Package ‘fdth’

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fdth-package ................................................................. 2
fdt .................................................. 9
fdt_cat .................................................. 13
make.fdt .................................................. 15
mean.fdt .................................................. 17
median.fdt .................................................. 19
mfv .................................................. 20
plot.fdt .................................................. 22
print.fdt .................................................. 31
quantile.fdt .................................................. 35
sd .................................................. 37
Description

The \texttt{fdth} package contains a set of functions which easily allows the user to make frequency distribution tables (\texttt{\texttt{fdt}}), its associated histograms and frequency polygons (absolute, relative and cumulative). The \texttt{\texttt{fdt}} can be formatted in many ways which may be suited to publication in many different ways (papers, books, etc). The \texttt{plot} method (S3) is the histogram which can be dealt with the easiness and flexibility of a high level function.

Details

The frequency of a particular observation is the number of times the observation occurs in the data. The distribution of a variable is the pattern of frequencies of the observation.

Frequency distribution table \texttt{\texttt{fdt}} can be used for ordinal, continuous and categorical variables. The \texttt{R} environment provides a set of functions (generally low level) enabling the user to perform a \texttt{\texttt{fdt}} and the associated graphical representation, the histogram. A \texttt{\texttt{fdt}} plays an important role to summarize data information and is the basis for the estimation of probability density function used in parametrical inference.

However, for novices or occasional users of \texttt{R}, it can be laborious to find out all necessary functions and graphical parameters to do a normalized and pretty \texttt{\texttt{fdt}} and the associated histogram ready for publications.

That is the aim of this package, i.e, to allow the user easily and flexibly to do both: the \texttt{\texttt{fdt}} and the histogram. The most common input data for univariated is a \texttt{vector}. For multivariated data can be used both: a \texttt{data.frame}, in this case also allowing grouping all numerical variables according to one categorical, or matrices.

The simplest way to run \texttt{\texttt{fdt}} and \texttt{\texttt{fdt Cat}} is by supplying only the \texttt{x} object, for example: \texttt{d <-fdt(x)}. In this case all necessary default values (\texttt{breaks} and \texttt{right}) (\texttt{"Sturges"} and \texttt{FALSE} respectively) will be used, if the \texttt{x} object is categorical then just use \texttt{d <-fdt Cat(x)}.

If the variable is of continuous type, you can also supply:

- \texttt{x} and \texttt{k} (number of class intervals);
- \texttt{x}, \texttt{start} (left endpoint of the first class interval) and \texttt{end} (right endpoint of the last class interval); or
- \texttt{x}, \texttt{start}, \texttt{end} and \texttt{h} (class interval width).

These options make the \texttt{\texttt{fdt}} very easy and flexible.

The \texttt{\texttt{fdt}} and \texttt{\texttt{fdt Cat}} object store information to be used by methods \texttt{summary}, \texttt{print} and \texttt{plot}. The result of \texttt{plot} is a histogram or polygon (absolute, relative or cumulative). The methods \texttt{summary}, \texttt{print} and \texttt{plot} provide a reasonable set of parameters to format and plot the \texttt{\texttt{fdt}} object in a pretty (and publishable) way.
Author(s)
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See Also
hist provided by graphics and table, cut both provided by base.

Examples
library (fdth)

## Numerical
#======================
# Vectors: univariated
#======================

x <- rnorm(n=1e3,
    mean=5,
    sd=1)

(tb <- fdt(x))

# Histograms
plot(tb) # Absolute frequency histogram

plot(tb,
    main='My title')

plot(tb,
    x.round=3,
    col='darkgreen')

plot(tb,
    xlas=2)

plot(tb,
    x.round=3,
    xlas=2,
    xlab=NULL)

plot(tb,
    v=TRUE,
    cex=.8,
    x.round=3,
    xlas=2,
    xlab=NULL,
    col=rainbow(11))

plot(tb,
    type='fh')  # Absolute frequency histogram
plot(tb, type='rfh')  # Relative frequency histogram
plot(tb, type='rfph')  # Relative frequency (%) histogram
plot(tb, type='cdh')  # Cumulative density histogram
plot(tb, type='cfh')  # Cumulative frequency histogram
plot(tb, type='cfph')  # Cumulative frequency (%) histogram

# Polgons
plot(tb, type='fp')  # Absolute frequency polygon
plot(tb, type='rfp')  # Relative frequency polygon
plot(tb, type='rfpp')  # Relative frequency (%) polygon
plot(tb, type='cdp')  # Cumulative density polygon
plot(tb, type='cfp')  # Cumulative frequency polygon
plot(tb, type='cfpp')  # Cumulative frequency (%) polygon

