Package 'textBoxPlacement'

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Title Compute a Non-Overlapping Layout of Text Boxes to Label Multiple Overlain Plots

Maintainer Barry Zeeberg <barryz2013@gmail.com>

Author Barry Zeeberg [aut, cre]

Depends R (>= 4.2.0)

LazyData true

Imports graphics, stats, grDevices

Description Compute a non-overlapping layout of text boxes to label multiple overlain curves. For each curve, iteratively search for an adjacent x,y position for the text box that does not overlap with the other curves. If this process fails, then offsets are computed to add to the y values for each curve, that results in sufficient space to add all of the text labels.

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Encoding UTF-8

VignetteBuilder knitr

Suggests knitr, rmarkdown, testthat (>= 3.0.0)

RoxygenNote 7.2.3

Config/testthat/edition 3

NeedsCompilation no

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Contents

`axesRange` *axesRange*

Description

compute correct axes ranges for a set of overlain plots

Usage

```
axesRange(xList)
```

Arguments

`xList`	list of numerical vectors containing axis points

Value

xlim

Examples

```
axesRange(yList1)
```

labs *textBoxPlacement data sets*

Description

textBoxPlacement data sets

Usage

```
data(labs)
```

permInd *permInd*

Description

compute the indices of sorting yrange in decreasing order

Usage

```
permInd(yrange)
```

Arguments

yrange	numeric vector (max-min) for vector of y values

Value

returns the integer vector indices of sorting yrange in decreasing order

Examples

```
permInd(yrange(yList1))
```

permuteCurves *permuteCurves*

Description

reorder multiple curves so that the curve with the largest y range is on the bottom of the staggered graph

Usage

```
permuteCurves(xList, yList, tList, textBoxHeights, permInd)
```

Arguments

xList	list whose components are numeric vectors of the x values for overlaid curves
yList	list whose components are numeric vectors of the y values for overlaid curves
tList	list of character string texts to insert in plot
textBoxHeights	return value of textBoxUserUnits()
permInd	return value of permInd()

Value

returns a list whose (re-ordered) components are:

- xList a list of numeric vector for x values
- yList a list of numeric vector for y values - re-ordered and offset-adjusted
- tList a list of character strings for text boxes to label the curves
- offset a numeric vector offset to add to each staggered curve
- ystart a numeric vector of starting positions

Examples

```
units<-textBoxUserUnits(textList,yrange(yList1),verbose=TRUE)
permuteCurves(xList1,yList1,textList,units,permInd(yrange(yList1)))
```

positionTextBox *positionTextBox*

Description

compute x and y coordinates for placement of text box based upon the values of the function to avoid running into the graph line

Usage

```
positionTextBox(text, x, y, xPos, adj, nApprox = 10, reallyText)
```

Arguments

text	character string text to insert in plot
x	numeric vector of x values
y	numeric vector of y values
xPos	numeric x position for text box
adj	numeric vector param passed to text()
nApprox	integer number of intervals to interpolate between x data points
reallyText	Boolean if TRUE then execute text() command

Value

returns a list c(ymin,ymax,strheight(text),xPos1)

Examples

```
x<-1:10
y<-1:10
plot(x,y,type="l")
positionTextBox(text="TEXT ME",x=x,y=y,xPos=1,
  adj=c(0,0),nApprox=10,reallyText=TRUE)
```

positionTextBoxDriver *positionTextBoxDriver*

Description

Driver to compute x and y coordinates for placement of text box based upon the values of the function to avoid running into the graph line and avoid overlapping with other overlay curves

Usage

```
positionTextBoxDriver(
  text,
  x,
  y,
  xPos,
  nApprox = 10,
  xList,
  yList,
  stag = FALSE,
  offset = 0,
  verbose
)
```

Arguments

text	character string text to insert in plot
x	numeric vector of x values
y	numeric vector of y values
xPos	numeric x position for text box
nApprox	integer number of intervals to interpolate between x data points
xList	list whose components are numeric vectors of the x values for overlaid curves
yList	list whose components are numeric vectors of the y values for overlaid curves
stag	Boolean TRUE if this plot has staggering added to curves
offset	numeric vector of offsets added to each curve
verbose	Boolean if TRUE print informative or diagnostic messages to console

