



RKward –

*a graphical user interface and
integrated development environment
for statistical analysis with R*

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microsoft, cologne – 26.II.2016



RKWard | in another life

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

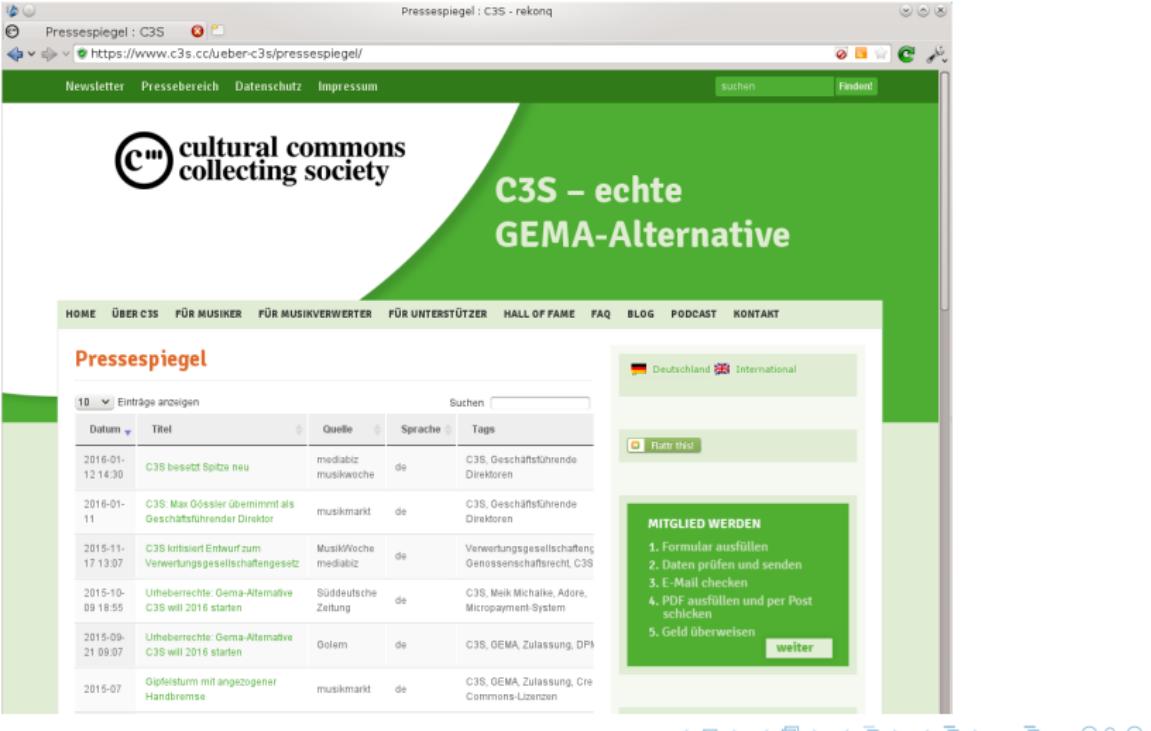
extendable

plugin concept

rkwarddev

feedback

thx



The screenshot shows a web browser window displaying the C3S Pressespiegel page. The URL is <https://www.c3s.cc/ueber-c3s/pressespiegel/>. The page features a green header with the C3S logo and the text "cultural commons collecting society". Below the header, a large green banner reads "C3S – echte GEMA-Alternative". The main content area displays a table of news articles with columns for Datum, Titel, Quelle, Sprache, and Tags. The first article listed is "C3S besetzt Spize neu". On the right side, there is a sidebar titled "MITGLIED WERDEN" with steps 1-5 for joining and a "weiter" button.

Datum	Titel	Quelle	Sprache	Tags
2016-01-12 14:30	C3S besetzt Spize neu	mediabiz musikwoche	de	C3S, Geschäftsführende Direktoren
2016-01-11	C3S: Max Gössler übernimmt als Geschäftsführender Direktor	musikmarkt	de	C3S, Geschäftsführende Direktoren
2015-11-17 13:07	C3S kritisiert Entwurf zum Verwertungsgesellschaftengesetz	MusikWoche mediabiz	de	Verwertungsgesellschaften Genossenschaftsrecht, C3S
2015-10-09 18:55	Urheberrechte: Gema-Alternative C3S will 2016 starten	Süddeutsche Zeitung	de	C3S, Melk Kithalle, Adore, Micropayment-System
2015-09-21 09:07	Urheberrechte: Gema-Alternative C3S will 2016 starten	Golem	de	C3S, OEMA, Zulassung, DP
2015-07	Olpfeisturm mit angezogener Handbremse	musikmarkt	de	C3S, OEMA, Zulassung, Creative Commons-Lizenzen

RKWard | (some of) my R packages

GUIs for R

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plots

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rkwarddev

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- ▶ **koRpus**
text analysis, POS tagging, readability
- ▶ **klausuR**
multiple choice test evaluation
- ▶ **roxyPackage**
R package for packaging R packages
- ▶ **XiMpLe**
XML parser and generator
- ▶ **rkwarddev**
RKWard plugin generator
- ▶ **iRcotofun**
a jeopardy game in R ;o)

GUIs for R

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RKWard

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data

plots

packages

configuration

extendable

plugin concept

rkwarddev

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thx

JSS special volume 49: »graphical user interfaces for R«



Journal of Statistical Software

June 2012, Volume 49, Issue 1.

<http://www.jstatsoft.org/>

Graphical User Interfaces for R

Pedro M. Valero-Mora
Universidad de Valencia

Rubén D. Ledesma
Universidad Nacional de Mar del Plata

Abstract

Since R was first launched, it has struggled to gain the support of an ever-increasing percentage of academic and professional users. However, the spread of its use among novice and occasional users of statistical software has not progressed at the same pace, which may be due to the lack of graphical user interfaces (GUIs) for R. In this article, we argue that this situation has changed in the last years and there is currently several projects that have added GUIs to R. This article describes briefly the history of GUIs for data analysis and presents some of the programs submitted to an special issue of the *Journal of Statistical Software* on GUIs for R.

Keywords: GUI, statistical software, R.

1. Introduction

Nowadays, graphical user interfaces (GUIs) are the most common way of interacting with most computer applications. Whether it is a word processor, a web browser, or a way of performing every conceivable job, its dominance has rendered the principal operating systems, application domains, and tasks. Measured it in purely statistical terms, the triumph of this paradigm is almost unquestionable and it seems clear that it will remain very popular in the foreseeable future.