# Density
plot(tb, type='d')  # Density

# Summary
summary(tb)  # the same
print(tb)  # the same
show(tb)  # the same

summary(tb, format=TRUE)  # It can not be what you want to publications!
summary(tb, format=TRUE, pattern='%.2f')  # Huumm ..., good, but ... Can it be better?
summary(tb, 
  col=c(1:2, 4, 6),  
  format=TRUE, 
  pattern='%.2f')  # Yes, it can!

range(x)  # To know x

summary(fdt(x, 
  start=1, 
  end=9, 
  h=1), 
  col=c(1:2, 4, 6), 
  format=TRUE, 
  pattern='%d')  # Is it nice now?

# The fdt.object
tb[['table']]  # Stores the freq. dist. table (fdt)
tb[['breaks']]  # Stores the breaks of fdt
tb[['breaks']][['start']]  # Stores the left value of the first class
tb[['breaks']][['end']]  # Stores the right value of the last class
tb[['breaks']][['h']]  # Stores the class interval
as.logical(tb[['breaks']][['right']])  # Stores the right option

# Theoretical curve and fdt
y <- rnorm(1e5, 
  mean=5, 
  sd=1)

tb <- fdt(y, 
  k=100)

plot(tb, 
  type='d',  # density
  col=heat.colors(100))

curve(dnorm(x, 
  mean=5, 
  sd=1), 
  n=1e3, 
  add=TRUE, 
  lwd=4)

#============================================= 
# Data.frames: multivariated with categorical 
#=============================================
(tb <- fdt(mdf))

# Histograms
plot(tb,
    v=TRUE)
plot(tb,
    col=rainbow(8))
plot(tb,
    type='fh')
plot(tb,
    type='rfh')
plot(tb,
    type='rfph')
plot(tb,
    type='cdh')
plot(tb,
    type='cfh')
plot(tb,
    type='cfph')

# Poligons
plot(tb,
    v=TRUE,
    type='fp')
plot(tb,
    type='rfp')
plot(tb,
    type='rfpp')
plot(tb,
    type='cdp')
plot(tb,
    type='cfp')
plot(tb,
    type='cfpp')

# Density
plot(tb,
    type='d')

# Summary
tb

summary(tb)  # the same
print(tb)    # the same
show(tb)    # the same

summary(tb,
    format=TRUE)

summary(tb,
    format=TRUE,
    pattern='%05.2f')  # regular expression

summary(tb,
    col=c(1:2, 4, 6),
    format=TRUE,
    pattern='%05.2f')

print(tb,
    col=c(1:2, 4, 6))

print(tb,
    col=c(1:2, 4, 6),
    format=TRUE,
    pattern='%05.2f')

# Using by
levels(mdf$X1)

plot(fdt(mdf,
    k=5,
    by='X1'),
    col=rainbow(5))

levels(mdf$X2)

summary(fdt(iris,
    k=5),
    format=TRUE,
    pattern='%04.2f')

plot(fdt(iris,
    k=5),
    col=rainbow(5))

levels(iris$Species)

summary(fdt(iris,
    k=5,
    by='Species'),
    format=TRUE,
patter='%04.2f')

plot(fdt(iris,
    k=5,
    by='Species'),
    v=TRUE)

#=========================
# Matrices: multivariated
#=========================
summary(fdt(state.x77),
    col=c(1:2, 4, 6),
    format=TRUE)

plot(fdt(state.x77))

# Very big
summary(fdt(volcano,
    right=TRUE),
    col=c(1:2, 4, 6),
    round=3,
    format=TRUE,
    pattern='%05.1f')

plot(fdt(volcano,
    right=TRUE))

### Categorical
x <- sample(x=letters[1:5],
    size=5e2,
    rep=TRUE)

(fdt.c <- fdt_cat(x))

(fdt.c <- fdt_cat(x,
    sort=FALSE))

### Data.frame: multivariated with two categorical
### Data.frame: multivariated with two categorical
mdf <- data.frame(c1=sample(LETTERS[1:3], 1e2, rep=TRUE),
    c2=as.factor(sample(1:10, 1e2, rep=TRUE)),
    n1=c(NA, NA, rnorm(96, 10, 1), NA, NA),
    n2=rnorm(100, 60, 4),
    n3=rnorm(100, 50, 4),
    stringsAsFactors=TRUE)

head(mdf)

