

Package ‘teachingApps’

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Type Package

Title Apps for Teaching Statistics, R Programming, and Shiny App Development

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Description Contains apps and gadgets for teaching data analysis and statistics concepts along with how to implement them in R. Includes tools to make app development easier and faster by nesting apps together.

URL <https://github.com/Auburngrads/teachingApps>

BugReports <https://github.com/Auburngrads/teachingApps/issues>

Encoding UTF-8

License GPL (>= 2)

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add_css	<i>Add teachingApps CSS style rules to an app</i>
---------	---

Description

Add teachingApps CSS style rules to an app

Usage

```
add_css()
```

Details

This function should not be called directly but must be included within the body of an app's ui

Value

teachingApps style rules defined to an app

See Also

[add_theme](#)

add_logo	<i>Adds a branding logo to the footer of a navbarPage app</i>
----------	---

Description

Adds a branding logo to the footer of a navbarPage app

Usage

```
add_logo(  
  app_dir = getShinyOption("appDir"),  
  git_user = getShinyOption("gitUser"),  
  icon = getShinyOption("icon"),  
  img = getShinyOption("img")  
)
```

Arguments

app_dir	character Directory in which the app files are located
git_user	character GitHub account username (see details)
icon	character Name of a fontAwesome icon printed in the app footer
img	character Path to an image printed in the app footer

Value

A fontAwesome icon or an image printed in the footer of a navbarPage app

See Also

[create_logo](#)

add_options	<i>Pass objects and customization options to a shiny app</i>
-------------	--

Description

Provides a general method for passing arguments to shiny apps allowing for dynamic customization.

Usage

```
add_options(  
  opts,  
  dir,  
  theme = "flatly",  
  icon = NULL,  
  img = NULL,  
  git_user = NULL  
)
```

Arguments

opts	A list of additional options or objects to pass to a shiny app
dir	A character string indicating the path to the directory containing ui.R and server.R
theme	A character string naming a Bootstrap color theme (used by shinythemes::shinytheme)
icon	A character string naming a FontAwesome icon to be placed in the footer of a navbarPage app
img	A character string for the path/url of an image to be placed in the footer of a navbarPage app
git_user	A character string for github username used in the branding link

Details

Shiny apps are not functions. Thus, customization options cannot be passed to a shiny app as simply as arguments are passed between functions. Further, the manner in which objects are loaded prior to deploying an app differ if the app will be published as a stand-alone or embedded within an rmarkdown document. Assigning objects as shiny::shinyOptions ensures that these values are passed to a shiny app and can be deployed.

Value

A list of shiny options set with shinyOptions

See Also

[add_css](#)

[add_logo](#)

add_packages	<i>Install and load an R package</i>
--------------	--------------------------------------

Description

Install and load an R package

Usage

```
add_packages(pkg = NULL, repo = NULL, pub = FALSE)
```

Arguments

pkg	character Name of a package to be installed/loaded
repo	character Name of the repository from which the package should be installed.
pub	logical variable indicating whether the app be published (see details)

Details

If repo = NULL the package will be installed from the CRAN. Otherwise, repo is a character string that referring to the GitHub account in which the package is located.

When publishing apps on shinyapps.io or shinyServer, attempting to install .packages will result in an error. Calls to install .packages should not be included within an app.

Value

A printed shiny app

add_rmd	<i>Add an rmarkdown file to an app</i>
---------	--

Description

Run inline and stand-alone code chunks and include results as part of a shiny app. Include LaTeX-typeset equations with MathJax

Usage

```
add_rmd(rmd, path)
```

Arguments

rmd	character Name of an rmarkdown file saved in the app directory
path	Path to a file outside of the app directory

See Also

[add_server](#) [add_ui](#)

Examples

```
## Not run:  
# see examples in add_server and add_ui documentation  
  
## End(Not run)
```

add_server	<i>Add the server of one app to the server of another app</i>
------------	---

Description

Sources a server .R file before parsing and evaluating its contents in a specified environment

Usage

```
add_server(app, path, env = NULL)
```

Arguments

app	Name of the teachingApp from which the content of the server .R will be pulled
path	Path to a directory containing the app from which the content of the server .R will be pulled
env	Environment in which the call is made, typically environment()

Details

Currently, this function can be used to insert an server into a navbarPage app. The types of apps that can be inserted are:

- fluidPage
- bootstrapPage
- pageWithSidebar
- basicPage
- fixedPage

A server can be added as an entire tabPanel or as a row within within a tabPanel portion of a shiny app.