However, regarding the discipline of statistics, this supremacy does not seem as dramatically clear, as many of the people working in this field seem to favor that using a typed language (such as R) is more appropriate than a GUI. We believe that this is mainly due to the fact of preferring their tasks than a GUI. Actually, we are positive that they are right, because writing up commands can be undoubtedly much more productive than using a GUI, at least as far as statistical tasks are concerned. However, this does not mean that one should always choose a command-based language is within reason. If you are going to use it very often, the novice and occasional users of statistical software may not even see sufficient reasons to justify the



Journal of Statistical Software

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<http://www.jstatsoft.org/>

RKWard: A Comprehensive Graphical User Interface and Integrated Development Environment for Statistical Analysis with R

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Prasenjit Kapat
The Ohio State University

Möck Michalke
Heinrich Heine Universität Düsseldorf

Abstract

R is a free open-source implementation of the S statistical computing language and programming environment. The current status of R is a command-line driven interface with a large number of contributed packages that make it a powerful tool for building rich. Over the past years, proprietary and non-proprietary GUI solutions have emerged, based on different technologies and paradigms, with different strengths and potential weaknesses. In this paper, we introduce RKWard, a graphical user interface for R that runs on the K desktop environment on Microsoft Windows and Mac OS X platforms, respectively, for most users. In this paper we also introduce the integrated development environment (IDE) of RKWard, which is an open-source environment for R. RKWard is based on the KDE software libraries. Statistical analysis and programming in R is supported by RKWard through a graphical user interface on KCMMSocial (interface), R, and XML. RKWard provides an excellent tool to manage different types of data objects even allowing for random editing of certain types. The object-oriented nature of the IDE allows for a highly modular design. It includes basic, linear and advanced statistical and graphical analysis, while not compromising on flexibility and modularity of the R programming environment itself.

Keywords: GUI, integrated development environment, plug-in, R.

1. Background and motivation

In mid 1993 Ihaka and Gentleman published initial efforts on the computing language and programming environment R on the r-socres mailing list. Announcements for this project were to

GUIs for R

RKWard

dialogs
console/editor
data
plots
packages
configuration

extendable

plugin concept
rkwarddev

feedback

thx



RKWard



- ▶ combines GUI and IDE
 - ▷ to satisfy both newbies and gurus
 - ▷ easy to extend
- ▶ mere desktop application
 - ▷ no server, but R backend configurable
- ▶ multi-platform (thanks to Qt)
 - ▷ MS Windows
 - ▷ OS X
 - ▷ GNU/Linux
- ▶ free software (GPL v2+)
- ▶ download: <http://rkward.kde.org>
 - ▷ part of the KDE family



RKWard | born out of frustration





► **thomas friedrichsmeier**

▷ and **many** others...

► until now **48** official releases

► some milestones:

0.1.0 (19.11.2002) first release

0.4.0 (17.10.2006) i joined the team ;o)

0.5.1 (04.08.2009) windows port

0.5.5 (15.03.2011) external plugins

0.6.0 (24.12.2012) OS X port

0.6.4 (21.12.2015) most recent release

GUIs for R

RKWard

- dialogs
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extendable

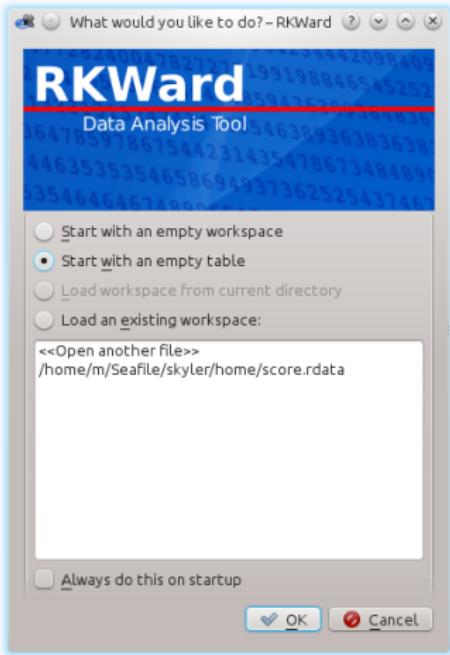
- plugin concept
- rkwarddev

feedback

thx



main window



[Unnamed Workspace] - rkward_welcome - RKWARD

File Edit View Workspace Run Data Analysis Plots Distributions Windows Settings Help

Open Create Save Back Forward

Workspace Files

Welcome to RKWARD

Summary

This help page gives a rough overview of the most important parts of RKWARD.

By default, this page is shown each time RKWARD is started. You can disable or re-enable this behavior under Settings->Configure RKWARD->General.

Introduction to RKWARD

RKWARD is a GUI frontend and IDE to R, a powerful scripting language for statistical computing. It aims to provide useful features both to experienced users of R, wishing to exploit R's scripting capabilities, as well as to users new to R, looking for an easy way to carry out statistical computation tasks.

Getting Started

Due to the large differences in prior knowledge of R, we provide two different guides for getting started with RKWARD. The first is aimed at users with some knowledge of the R language, and focuses on introducing the IDE features of RKWARD: [RKWARD for R Users](#).

The second gives a more hands on introduction to getting started with RKWARD, but does not go quite as deep. If you have never used R or RKWARD before, you should start with this guide, then later read the above page link: [RKWARD for new Users](#).

Trouble Shooting

If you encounter problems please feel free to search in [Trouble Shooting](#) first.

Missing something?

Are you missing a particular GUI dialog in the current menu? A growing number of plugins is available for separate download as R packages. See what's available for installation at Settings->Manage R packages and plugins. In the R package installation section, you can select to show packages providing graphics dialogs for RKWARD.

Still missing something?

Check out the [Introduction to Writing Plugins for RKWARD](#) to learn how easy it is to enhance RKWARD with your custom dialogs. And if you like, how to share your work with the community of RKWARD users. See the [rkward package overview](#) for RKWARD specific function for development and scripting. As another way of contributing, consider supporting the development of RKWARD with money. One easy way to give a small amount is [donating via Flattr](#).

General Information

Command log R Console Help search

Ready. /home/m/daten/R

On this page:

- Summary
- Introduction to RKWARD
- Getting Started
- Trouble Shooting
- Missing something?
- Still missing something?
- General Information

Debugger Frames

RKward | main window: workspace browser

[Unnamed Workspace] - rkwrd_welcome - RKWard

File Edit View Workspace Run Data Analysis Plots Distributions Windows Settings Help

Open Create Save

Workspace

Search

Show Hidden Objects

Name Label Type

My Workspace

- sleep
- ID Factor
- extra Numeric
- group Factor

Other Environments

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- Summary
- Introduction to RKWard
- Getting Started
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Debugger Frames

Command log R Console Help search

Ready.

