Package 'widgetTools'

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Title Creates an interactive tcltk widget
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Description This packages contains tools to support the construction of tcltk widgets
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basicPW-class

Class "basicPW", a basic class for primary widgets

Description

This class defines the behavior shared by primary widget object used to build a GUI type interface

Objects from the Class

Objects can be created by calls of the form new("basicPW", ...). Constructors have been defined to create objects of this class for specific widgets such as buttons, list boxes, ..

Slots

```
wName: Object of class "character" - a string for the name of the object
```

wType: Object of class "character" - a string defining the type of the primary widget. (e.g. button)

wValue: Object of class "ANY" - the initial value to be associated with the object

wWidth: Object of class "numeric" - an integer for the width of the object to be rendered (if applicable)

wHeight: Object of class "numeric" - an integer for the height of the object to be rendered (if applicable)

wFuns: Object of class "list" - a list of R functions to be executed before the widget is activated

wPreFun: Object of class "function" - a list of functions to be executed before the value of the widget to be updated

wPostFun: Object of class "function" - a list of functions to be executed before the value of the widget to be retrieved

wNotify: Object of class "list" - a list of functions to be executed each time when the value of the widget changes

wEnv: Object of class "environment" - an R environment object within which the value of the object is stored

wView: Object of class "widgetView" - a object of the class widgetView to which the widget is rendered

Methods

```
wEnv<- signature(object = "basicPW"): Set the value for wEnv slot
wEnv signature(object = "basicPW"): Get the value for wEnv slot
wFuns<- signature(object = "basicPW"): Set the value for wFuns slot
wFuns signature(object = "basicPW"): Get the value for wFuns slot
wHeight<- signature(object = "basicPW"): Set the value for wHeight slot
wHeight signature(object = "basicPW"): Get the value for wHeight slot
wName<- signature(object = "basicPW"): Set the value for wName slot</pre>
```

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```
wName signature(object = "basicPW"): Get the value for wName slot
wNotify<- signature(object = "basicPW"): Set the value for wNotify slot
wNotify signature(object = "basicPW"): Get the value for wNotify slot
wPostFun<- signature(object = "basicPW"): Set the value for wPostFun slot
wPostFun signature(object = "basicPW"): Get the value for wPreFun slot
wPreFun<- signature(object = "basicPW"): Set the value for wPreFun slot
wPreFun signature(object = "basicPW"): Get the value for wPreFun slot
wType<- signature(object = "basicPW"): Set the value for wType slot
wType signature(object = "basicPW"): Get the value for wValue slot
wValue<- signature(object = "basicPW"): Set the value for wValue slot
wValue signature(object = "basicPW"): Set the value for wView slot
view signature(object = "basicPW"): Get the value for wView slot
view signature(object = "basicPW"): Set the value for wView slot
wWidth<- signature(object = "basicPW"): Set the value for wWidth slot</pre>
```

Author(s)

Jianhua Zhang

References

Programming with data

See Also

```
widgetView-class,widget-class
```

Examples

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button

Functions to construct objects of primary widgets and render them

Description

All the primary widgets such as button, text box, and so on are objects of basicPW class. The functions are constructors of primary widgets that are subjects of basicPW class with behaviors specific to primary widgets.

Usage