May be used with apps stored in packages other than teachingApps. However, apps are assumed be stored in the apps/ directory located at top level of the package.

Value

An Observer-class object resulting from evaluating a server .R file

See Also[add_ui](#), [add_rmd](#)**Examples**

```
## Not run:

## server.R from app: 'maximum_likelihood'

server_ml <- system.file('apps',
                        'maximum_likelihood',
                        'server.R',
                        package = 'teachingApps')
browseURL(server_ml)

## server.R from app: 'distribution_weibull'

server_dw <- system.file('apps',
                        'distribution_weibull',
                        'server.R',
                        package = 'teachingApps')
browseURL(server_dw)

## End(Not run)
```

`add_theme`*Add a bootswatch color theme to an app*

Description

Add a bootswatch color theme to an app

Usage

```
add_theme(theme = NULL)
```

Arguments

theme character A bootswatch theme name (see details)

Details

This function should not be called directly but is invoked when an app is rendered.

Themes are provided by calling `shinythemes::shinytheme`, therefore available theme names are those provided by the `shinythemes` package. By default, `theme = 'flatly'`

`add_ui`*Add the UI of one app within the UI of another app*

Description

Sources a `ui.R` file before parsing and evaluating its contents in a specified environment

Usage

```
add_ui(app, path)
```

Arguments

<code>app</code>	Name of the app from which the content of the <code>ui.R</code> will be pulled
<code>path</code>	Path to a directory containing the app from which the content of the <code>ui.R</code> will be pulled

Details

Currently, this function can be used to insert an `server` into a `navbarPage` app. The types of apps that can be inserted are:

- `fluidPage`
- `bootstrapPage`
- `pageWithSidebar`
- `basicPage`
- `fixedPage`

A `server` can be added as an entire `tabpanel` or as a row within within a `tabpanel` portion of a shiny app.

May be used with apps stored in packages other than `teachingApps`. However, apps are assumed be stored in the `apps/` directory located at top level of the package.

Value

A list of length 2

<code>head</code>	A sub list containing the HTML content within the <code><head></code> tag
<code>body</code>	A sub list containing the HTML content within the <code><body></code> tag

See Also

[add_server](#) [add_rmd](#)

Examples

```
## Not run:

## ui.R from app: 'maximum_likelihood'

ui_ml <- system.file('apps',
                     'maximum_likelihood',
                     'server.R',
                     package = 'teachingApps')
browseURL(ui_ml)

## ui.R from app: 'distribution_weibull'

ui_dw <- system.file('apps',
                     'distribution_weibull',
                     'server.R',
                     package = 'teachingApps')
browseURL(ui_dw)

## End(Not run)
```

add_update

Add an update to a shiny app

Description

Pass app updates from a local inst directory to an app in an installed package

Usage

```
add_update(local_pkg, ..., app_name, open_dir = FALSE, update_css = FALSE)
```

Arguments

local_pkg	character Path to the local version of the package from which updates will be passed
...	Additional directory names passed to file.path() (see details)
app_name	character Name of the app to be updated
open_dir	logical If TRUE, browseURL() is called to view the files in the app directory
update_css	logical If TRUE the css file is updated

Details

This function enables ultra-fast updates to shiny apps without needing to rebuild the package. It is assumed that two versions of a package exist on the user's machine. The first version is an installed package stored in the user's library, while the second version is a pre-compiled (in-work) version of the package. This function allows users to pass updates to an app from the in-work version of the package to the installed version while ensuring that the app can be deployed/published. Because files in the `inst/` directory aren't compiled when packages are built, updates can be passed to an installed package. This is useful for testing changes made to an app without re-building the package each time.