/home/m/daten/R

RKWard | main window: file browser

[Unnamed Workspace] - rkward_welcome - RKWard

File Edit View Workspace Run Data Analysis Plots Distributions Windows Settings Help

Open Create Save

Workspace Files

n/r/rkwarddev/git/rkwarddev/R/

- 00_class_01_rk.JS.arr.R
- 00_class_02_rk.JS.var.R
- 00_class_03_rk.JSite.R
- 00_class_04_rk.JS.opt.R
- 00_class_05_rk.JSoset.R
- 00_class_06_rk.plugin.comp.R
- 01_methods_01_plugin2script.R
- 50_all.valid.children.R
- 50_all.valid.modifiers.R
- 60_JS.getters.default.R
- echo.R
- i18n.R
- id.R
- idq.R
- lte.R
- join.R
- js.R
- modifiers.R
- qp.R
- R.comment.R
- rk-internal.R
- rk.build.plugin.R
- rk.comment.R
- rk.get.comp.R
- rk.get.empty.e.R
- rk.get.indent.R
- rk.get.rkh.prompter.R
- rk.i18n.comment.R
- rk.JS.array.R
- rk.JS.doc.R
- rk.JS.header.R
- rk.JS.options.R
- rk.JS.optionset.R
- rk.JS.saveobj.R

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- Introduction to RKWard
- Getting Started
- Trouble Shooting
- Missing something?
- Still missing something?
- General Information

Debugger Frames

Command log R Console Help search

Ready.

/home/m/daten/R

RKWard | main window: R console

[Unnamed Workspace] - rkwrd_welcome - RKWard

File Edit View Workspace Run Data Analysis Plots Distributions Windows Settings Help

Open Create Save Interrupt running command

Workspace

Files

n/R/rkwarddev/git/rkwarddev/R

00_class_01_rk.JS.arr.R
00_class_02_rk.JSvar.R
00_class_03_rk.JSsite.R
00_class_04_rk.JS.opt.R
00_class_05_rk.JSoset.R
00_class_06_rk.plugin.comp.R
01_methods_01_plugin2script.R
50_all.valid.children.R
50_all.valid.modifiers.R
60_JS.getters.default.R
echo.R
i18n.R
id.R
idq.R
ite.R
join.R
js.R
modifiers.R
qp.R
R.comment.R
rk-internal.R
rk.build.plugin.R
rk.comment.R
rk.get.comp.R

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- Summary
- Introduction to RKWard
- Getting Started
- Trouble Shooting
- Missing something?
- Still missing something?
- General Information

```
> data(sleep)
> summary(sleep)
   extra group ID
Min. :-1.600 1:10 1 :2
1st Qu.:-0.025 2:10 2 :2
Median : 0.950 3 :2
Mean : 1.540 4 :2
3rd Qu.: 3.400 5 :2
Max. : 5.500 6 :2
          (other):8
```

Command log R Console Help search

/home/m/daten/R

RKward | main window: debugger

[Unnamed Workspace] - rkwrd_welcome - RKWard

File Edit View Workspace Run Data Analysis Plots Distributions Windows Settings Help

Open Create Save

Workspace

Files

n/R/rkwarddev/git/rkwarddev/R

00_class_01_rk.JSarr.R
00_class_02_rk.JSvar.R
00_class_03_rk.JSsite.R
00_class_04_rk.JSopt.R
00_class_05_rk.JSoset.R
00_class_06_rk.plugin.comp.R
01_methods_01_plugin2script.R
50_all.valid.children.R
50_all.valid.modifiers.R
60_JS.getters.default.R
echo.R
i18n.R
id.R
idq.R
ite.R
join.R
js.R
modifiers.R
qp.R
R.comment.R
rk-internal.R
rk.build.plugin.R
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Active calls

Not in a debugger context

On this page:

- Summary
- Introduction to RKWard
- Getting Started
- Trouble Shooting
- Missing something?
- Still missing something?
- General Information

Debugger Frames

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> summary(sleep)
   extra   group    ID
Min.   :-1.600  1:10   1 :2
1st Qu.:-0.025  2:10   2 :2
Median : 0.950   3 :2
Mean   : 1.540   4 :2
3rd Qu.: 3.400   5 :2
Max.   : 5.500   6 :2
          (other):8
```

Command log R Console Help search

/home/m/daten/R

RKward | main window: online help

[Unnamed Workspace] - t.test.html - RKward

File Edit View Workspace Run Data Analysis Plots Distributions Windows Settings Help

Open Create Save Back Forward

Search

Workspace

Name Label Type

My Workspace

sleep

- ID Factor
- extra Numeric
- group Factor

Other Environments

rkward_welcome sleep t.test.html

t.test (stats)

Student's t-Test

Description

Performs one and two sample t-tests on vectors of data.

Usage

```
t.test(x, ...)

## Default S3 method:
t.test(x, y = NULL,
       alternative = c("two.sided", "less", "greater"),
       mu = 0, paired = FALSE, var.equal = FALSE,
       conf.level = 0.95, ...)

## S3 method for class 'formula'
t.test(formula, data, subset, na.action, ...)
```

Arguments

x a (non-empty) numeric vector of data values.

y an optional (non-empty) numeric vector of data values.

Update

> summary(sleep)

extra	group	ID
Min. :-1.600	1:10	1 :2
1st Qu.:-0.025	2:10	2 :2
Median : 0.950	3	:2
Mean : 1.540	4	:2
3rd Qu.: 3.400	5	:2
Max. : 5.500	6	:2
	(Other):8	

> ?t.test

Command log R Console Help search

/home/m/daten/R

Ready.

RKWard | main window: results in HTML

[Unnamed Workspace] - Output rk_out.html - RKWard

File Edit View Workspace Run Data Analysis Plots Distributions Windows Settings Help

Open Create Save Flush Output Refresh Output

Search Show Hidden Objects

Workspace Name Label Type

My Workspace sleep

- ID Factor
- extra Numeric
- group Factor

Other Environments

rkward_welcome sleep t.test.html Output rk_out.html

Show TOC Go to top Debugger Frames

Two-sample t test power calculation

Parameters

- Parameter to determine: Sample size
- alternative: two.sided

Mon Feb 8 22:30:07 2016

	Parameters
n	175.3847
d	0.3000
sig.level	0.0500
power	0.8000

Note: n is number in *each* group

Interpretation of effect size d (according to Cohen):

small	medium	large
0.2	0.5	0.8

[Run again](#)

Update

```
> summary(sleep)
   extra      group     ID
Min. :-1.600  1:10    1 :2
1st Qu.:-0.025 2:10    2 :2
Median : 0.950 3       3 :2
Mean   : 1.540 4       4 :2
3rd Qu.: 3.400 5       5 :2
Max.   : 5.500 6       6 :2
              (Other):8