Value

returns a numeric vector c(yReal,yAdj) where xTry is an x value at which the text box will fit without overlapping another overlay curve, or returns -1000000 for failure

Examples

```
positionTextBoxDriver(text="TEXT ME",x=xList1[[1]],y=yList1[[1]],
  xPos=1,nApprox=10,xList=xList1[-1],yList=yList1[-1],stag=FALSE,offset=0,verbose=TRUE)
```

positionTextBoxDriverDriver *positionTextBoxDriverDriver*

Description

Driver to compute x and y coordinates for placement of text box based upon the y values of the function to avoid running into the graph line and avoid overlapping with other overlay curves

Usage

```
positionTextBoxDriverDriver(
  xList,
  yList,
  textList,
  xPos,
  nApprox = 10,
  labs,
  stag = FALSE,
  offset = 0,
  ystart,
  ylim,
  verbose
)
```

Arguments

xList	list whose components are numeric vectors of the x values for overlaid curves
yList	list whose components are numeric vectors of the y values for overlaid curves
textList	list of character string texts to insert in plot
xPos	numeric vector x position for text box
nApprox	integer number of intervals to interpolate between x data points
labs	list of labels annotating a graph • main character string main title • xlab character string x axis label • ylab character string y axis label
stag	Boolean TRUE if this plot has staggering added to curves
offset	numeric vector of offsets added to each curve
ystart	numeric vector of starting positions
ylim	numeric vector ylim parameter for plot()
verbose	Boolean if TRUE print informative or diagnostic messages to console

Details

if the length of the return value is not 0, then additional processing might be needed for the bad curves, such as adding an offset to their y values, plotting them in a different color or symbol, and keying them to a second y axis on the right of the graph

Value

returns a vector of integers indicating curves whose text box could not be drawn

Examples

```
# the text box for the second curve cannot fit,
# as it is sandwiched between two curves that are too close

plot(xList1[[1]],yList1[[1]],type="l")
positionTextBoxDriverDriver(xList=xList1,yList=yList1,
  textList=textList,xPos=c(1,1,1),nApprox=10,labs=labs,
  stag=FALSE,offset=0,ystart=0,ylim=axesRange(yList1),verbose=TRUE)
```

`positionTextBoxDriverDriverDriver`

positionTextBoxDriverDriverDriver

Description

Driver invoke positionTextBoxDriverDriver() using the original user input data If that fails to produce an uncluttered plot, then invokes stagger() to reshape the data before re-running positionTextBoxDriverDriver().

Usage

```
positionTextBoxDriverDriverDriver(
  xList,
  yList,
  textList,
  xPos,
  nApprox = 10,
  labs,
  sortB,
  verbose = FALSE
)
```

Arguments

xList	(optional) list whose components are numeric vectors of the x values for overlaid curves
yList	list whose components are numeric vectors of the y values for overlaid curves
textList	(optional) list of character string texts to insert in plot
xPos	(optional) numeric vector x position for text box
nApprox	(optional) integer number of intervals to interpolate between x data points
labs	(optional) list of labels annotating a graph • main character string main title • xlab character string x axis label • ylab character string y axis label
sortB	Boolean if TRUE staggered curves reordered, with largest range curve on bottom of graph
verbose	Boolean if TRUE print informative or diagnostic messages to console

Details

if xList or textList is missing, it is constructed from elements in yList

hint: to prevent conflicts, run the following line manually before running positionTextBoxDriverDriverDriver()

rm(list=ls())

see https://stackoverflow.com/questions/27253376/different-results-from-rscript-and-r-cmd-batch

Value

returns no values, but has side effect of generating a graph.

Examples

```
# There is not enough space for text boxes in original graph.
# The package automatically adds offsets to the curves,
# keeping the curves in the original order,
# and successfully adds text boxes

positionTextBoxDriverDriverDriver(xList=xList1,yList=yList1,
  textList=textList,xPos=c(1,1,1),nApprox=10,labs=labs,sortB=FALSE)

# data set contains some negative values

positionTextBoxDriverDriverDriver(xList=xList2,yList=yList2,
  textList=textList,xPos=c(1,1,1),nApprox=10,labs=labs,sortB=FALSE)

# show the difference when we sort the order of the curves
# to position the curve with the largest range on the bottom

positionTextBoxDriverDriverDriver(xList=xList2,yList=yList2,
  textList=textList,xPos=c(1,1,1),nApprox=10,labs=labs,sortB=TRUE,verbose=TRUE)
```