```
button(wName, wEnv, wValue = "", wWidth = 12, wHeight = 0, wFuns = list(),
wNotify = list(), wPreFun = function(x) x, wPostFun = function(x) x,
wView = new("widgetView") )
entryBox(wName, wEnv, wValue = "", wWidth = 50, wHeight = 0, wFuns = list(),
wNotify = list(), wPreFun = function (x) x, wPostFun = function(x) x,
wView = new("widgetView"))
textBox(wName, wEnv, wValue = "", wWidth = 25, wHeight = 12, wFuns = list(),
wNotify = list(), wPreFun = function (x) x, wPostFun = function(x) x,
wView = new("widgetView"))
listBox(wName, wEnv, wValue = "", wWidth = 25, wHeight = 10, wFuns = list(),
wNotify = list(), wPreFun = function (x) x, wPostFun = function(x) x,
wView = new("widgetView"))
checkButton(wName, wEnv, wValue, wWidth = 50, wFuns = list(), wNotify =
list(), wPreFun = function (x) x, wPostFun = function(x) x,
wView = new("widgetView"))
radioButton(wName, wEnv, wValue, wWidth = 50, wFuns = list(), wNotify =
list(), wPreFun = function (x) x, wPostFun = function(x) x,
wView = new("widgetView"))
label(wName, wEnv, wValue = "", wWidth = 0, wHeight = 0, wFuns = list(),
wNotify = list(), wPreFun = function (x) x, wPostFun = function(x) x,
wView = new("widgetView"))
widget(wTitle, pWidgets, funs = list(), preFun = function()
print("Hello"), postFun = function() print("Bye"), env, defaultNames =c(
"Finish", "Cancel"))
widgetView(WVTitle, vName, widgetids = list(), theWidget = new("widget"),
winid)
```

Arguments

wName	wName a character string for the name to be associated with a given primary widget
vName	vName same as wName but for a widget object
wEnv	$\label{eq:weight} \begin{tabular}{ll} wEnv \ an \ R \ environment \ object \ within \ which \ the \ original \ values \ for each \ primary \ widget \ will \ be \ stored \ and \ updating \ and \ retrieval \ of \ the \ values \ will \ take \ place \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$
env	env same as wEnv but for a widget object

button 5

wValue wValue the initial values to be associated with a given primary widget wWidth an integer for the width of the primary widget (if applicable) wHeight wHeight an integer for the height of the primary widget (if applicable)

wFuns a list of R functions that will be associated with a primary widget and

invoked when an operation (e.g. click, get focus, ...) is applied to the primary

widget

funs funs same as wFuns but for a widget object

wNotify wNotify a list of functions defining the actions to be performed when the value

of the primary widget changes

wPreFun wPreFun an R function that should be applied when the widget is activated

preFun preFun same as wPreFun but for a view

wPostFun an R function that will be applied when the widget is inactivated

postFun postFun same as wPostFun but for a view

wTitle wTitle a character string for the title to be displayed when the widget is ren-

dered

pWidgets pWidget a list of primary widgets (e.g. button, list box, ...) to be rendered

WVTitle WVTitle same as wTitle

widgetids widgetids a list of tkwin ids for the primary widgets to be rendered

theWidget a widget object to render the primary widgets

wView an object of class widgetView winid winid an object of class winid

defaultNames defaultName a vector of character string of length two for the text to be shown

on the two default buttons. The first is to end the process and the second to abort

the process

Details

button constructs a button widget object.

button constructs an entry box widget object.

textBox constructs a text box widget object.

listBox constructs a list box widget object. Value for a listbox object should be a named vector with names being the content to be shown in the list box and values being TRUE (default value) or FALSE.

checkButton constructs a group of check box widget objects. Value for check button objects should be a named vector with names being the content to be shown in the list box and values being TRUE (checked) or FALSE (not checked).

radioButton constructs a group of radio button widget objects. Value for radio button objects should be a named vector with names being the content to be shown in the list box and values being TRUE (default) or FALSE.

label constructs a text label widget object with the value displayed as the text.

widget constructs a widget object to render the primary widgets.

widgetView constructs a widgetView object. This class is for internal use by class widget-class. Users trying to create GUI type widget do not need to use this class.

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Value

Each constructor returns a tkwin object for the primary widget object.

Author(s)

Jianhua Zhang

References

R tcltk

See Also

