Package ‘RcmdrPlugin.IPSUR’

January 26, 2019

Version 0.2-1.1
Date 2014-09-10
Title An IPSUR Plugin for the R Commander
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Imports Rcmdr (>= 2.1-0)
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 yes
LazyData yes
Description Provides an R Commander plugin that accompanies IPSUR, an Introduction to Probability and Statistics Using R.
License GPL (>= 2)
NeedsCompilation no
Repository CRAN
Date/Publication 2019-01-26 16:32:58 UTC

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RcmdrPlugin.IPSUR-package

An IPSUR Plugin for the R Commander

Description

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

Details

Package: RcmdrPlugin.IPSUR
Version: 0.2-1
Date: 2014-09-10
Imports: Rcmdr (>= 2.1-0)
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: yes
LazyData: yes
License: GPL (>= 2)
URL: http://www.r-project.org, http://ipsur.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


Examples

```r
## 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.

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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.

Description

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

Usage

\begin{verbatim}
checkMultilevelFactors(n=1)
listMultilevelFactors(dataset=ActiveDataSet())
MultilevelFactors(names)
multilevelFactorsP(n=1)
\end{verbatim}

Arguments

- \texttt{dataset} the quoted name of a data frame in memory.
- \texttt{names} optional names to be stored.
- \texttt{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.

\textit{Checking for errors:} The function \texttt{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).

\textit{Information:} The following function returns vectors of object names: \texttt{listMultilevelFactors}
numSummaryIPSUR

Author(s)

G. Jay Kerns <gkerns@ysu.edu>

References


<table>
<thead>
<tr>
<th>numSummaryIPSUR</th>
<th>Mean, Standard Deviation, Skewness, Kurtosis, and Quantiles for Numeric Variables</th>
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</thead>
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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 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.
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](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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