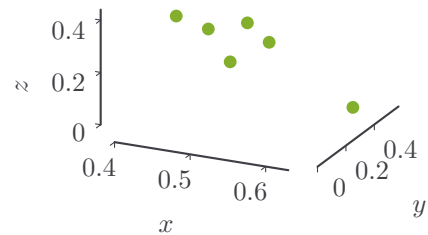


```
/examples/threedim.tex
```

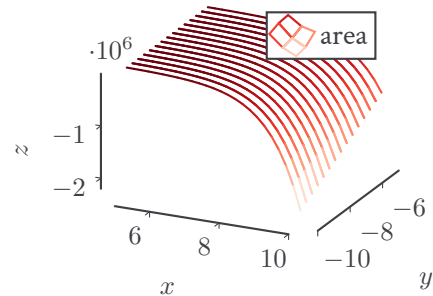
```
\begin{axis}[
  pretty 3daxis,
  mesh legend,
  samples = 10,
  domain = 0:1,
  xlabel = {\$x\$},
  ylabel = {\$y\$},
  zlabel = {\$z\$},
]
\addplot3 [pr-surf] {x*y*exp(x)};
\legend{area};
\end{axis}
```



```
\addplot3+ [pr-scatter] table {data/ternary.tsv};
```

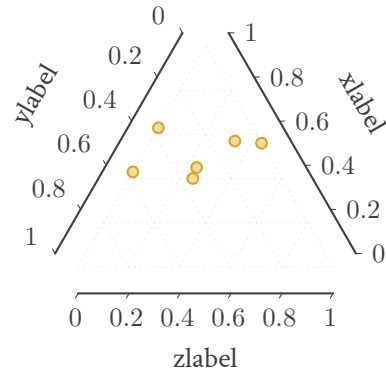


```
\begin{axis}[
  pretty 3daxis,
  scaled ticks = true,
  domain = 5:10,
  domain y = -10:-5,
  samples y = 15,
  xlabel = {\$x\$},
  ylabel = {\$y\$},
  zlabel = {\$z\$},
  mesh legend
]
\addplot3 [pr-contour] {x*y*exp(x)};
\legend{area};
\end{axis}
```



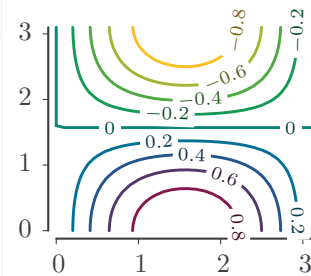
```
/examples/ternary.tex
```

```
% preamble
\pgfplotsset{compat=1.18}
\usepgfplotslibrary{ternary}
%
\begin{ternaryaxis}[
  pretty ternary axis,
  xlabel= {xlabel},
  ylabel= {ylabel},
  zlabel= {zlabel},
]
\addplot3+[pr-scatter] table {data/ternary.tsv} ;
\end{ternaryaxis}
```



```
/examples/contour.tex
```

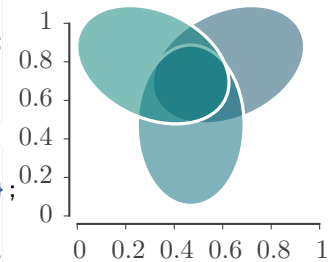
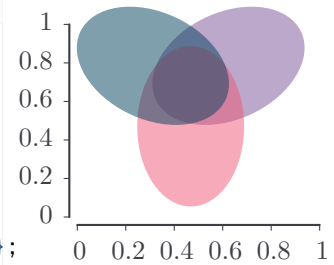
```
\begin{axis}[ pretty contour ]
  \addplot[
    contour prepared,
    contour prepared format=matlab,
  ] table {contours.txt};
\end{axis}
```



```
/examples/venn.tex
```