> ?t.test
```

Command log R Console Help search

/home/m/daten/R

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

rkwarddev

feedback

thx



dialogs

RKWard | dialog windows

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

rkwrddev

feedback

thx

data

- ANOVA >
- Generate random data**
- Multiple Choice >
- Recode categorical data
- Sort data
- Subset data.frame

analysis

- Basic Statistics**
- Descriptive Statistics
- ANOVA >
- Cluster analysis >
- Cohen's Kappa
- Correlation >
- Crosstabs >
- Factor analysis >
- Item Response Theory >
- means >
- Moments >
- Multidimensional scaling
- Multiple Choice >
- Outlier Tests >
- Power Analysis**
- Regression >
- Text Analysis >
- Time Series >
- Variances / Scale >
- Wilcoxon Tests >

plots

- Barplot
- Box Plot
- Cluster analysis >
- Density Plot
- Dotchart
- ECDF Plot
- Factor analysis >
- Generic Plot
- Histogram**
- Interaction plot
- Item Response Theory >
- Pareto Chart
- Piechart
- Scatterplot
- Scatterplot Matrix
- Stem-and-Leaf Plot
- Stripchart

RKWard | dialogs: power analysis

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

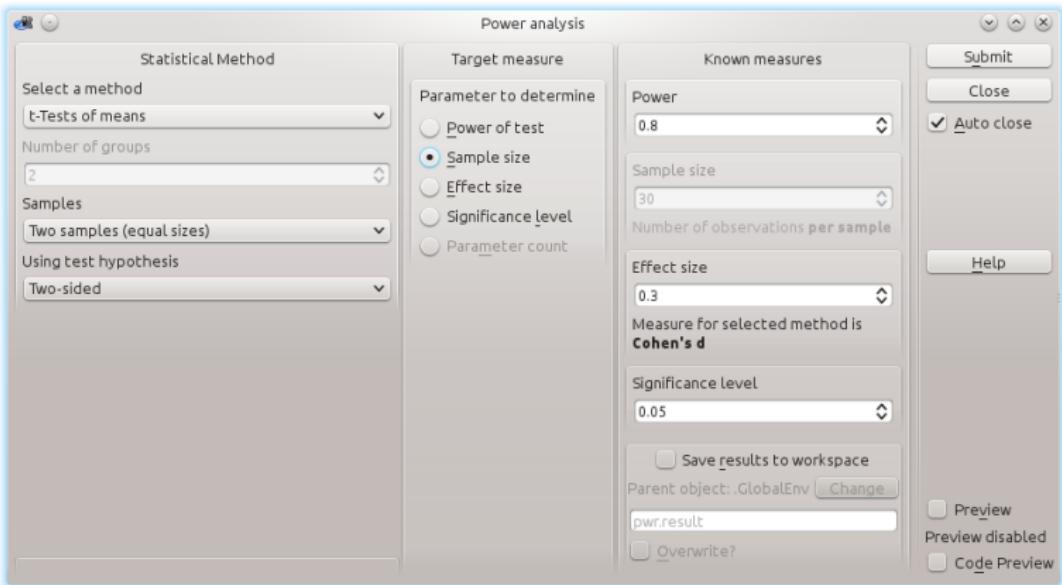
extendable

plugin concept

rkwarddev

feedback

thx



RKWard | dialogs: mandatory fields

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

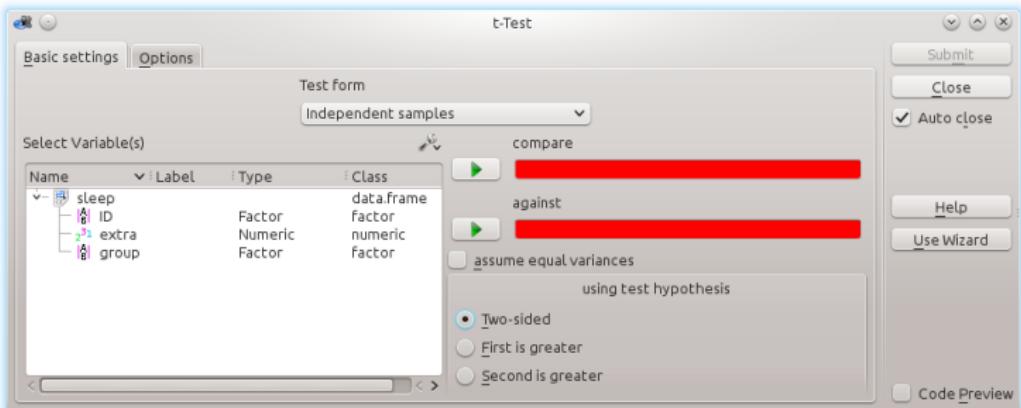
extendable

plugin concept

rkwarddev

feedback

thx



RKWard | dialogs: code

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

rkwrddev

feedback

thx

t-Test

Basic settings Options

Test form: Independent samples

Select Variable(s)

Name	Label	Type	Class
sleep	ID	Factor	factor
extra		Numeric	numeric
group		Factor	factor

compare: [redacted]

against: [redacted]

assume equal variances

using test hypothesis:

Two-sided

First is greater

Second is greater

Code Preview

```
## Compute
result <- t.test (x=, y=, alternative="two.sided")
## Print result
rk.header (result$method, parameters=list("Comparing"=names[1],
  "against"=names[2],
  "H1"=rk.describe.alternative (result),
  "Equal variances"="not assumed"))

rk.results (list (
  "Variable Name"=names,
  "estimated mean"=result$estimate,
```



RKWard | dialogs: wizard

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

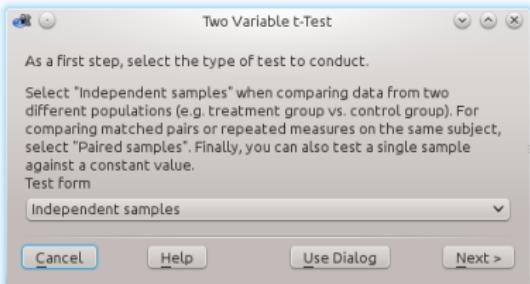
extendable

plugin concept

rkwaddev

feedback

thx



RKward | dialogs: online help

[Unnamed Workspace] - t_test - RKward

File Edit View Workspace Run Data Analysis Plots Distributions Windows Settings Help

Open Create Save Back Forward

t_kward_welcome sleep t.test.html Output rk_out.html t_test

t-Test

[Use t-Test now](#)

Summary

t-Test (two variable paired or independent samples, or one variable).

Usage

Choose two numeric vectors or one vector and a constant to compare against each other. For two samples, specify whether the variables are paired or independent samples. For details, see below.

GUI settings

Basic settings

Test form
Choose whether you want a two samples test (paired samples or independent samples), or to test a single variable against a constant

compare
A numeric vector for the first variable

against
A numeric vector for the second variable. Available for two samples tests only.

against
A numeric constant. Available for tests against constant only.

assume equal variances
Whether to assume equal variances for the two samples (for independent samples t-test, only). This option is implied for a paired test.

using test hypothesis
Alternative hypothesis (H_1) of the test.

Options

Show Confidence Interval
Whether to print the confidence interval of the estimated mean.

On this page:
[Summary](#)
[Usage](#)
[GUI settings](#)
[Related functions and pages](#)
[Dependencies](#)
[About](#)

Debugger Frames

Command log R Console Help search

/home/m/daten/R

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

rkwarddev

feedback

thx



R console & code editor

RKWard | R console & code editor

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

rkwrddev

feedback

thx

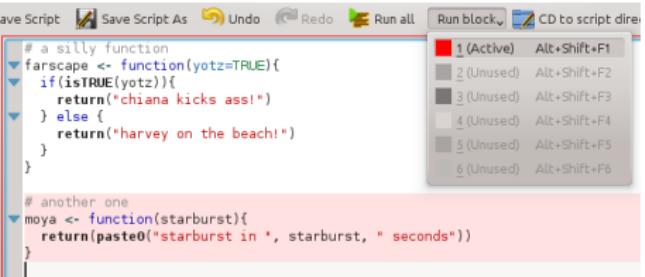
- ▶ syntax highlighting
- ▶ code hinting
- ▶ code folding
- ▶ code blocks

R console:

