

Package ‘RcmdrPlugin.IPSUR’

March 23, 2012

Version 0.1-8

Date 2012-03-23

Title An IPSUR Plugin for the R Commander

Author G. Jay Kerns <gkerns@ysu.edu> with contributions by Theophilus Boye and Tyler Drombosky, adapted from the work of John Fox et al.

Maintainer G. Jay Kerns <gkerns@ysu.edu>

Depends Rcmdr (>= 1.4-0)

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

LazyLoad no

Description This package is an R Commander plugin that accompanies IPSUR, an Introduction to Probability and Statistics Using R.

License GPL (>= 2)

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

Repository CRAN

Date/Publication 2012-03-23 16:34:03

R topics documented:

RcmdrPlugin.IPSUR-package	2
birthday.ipsur	2
BloodPressure	3
FeedingTimes	4
IPSUR.Utilities	5
numSummaryIPSUR	6
RcmdrTestDrive	7

Index	8
--------------	----------

RcmdrPlugin.IPSUR-package

An IPSUR Plugin for the R Commander

Description

This package accompanies Introduction to Probability and Statistics Using R by G. Jay Kerns. It contributes functions unique to the book as well as specific configuration and selected functionality to the R Commander by John Fox.

Details

Package: RcmdrPlugin.IPSUR
Version: 0.1-8
Date: 2012-03-23
Depends: Rcmdr (>= 1.4-0), rgl
Suggests: abind, car, distr, distrEx, e1071, effects (>= 1.0-7), foreign, grid, lattice, lmtest, MASS, mgcv, multcomp (>= 0.9-999)
LazyLoad: no
License: GPL (>= 2)
URL: <http://www.r-project.org>, <http://ipsur.r-forge.r-project.org/>

Author(s)

G. Jay Kerns <gkerns@ysu.edu> with contributions by Theophilus Boye and Tyler Drombosky, adapted from the work of John Fox et al.

Maintainer: G. Jay Kerns <gkerns@ysu.edu>

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

classes	How many distinct categories the people could fall into
prob	The desired probability of coincidence
n	The number of people
coincident	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

qbirthday.ipsur	Number of people needed for a probability prob that k of them have the same one out of classes equiprobable labels.
pbirthday.ipsur	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

dataSet	the quoted name of a data frame in memory.
names	optional names to be stored.
n	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.

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

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 c(0, 0.25, 0.5, 0.75, 1).
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)
```

RcmdrTestDrive

Test-driving the R Commander

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.

Index

- *Topic **datasets**
 - BloodPressure, [3](#)
 - FeedingTimes, [4](#)
 - RcmdrTestDrive, [7](#)
- *Topic **distribution**
 - birthday.ipsur, [2](#)
- *Topic **misc**
 - IPSUR.Utilities, [5](#)
 - numSummaryIPSUR, [6](#)
- *Topic **package**
 - RcmdrPlugin.IPSUR-package, [2](#)

birthday.ipsur, [2](#)
BloodPressure, [3](#)

checkMultiLevelFactors
(IPSUR.Utilities), [5](#)

FeedingTimes, [4](#)

IPSUR.Utilities, [5](#)

kurtosis, [6](#)

listMultiLevelFactors
(IPSUR.Utilities), [5](#)

mean, [6](#)
MultiLevelFactors (IPSUR.Utilities), [5](#)
multiLevelFactorsP (IPSUR.Utilities), [5](#)

numSummaryIPSUR, [6](#)

pbirthday.ipsur (birthday.ipsur), [2](#)
print.numSummaryIPSUR
(numSummaryIPSUR), [6](#)

qbirthday.ipsur (birthday.ipsur), [2](#)
quantile, [6](#)

RcmdrPlugin.IPSUR
(RcmdrPlugin.IPSUR-package), [2](#)

RcmdrPlugin.IPSUR-package, [2](#)
RcmdrTestDrive, [7](#)

sd, [6](#)
skewness, [6](#)