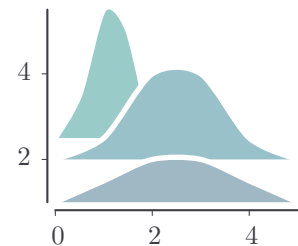
```
\begin{tikzpicture}[
  \begin{axis}[pretty line] \end{axis}
  \coordinate (c1) at (2,2);
  \coordinate (c2) at (1.5,1.2);
  \coordinate (c3) at (1,2);
  \node[prellipse, fill=prcl-palette3c, rotate=-65] at (c1) {};
  \node[prellipse, fill=prcl-palette3e, rotate=0] at (c2) {};
  \node[prellipse, fill=prcl-palette3a, rotate=65] at (c3) {};
\end{tikzpicture}
```

```
\node[prellipse white, fill=pr-color2a, rotate=-65] at (c1) {};
\node[prellipse white, fill=pr-color2b, rotate=0] at (c2) {};
\node[prellipse white, fill=pr-color2c, rotate=65] at (c3) {};
```

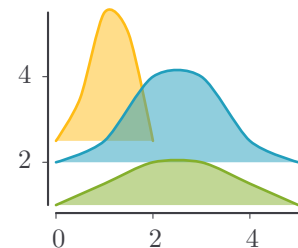


```
/examples/ridgeline.tex
```

```
\begin{axis}[
  pretty ridge line,
  cycle list name = pr-ridgeline
]
\addplot coordinates {(0,1) (1,1.5) (2,2) (3,2) (4,1.5) (5,1)} ;
\addplot coordinates {(0,1) (1,1) (2,2) (3,2) (4,1) (5,1)} ;
\addplot coordinates {(0,0.5) (0.5,1) (1,1.5) (1.5,1) (2,0)} ;
\end{axis}
```



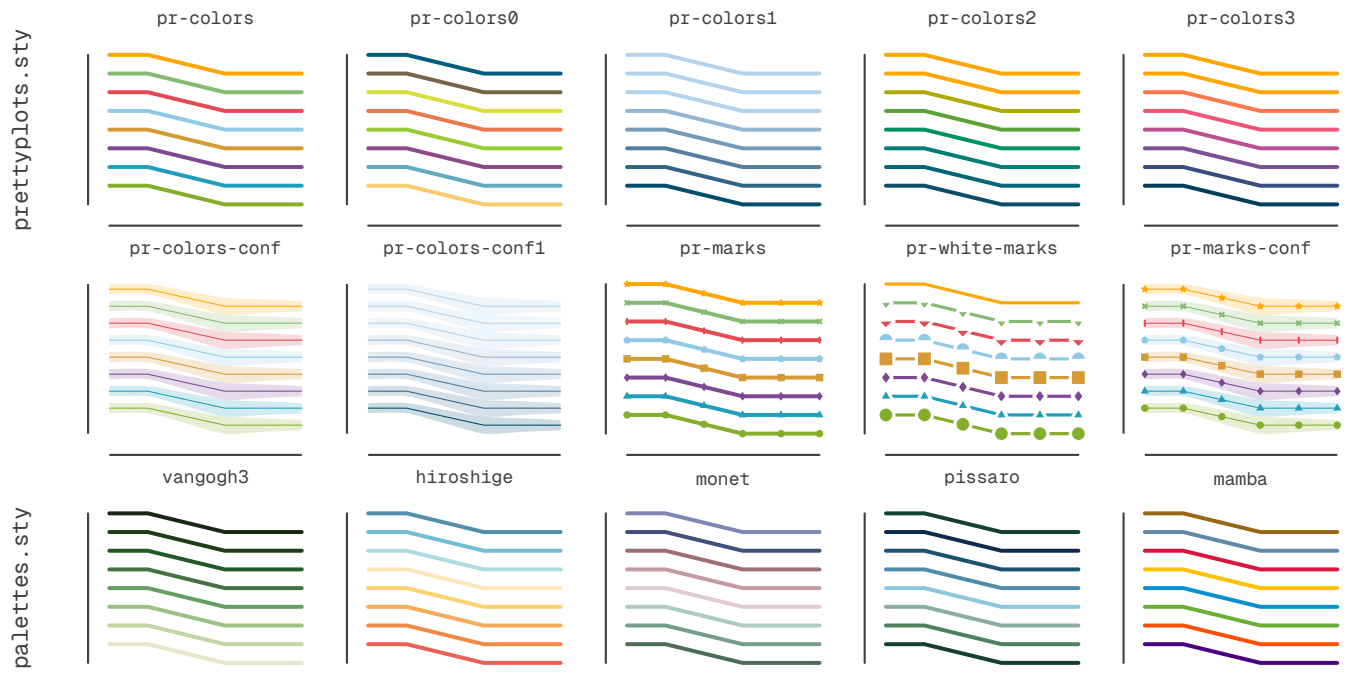
```
\begin{axis}[
  pretty ridge line,
  cycle list name=pr-ridgeline-transparent
]
% ...
\end{axis}
```