The `local_pkg` argument can be specified by providing a full file path to any file in the un-compiled version of the package. The root directory of the in-work package is located using `rprojroot::find_root`. The root directory of the installed version of the package is located using `devtools::inst()`. Any changes made to an app in the in-work package are passed to the app within the installed version of the package stored in the user's package library.

The `...` arguments are passed `file.path()` and name the directories between the package root directory and the `app_name/` directory. Note: the `inst` has already been provided and should not be included. For `update_css=TRUE` the `...` argument specifies the directories between the package root and the directory in which the `css` files are stored.

Examples

```
# In the \code{teachingApps} package, apps are stored in the
# \code{inst/apps/} directory.
## Not run:
teachingApps::add_update(local_pkg = file.choose(),
                          'apps',
                          app_name = 'maximum_likelihood')

## End(Not run)

# Open an app directory to make and push updates

## Not run:
teachingApps::add_update(local_pkg = file.choose(),
                          'apps',
                          app_name = 'maximum_likelihood',
                          open_dir = TRUE)

## End(Not run)
```

Description

Density, distribution function, quantile function and random generation for the BISA distribution with location `loc` and scale `scale`.

Usage

qbisa(p, shape, scale = 1)

pbisa(q, shape, scale = 1)

dbisa(x, shape, scale = 1)

rbisa(n, shape, scale = 1)

Arguments

p	Vector of probabilities
shape	Shape parameter
scale	Scale parameter
q	Vector of quantiles
x	Vector of quantiles
n	Number of observations

Details

If shape is not specified, a default value of 1 is used.

The Birnbaum-Saunders distribution with shape β and scale θ has density

$$f(x; \theta, \beta) = \frac{\sqrt{\frac{x}{\theta}} + \sqrt{\frac{\theta}{x}}}{2\beta x} \phi_{NOR}(z), \quad x \geq 0$$

where $\phi_{NOR}(z)$ is the density of the standard normal distribution and

$$z = \frac{1}{\beta} \left(\sqrt{\frac{x}{\theta}} - \sqrt{\frac{\theta}{x}} \right)$$

Value

dbisa gives the density, pbisa gives the distribution function, qbisa gives the quantile function, and rbisa generates random observations.

The length of the result is determined by n for rbisa, and is the maximum of the lengths of the numerical arguments for the other functions.

The numerical arguments other than n are recycled to the length of the result.

Source

Birnbaum, Z. W.; Saunders, S. C. (1969), "A new family of life distributions", *Journal of Applied Probability*, 6 (2): 319–327, JSTOR 3212003, doi:10.2307/3212003

`create_logo`*Create a branding logo for a teachingApp*

Description

Create a branding logo for a teachingApp

Usage

```
create_logo(app_dir = NULL, git_user = NULL, icon = NULL, img = NULL)
```

Arguments

<code>app_dir</code>	character	Directory in which the app files are located
<code>git_user</code>	character	GitHub account username (see details)
<code>icon</code>	character	Name of a fontAwesome icon printed in the app footer
<code>img</code>	character	Path to an image printed in the app footer

Details

This function should not be called directly, but is invoked by `add_options` when an app is rendered.

By default, the branding logo is the GitHub fontAwesome icon (`'fa fa-github'`). If `img` is specified, it takes precedence over `icon`.

Hovering over the logo will reveal a link to view the code used to create the app. This is helpful in a teaching environment, where students often are interested in understanding how an app functions. The URL for the link is of the form (`https://github.comgit_userapp_pkgblob/master/inst/apps`) where `app_pkg` is created dynamically.