```
widget-class, basicPW-class
```

Examples

```
# Create an R environment to store the values of primary widgets
PWEnv <- new.env(hash = TRUE, parent = parent.frame(1))</pre>
# Create a label
label1 <- label(wName = "label1", wValue = "File Name: ", wEnv = PWEnv)</pre>
# Create an entry box with "Feed me using brows" as the default value
entry1 <- entryBox(wName = "entry1", wValue = "Feed me using browse",</pre>
                   wEnv = PWEnv)
# Create a button that will call the function browse2Entry1 when
# pressed.
browse2Entry1 <- function(){</pre>
    tempValue <- tclvalue(tkgetOpenFile())</pre>
    temp <- get(wName(entry1), env = PWEnv)</pre>
    wValue(temp) <- paste(tempValue, sep = "", collapse = ";")</pre>
    assign(wName(entry1), temp, env = PWEnv)
}
button1 <- button(wName = "button1", wValue = "Browse",</pre>
                      wFuns = list(command = browse2Entry1), wEnv = PWEnv)
# Create a list box with "Option1", "Option2", and "Option3" as the
# content and "Option1" selected
list1 <- listBox(wName = "list1", wValue = c(Option1 = TRUE, Option2 = FALSE,</pre>
                                   Option3 = FALSE), wEnv = PWEnv)
# Create a text box with "Feed me something" displayed
text1 <- textBox(wName = "text1", wValue = "Feed me something",</pre>
                  wEnv = PWEnv)
# Create a set of radio buttons with "radio1" as the default
label2 <- label(wName = "label2", wValue = "Select one: ", wEnv = PWEnv)</pre>
radios1 <- radioButton(wName = "radios1", wValue = c(radio1 = TRUE,</pre>
                        radio2 = FALSE, radio3 = FALSE), wEnv = PWEnv)
```

dropdownList 7

```
# Create a set of check boxes with "check1" selected and "check2" and
# "check3" not selected
label3 <- label(wName = "label3", wValue = "Select one to many: ",</pre>
wEnv = PWEnv)
checks1 <- checkButton(wName = "checks1", wValue = c(check1 = TRUE,</pre>
                       check22 = FALSE, check3 = FALSE), wEnv = PWEnv)
# Please not that the name of the primary widget object (e.g. checks1)
# should be the same as the value of the name slot of the object
# (e. g. name = "checks1")
# Render the widgets
pWidgets <- list(topRow = list(label1 = label1, entry1 = entry1,</pre>
                 button1 = button1), textRow = list(list1 = list1,
                 text1 = text1), radGroup = list(label2 = label2,
                 radios1 = radios1), chkGroup = list(label3 = label3,
                                      checks1 = checks1))
## Not run:
## These cannot be run by examples() but should be OK when pasted
## into an interactive R session with the widgetTools package loaded
aWidget <- widget(wTitle = "A test widget", pWidgets, funs = list(),</pre>
                 preFun = function() print("Hello"),
                 postFun = function() print("Bye"), env = PWEnv)
## End(Not run)
```

dropdownList

A widget to mimic a dropdown list

Description

The current tcltk library does not support dropdown lists unless an extension is included. The function dropdownList provide an alternative.

Usage

```
dropdownList(base, options, textvariable, width = 10, default, editable
= FALSE)
getListOption(targetWidget, options, height, vScroll = FALSE)
```

Arguments

base	base a tkwin object that is the parent frame of the dropdown list to be created
options	options a vector of character strings for the content of the dropdown list
textvariable	textvariable a tclVar object to be associated with the selected item of the dropdown list
width	width an integer for the width in number of characters of the selection containing part of the dropdown list

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default	default a character string for the default selection that is going to be shown in the selection containing window of the dropdown list
targetWidget	targetWidget a tkwin object for an entry box to which a button will be associated to make the look of a dropdown list
editable	editable a boolean indicating whether the dropdown list will be editable or not
height	height an integer for the height of the dropdown list box. If missing, height will be assigned the length of the options to be shown in the list box
vScroll	vScroll a boolean indicating whether a vertical scroll bar will be associated with the dropdown list box

Details

base can be a top window or a frame.

The widget returns a frame that contains a dropdown list. The frame need to be placed using any of the layout methods of tcltk. The value of the selection will be accessed through the tclVar object passed to the function.

getListOptions is called by dropdown list to get the selected item

Value

dropdownList returns a tkwin object for the frame that contains a dropdown list getListOptions returns a character string for the selected item

Author(s)

Jianhua Zhang

References

tcltk

See Also

tooltip

Examples

makeViewer 9

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Put a Scrollable List Box into a tkWidget.

Description

This function associates a tk listbox with a scroll bar and then puts them into a given tk widget.

Usage