(fdt.c <- fdt_cat(mdf))

(fdt.c <- fdt_cat(mdf,
    dec=FALSE))
(fdt.c <- fdt_cat(mdf, 
    sort=FALSE))

(fdt.c <- fdt_cat(mdf, 
    by='c1'))

##================================================
## Matrix: two categorical
##================================================

x <- matrix(sample(x=letters[1:10],
    size=100, 
    rep=TRUE),
    nc=2, 
    dimnames=list(NULL, 
        c('c1', 'c2')))

head(x)

(fd <- fdt(x))

---

**fdt**  

*Frequency distribution table for numerical data*

**Description**

A S3 set of methods to easily perform frequency distribution table (`fdt`) from vector, data.frame and matrix objects.

**Usage**

```r
## S3 generic
fdt(x, ...)  

## S3 methods
## Default S3 method:
fdt(x, 
    k, 
    start, 
    end, 
    h, 
    breaks=c('Sturges', 'Scott', 'FD'), 
    right=FALSE, ...)

## S3 method for class 'data.frame'
fdt(x, 
    k, 
    by, 
    ...)  
```
breaks=c('Sturges', 'Scott', 'FD'),
right=FALSE, ...
)

## S3 method for class 'matrix'
fdt(x,
k,
breaks=c('Sturges', 'Scott', 'FD'),
right=FALSE, ...
)

### Arguments

- **x**
  - A vector, data.frame or matrix object. If 'x' is data.frame or matrix it must contain at least one numeric column.

- **k**
  - Number of class intervals.

- **start**
  - Left endpoint of the first class interval.

- **end**
  - Right endpoint of the last class interval.

- **h**
  - Class interval width.

- **by**
  - Categorical variable used for grouping each numeric variable, useful only on data.frame.

- **breaks**
  - Method used to determine the number of interval classes, c("Sturges", "Scott", "FD").

- **right**
  - Right endpoints open (default = FALSE).

- ... Potencial further arguments (required by generic).

### Details

The simplest way to run `fdt` is done by supplying only the `x` object, for example: `nm <- fdt(x)`. In this case all necessary default values (‘breaks’ and ‘right’) (“Sturges” and FALSE respectively) will be used.

It can be provided also:

- ‘x’ and ‘k’ (number of class intervals);
- ‘x’, ‘start’ (left endpoint of the first class interval) and ‘end’ (right endpoint of the last class interval); or
- ‘x’, ‘start’, ‘end’ and ‘h’ (class interval width).

These options make the ‘fdt’ very easy and flexible.

The ‘fdt’ object stores information to be used by methods `summary`, `print`, `plot`, `mean`, `median` and `mfv`. The result of plot is a histogram. The methods `summary`, `print` and `plot` provide a reasonable set of parameters to format and plot the ‘fdt’ object in a pretty (and publishable) way.

### Value

For fdt the method `fdt.default` returns a list of class `fdt.default` with the slots:

- ‘table’
  - A data.frame storing the ‘fdt’;
‘breaks’ A vector of length 4 storing ‘start’, ‘end’, ‘h’ and ‘right’ of the ‘fdt’ generated by this method;

‘data’ A vector of the data ‘x’ provided.

The methods fdt.data.frame and fdt.matrix return a list of class fdt.multiple. This list has one slot for each numeric (fdt) variable of the ‘x’ provided. Each slot, corresponding to each numeric variable, stores the same slots of the fdt.default described above.

Author(s)
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Ivan B. Allaman

See Also
hist provided by graphics and table, cut both provided by base.

Examples
library(fdth)

##========
## Vector
##========
## Vector
x <- rnorm(n=1e3, mean=5, sd=1)

# x
(fd <- fdt(x))

# x, alternative breaks
(fd <- fdt(x,
  breaks='Scott'))

# x, k
(fd <- fdt(x,
  k=10))

# x, star, end
range(x)

(fd <- fdt(x,
  start=floor(min(x)),
  end=floor(max(x) + 1))))

# x, start, end, h
(fd <- fdt(x,
  start=floor(min(x)),
  end=floor(max(x) + 1),
  h=1))
# Effect of right
x <- rep(1:3, 3); sort(x)

(fdt <- fdt(x,
    start=1,
    end=4,
    h=1))

(fdt <- fdt(x,
    start=0,
    end=3,
    h=1,
    right=TRUE))