Value

HTML code for inserting a logo (icon or image) in the footer of a `navbarPage` app

See Also

[add_options](#)

[add_logo](#)

 degengl *The Extended Generalized Gamma Distribution*

Description

The Extended Generalized Gamma Distribution

Usage

```
degengl(x, mu, sigma, delta)
```

```
pegeng(q, mu, sigma, delta)
```

```
qegengl(p, mu, sigma, delta, smalldelta = 1e-04)
```

Arguments

x	A numeric vector of observed values
mu	The location parameter
sigma	The scale parameter
delta	The delta parameter
q	A numeric vector of quantile values
p	A numeric vector of probability values
smalldelta	A numeric shift value

 dgeng *The Generalized Gamma Distribution*

Description

The Generalized Gamma Distribution

Usage

```
dgeng(x, theta, delta, varrho)
```

```
pgeng(q, theta, delta, varrho)
```

```
qgeng(p, theta, delta, varrho, smalldelta = 1e-05)
```

```
rgeng(n, theta, delta, varrho)
```

Arguments

x	A numeric vector of observations
theta	The theta parameter
delta	The delta parameter
varrho	The varrho parameter
q	A numeric vector of quantiles
p	A numeric vector of probabilities
smalldelta	A numeric shift value
n	The number of random observations

dgets

The Generalized Threshold Distribution

Description

Compute values for members of the generalized threshold distribution family. Members include distributions based on the normal distribution ("nor-gets"), the smallest- extreme value distribution ("sev-gets"), and the largest- extreme value distribution ("lev-gets").

Usage

```
dgets(x, alpha, sigma, varzeta, distribution, smallsigma = 2e-05)
pgets(q, alpha, sigma, varzeta, distribution, smallsigma = 2e-05)
qgets(p, alpha, sigma, varzeta, distribution, smallsigma = 1e-05)
sgets(x, alpha, sigma, varzeta, distribution, smallsigma = 2e-05)
```

Arguments

x	The x
alpha	The alpha
sigma	The sigma
varzeta	The varzeta
distribution	The distribution on which the gets values are based Either 'normal', 'lev', or 'sev'
smallsigma	The small sigma value
q	The q
p	The p

dgoma

The Gompertz Makeham Distribution

Description

The Gompertz Makeham Distribution

Usage

```
dgoma(x, shape, shape2, scale = 1)
```

```
pgoma(q, shape, shape2, scale = 1)
```

```
qgoma(  
  p,  
  shape = stop("no shape arg"),  
  shape2 = stop("no shape2 arg"),  
  scale = 1  
)
```

Arguments

x	A numeric vector of observations
shape	A shape parameter
shape2	Another shape parameter
scale	The scale parameter
q	A numeric vector of quantiles
p	A numeric vector of probabilities

digau

The Inverse Gaussian Distribution

Description

The Inverse Gaussian Distribution

Usage

```
digau(x, shape, scale = 1)
```

```
pigau(q, shape, scale = 1)
```

```
qigau(p, shape = stop("no shape arg"), scale = 1)
```

Arguments

x	A numeric vector of observations
shape	The shape parameter
scale	The scale parameter
q	A numeric vector of quantiles
p	A numeric vector of probabilities

Four Parameter Beta *The Four Parameter Beta Distribution*

Description

Density, distribution function, quantile function and random generation for the four parameter Beta distribution with minimum value `min` and scale `scale`.

Usage

```
dbeta4(x, min, max, shape1, shape2, gap = 0)
pbeta4(q, min, max, shape1, shape2, gap = 0)
qbeta4(p, min, max, shape1, shape2)
rbeta4(n, min, max, shape1, shape2, seed = 42)
```

Arguments

x	Vector of quantiles
min	The minimum value on which the distribution is defined
max	The maximum value on which the distribution is defined
shape1	Shape parameter
shape2	Shape parameter
gap	Spacing from min and max
q	Vector of quantiles
p	Vector of probabilities
n	Number of observations
seed	A numeric value for the seed of the random number generator

Details

If shape is not specified, a default value of 1 is used.

The Birnbaum-Saunders distribution with shape β and scale θ has density

$$f(x; \theta, \beta) = \frac{\sqrt{\frac{x}{\theta}} + \sqrt{\frac{\theta}{x}}}{2\beta x} \phi_{NOR}(z), \quad x \geq 0$$

where $\phi_{NOR}(z)$ is the density of the standard normal distribution and

$$z = \frac{1}{\beta} \left(\sqrt{\frac{x}{\theta}} - \sqrt{\frac{\theta}{x}} \right)$$

Value

dbeta4 gives the density, pbeta4 gives the distribution function, qbeta4 gives the quantile function, and rbeta4 generates random observations.

