

Package ‘LotkasLaw’

August 17, 2015

Title Runs Lotka's Law which is One of the Special Applications of Zipf's Law

Version 0.0.1.0

Description Running Lotka's Law following Pao (1985)(DOI: 10.1016/0306-4573(85)90055-X). The Law is based around the proof that the number of authors making n contributions is about $1/n^a$ of those making one contribution.

Depends R (\geq 3.1.1)

License GPL

LazyData true

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NeedsCompilation no

Repository CRAN

Date/Publication 2015-08-17 07:53:29

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LotkasLaw-package *LotkasLaw*

Description

Runs Lotka's Law which is One of the Special Applications of Zipf's Law in Open Source R.

Details

Package: LotkasLaw
Type: Package
Version: 1.0
Date: 2015-07-29
License: What license is it under?

Author(s)

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References

<http://www.sciencedirect.com/science/article/pii/030645738590055X> (Pao 1985)

CV *Runs Critical Value*

Description

Runs Critical Value for Desired Data (in this case Sums). Assumes 1.63 Value.

Usage

CV(Sums)

Arguments

Sums A Summed Table of the Data Being Run Through Lotkas Law.

Value

The Value Returned is the Critical Value From the Data Inputted (as Sums)

Author(s)

Kenneth Buker

Examples

```
##---- Should be DIRECTLY executable !! ----
##-- ==> Define data, use random,
##--or do help(data=index) for the standard data sets.

## The function is currently defined as
function (Sums)
{
  bottom <- sqrt(Sums[2])
  top <- 1.63
  answer <- top/bottom
  return(answer)
}
```

CVm

Runs Critical Value based on custom value

Description

Runs Critical Value Based on Custom value.

Usage

CVm(value, Sums)

Arguments

value	Value Is the desired Critical Value test, See Refernces to determine the Values Needed.
Sums	A sumorization of The Data Being Tested.

Value

The value is the Critical Value Derived from Custom Critical Value Test.

Note

Typcial CV tests are .99 but this allows you to run .95 and .90 as well.

Author(s)

Kenneth Buker

References

The custom value inputed for Critical value can be found at both http://www.soest.hawaii.edu/wessel/courses/gg313/Critical_
& also http://www.mathematik.uni-kl.de/~schwaar/Exercises/Tabellen/table_kolmogorov.pdf

Examples

```
##---- Should be DIRECTLY executable !! ----
##-- ==> Define data, use random,
##--or do help(data=index) for the standard data sets.

## The function is currently defined as
function (value, Sums)
{
  bottom <- sqrt(Sums[2])
  top <- value
  answer <- top/bottom
  return(answer)
}
```

expected

Runs Expected Authors from table

Description

Generates Expected Value From the Data Being Tested

Usage

```
expected(Table, C, N)
```

Arguments

Table	Table Imported and Being Edited for Lotkas Law
C	The value of C generated by LotkasC
N	The Value of N Generated by LotkasN

Value

The Value Returned is a Expected Authors Table Generated From Authors Table.

Author(s)

Kenneth Buker

Examples

```
##---- Should be DIRECTLY executable !! ----
##-- ==> Define data, use random,
##--or do help(data=index) for the standard data sets.

## The function is currently defined as
function (Table, C, N)
{
  value <- Table[,1:1]^N
  nvalue <- 1/value
  part2 <- C*nvalue
  return(part2)
}
```

LotkasC

Runs the creation of C value in Lotkas Law

Description

Generates Lotkas C value from Equations in Pao(1985)

Usage

LotkasC(N)

Arguments

N Value N Generated by LotkasN

Value

Value Returned is C.

Author(s)

Kenneth Buker

Examples

```
##---- Should be DIRECTLY executable !! ----
##-- ==> Define data, use random,
##--or do help(data=index) for the standard data sets.

## The function is currently defined as
function (N)
{
  P <- 20
  increm <- c(1:(P - 1))
  sum <- sum(1/increm^N)
```

```

part1 <- sum
part2 <- 1/((N - 1) * (P^(N - 1)))
part3 <- 1/(2 * (P^N))
part4 <- N/(24 * (P - 1)^(N + 1))
result <- (part1 + part2 + part3 + part4)
result <- 1/result
return(result)
}

```

LotkasLogX

Generate a Log 10(of X from Table)

Description

Generates a table of Log base 10 of X

Usage

LotkasLogX(Table)

Arguments

Table The table being imported containing Papers and Authors

Value

Returns a Column with Log base 10 of X.