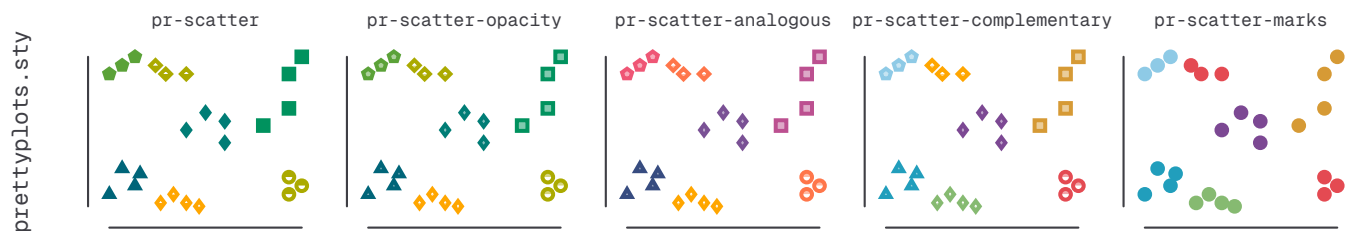
4 Colors and Style

4.1 Color Palettes

Here are some color schemes as a starting point.



Example 1: Cycle lists for line plots, use with `\begin{axis}[cycle list name=<name>]`.



Example 2: Scatter classes, use with `\addplot+ [<name>]` in an `\begin{axis}[pretty scatter]` environment.

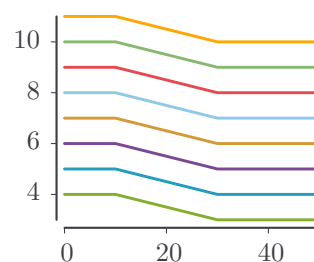
4.2 Custom Colors

To set your own colors manually, pass your color of choice to `\addplot[black]`. You can also pre-define a list of colors that each call of `\addplot` will use through in order. This is known as a cycle list, which you can pass to the axis keys as `cycle list=(name)`.

/examples/line_colors.tex

```
%% Create a cycle list defining the color of each line
\pgfplotscreateplotcyclelist{pr-colors}{
  {pr-color1a},
  {pr-color1b},
  {pr-color1c},
  {pr-color1d},
  {pr-color1e},
  {pr-color1f},
  {pr-color1g},
  {pr-color1h}
}

%% Usage in an axis environment
\begin{axis}[pretty line, cycle list name=pr-colors]
\pgfplotsinvokeforeach{1,...,8}{
  \addplot table[x=x, y=y#1] {data/lines.tsv};
}
\end{axis}
```



You can change the above definition of `pr-colors` directly in `prettyplots.sty` to use consistent colors in all of your work. For experiments, you can also define method-specific colors as follows

```
%% Pick your colors
\colorlet{color-ourmethod}{pr-color1a}
\definecolor{color-baselineA}{HTML}{f3f4f6}
\definecolor{color-baselineB}{HTML}{f3f4f6}
%% Create a cycle list
\pgfplotscreateplotcyclelist{colors-methods}{
  {color-ourmethod},
  {color-baselineA},
  {color-baselineB}
}

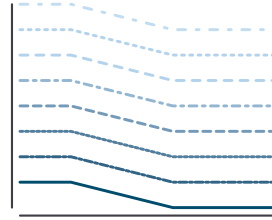
%% Usage in an axis environment
\begin{axis}[pretty line, cycle list name=colors-methods]
\pgfplotsinvokeforeach{1,...,3}{
  \addplot table[x=x, y=y#1] {data/lines.tsv};
}
\end{axis}
```