The length of the result is determined by n for rbeta4, and is the maximum of the lengths of the numerical arguments for the other functions.

The numerical arguments other than n are recycled to the length of the result.

Source

Birnbaum, Z. W.; Saunders, S. C. (1969), "A new family of life distributions", *Journal of Applied Probability*, 6 (2): 319–327, JSTOR 3212003, doi:10.2307/3212003

gadget_clean_columns *Visually remove columns from data set*

Description

Shiny gadget used to visually inspect columns in a data set and select columns to remove

Usage

```
gadget_clean_columns(
  data,
  rownames = TRUE,
  theme = "flatly",
  width = "100%",
  height = "600px",
  css = NULL
)
```

Arguments

data	A data set
rownames	logical Should rownames be included?
theme	character A bootswatch theme provided to shinythemes::shinytheme
width	character Width of the gadget (in valid css units)
height	character Height of the gadget (in valid css units)
css	character Path to a custom css file

Value

A list of length 2

data	A data.frame containing the columns that were not removed
script	A line of code that can be used to replicate cleaning performed in the gadget
	A printed shiny app

Examples

```
## Not run: clean_columns(mtcars)
```

gadget_lm

Function Title

Description

Description

Usage

```
gadget_lm(
  data,
  xvar,
  yvar,
  theme = "flatly",
  width = "100%",
  css = NULL,
  height = "600px",
  ...
)
```

Arguments

data	A data.frame object
xvar	Column title (as a character-string) from data to display on the x-axis
yvar	Column title (as a character-string) from data to display on the y-axis
theme	character string naming a color theme bootswatch color theme. Must be one of the themes that can be used in shinythemes::shinytheme()
width	Width of the printed app.
css	Path to a custom css file. If NULL the default css file is used
height	Height of the printed app.
...	Additional options passed to shiny::shinyAppDir()

inst	<i>Get the installation path of a package</i>
------	---

Description

Given the name of a package, this returns a path to the installed copy of the package, which can be passed to other functions.

Usage

```
inst(name)
```

Arguments

name	the name of a package.
------	------------------------

Details

It searches for the package in `.libPaths()`. If multiple dirs are found, it will return the first one.

Source

Deprecated function from the devtools package

Examples

```
inst("devtools")
inst("grid")
## Not run:
# Can be passed to other devtools functions
unload(inst("ggplot2"))

## End(Not run)
```

<code>jkf.par</code>	<i>Custom par function</i>
----------------------	----------------------------

Description

Custom par function

Usage

`jkf.par(...)`

Arguments

`...` Parameter passed to `par` in addition to those defined

Largest Extreme Value *The Largest Extreme Value Distribution*

Description

Density, distribution function, quantile function and random generation for the LEV distribution with location `loc` and scale `scale`.

Usage

`qlev(p, loc = 0, scale = 1)`

`plev(q, loc = 0, scale = 1)`

`dlev(x, loc = 0, scale = 1)`

`rlev(n, loc = 0, scale = 1)`

Arguments

<code>p</code>	Vector of probabilities
<code>loc</code>	Location parameter
<code>scale</code>	Scale parameter
<code>q</code>	Vector of quantiles
<code>x</code>	Vector of quantiles
<code>n</code>	Number of observations

Details

If `loc` is not specified, a default value of 0 is used. If `scale` is not specified, a default value of 1 is used.

The largest extreme value distribution with location parameter μ and scale σ has density

$$f(x; \mu, \sigma) = \frac{1}{\sigma} \phi_{LEV} \left(\frac{x - \mu}{\sigma} \right), \quad -\infty < x < \infty$$

where $\phi_{LEV}(z) \exp[-z - \exp(-z)]$ is the density of the standard LEV distribution.

Value

`dlev` gives the density, `plev` gives the distribution function, `qllev` gives the quantile function, and `rlev` generates random observations.