```
> foo <- function(x){
+   return(x+2)
+ }
> foo(3)
[1] 5
> cat(|
```

cat(..., file="", sep=" ", fill=FALSE, labels=NULL,
append=FALSE)

code editor:



The screenshot shows the RKWard code editor interface. The main window displays R code with syntax highlighting: function names in blue, variable names in black, and comments in red. The code includes two functions: `farscape` and `moya`. A context menu is open over the second function, showing options like "Run block" and "CD to script directory". To the right of the menu, a keybinding palette lists several keyboard shortcuts for different actions.

```
# a silly function
farscape <- function(yotz=TRUE){
  if(isTRUE(yotz)){
    return("chiana kicks ass!")
  } else {
    return("harvey on the beach!")
  }

# another one
moya <- function(starburst){
  return(paste0("starburst in ", starburst, " seconds"))
}
```

1 (Active)	Alt+Shift+F1
2 (Unused)	Alt+Shift+F2
3 (Unused)	Alt+Shift+F3
4 (Unused)	Alt+Shift+F4
5 (Unused)	Alt+Shift+F5
6 (Unused)	Alt+Shift+F6

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

rkwarddev

feedback

thx



working with data
import/edit/export

RKWard | data import/export

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

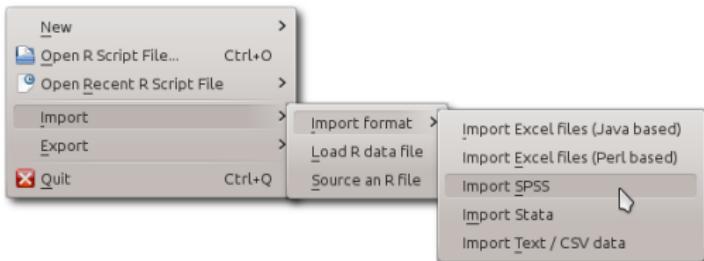
extendable

plugin concept

rkwarddev

feedback

thx



RKWard | import SPSS files

GUIs for R

RKWard

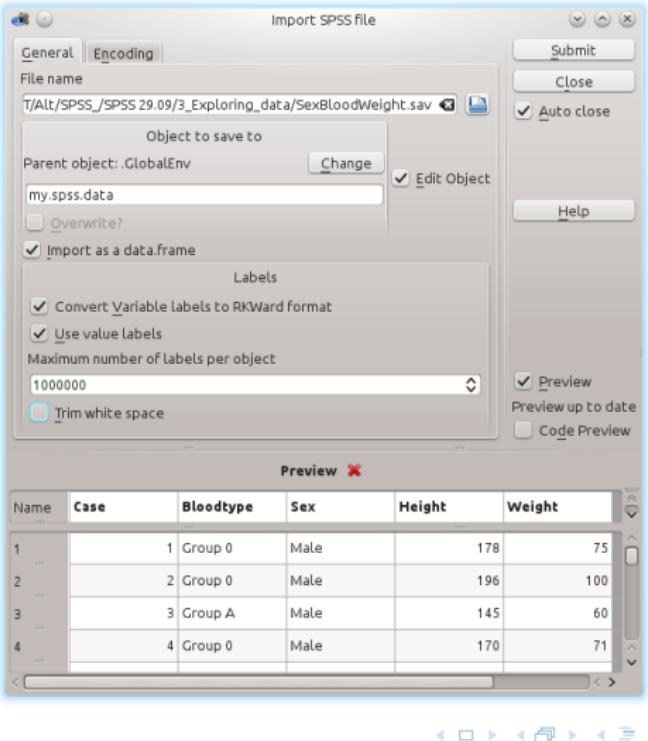
- dialogs
- console/editor
- data**
- plots
- packages
- configuration

extendable

- plugin concept
- rkwarddev

feedback

thx



RKward | data.frame editor

[Unnamed Workspace] - sleep - RKward

File Edit View Workspace Run Data Analysis Plots Distributions Windows Settings Help

Open Create Save Cut Copy Paste Paste Inside selection Paste Inside table Lock Unlock

Workspace Search

Files My Workspace sleep extra group ID Factor Numeric Factor

extra group ID

Name extra group ID

Label

Type Numeric Factor Factor

Format

Levels 1:#,##0 1:#,##0;#3#,##0;

0.7 1 1
-1.6 1 2
<NA> 1 3
-1.2 1 4
foo 1 5
3.4 1 6
3.7 1 7
0.8 1 8
0 1 9
2 1 10
1.9 2 1

Type on these fields to add new columns

Update

