Package 'lucid'

October 13, 2022

Version 1.8

Title Printing Floating Point Numbers in a Human-Friendly Format

Description Print vectors (and data frames) of floating point numbers
using a non-scientific format optimized for human readers. Vectors
of numbers are rounded using significant digits, aligned at the
decimal point, and all zeros trailing the decimal point are dropped.
See: Wright (2016). Lucid: An R Package for Pretty-Printing Floating Point
Numbers. In JSM Proceedings, Statistical Computing Section. Alexandria,
VA: American Statistical Association. 2270-2279.

LazyData yes

License GPL-3

URL https://kwstat.github.io/lucid/

BugReports https://github.com/kwstat/lucid/issues

VignetteBuilder knitr

Imports nlme

Suggests broom, dplyr, knitr, lattice, lme4, rjags, rmarkdown, sommer,
testthat

Encoding UTF-8

RoxygenNote 7.1.1

NeedsCompilation no

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Repository CRAN

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R topics documented:

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antibiotic	*Effectiveness of 3 antibiotics against 16 bacterial species.*

Description

Effectiveness of 3 antibiotics against 16 bacterial species.

Format

A data frame with 16 observations on the following 5 variables.

bacteria bacterial species, 16 levels

penicillin MIC for penicillin

streptomycin MIC for streptomycin

neomycin MIC for neomycin

gramstain Gram staining (positive or negative)

Details

The values reported are the minimum inhibitory concentration (MIC) in micrograms/milliliter, which represents the concentration of antibiotic required to prevent growth in vitro.

Source

Will Burtin (1951). *Scope*. Fall, 1951.

References

Wainer, H. (2009). A Centenary Celebration for Will Burtin: A Pioneer of Scientific Visualization. *Chance*, 22(1), 51-55. https://chance.amstat.org/2009/02/visrev221/

Wainer, H. (2009). Visual Revelations: Pictures at an Exhibition. *Chance*, 22(2), 46–54. https://chance.amstat.org/2009/04/vi

Wainer, H. (2014). Medical Illuminations: Using Evidence, Visualization and Statistical Thinking to Improve Healthcare.

Examples

```
data(antibiotic)
lucid(antibiotic)

## Not run:
# Plot the data similar to Fig 2.14 of Wainer's book, "Medical Illuminations"

require(lattice)
require(reshape2)

# Use log10 transform
```

```
dat <- transform(antibiotic,
                   penicillin=log10(penicillin),
                   streptomycin=log10(streptomycin),
                   neomycin=log10(neomycin))
dat <- transform(dat, sgn = ifelse(dat$gramstain=="neg", "-", "+"))
dat <- transform(dat,
                   bacteria = paste(bacteria, sgn))
dat <- transform(dat, bacteria=reorder(bacteria, -penicillin))

dat <- melt(dat)

op <- tpg <- trellis.par.get()
tpg$superpose.symbol$pch <- toupper(substring(levels(dat$variable),1,1))
tpg$superpose.symbol$col <- c("darkgreen","purple","orange")
trellis.par.set(tpg)
dotplot(bacteria ~ value, data=dat, group=variable,
         cex=2,
         scales=list(x=list(at= -3:3,
                       labels=c('.001', '.01', '.1', '1', '10', '100', '1000'))),
         main="Bacterial response to Neomycin, Streptomycin, and Penicillin",
         xlab="Minimum Inhibitory Concentration (mg/L)")

trellis.par.set(op)


## End(Not run)
```

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lucid	*Lucid printing*

Description

Format a column of numbers in a way to make it easy to understand.

Usage

```
lucid(x, dig = 3, na.value = NULL, ...)

## Default S3 method:
lucid(x, dig = 3, na.value = NULL, ...)

## S3 method for class 'numeric'
lucid(x, dig = 3, na.value = NULL, ...)

## S3 method for class 'data.frame'
lucid(x, dig = 3, na.value = NULL, ...)
```

```
## S3 method for class 'matrix'
lucid(x, dig = 3, na.value = NULL, ...)

## S3 method for class 'list'
lucid(x, dig = 3, na.value = NULL, ...)

## S3 method for class 'tbl_df'
lucid(x, dig = 3, na.value = NULL, ...)
```

Arguments

x	Object to format.
dig	Number of significant digits to use in printing.
na.value	Character string to use instead of 'NA' for numeric missing values. Default is NULL, which does nothing.
...	Additional arguments passed to the data.frame method.