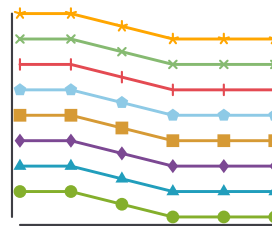
4.3 Line Style

Similar to color, you can set up the line style for your plots as follows.

```
%% Create a cycle list that changes linestyle
\pgfplotscreateplotcyclelist{pr-linestyle}{
  {pr-color0a, solid},
  {pr-color0b, densely dashdotted},
  {pr-color0c, densely dotted},
  {pr-color0d, densely dashed},
  {pr-color0e, dashdotted},
  {pr-color0f, dashed},
  {pr-color0g, dotted},
  {pr-color0g!80, loosely dashdotted}
}
\lines{data/lines.tsv}[cycle list name=pr-linestyle]
```



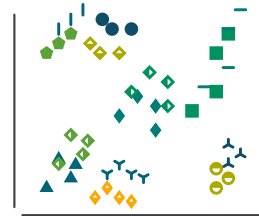
```
%% Create a cycle list that changes marker style
\pgfplotscreateplotcyclelist{pr-marks}{
  {pr-color1a,mark=*,
  mark options={pr-color1a,fill=pr-color1a}},
  {pr-color1b,mark=triangle*,
  mark options={pr-color1b,fill=pr-color1b}},
  {pr-color1c,mark=square*,
  mark options={pr-color1c,fill=pr-color1b}},
  % ...
}
\lines{data/lines.tsv}[cycle list name=pr-marks]
```



4.4 Scatter Classes

For scatter plots, `pr-scatter` defines how each of the classes should appear and is passed to `addplot`,

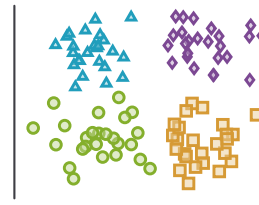
```
\begin{axis}[pretty scatter,pretty nolabels]
  \addplot [pr-scatter] table[x=x1,y=x2,meta=y,
    col sep=comma] {data/classes.csv};
\end{axis}
```



To replace this with your own,

```
/examples/scatter_colors.tex
```

```
% Define custom scatter colors
\pgfplotsset{
  my-scatter/.style={
    only marks, mark options={fill opacity=0.50},
    scatter src=explicit symbolic,
    scatter/classes={
      0={mark=*, pr-color1a, fill=pr-color1a!50},
      1={mark=triangle*, pr-color1b, fill=pr-color1b!50},
      2={mark=diamond*, pr-color1c, fill=pr-color1c!50},
      3={mark=square*, pr-color1d, fill=pr-color1d!50}
      %no comma in the last line, otherwise latex complains
    }
  }
}
\begin{axis}[pretty scatter,pretty nolabels]
  \addplot [my-scatter]
    table[x=x1,y=x2,meta=y, col sep=comma] {data/blobs.csv};
\end{axis}
```



Here is an example for cases where your label is continuous instead of discrete.

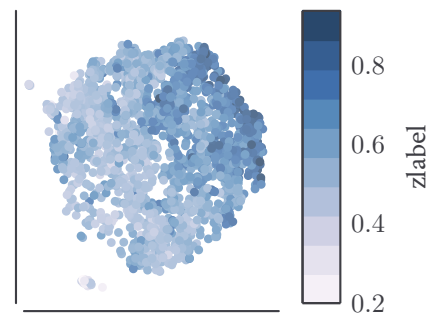
```
/data/blob.tsv
```

```
%x    y    color value
x     y    col
-82.87 16.81 0.52
-75.32 44.21 0.41
```

Then, you can pick a few transition colors and set up a color map as follows.

```
/examples/scatter_colormap_custom.tex
```

```
\begin{axis}[
  pretty scatter colormap,
  colormap={mymap}{rgb255=(253,247,251)
    rgb255=(234,230,241) rgb255=(207,208,228)
    rgb255=(171,188,217) rgb255=(133,168,204)
    rgb255=(92,143,189)  rgb255=(64,111,172)
    rgb255=(52,90,138)  rgb255=(34,59,88)},
]
  \addplot+[pr-scatter-meta]
    table[meta=col] {data/blob.tsv};
\end{axis}
```