# Data.frame: multivariate with two categorical
#=====================================================================
mdf <- data.frame(c1=sample(LETTERS[1:3], 1e2, TRUE),
    c2=as.factor(sample(1:10, 1e2, TRUE)),
    n1=c(NA, NA, rnorm(96, 10, 1), NA, NA),
    n2=rnorm(100, 60, 4),
    n3=rnorm(100, 50, 4),
    stringsAsFactors=TRUE)

head(mdf)

(fdt <- fdt(mdf))

# By factor!
(fdt <- fdt(mdf,
    k=5,
    by='c1'))

# choose FD criteria
(fdt <- fdt(mdf,
    breaks='FD',
    by='c1'))

(fdt <- fdt(mdf,
    k=5,
    by='c2'))

(fdt <- fdt(iris,
    k=10))

(fdt <- fdt(iris,
    k=5,
    by='Species'))

# Matrices: multivariate
### Description

A S3 set of methods to easily perform categorical frequency distribution table (‘fdt_cat’) from vector, data.frame and matrix objects.

### Usage

```r
## S3 generic
fdt_cat(x, ...)  
## S3 methods
## Default S3 method:
fdt_cat(x,
        sort=TRUE,
        decreasing=TRUE, ...)
## S3 method for class 'data.frame'
fdt_cat(x,
        by,
        sort=TRUE,
        decreasing=TRUE, ...)
## S3 method for class 'matrix'
fdt_cat(x,
        sort=TRUE,
        decreasing=TRUE, ...)
```

### Arguments

- **x**: A vector, data.frame or matrix object. If `x` is data.frame or matrix it must contain at least one character/factor column.
- **by**: Categorical variable used for grouping each categorical response, useful only on data.frame.
- **sort**: Logical. Should the `fdt_cat` be sorted by the absolute frequency into ascending or descending order? (default = `TRUE`).
- **decreasing**: Logical. Should the sort order be increasing or decreasing? (default = `TRUE`).
- **...**: Optional further arguments (required by generic).
Details

The simplest way to run ‘fdt_cat’ is supplying only the ‘x’ object, for example: ct <- fdt_cat(x). In this case all necessary default values (‘sort = TRUE’ and ‘decreasing = TRUE’) will be used.

These options make the ‘fdt_cat’ very easy and flexible.

The ‘fdt_cat’ object stores information to be used by methods summary, print, plot and mfv. The result of plot is a bar plot. The methods summary.fdt_cat, print.fdt_cat and plot.fdt_cat provide a reasonable set of parameters to format and plot the ‘fdt_cat’ object in a pretty (and publishable) way.

Value

For fdt_cat the method fdt_cat.default returns a data.frame storing the ‘fdt’.

The methods fdt_cat.data.frame and fdt_cat.matrix return a list of class fdt_cat..multiple. This list has one slot for each categorical variable of the supplied ‘x’. Each slot, corresponding to each categorical variable, stores the same slots of the fdt_cat.default described above.

Author(s)

José Cláudio Faria
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Ivan B. Allaman

See Also

hist provided by graphics and table, cut both provided by base.

Examples

library(fdth)

## Categorical
x <- sample(x=letters[1:5],
  size=5e2,
  rep=TRUE)

(fdt.c <- fdt_cat(x))

(fdt.c <- fdt_cat(x,
  sort=FALSE))

#==================================================================
## Data.frame: multivariated with two categorical
#==================================================================
mdf <- data.frame(c1=sample(LETTERS[1:3], 1e2, rep=TRUE),
c2=as.factor(sample(1:10, 1e2, rep=TRUE)),
n1=c(NA, NA, rnorm(96, 10, 1), NA, NA),
n2=rnorm(100, 60, 4),
n3=rnorm(100, 50, 4),
stringsAsFactors=TRUE)
make.fdt

Frequency distribution table for continuous and categorical variables

Description

Makes a full fdt from a minimal set of information.
Useful to reproduce (when the real data vector is not known) a previous fdt.

Usage

make.fdt(f,
    start,
    end,
    right=FALSE)

make.fdt_cat(f,
    categories=NULL,
    sort=TRUE,
    decreasing=TRUE)
Arguments

f  A numeric vector object of frequency.
start  The left value of the interval of the first class.
end  The last value of the interval of the last class.
right  Intervals right open (default = FALSE).
categories  The levels of the categorical variable.
sort  The levels of the categorical variable will be ordered by frequency. The default is TRUE.
decreasing  If sort argument is TRUE, the order will be decreasing by default.