Details

Output from R is often in scientific notation, which makes it difficult to quickly glance at numbers and gain an understanding of the relative values. This function formats the numbers in a way that makes interpretation of the numbers _immediately_ apparent.

The sequence of steps in formatting the output is: (1) zap to zero (2) use significant digits (3) drop trailing zeros after decimal (4) align decimals.

Value

Text, formatted in a human-readable way. Standard R methods are used to print the value.

See Also

signif

Examples

```
x0 <- c(123, 12.3, 1.23, .123456) # From Finney, page 352
print(x0)
lucid(x0, dig=2)

x1 <- c(123, NA, 1.23, NA)
lucid(x1, na.value="--")

signif(mtcars[15:20,])
lucid(mtcars[15:20,])

x2 <- c(1/3, 5/3, 1, 1.5, 2, 11/6, 5/6, 8.43215652105343e-17)
print(x2)
lucid(x2)
```

```
# Which coef is 0 ? How large is the intercept?
df1 <- data.frame(effect=c(-13.5, 4.5,  24.5, 6.927792e-14, -1.75,
                     16.5, 113.5000))
rownames(df1) <- c("A","B","C","C1","C2","D","(Intercept)")
print(df1)
lucid(df1)

df2 <- data.frame(effect=c("hyb","region","region:loc","hyb:region",
                           "yr","hyb:yr","region:yr","R!variance"),
                  component=c(10.9,277,493,1.30E-04,126,22.3,481,268),
                  std.error=c(4.40,166,26.1,1.58E-06,119,4.50,108,3.25),
                  z.ratio=c(2.471,1.669,18.899,82.242,
                  1.060,4.951,4.442,82.242),
                  constraint=c("pos","pos","pos","bnd",
                  "pos","pos","pos","pos"))
print(df2)
lucid(df2)
```

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vc   *Extract variance components from mixed models*

Description

Extract the variance components from a fitted model. Currently supports asreml, lme4, mmer, nlme and mcmc.list objects.

Usage

```
vc(object, ...)

## Default S3 method:
vc(object, ...)

## S3 method for class 'asreml'
vc(object, gamma = FALSE, ...)

## S3 method for class 'lme'
vc(object, ...)

## S3 method for class 'glmerMod'
vc(object, ...)

## S3 method for class 'lmerMod'
vc(object, ...)

## S3 method for class 'mcmc.list'
vc(object, quantiles = c(0.025, 0.5, 0.975), ...)
```

```
## S3 method for class 'mmer'
vc(object, ...)
```

Arguments

`object`	A fitted model object
`...`	Not used. Extra arguments.
`gamma`	If gamma=FALSE, then the 'gamma' column is omitted from the results from asreml
`quantiles`	The quantiles to use for printing mcmc.list objects

Details

The extracted variance components are stored in a data frame with an additional 'vc.xxx' class that has an associated print method.

Value

A data frame or other object.

Examples

```
## Not run:

require("nlme")
data(Rail)
m3 <- lme(travel~1, random=~1|Rail, data=Rail)
vc(m3)
##        effect variance stddev
##   (Intercept)   615.3   24.81
##      Residual   16.17   4.021

require("lme4")
m4 <- lmer(travel~1 + (1|Rail), data=Rail)
vc(m4)
##       grp        var1 var2   vcov  sdcor
##      Rail (Intercept) <NA> 615.3  24.81
## Residual       <NA> <NA> 16.17  4.021

require("asreml")
ma <- asreml(travel~1, random=~Rail, data=Rail)
vc(ma)
##          effect component std.error z.ratio constr
## Rail!Rail.var     615.3     392.6      1.6    pos
##     R!variance    16.17       6.6      2.4    pos

# See vignette for rjags example

# To change the number of digits, use the print function.
```

```
print(vc(m3), dig=5)


## End(Not run)
```

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