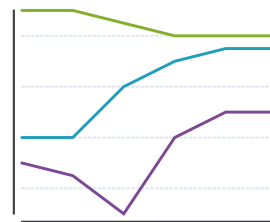


4.5 Grids

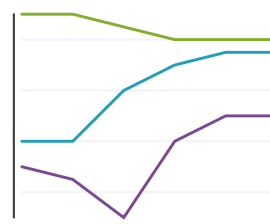
The plot types come with some grids that you can use, usually called `pretty grid` (`plotname`).

```
/examples/grids.tex
```

```
% preamble
\renewcommand{\prgridcolor}{tcss-slate1}
%
\begin{axis}[pretty line, pretty grid line] % ...
\end{axis}
```

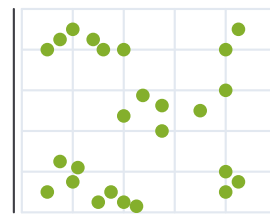


```
%% defining custom grids
\pgfplotsset{
  pretty grid line/.style={
    ymajorgrids,
    major grid style = {tcss-slate1, solid, thick},
  },
}
\begin{axis}[ pretty line, pretty grid line] %...
\end{axis}
```



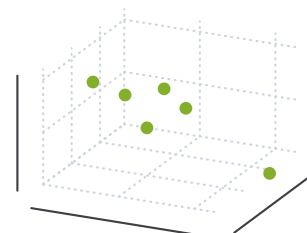
Similarly for the other plot types.

```
\pgfplotsset{
  pretty grid scatter/.style={
    grid = major,
    major grid style = {tcss-slate1, thick},
    width=\textwidth
  },
}
\begin{axis}[ pretty scatter, pretty grid scatter] %...
\end{axis}
```



The default grid color for all grids is defined via `\prgridcolor`.

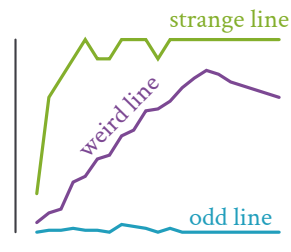
```
\renewcommand{\prgridcolor}{tcss-slate3}
\begin{axis}[pretty 3daxis, pretty grid 3d]
  \addplot3+ [pr-scatter] table {data/ternary.tsv} ;
\end{axis}
```



4.6 Labels

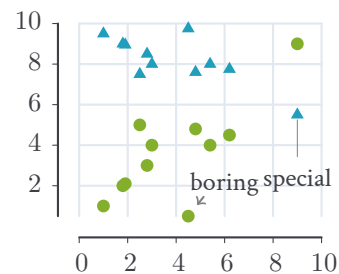
/examples/line_labels.tex

```
\begin{axis}[pretty line,pretty nolabels,very thick,smooth]
  \addplot table[x = x, y = y2] {data/line_odd.tsv}
  node [sloped,above,font=\small,inner sep=2pt,pos=0.8]
    {strange line};
  \addplot table[x = x, y = y3] {data/line_odd.tsv}
  node [sloped,above,font=\small,inner sep=2pt,pos=0.8]
    {odd line};
  \addplot table[x = x, y = y1] {data/line_odd.tsv}
  node [sloped,above,font=\small,inner sep=4pt,
    pos=0.45,rotate=20] {weird line};
\end{axis}
```



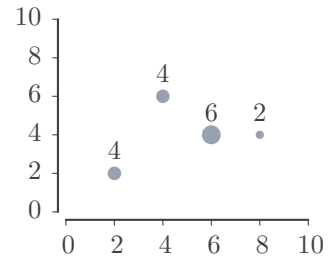
/examples/marks_labels.tex

```
\begin{axis}[
  pretty line marks,
  pretty grid scatter
]
  \addplot table[x=x, y=y] {data/marks.txt};
  \addplot table[x=x, y expr=10-0.5*\thisrow{y}]
    {data/marks.txt};
  \node at (axis cs:6, 2.1) {\small boring};
  \node at (axis cs:5.5, 2) (node1) {};
  \node at (axis cs:4.5, 0.5) (node2) {};
  \draw [->, gray, thick] (node1) --(node2);
  \node[pin=-90:{\small special}] at (axis cs:9,5.8) {};
\end{axis}
```