```
> data(sleep)
> summary(sleep)
   extra    group     ID
Min. :-1.600  1:10  1 :2
1st Qu.:-0.025 2:10  2 :2
Median : 0.950 3      3 :2
Mean   : 1.540 4      4 :2
3rd Qu.: 3.400 5      5 :2
Max.   : 5.500 6      6 :2
          (other):8
```

Command log R Console Help search

/home/m/daten/R

Ready.

RKWard | export CSV files

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

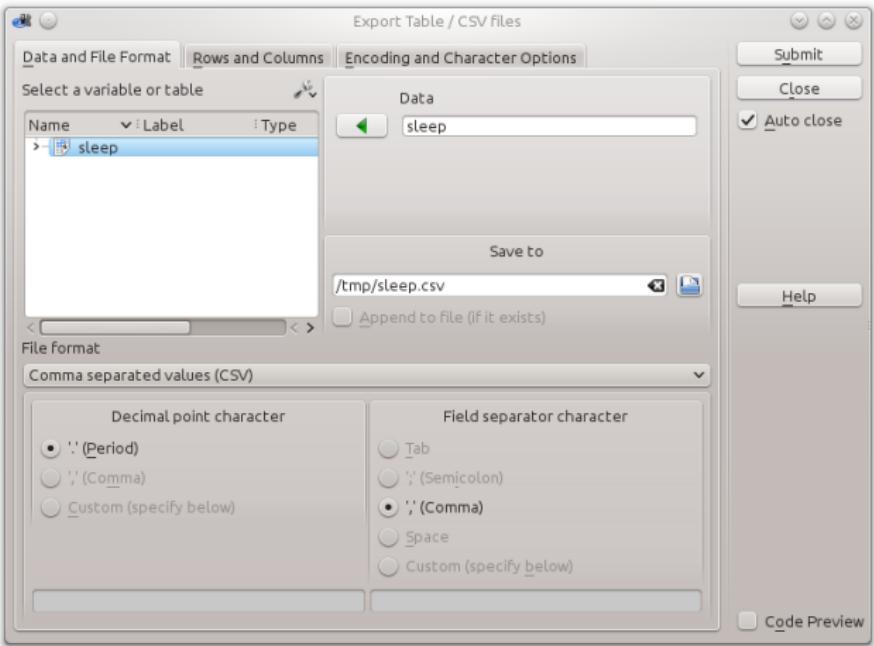
extendable

plugin concept

rkwarddev

feedback

thx



GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

rkwarddev

feedback

thx



plots
preview, history & export

RKWard | plot preview, history & export

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

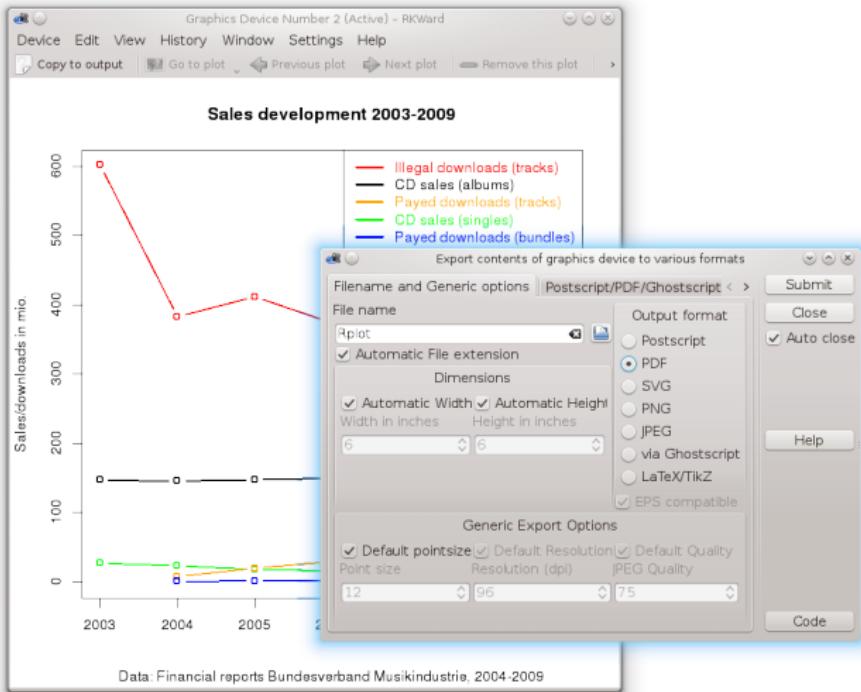
extendable

plugin concept

rkwarddev

feedback

thx



RKWard | export to TikZ format (L^AT_EX)

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

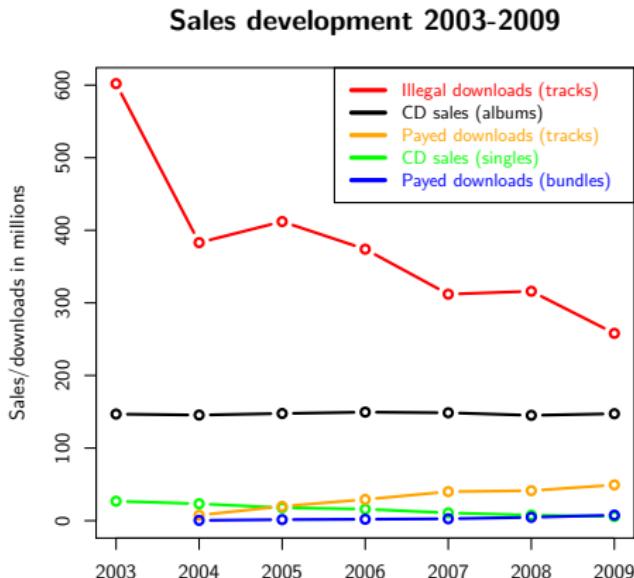
extendable

plugin concept

rkwarddev

feedback

thx



Data: Financial reports Bundesverband Musikindustrie, 2004-2009

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

rkwarddev

feedback

thx



package management

RKWard | R packages: installed locally

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

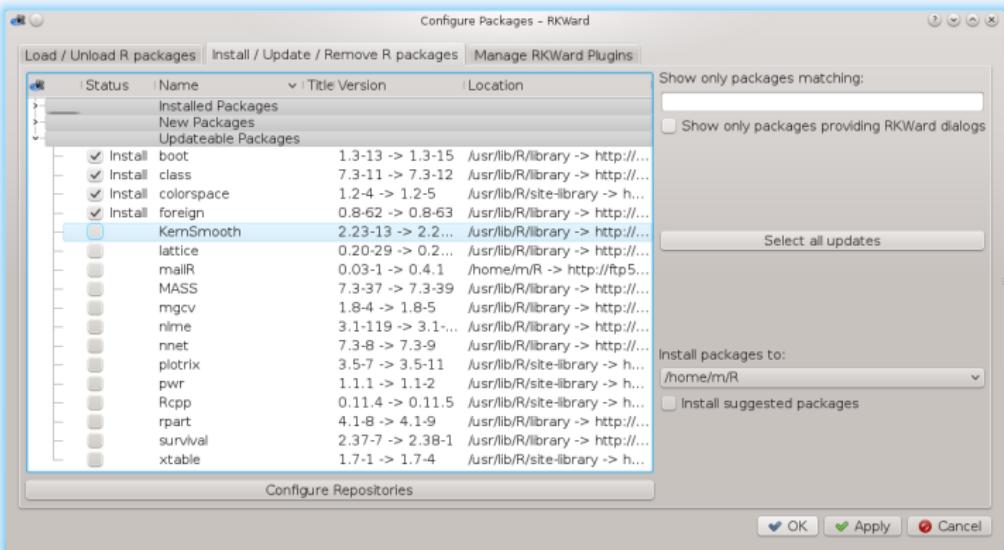
extendable

plugin concept

rkwrddev

feedback

thx



GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

rkwarddev

feedback

thx



