

Package ‘RcmdrPlugin.IPSUR’

April 17, 2009

Version 0.1-5

Date 2008-08-10

Title Introduction to Probability and Statistics Using R

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Depends Rcmdr (>= 1.3-0), rgl

Suggests abind, distr, distrEx, e1071, effects (>= 1.0-7), foreign, grid, lattice, lmtest, MASS, mgcv, multcomp (>= 0.991-2), nlme, nnet, qcc, relimp, rgl, RODBC

LazyLoad no

Description This package accompanies G. Andy Chang and G. Jay Kerns, Introduction to Probability and Statistics Using R (in progress). The package contributes functions unique to the book as well as specific configuration and selected functionality to the R Commander by John Fox.

License GPL (>= 2)

URL <http://www.r-project.org>, <http://ipsur.r-forge.r-project.org/>

Repository CRAN

Date/Publication 2008-08-11 14:15:24

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 IPSUR-package *Introduction to Probability and Statistics Using R*

Description

This package accompanies G. Andy Chang and G. Jay Kerns, *Introduction to Probability and Statistics Using R* (in progress). This RcmdrPlugin contributes functions unique to the book as well as specific configuration and selected functionality to the R Commander by John Fox.

Details

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 LazyLoad: no
 License: GPL version 3
 URL: <http://www.r-project.org>, <http://ipsur.r-forge.r-project.org/>

Author(s)

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 birthday.ipsur *Probability of coincidences for the IPSUR package*

Description

This is a modified version of the `pbirthday` and `qbirthday` functions in the `stats` package. Computes approximate answers to a generalised “birthday paradox” problem. `pbirthday.ipsur` computes the probability of a coincidence and `qbirthday.ipsur` computes the number of observations needed to have a specified probability of coincidence. The change is that precise answers are given (instead of asymptotics) in the case of exactly two coincidences.

Usage

```
qbirthday.ipsur(prob = 0.5, classes = 365, coincident = 2)
pbirthday.ipsur(n, classes = 365, coincident = 2)
```

Arguments

<code>classes</code>	How many distinct categories the people could fall into
<code>prob</code>	The desired probability of coincidence
<code>n</code>	The number of people
<code>coincident</code>	The number of people to fall in the same category

Details

The birthday paradox is that a very small number of people, 23, suffices to have a 50-50 chance that two of them have the same birthday. This function generalises the calculation to probabilities other than 0.5, numbers of coincident events other than 2, and numbers of classes other than 365.

The formula is approximate, except in the case `coincident=2`.

Value

<code>qbirthday.ipsur</code>	Number of people needed for a probability <code>prob</code> that <code>k</code> of them have the same one out of <code>classes</code> equiprobable labels.
<code>pbirthday.ipsur</code>	Probability of the specified coincidence.

References

Diaconis P, Mosteller F., “Methods for studying coincidences”. JASA 84:853-861

Examples

```
## the standard version
qbirthday.ipsur()
## same 4-digit PIN number
qbirthday.ipsur(classes=10^4)
## 0.9 probability of three coincident birthdays
qbirthday.ipsur(coincident=3, prob=0.9)
## Chance of 4 coincident birthdays in 150 people
pbirthday.ipsur(150, coincident=4)
## 100 coincident birthdays in 1000 people: *very* rare:
pbirthday.ipsur(1000, coincident=100)
```

BloodPressure

Blood Pressure and Heart Rate Readings

Description

These data were collected during from 2004 through 2006 by Taoying Bian.

Usage

```
data(BloodPressure)
```

Format

A data frame with 202 observations on the following 7 variables:

year year. From 2004 through 2006

month month of the year. January = 1.

day the day of the month.

hour the 24-clock hour.

systolic systolic blood pressure reading (in mm Hg).

diastolic diastolic blood pressure reading (in mm Hg).

heart.rate heart rate reading, in beats per minute.

Details

From 2004 through 2006, Mrs. Taoying Bian regularly collected data concerning her blood pressure and heart rate.

Source

These data were collected by Taoying Bian from 2004 through 2006.

FeedingTimes

Feeding Times of a Newborn

Description

These data were collected during July and August, 2006 at the request of the pediatrician concerning the feeding habits of Anna Lu Kerns.

Usage

```
data(FeedingTimes)
```

Format

A data frame with 42 observations on the following 7 variables:

age.days age in days. July 1, 2006 = 1.

clock.hours the 24-clock hour.

clock.min the clock minute.

type type of food eaten, being direct breast milk, formula, pumped breast milk, or no food (rest)

amount.oz amount of food eaten, in ounces.

duration.min duration of feeding time.

time.hours sequential time in hours. Time = 0 corresponds to 8 AM, July 9th, 2006.

Details

During July and August 2006 the author collected data concerning the feeding habits of his newborn daughter, Anna Lu Kerns. The time of feeding was recorded, along with the type of food eaten. The amount of food eaten (in oz.) was recorded except when Anna was breastfeeding, in which case the duration of feeding was recorded. Some other durations were missing and others were calculated from the clock times.

Source

These data were collected by the author during July and August 2006 during observation of his newborn daughter.