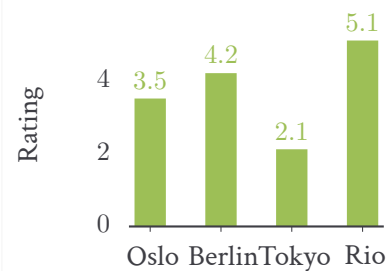
/examples/scatter_labels.tex

```
\begin{axis}[
  pretty scatter,
  scatter/use mapped color =
    {draw=gray, fill=gray} ]
% \addplot[pr-markweights] table {data/marks_weighted.tsv};
\addplot[only marks,
  nodes near coords*={
    \prnodefontsize $\pgfmathprintnumber \weight$
  },
  every node near coord/.append style = {yshift = 1 pt},
  visualization depends on={\thisrow{weight} \as \weight},
  scatter/@pre marker code/.append style=
    {\tikz/mark size=0.5*\weight}
] table {data/marks_weighted.tsv};
\end{axis}
```



/examples/bar_labels.tex

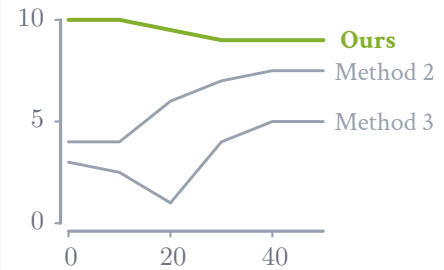
```
\begin{axis}[
  pretty ybar,
  %% label each bar with y value
  visualization depends on=y \as \y,
  nodes near coords = {
    \pgfmathprintnumber[precision=2]{\y}},
  %% opt. label layout
  %every node near coord/.append style={
  %  font=\prnodefontsize, color=pr-gray4},
  bar width = 1em,
  ylabel = {Rating},
  symbolic x coords = {Oslo,Berlin,Tokyo,Rio},
]
\addplot table[x=x, y=y3] {data/cities.tsv};
\end{axis}
```



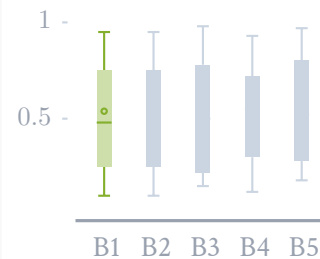
4.7 Highlighting

The following examples are inspired from [Knaflc(2015)].

```
\begin{axis}[
  pretty line,
  ytick = {0, 5, 10},
  x tick label style = {pr-color-gray5},
  y tick label style = {pr-color-gray5},
  xtick style = {pr-color-gray4, thick},
  ytick style = {pr-color-gray4, thick},
  x axis line style = {pr-color-gray4, very thick},
  y axis line style = {pr-color-gray4, very thick}
]
\addplot+[line width=1.5pt]
table[x=x, y expr=\thisrow{y1}+1]
{data/line.tsv}
node[pos=1, right] (n) {\small \textbf{Ours}};
\pgfplotsinvokeforeach{2, ... ,3}{
\addplot+[pr-color-gray4] table[x=x, y=y#1]
{data/line.tsv}
node[pos=1, right] (n) {\small Method #1};
}
\end{axis}
```