Details

Given the starting and ending values of the continuous variable table or the levels of the categorical variable plus the number of intervals and the absolute frequency values the functions make.fdt and make.fdt_cat reconstruct whole fdt or fdt_cat table.

Value

The function make.fdt returns a list with the slots:

table  A data.frame storing the ‘fdt’.
breaks  A vector of length 4 storing ‘start’, ‘end’, ‘h’ and ‘right’ of the ‘fdt’ generated by this method.

The function make.fdt_cat returns a list with the slots:

Category  The levels of the categorical variable.

f  Absolute frequency, numeric
rf  Relative frequency, numeric
rf(%)  Relative frequency in percentages, numeric
cf  Cumulative frequency; numeric
cf(%)  Cumulative frequency in percentages, numeric

Author(s)

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Ivan B. Allaman

See Also

table and cut provided by base package.
## Examples

### Numeric

```r
# Making one reference fdt
set.seed(33)
x <- rnorm(1e3, 20, 2)

(tb.r <- fdt(x))

# Making a brand new
(tb.n <- make.fdt(f=tb.r$table$f, start=13.711, end=27.229)) # Huumm ..., good, but ... Can it be better?

summary(tb.n, format=TRUE, pattern='%.3f') # Is it nice now?
```

### Categorical

```r
# Making one reference fdt
x <- sample(letters[1:5], 1e3, rep=TRUE)

(tb.r <- fdt_cat(x))

# Making a brand new
(tb.n <- make.fdt_cat(f=tb.r$f, categ=tb.r$Category))
```

---

**mean.fdt**  
*Mean of frequency distribution table (numerical variable)*

---

**Description**

S3 method for the arithmetic mean of a fdt. Useful to estimate the arithmetic mean (when the real data vector is not known) from a previous fdt.

**Usage**

```r
# S3 method: numerical
# S3 method for class 'fdt'
mean(x, ...)
```
mean.fdt

Arguments

x
A fdt (simple or multiple) object.

... Required by generic.

Details

mean.fdt calculates the mean value based on a known formula using the midpoint of each interval class. mean.fdt.multiple calls mean.fdt for each variable, that is, each column of the data.frame.

Value

mean.fdt returns a numeric vector containing the mean value of the fdt. mean.fdt.multiple returns a list, where each element is a numeric vector containing the mean value of the fdt for each variable.

Author(s)

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Ivan B. Allaman

See Also

median.fdt, mfv.

Examples

mdf <- data.frame(x=rnorm(1e3, 20, 2),
y=rnorm(1e3, 30, 3),
z=rnorm(1e3, 40, 4))

head(mdf)

apply(mdf, 2, mean)

mean(fdt(mdf))
Description

S3 method for the median of a fdt.
Useful to estimate the median (when the real data vector is not known) from a previous fdt.

Usage

```r
## S3 method: numerical
## S3 method for class 'fdt'
median(x, ...)
```

Arguments

- `x` A fdt (simple or multiple) object.
- `...` Required by generic.

Details

median.fdt calculates the value of the median based on a known formula. median.fdt.multiple calls mean.fdt for each variable, that is, each column of the data.frame.

Value

mean.fdt returns a numeric vector containing the value of the median of the fdt. median.fdt.multiple returns a list, where each element is a numeric vector containing the value of the median of the fdt for each variable.

Author(s)

José Cláudio Faria
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Ivan B. Allaman

See Also

mean.fdt, mfv.

Examples

```r
mdf <- data.frame(x=rnorm(1e3, 20, 2),
y=rnorm(1e3, 30, 3),
z=rnorm(1e3, 40, 4))
```
```r
z = rnorm(1e3,
        40,
        4)

head(mdf)
apply(mdf,
     2,
     median)
median(fdt(mdf))
```

---

### Description

S3 methods for the most frequent value (statistical mode) of a `fdt`. Useful to estimate the most frequent value or statistical mode. May also be used, by using a previous `fdt`, when the original data vector is not known.