configuration

RKWard | configuration

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

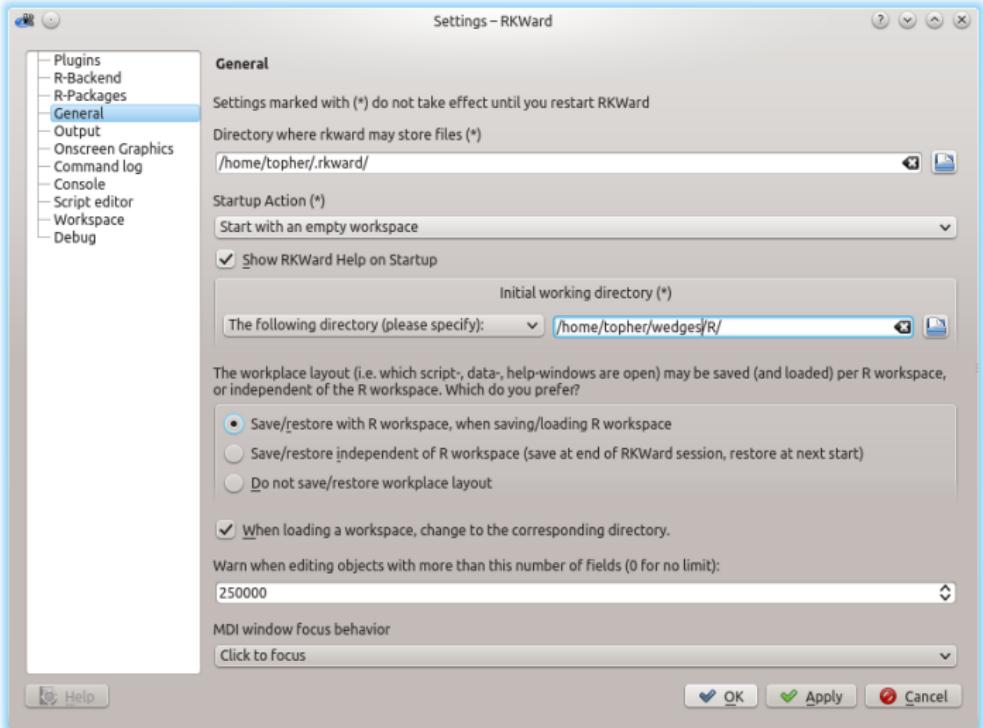
extendable

plugin concept

rkwarddev

feedback

thx



GUIs for R

RKWard

- dialogs
- console/editor
- data
- plots
- packages
- configuration

extendable

- plugin concept

- rkwarddev

feedback

thx



plugin concept

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

rkwarddev

feedback

thx

- ▶ **dialogs** are implemented as plugins
 - ▷ QA: support for unit tests
 - ▷ i18n: support for translations
- ▶ you can **extend RKWard** with your own plugins
 - ▷ can be packaged/installed as **R packages**
 - ▷ <https://github.com/rkward-community>
 - ▷ rk.ANOVA
 - ▷ rk.ClusterAnalysis
 - ▷ rk.FactorAnalysis
 - ▷ rk.gitInstall
 - ▷ rk.MultidimensionalScaling
 - ▷ ...

RKWard | R packages: RKWard plugins

GUIs for R

RKWard

dialogs
console/editor
data
plots
packages
configuration

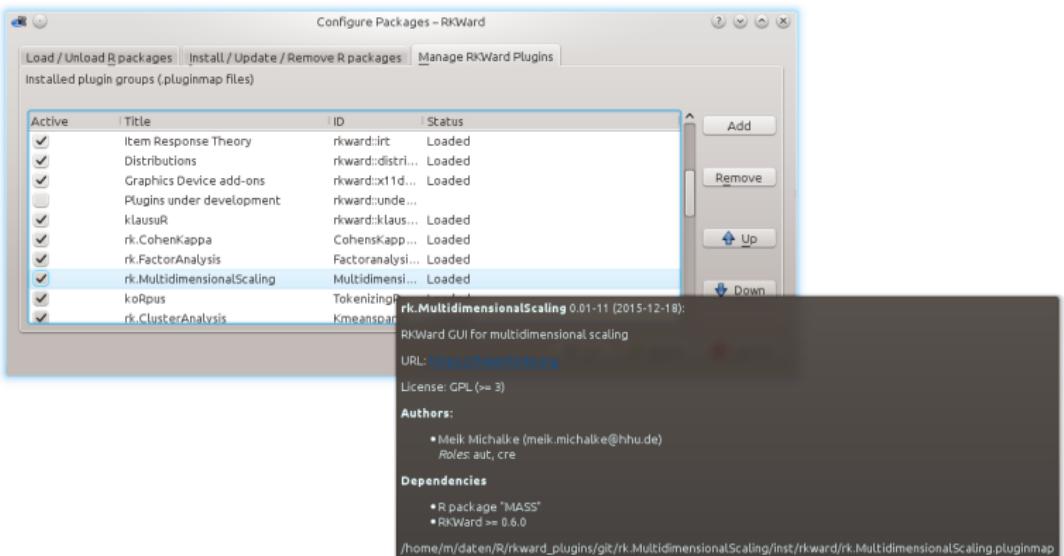
extendable

plugin concept

rkwarddev

feedback

thx



RKWard | plugins: XML & JavaScript

GUIs for R

RKWard

- dialogs
- console/editor
- data
- plots
- packages
- configuration

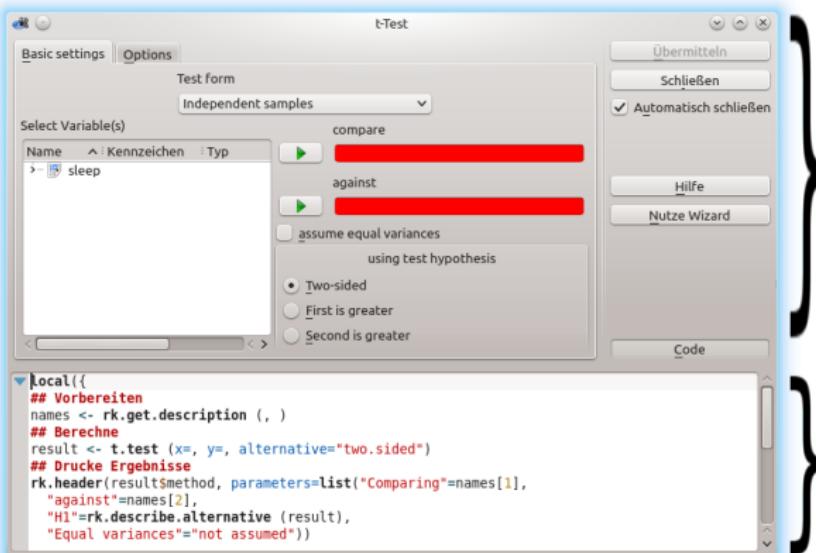
extendable

plugin concept

rkwrddev

feedback

thx



XML

JS

RKWard | example: radio button

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

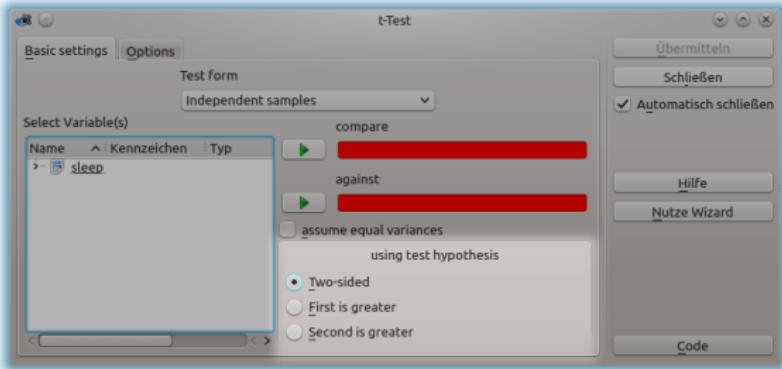
rkwarddev

feedback

thx

radio button: define GUI in XML