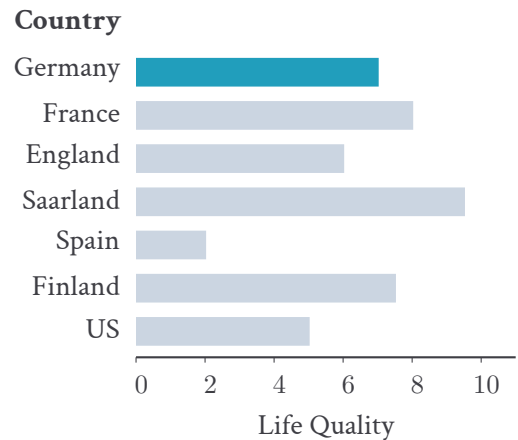
```
\begin{axis}[
  pretty boxplot,
  xticklabels = {B1,B2,B3,B4},
  xtick = {1,2,3,4},
  y tick label style = {pr-color-gray4,
    font=\prtickfontsize},
  x tick label style = {pr-color-gray4,
    font=\prtickfontsize},
  ytick style = {pr-color-gray3, thick},
  x axis line style = {pr-color-gray4, thick},
  ymin=0
]
\addplot table[y=y1] {data/boxes.tsv};
\foreach \col in {y1,y2,y3,y4,y5}{
\addplot+[pr-color-gray3] table[y=\col]
{data/boxes.tsv};
}
\end{axis}
```



```

\begin{tikzpicture}
\pgfplotstablegetrowsof{data/countries.tsv}
\edef\numberofrows{\pgfplotsretval}
\begin{axis}[
    pretty xbar,
    bar shift = 0pt,
    y dir = reverse,
    ytick = {0,...,\numberofrows},
    yticklabels from table =
        {data/countries.tsv}{{[index]0},
    xlabel = {Life Quality},
    ylabel = {\textbf{Country}}
]
\addplot+[pr-color-bg, fill=pr-color-bg,
show except={country}{Germany}] table [
y expr=\coordindex, x index=1]
{data/countries.tsv};
\addplot+[pr-color1b, fill=pr-color1b,
show only={country}{Germany}] table [
y expr=\coordindex,
x index=1]
{data/countries.tsv};
\end{axis}
\end{tikzpicture}

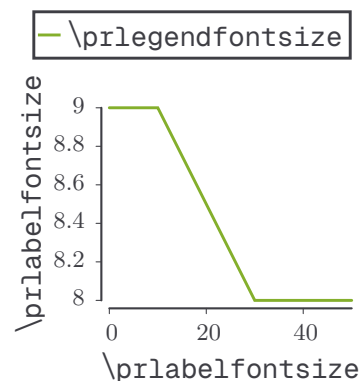
```



4.8 Axis Style

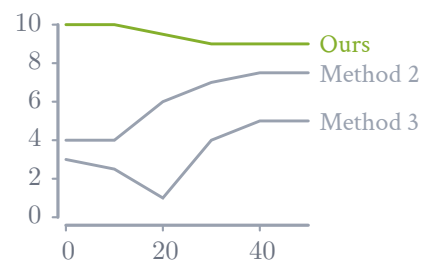
The following macros can be redefined to adjust label sizes,

```
\renewcommand{\prlabelfontsize}{\large}
\renewcommand{\prtickfontsize}{\small}
\renewcommand{\prlegendfontsize}{\large}
```



Or apply changes to the axis environment directly,

```
\begin{axis}[
  pretty line,
  xlabel style = {pr-color-gray4, font=\prlabelfontsize},
  ylabel style = {pr-color-gray4, font=\prlabelfontsize},
  x tick label style = {pr-color-gray5,
    font=\prtickfontsize,},
  y tick label style = {pr-color-gray5,
    font=\prtickfontsize,},
  xtick style = {pr-color-gray4, thick},
  ytick style = {pr-color-gray4, thick},
  x axis line style = {pr-color-gray4, very thick},
  y axis line style = {pr-color-gray4, very thick}
]
\addplot table[x=x, y expr=\thisrow{y1}+1]
{data/line.tsv}
node[pos=1, right] (n) {\small Ours};
\pgfplotsinvokeforeach{2,...,3}{
  \addplot+[pr-color-gray4] table[x=x, y=y#1]
  {data/line.tsv}
  node[pos=1, right] (n) {\small Method #1};
}
\end{axis}
```



5 Advanced Usage

Commands for Line Plots

```
\addlines      <data.tsv> [<addplot options>] [<table options>]
                adds all line plots from a given file, from columns (x, y1),..., (x, yn) .

\addconflines  <data.tsv> [<addplot options>] [<table options>]
                adds line plots and confidence regions from a given file, from columns (x,
                y1, y1_c),..., (x, yn, yn_c).

\groupplines   <data.tsv> [<addplot options>] [<table options>]
                adds line plots to a group plot.

\groupconflines <data.tsv> [<addplot options>] [<table options>]
                adds line plots to a group plot.
```