stagger *stagger*

Description

unclutter the overlay plot by staggering the graphs

Usage

```
stagger(xList, yList, tList, sortB = FALSE, verbose)
```

Arguments

xList	list whose components are numeric vectors of the x values for overlaid curves
yList	list whose components are numeric vectors of the y values for overlaid curves
tList	list of character string texts to insert in plot
sortB	Boolean if TRUE staggered curves reordered, with largest range curve on bottom of graph
verbose	Boolean if TRUE print informative or diagnostic messages to console

Details

In order to unclutter the overlay plot, we need to stagger the graphs the offset for each graph will be the sum of the max values for all of the preceding graphs. So the stack of staggered graphs will have max y (ie, ymax) equal to the sum of the max's.

Value

returns a list whose components are:

- textBoxHeights return value of textBoxUserUnits()
- permInd return value of permInd()
- xlim numeric vector parameter for plot()
- ylim numeric vector parameter for plot()

Examples

```
# demonstrate effect of sorting the curves

plot.new()

stagger(xList2,yList2,textList,sortB=FALSE,verbose=TRUE)

stagger(xList2,yList2,textList,sortB=TRUE,verbose=TRUE)
```

textBoxUserUnits *textBoxUserUnits*

Description

compute the heights of the text boxes in user units

Usage

```
textBoxUserUnits(tList, yrange, verbose)
```

Arguments

tList	a list of character strings for text boxes to label the curves
yrange	numeric vector (max-min) for vector of y values
verbose	Boolean if TRUE print informative or diagnostic messages to console

Value

numeric vector of the heights of the text boxes in user units

Examples

```
textBoxUserUnits(textList,yrange(yList1),verbose=TRUE)
```

textList *textBoxPlacement data sets*

Description

textBoxPlacement data sets

Usage

```
data(textList)
```

xlim *xlim*

Description

compute the numeric vector xlim for a set of curves

Usage

```
xlim(xList)
```

Arguments

xList	list whose components are numeric vectors of the x values for overlaid curves

Value

numeric vector xlim

Examples

```
xlim(xList1)
```

xList1 *textBoxPlacement data sets*

Description

textBoxPlacement data sets

Usage

```
data(xList1)
```

xList2 *textBoxPlacement data sets*

Description

textBoxPlacement data sets

Usage

```
data(xList2)
```

xPosCheck *xPosCheck*

Description

is the value of xPos within a valid range?

Usage

```
xPosCheck(xPos, xList, verbose)
```

Arguments

xPos	integer specifying x position to try to place text box
xList	list whose components are numeric vectors of the x values for overlaid curves
verbose	Boolean if TRUE print informative or diagnostic messages to console

Value

numeric vector valid values of xPos

Examples

```
# replace incorrect xPos with reasonable value

xPosCheck(c(1,1,-5),xList2,verbose=TRUE)
```

ylim *ylim*

Description

compute the numeric vector ylim

Usage

```
ylim(yList, yrange, textBoxHeights, sortB, permInd)
```

Arguments

yList	list whose components are numeric vectors of the y values for overlaid curves
yrange	numeric vector (max-min) for vector of y values
textBoxHeights	return value of textBoxUserUnits()
sortB	Boolean if TRUE staggered curves are reordered, with largest range curve on bottom of graph
permInd	return value of permInd()

Value

returns a numeric vector ylim

Examples

```
# demonstrate effect of sorting the curves

plot.new()
ylim(yList1,yrange(yList1),textBoxUserUnits(textList,yrange(yList1),verbose=TRUE),
  FALSE,permInd(yrange(yList1)))
```

---

yList1 *textBoxPlacement data sets*

Description

textBoxPlacement data sets

Usage

```
data(yList1)
```

---

yList2 *textBoxPlacement data sets*

Description

textBoxPlacement data sets

Usage

```
data(yList2)
```

yrange *yrange*

Description

compute the staggered y values for the overlay plot

Usage

```
yrange(yList)
```

Arguments

yList	list whose components are numeric vectors of the y values for overlaid curves

Value

numeric vector yrange (max-min) for vector of y values

Examples

```
yrange(yList1)
```

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