```
makeViewer(target, vWidth = "", vHeight = "", hScroll = FALSE,
vScroll = TRUE, what = "list", side = "left", text = "")
```

Arguments

target that can accommodate a list box.

vWidth, vHeight

integers giving width and height of the listbox.

hScroll, vScroll

logicals indicating whether a horizontal or vertical scroll bar should be associ-

ated with the list box.

what A character string indicating the type of the viewer to be put on a widget. Valid

types include "list" for list box, "canvas", and "text" for text box

side A character string for the geometry management of the viewer on the widget.

Valid values include "left", "right", "top", and "bottom"

text A character string to be displayed

Details

Tk list boxes (or canvas, text box) and scroll bars are separate widgets. This function provides a common interface to put them together and functionally associated.

Value

This function does not return any value.

Author(s)

Jianhua (John) Zhang

See Also

```
tklistbox (from the 'tcltk' package).
```

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Examples

```
## Not run:
    ## These cannot be run by examples() but should be OK when pasted
    ## into an interactive R session with the widgetTools package loaded

# Create a top level window and put a list box in it
base <- tktoplevel()
listBox <- makeViewer(base)

# Destroy toplevel widget
# tkdestroy(base)

## End(Not run)

oneVScrList

A function that creates a groups of list boxes sharing a single vertical
scroll bar</pre>
```

Description

This function creates a group of list boxes what share a common vertical scroll bar. Values in all the list boxes scroll up or down when the scroll bar is dragged

Usage

```
oneVScrList(base, data)
```

Arguments

base base a tkwin object that will be the container of the list boxes to be created data data a matrix with data to be put in the list boxes

Details

The matrix should have names for its columns. The names of the list boxes to be created will be the same as the corresponding columns of the matrix.

Data in the list boxes can be sorted based on values in any of the list boxes.

Value

This function returns a list containing the tkwin objects of the list boxes created.

Author(s)

Jianhua Zhang

References

tcltk

safeFileOpen 11

See Also

```
dropdownList, tooltip
```

Examples

```
## Not run:
    ## These cannot be run by examples() but should be OK when pasted
    ## into an interactive R session with the widgetTools package loaded

testData <- matrix(c(1:50, 100:51), ncol = 2)
    colnames(testData) <- c("Column 1", "Column 2")
    base <- tktoplevel()
    tt <- oneVScrList(base, testData)

# Destroy toplevel widget
    # tkdestroy(base)

## End(Not run)</pre>
```

safeFileOpen

A function that checks to see if a connection can be made to a given file

Description

This function checks to see if a given file name exists. If so, the function returns a connection to the file. Otherwise, it returns "fileName doest exist".

Usage

```
safeFileOpen(fileName)
```

Arguments

fileName

fileName a character string for the name of a file to which a connection is to be oppened

Details

When this function is used, users have to make sure to check to see if the returnd object inherits object "connection". Otherwise, the file doest not exist or a connection has not be made.

Value

The function returns a connection object that inherits class "connection" if the file exists and is opend. Otherwise, the string "fileName doest not exist"

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Note

This function is no placed here to be used by various widgets. May be mored to a more suitable place later

Author(s)

Jianhua Zhang

See Also

file

Examples

```
write("A test file", "testFile4safeFile0pen")
tt <- safeFile0pen("testFile4safeFile0pen")
inherits(tt, "connection")
unlink("testFile4safeFile0pen")
tt <- safeFile0pen("testFile4safeFile0pen")
inherits(tt, "connection")</pre>
```

tooltip

A tcltk widget to mimic a tooltip

Description

Current teltk library does not support tooltip unless an extension is included. The function tooltip is implemented as an alternative.

Usage

```
tooltip(text, targetWidget, width = 350)
```

Arguments

text text a character string for the content of the tooltip

targetWidget targetWidget a tkwin object for the target tcltk widget to which a tool tip will

be associated

width an integer for the width (in pixels) of the tooltip

Details

Given a target tcltk widget, a tooltip will be associated with the widget. The content of the tooltip will be shown when mouse moves over the widget and disappear when mouse moves out of the widget.

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Value

This function returns invisible()

Author(s)

Jianhua Zhang

References

tcltk

See Also

dropdownList

Examples

```
## Not run:
    ## These cannot be run by examples() but should be OK when pasted
    ## into an interactive R session with the widgetTools package loaded

base <- tktoplevel()
but <- tkbutton(base, text = "Move Mouse Over Me")
tkpack(but)
tkbind(but, "<Enter>", expression(tooltip("Move mouse off me", but)))