Arguments

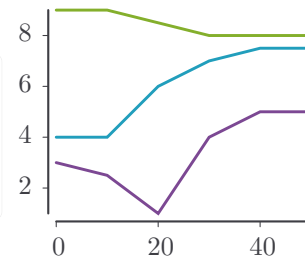
- <data.tsv> — *(Required)* data file.
- [<addplot options>] — *(Optional)* style for adding plots, such as color, line-, and markers style. (*Examples:* black, smooth, line width=1.2pt, mark=*, mark options={fill opacity=0.5,mark size=1pt})
- [<table options>] — *(Optional)* keys to table. (*Examples:* col sep=comma)

Examples

```
/data/line.tsv
```

```
%Metric      Method1 ... MethodN
x    y1      y2      y3
0    9      4      3
%...
```

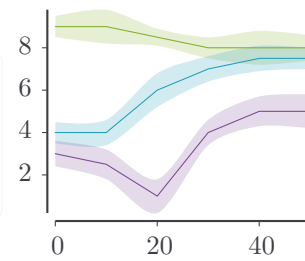
```
\begin{axis}[ pretty line ]
\addlines{data/line.tsv}
\end{axis}
```



```
/data/line_conf.tsv
```

```
%Metric      Method1      Method1_conf ...      MethodN_conf
x    y1      y1_c      y1      y1_c      y3      y3_c
0    9      0.5      4      0.5      3      0.6
%....
```

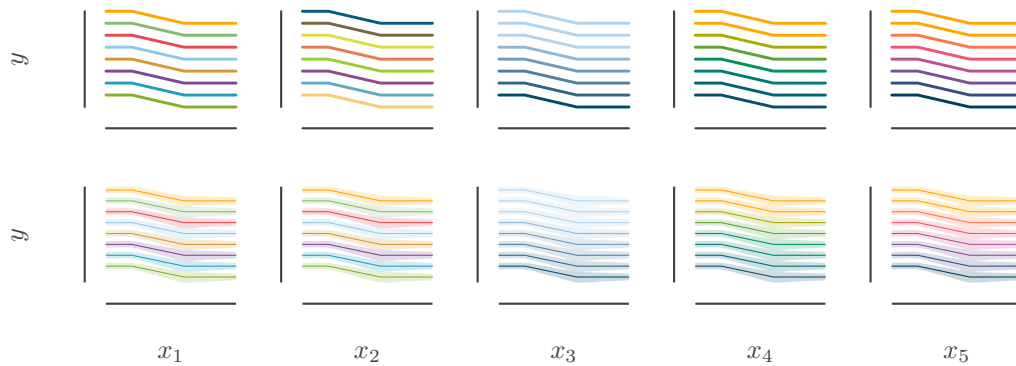
```
\begin{axis}[pretty confline]
\addconflines{data/line_conf.tsv}
\end{axis}
```



```

\begin{tikzpicture}
\def\file{data/lines_conf.tsv}
\begin{groupplot}[
  group style={
    group size=5 by 2,
    horizontal sep=25pt,
    vertical sep=30pt},
  xtick align=center, ytick align=center,
  width=0.25\textwidth
]
\groupplot{data/lines.tsv}[ylabel=$y$]
\groupplot{data/lines.tsv}[cycle list name=pr-colors0]
\groupplot{data/lines.tsv}[cycle list name=pr-colors1]
\groupplot{data/lines.tsv}[cycle list name=pr-colors2]
\groupplot{data/lines.tsv}[cycle list name=pr-colors3]
\\
\groupconflines{data/lines_conf.tsv}[ylabel=$y$, xlabel=$x_{\textcolor{blue}{1}}$]
\groupconflines{data/lines_conf.tsv}[cycle list name=pr-colors-conf0]
\groupconflines{data/lines_conf.tsv}[cycle list name=pr-colors-conf1]
\groupconflines{data/lines_conf.tsv}[cycle list name=pr-colors-conf2]
\groupconflines{data/lines_conf.tsv}[cycle list name=pr-colors-conf3]
]
\end{groupplot}
\end{tikzpicture}

```



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References

[Knafllic(2015)] Knafllic, C. *Storytelling with Data: A Data Visualization Guide for Business Professionals*. Wiley, 2015.

[Tufte(2001)] Tufte, E. R. *The Visual Display of Quantitative Information*. Graphics Press, 2001.