IP SUR.Utilities *IP SUR Utility Functions*

Description

These functions support writing additions to the IP SUR package, and were patterned after their Rcmdr equivalents. Additional R code can be placed in files with file type `.R` in the `etc` subdirectory of the package. Add menus, submenus, and menu items by editing the file `menus.txt` in the same directory.

Usage

```
checkMultiLevelFactors (n=1)
listMultiLevelFactors (dataSet=ActiveDataSet ())
MultiLevelFactors (names)
multiLevelFactorsP (n=1)
```

Arguments

<code>dataSet</code>	the quoted name of a data frame in memory.
<code>names</code>	optional names to be stored.
<code>n</code>	number of variables to check for.

Details

There are several groups of functions exported by the Rcmdr package and documented briefly here. To see how these functions work, it is simplest to examine the dialog-generating functions in the Rcmdr package.

Checking for errors: The function `checkMultiLevelFactors` checks for the existence of objects and writes an error message to the log if it is absent (or insufficiently numerous, in the case of different kinds of variables).

Information: The following function returns vectors of object names: `listMultiLevelFactors`

Author(s)

G. Jay Kerns (gkerns@ysu.edu)

References

T. Lumley (2001) Programmer's niche: Macros in R. *R News*, **1(3)**, 11–13.

IPSURgetAnswer

Display answers to selected problems

Description

Displays answers to selected problems in the system's web browser. Adapted from a function in the UsingR package by John Verzani.

Usage

```
IPSURgetAnswer(chapter = NULL, problem = NULL)
```

Arguments

chapter	The chapter number
problem	The problems number

Not all answers are available.

Details

Some selected answers from the problems in *Introduction to Probability & Statistics Using R* are available from the webpage <http://www.cc.ysu.edu/~gjkerns/IPSUR>. This function will display them one-by-one in the browser.

Value

If available, opens web browser to the requested answer.

Author(s)

G. Jay Kerns

See Also

See Also [IPSURweb](#)

Examples

```
IPSURgetAnswer()
```

`IP SURweb`*Opens browser to IP SUR webpages*

Description

Opens the browser to webpages from the IP SUR website. Adapted from a function in the UsingR package by John Verzani.

Usage

```
IP SURweb(what = c("homepage", "errata", "changes", "exercises", "package"))
```

Arguments

<code>what</code>	A character string indicating what page to open. No value specified will open the IP SUR homepage. Others are "errata" for typos and errors, "changes" for changes to the text brought about by new changes to R, "exercises" to go to a page containing selected answers, and "packages" for materials related to the IP SUR package.
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Value

Opens the browser to the respective web page.

Author(s)

G. Jay Kerns

References

see <http://www.cc.ysu.edu/~gjkerns>

See Also

See Also [IP SURgetAnswer](#)

Examples

```
## Not run: IP SURweb()                # main webpage
## Not run: IP SURweb("err")          # errata
```

numSummaryIPSUR	<i>Mean, Standard Deviation, Skewness, Kurtosis, and Quantiles for Numeric Variables</i>
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Description

numSummary creates neatly formatted tables of means, standard deviations, skewness, kurtosis, and quantiles of numeric variables. Note that the `e1071` package must be installed to compute skewness or kurtosis.

Usage

```
numSummaryIPSUR(data, statistics=c("mean", "sd", "skewness", "kurtosis", "quantiles",
  quantiles=c(0, .25, .5, .75, 1), groups)

## S3 method for class 'numSummaryIPSUR':
print(x, ...)
```

Arguments

data	a numeric vector, matrix, or data frame.
statistics	any of "mean", "sd", "skewness", "kurtosis", or "quantiles", defaulting to the first four.
quantiles	quantiles to report; default is <code>c(0, 0.25, 0.5, 0.75, 1)</code> .
groups	optional variable, typically a factor, to be used to partition the data.
x	object of class "numSummaryIPSUR" to print.
...	arguments to pass down from the print method.

Value

numSummaryIPSUR returns an object of class "numSummaryIPSUR" containing the table of statistics to be reported along with information on missing data, if there are any.

Author(s)

John Fox (jfox@mcmaster.ca), with skewness and kurtosis added by G. Jay Kerns (gkerns@ysu.edu)

See Also

[mean](#), [sd](#), [skewness](#), [kurtosis](#), [quantile](#).

Examples

```
library(car)
Prestige[1, "income"] <- NA
numSummary(Prestige[,c("income", "education")])
numSummary(Prestige[,c("income", "education")], groups=Prestige$type)
remove(Prestige)
```

Description

These are simulated data specifically designed to allow the inexperienced user to browse the capabilities of the R Commander.

Usage

```
data(RcmdrTestDrive)
```

Format

A data frame with 168 observations on the following 9 variables:

order sequential order
smoking smoking status
gender gender of victim
race race of victim
before life expectancy before exposure
after life expectancy after exposure
salary salary at retirement
reduction potential salary reduction
parking number of unpaid parking tickets

Details

The R Commander has extensive functionality, but many options are unavailable unless the correct types of data are loaded in the Active Data Set. This data set was randomly generated so that, when loaded, essentially all R Commander options would be available for the student to investigate. These data are entirely fictional. For an amusing contributed story tying these variables together, please visit <http://www.cc.ysu.edu/~gjkerns/IPSUR/package>.

Source

These data were randomly generated using the IPSUR probability menu for the R Commander.

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