# Destroy toplevel widget
# tkdestroy(base)

## End(Not run)
```

widget-class

Class "widget" creates a widget with primary widgets contained in the list pWidgets rendered

Description

This class takes a list of primary widgets and then creates a "widgetView" object that renders the primary widgets

Objects from the Class

Objects can be created by calls of the form new("widget", ...).

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Slots

wTitle: Object of class "character" - a character string for the title of the widget to be created pWidgets: Object of class "list" - a list of "basicPW" objects representing widget elements to be rendered

env: Object of class "environment" - an R environment for the object to work within

funs: Object of class "list" - a list of functions that will be associated with buttons on the widget to be rendered. The name of the function in the list will be the text appears on the button and the function will be executed when the button is pressed

preFun: Object of class "function" - a function that will be executed before the widget is constructed

postFun: Object of class "function" - a function that will be executed before the widget is destroyed

Methods

```
env<- signature(object = "widget"): set the value for env</pre>
wEnv signature(object = "widget"): get the value for env
funs<- signature(object = "widget"): set the value for funs
funs signature(object = "widget"): get the value for funs
postFuns<- signature(object = "widget"): set the value for postFuns</pre>
postFun signature(object = "widget"): get the value for postFuns
preFuns<- signature(object = "widget"): set the value for preFun</pre>
preFun signature(object = "widget"): get the value for preFun
pWidgets<- signature(object = "widget"): set the value for pWidgets
pWidgets signature(object = "widget"): get the value for pWidgets
updateCheck signature(object = "widget"): update the value of check buttons of the widget
     to be rendered
updateList signature(object = "widget"): update the value of list box/entry of the widget to
     be rendered
updateRadio signature(object = "widget"): update the value of radio buttons of the widget to
    be rendered
updateText signature(object = "widget"): update the value of text box of the widget to be
    rendered
wTitle<- signature(object = "widget"): set the value of wTitle</pre>
wTitle signature(object = "widget"): get the value of wTitle
```

Author(s)

Jianhua Zhang

References

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See Also

basicPW-class, widgetView-class

Examples

```
PWEnv <- new.env(hash = TRUE, parent = parent.frame(1))</pre>
label1 <- label(wName = "label1", wValue = "File Name: ", wEnv = PWEnv)</pre>
entry1 <- entryBox(wName = "entry1", wValue = "Feed me using browse",</pre>
                    wEnv = PWEnv)
browse2Entry1 <- function(){</pre>
    tempValue <- fileBrowser()</pre>
    temp <- get(wName(entry1), wEnv = PWEnv)</pre>
    wValue(temp) <- paste(tempValue, sep = "", collapse = ";")</pre>
    assign(wName(entry1), temp, env = PWEnv)
}
button1 <- button(wName = "button1", wValue = "Browse",</pre>
                      wFuns = list(command = browse2Entry1), wEnv = PWEnv)
list1 <- listBox(wName = "list1", wValue = c(Option1 = TRUE, Option2 = FALSE,</pre>
                                  Option3 = FALSE), wEnv = PWEnv)
text1 <- textBox(wName = "text1", wValue = "Feed me something",</pre>
                  wEnv = PWEnv)
label2 <- label(wName = "label2", wValue = "Select one: ", wEnv = PWEnv)</pre>
radios1 <- radioButton(wName = "radios1", wValue = c(radio1 = TRUE,</pre>
                        radio2 = FALSE, radio3 = FALSE), wEnv = PWEnv)
label3 <- label(wName = "label3", wValue = "Select one to many: ",</pre>
wEnv = PWEnv)
checks1 <- checkButton(wName = "checks1", wValue = c(check1 = TRUE,</pre>
                        check22 = FALSE, check3 = FALSE), wEnv = PWEnv)
pWidgets <- list(topRow = list(label1 = label1, entry1 = entry1,
                  button1 = button1), textRow = list(list1 = list1,
                  text1 = text1), radGroup = list(label2 = label2,
                  radios1 = radios1), chkGroup = list(label3 = label3,
                                       checks1 = checks1))
## Not run:
## These cannot be run by examples() but should be OK when pasted
## into an interactive R session with the widgetTools package loaded
aWidget <- widget(wTitle = "A test widget", pWidgets, funs = list(),
                  preFun = function() print("Hello"),
                  postFun = function() print("Bye"), env = PWEnv)
## End(Not run)
```

widgetView-class Class "widgetView", a class for a GUI type widget holding widget elements 16 widgetView-class

Description

"widgetView" renders element widgets

Objects from the Class

Objects can be created by calls of the form new("widgetView", ...). This class is for internal use by class widget-class. Users trying to create GUI type widget do not need to use this class.

Slots