The length of the result is determined by `n` for `rlev`, and is the maximum of the lengths of the numerical arguments for the other functions.

The numerical arguments other than `n` are recycled to the length of the result.

sgpdf1	<i>R interface for GENG cdf;</i>
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Description

R interface for GENG cdf;

sgquan	<i>R interface for GENG cdf</i>
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Description

R interface for GENG cdf

Smallest Extreme Value

The Smallest Extreme Value Distribution

Description

Density, distribution function, quantile function and random generation for the SEV distribution with location `loc` and scale `scale`.

Usage

```
qsev(p, loc = 0, scale = 1)
```

```
psev(q, loc = 0, scale = 1)
```

```
dsev(x, loc = 0, scale = 1)
```

```
rsev(n, loc = 0, scale = 1)
```

```
ssev(x, loc = 0, scale = 1)
```

Arguments

<code>p</code>	Vector of probabilities
<code>loc</code>	Location parameter
<code>scale</code>	Scale parameter
<code>q</code>	Vector of quantiles
<code>x</code>	Vector of quantiles
<code>n</code>	Number of observations

Details

If `loc` is not specified, a default value of 0 is used. If `scale` is not specified, a default value of 1 is used.

The smallest extreme value distribution with location parameter μ and scale σ has density

$$f(x; \mu, \sigma) = \frac{1}{\sigma} \phi_{SEV} \left(\frac{x - \mu}{\sigma} \right), \quad -\infty < x < \infty$$

where $\phi_{SEV}(z) \exp[z - \exp(z)]$ is the density of the standard LEV distribution.

Value

dsev gives the density, psev gives the distribution function, qsev gives the quantile function, and rsev generates random observations.

The length of the result is determined by n for rsev, and is the maximum of the lengths of the numerical arguments for the other functions.

The numerical arguments other than n are recycled to the length of the result.

spgeng	<i>R interface for GENG cdf;</i>
--------	----------------------------------

Description

R interface for GENG cdf;

spmlgeng	<i>R interface for gng log(1-cdf)</i>
----------	---------------------------------------

Description

R interface for gng log(1-cdf)

Usage

```
spmlgeng(tvec, gamme, maxlen, answer)
```

Arguments

tvec	A numeric vector of observations
gamme	A numeric matrix containing the parameter values
maxlen	The number of columns in gamme
answer	A numeric vector containing the return values

teachingApp

*Render a teachingApp With Options***Description**

Renders a teachingApp as a stand-alone shiny app or as an element within an rmarkdown document.

Usage

```
teachingApp(
  app_name = NULL,
  theme = "flatly",
  width = "100%",
  height = "800px",
  icon = "fa fa-github",
  img = NULL,
  git_user = "Auburngrads",
  more_opts = list(NA),
  launch.browser = TRUE,
  ...
)
```

Arguments

app_name	character	Name of the app to be rendered
theme	character	Name of a bootswatch color theme (provided by shinythemes::shinytheme)
width	character	The width of the printed app (in pixels)
height	character	The height of the printed app (in pixels)
icon	character	A fontAwesome icon to be placed in the footer of a navbarPage app
img	character	A path (or URL) to an image to be placed in the footer of a navbarPage app
git_user	character	GitHub username used in the branding logo
more_opts		A list of additional options/objects that can be passed to the app (see Details)
launch.browser	logical	If TRUE The app launches in the user's default browser
...		A list of additional options passed to shiny::shinyAppDir()

Details

The teachingApps package provides an infrastructure that allows users to dynamically change the appearance and function of shiny apps. R users a familiar with writing functions to dynamically alter some output - in this case the output is a app. Normally,

Value

A printed shiny app

See Also

codelinkcreate_logo
codelinkadd_logo

Examples

```
## Not run:  
teachingApps(app_name = 'distribution_weibull',  
             theme = 'spacelab',  
             height = '800px')  
  
teachingApps(app_name = 'maximum_likelihood_simulation',  
             theme = 'flatly',  
             height = '600px')  
  
## End(Not run)
```

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