```
<radio id="hypothesis" label="using test hypothesis">
    <option value="two.sided" label="Two-sided" />
    <option value="greater" label="First is greater" />
    <option value="less" label="Second is greater" />
</radio>
```



RKWard | example: radio button

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

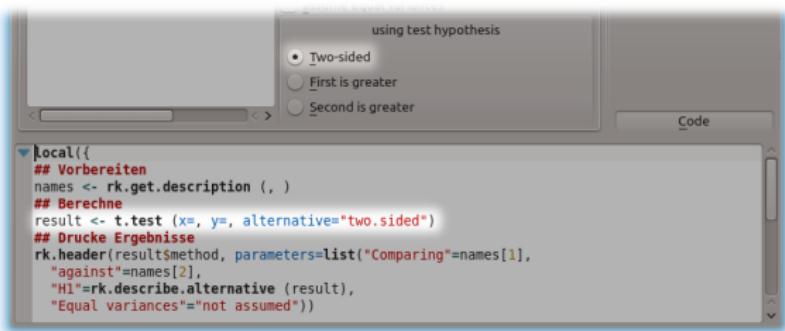
rkwarddev

feedback

thx

radio button: generate R code with JavaScript

```
var hypothesis = getValue("hypothesis");
var x = getValue("x");
var y = getValue("y");
echo("result <- t.test (x=" + x + ", y=" + y);
echo(", alternative=\"" + hypothesis + "\\"\n");
```



GUIs for R

RKWard

- dialogs
- console/editor
- data
- plots
- packages
- configuration

extendable

- plugin concept
- rkwarddev

feedback

thx



rkwarddev

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

rkwarddev

feedback

thx

how-to as vignette in the package

RKWard plugin development with the rkwarddev package

m.eik michalke

November 9, 2014

Writing plugins for RKWard means writing at least two XML files (a GUI description and a plugin XML); one JavaScript file (to create the R code for your plugin), and for each function you want to implement, a DESCRIPTION file. Furthermore, all of these files need to be in a certain directory structure.

This vignette will try to simplify this, by walked you through all the listed tasks in just one R script.

1 About the package

You may ask why we need a whole R script to generate plugins, if one could just drop-in a XML and a JavaScript file. First of all, you don't have to use this package at all, it's totally fine to create your plugin how ever you like. The main reason is, that this package is designed to make the creation of a new plugin as simple as possible. That is, if you didn't yet read the introduction to Writing Plugins for RKWard,¹ please do so before you start working with this package. Once you're over you noticed how plugins in RKWard actually work, just come back here.

¹<http://rkward.kde.org/doc/manuals/rkward/index.html>

1

```
<checkbox id="cls_Check" label="Check me" value="true" />
<checkbox id="cls_CheckMe" label="Me, check me?" value="true" checked="true" />
</frame>
</frame>
</vbox>
</dialog>

Now, wouldn't it be nice to see how that looks like in RKWard? Well, you can:
> rkwd-plugin-electron
+ ./myPlugin/electron
+ ./myPlugin/electron/plugins
+ ./myPlugin/electron/plugins/main
+ ./myPlugin/electron/plugins/main/checkboxes
+ ./myPlugin/electron/plugins/main/checkboxes/cls
+ ./myPlugin/electron/plugins/main/checkboxes/cls/cls_Check
+ ./myPlugin/electron/plugins/main/checkboxes/cls/cls_CheckMe

For filename "Example plugin" is renamed to "ExamplePlugin".
[1] "ExamplePlugin/ExamplePlugin"

Although we did not mention the XML description of our plugin, it is still generated when we run a full plugin. Just R-DEB makes sure that RDEB recognises the new plugin immediately after it was created, and when RDEB will run under it's own up, too.
```



Not bad for less than 20 short lines of code. This makes plugin design both very efficient and flexible: because you want to re-arrange the order of elements or replace them with completely different (ui)look/layouts, all you need to do is to change the

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

rkwarddev

feedback

thx

functions for XML & JavaScript

```
> hypo <- rk.XML.radio(label="using test hypothesis", id.name="hypothesis",
+   options=list(
+     "Two-sided"=c(val="two.sided"),
+     "First is greater"=c(val="greater"),
+     "Second is greater"=c(val="less")
+   )
+ )
> hypo
<radio id="hypothesis" label="using test hypothesis">
  <option label="Two-sided" value="two.sided" />
  <option label="First is greater" value="greater" />
  <option label="Second is greater" value="less" />
</radio>
> cat(echo("", alternative="", hypo, "\n"))
echo("", alternative="" + hypothesis + "\n");
```

GUIs for R

RKWard

- dialogs
- console/editor
- data
- plots
- packages
- configuration

extendable

- plugin concept
- rkwarddev

feedback

thx



»developers, developers, developers...«

RKWard | feedback

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

rkwarddev

feedback

thx



- ▶ download: <http://rkward.kde.org>
- ▶ feedback: rkward-devel@kde.org
- ▶ twitter: [@RKWardNet](https://twitter.com/RKWardNet)

GUIs for R

RKWard

dialogs

console/editor

data

plots

packages

configuration

extendable

plugin concept

rkwarddev

feedback

thx

thx!

questions? ideas? comments?
<meik.michalke@hhu.de>
twitter: [@yrlaNor](https://twitter.com/yrlaNor)

references

- ▶ RKWard Development Team (2015). RKWard Version 0.6.4.
<http://rkward.kde.org>
- ▶ Rödiger, S., Friedrichsmeier, T., Kapat, P. & Michalke, M. (2012). RKWard: A comprehensive graphical user interface and integrated development environment for statistical analysis with R. *Journal of Statistical Software*, 49(9).
- ▶ Michalke, M. (2015). rkwarddev: A collection of tools for RKWard plugin development. R package version 0.08-1.
<http://files.kde.org/rkward/R/pckg/rkwarddev/>