```
WVTitle: Object of class "character" - a character string that will be displayed as the title of the widget to be created
vName: Object of class "character" - a character string for the vName of the widget
winid: Object of class "tkwin" - a tkwin object for the id of the top window for the widget
widgetids: Object of class "list" - a list of tkwin ids for element widgets
theWidget: Object of class "widget" - a widget object that creates the widgetView
```

Methods

```
killWin signature(tkWidget = "widgetView"): destroys the window representing the widgetView
vName<- signature(object = "widgetView"): set the value for vName</pre>
vName signature(object = "widgetView"): get the value for vName
renderWidgets signature(widgetView = "widgetView",pWidgets = "list"): takes a list of
     "basicPW" objects (pWidgets) and renders them accordingly
renewView signature(widgetView = "widgetView", pWidgets = "list"): using values con-
    tained by the "basicPW" objects of pWidgets to update the values of widget elements dis-
    played
theWidget<- signature(object = "widgetView"): set the value for theWidget
theWidget signature(object = "widgetView"): get the value for theWidget
updateDisplay signature(widgetView = "widgetView"): update the value of list box or text
    box element widgets
widgetids<- signature(object = "widgetView"): set the value of widgetids
widgetids signature(object = "widgetView"): get the value of widgetids
winid<- signature(object = "widgetView"): set the value of winid
winid signature(object = "widgetView"): set the value of winid
winWait signature(tkWidget = "widgetView"): make widgetView modal
WVTitle signature(object = "widgetView"): get the value for WVTitle
```

Author(s)

Jianhua Zhang

References

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See Also

```
widget-class,basicPW-class
```

Examples

```
## Not run:
     ## These cannot be run by examples() but should be OK when pasted
     ## into an interactive R session with the widgetTools package loaded
widgetView <- widgetView(WVTitle = "demo", vName = "widget1")
## End(Not run)</pre>
```

writeText

Functions that read from and write to tcltk widgets

Description

These functions provide some of the common read and write operations for tcltk widgets

Usage

```
writeText(widget, value, clear = TRUE)
writeList(widget, value, clear = TRUE)
getListValue(which)
getTextValue(which)
getEntryValue(which)
```

Arguments

widget	widget a tkwin object for the tcltk widget to be read or written to
value	value the text of numerical value to be written to a tcltk widget
clear	clear a boolean to indicate whether a value will append to the existing one $(FALSE)$
which	which a tkwin object for the tcltk widget whose value will be retrieved

Details

```
writeText writes to a given tcltk text box widget.
writeList writes to a given tcltk list or entry box widget.
getListValue retrieves the selected value in a tcltk list widget.
getTextValue retrieves the value of a text box.
getEntryValue retrieves the value of an entry box.
```

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Value

```
getListValue returns the selected value in a tcltk list widget.
getTextValue returns the value of a text box.
getEntryValue returns the value of an entry box.
```

Author(s)

Jianhua Zhang

References

R tcltk

See Also

basicPW-class, widget-class

Examples

```
## Not run:
    ## These cannot be run by examples() but should be OK when pasted
    ## into an interactive R session with the widgetTools package loaded
    # Create the widgets
    base <- tktoplevel()</pre>
   list <- tklistbox(base, width = 20, height = 5)</pre>
    entry <- tkentry(base)</pre>
    text <- tktext(base, width = 20, height = 5)</pre>
    tkpack(list, entry, text)
    # Write and read from the widgets
   writeList(list, c("Option1", "Option2", "Option3"))
   writeList(entry, "An Entry box")
    writeText(text, "A text box")
    \# Will be NULL if not selected
    getListValue(list)
   getTextValue(text)
    getEntryValue(entry)
# Destroy toplevel widget
     tkdestroy(base)
## End(Not run)
```

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