Author(s)

Kenneth

Examples

```

##---- Should be DIRECTLY executable !! ----
##-- ==> Define data, use random,
##--or do help(data=index) for the standard data sets.

## The function is currently defined as
function (Table)
{
  value <- log(Table[, 1:1], base = 10)
  return(value)
}

```

LotkasLogY

Generates a Table of Log base 10 of Y

Description

This formula is to create the Log base 10 of Y

Usage

LotkasLogY(Table)

Arguments

Table Table imported containing Papers and Authors.

Value

Returned value is a Column containing Log base 10 of Y

Author(s)

Kenneth Buker

Examples

```
##---- Should be DIRECTLY executable !! ----  
##-- ==> Define data, use random,  
##--or do help(data=index) for the standard data sets.  
  
## The function is currently defined as  
function (Table)  
{  
  value <- log(Table[, 2:2], base = 10)  
  return(value)  
}
```

LotkasN

Runs the creation of N in Lotkas Law

Description

Runs The Creation of Lotkas Value N.

Usage

LotkasN(Sums, FullTable)

Arguments

Sums Sumed table from the Data being Tested
 FullTable Full table is the full table of data that is being imported for testing.

Value

The returned value is N in Lotkas Law.

Author(s)

Kenneth Buker

Examples

```
##---- Should be DIRECTLY executable !! ----
##-- ==> Define data, use random,
##--or do help(data=index) for the standard data sets.

## The function is currently defined as
LotkasN <- function(Sums,FullTable)
{
  N <- nrow(FullTable)
  lx <- Sums[3]
  ly <- Sums[4]
  xy <- Sums[5]
  x2 <- Sums[6]
  lx2 <- lx^2
  top <- (N*xy) - (lx*ly)
  bottom <- (N*x2) - (lx2)
  Nfinal <- top/bottom
  return(Nfinal)
}
```

LotkasXX

Multiplies Log base 10 of X by itself. (x^2)

Description

This formula is to create value of X^2

Usage

LotkasXX(Table)

Arguments

Table

Value

Returned value is the result of X^2

Author(s)

Kenneth Buker

Examples

```
##---- Should be DIRECTLY executable !! ----  
##-- ==> Define data, use random,  
##--or do help(data=index) for the standard data sets.  
  
## The function is currently defined as  
function (Table)  
{  
  value <- (Table[, 3:3] * Table[, 3:3])  
  return(value)  
}
```

LotkasXY

Multiplies Log base 10 of X and Log base 10 of Y

Description

Multiplies Log base 10 of X and Log base 10 of Y together and returns a table.

Usage

LotkasXY(Table)

Arguments

Table

Value

Returns a table of $X*Y$.

Author(s)

Kenneth Buker

Examples

```
##---- Should be DIRECTLY executable !! ----
##-- ==> Define data, use random,
##--or do help(data=index) for the standard data sets.

## The function is currently defined as
function (Table)
{
  value <- (Table[, 3:3] * Table[, 4:4])
  return(value)
}
```

percauthors

Runs a Percent of Authors Total from the table.

Description

Creates a Percent Authors Table based on each column variable for authors against the total.

Usage

```
percauthors(Table, Sums)
```

Arguments

Table	The Table of data that is being tested,
Sums	The sum of data based off the Table,

Value

The value returned is a table with percent Authors Table.

Author(s)

Kenneth Buker

Examples

```
##---- Should be DIRECTLY executable !! ----
##-- ==> Define data, use random,
##--or do help(data=index) for the standard data sets.

## The function is currently defined as
function (Table, Sums)
{
  justy <- Table[, 2:2]
  newcol <- justy/Sums[2]
  return(newcol)
}
```

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