### Usage

#### ## S3 generic
```
mfv(x, ...)
```

#### ## S3 methods: numerical and categorical
#### ## Default S3 method:
```
mfv(x, ...)
```

#### ## S3 method for class 'fdt'
```
mfv(x, ...)
```

#### ## S3 method for class 'fdt.multiple'
```
mfv(x, ...)
```

#### ## S3 method for class 'fdt_cat'
```
mfv(x, ...)
```

#### ## S3 method for class 'fdt_cat.multiple'
```
mfv(x, ...)
```

### Arguments

- `x` A `fdt` or `fdt_cat` (simple or multiple) object.
- `...` Required to be generic.
Details

`mfv.fdt` and `mfv.fdt_cat` calculates the most frequent value (mfv) based on a known formula. `mfv.fdt.multiple` and `mfv.fdt_cat.multiple` call respectively `mfv.fdt` or `mfv.fdt_cat` for each variable, that is, each column of the data.frame.

Value

`mfv.fdt` returns a numeric vector containing the mfv value of the `fdt`. `mean.fdt.multiple` returns a list, where each element is a numeric vector containing the mean value of the `fdt` for each variable. `mfv.fdt_cat` returns a character vector containing the mfv value of the `fdt_cat`. `mean.fdt_cat.multiple` returns a list, where each element is a character vector containing the mfv value of the `fdt_cat` for each variable.

Author(s)

José Cláudio Faria
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Ivan B. Allaman

See Also

`mean.fdt`, `median.fdt`.

Examples

```r
## Numerical
mdf <- data.frame(x=rnorm(1e2, 20, 2),
y=rnorm(1e2, 30, 3),
z=rnorm(1e2, 40, 4))

head(mdf)

mfv(mdf$x) # From vector x
mfv(mdf$y) # From vector y
mfv(mdf$z) # From vector z

(tb <- fdt(mdf))

mfv(tb) # From agruped dad in a fdt

## Categorical
mdf <- data.frame(c1=sample(letters[1:5], 1e3, rep=TRUE),
c2=sample(letters[1:5], 1e3, rep=TRUE),
c3=sample(letters[1:5], 1e3, rep=TRUE))

head(mdf)

mfv(mdf$c1) # From category c1
mfv(mdf$c2) # From category c2
mfv(mdf$c3) # From category c3
```

c2=sample(letters[6:10], 1e3, rep=TRUE),
c3=sample(letters[11:21], 1e3, rep=TRUE),
stringsAsFactors=TRUE)

head(mdf)

mfv(mdf$c1)  # From vector c1
mfv(mdf$c2)  # From vector c2
mfv(mdf$c3)  # From vector c3

(tb <- fdt_cat(mdf))

mfv(tb)  # From agruped dad in a fdt

---

plot.fdt  

*Plot fdt.default and fdt.multiple objects*

**Description**

S3 methods for `fdt.default` and `fdt.multiple` objects. It is possible to plot histograms and polygons (absolute, relative and cumulative).

**Usage**

```r
## S3 methods
## S3 method for class 'Var'
fdt.default

plot(x,
     type=c('fh', 'fp',
            'rfh', 'rfp',
            'rfph', 'rfpp',
            'd',
            'cdh', 'cdp',
            'cfh', 'cfp',
            'cfph', 'cfpp'),
     v=FALSE,
     v.round=2,
     v.pos=3,
     xlab="Class limits",
     xlas=0,
     ylab=NULL,
     col="gray",
     ylim=NULL,
     main=NULL,
     x.round=2, ...)
```
## S3 method for class 'fdt.multiple'
plot(x,
    type=c('fh', 'fp',
          'rfh', 'rfp',
          'rfph', 'rfpp',
          'd',
          'cdh', 'cdp',
          'cfh', 'cfp',
          'cfph', 'cfpp'),
    v=FALSE,
    v.round=2,
    v.pos=3,
    xlab="Class limits",
    xlas=0,
    ylab=FALSE,
    col="gray",
    xlim=NULL,
    ylim=NULL,
    main=NULL,
    main.vars=TRUE,
    x.round=2,
    grouped=FALSE,
    args.legend=NULL, ...)

## S3 method for class 'fdt_cat.default'
plot(x,
    type=c('fb', 'fp', 'fd',
          'rfb', 'rfp', 'rfd',
          'rfpb', 'rfpp', 'rfpd',
          'cfb', 'cfp', 'cfd',
          'cfpb', 'cfpp', 'cfpd',
          'pa'),
    v=FALSE,
    v.round=2,
    v.pos=3,
    xlab=FALSE,
    xlas=0,
    ylab=FALSE,
    y2lab=FALSE,
    y2cfp=seq(0, 100, 25),
    col=gray(.4),
    xlim=NULL,
    ylim=NULL,
    main=NULL,
    box=FALSE, ...)

## S3 method for class 'fdt_cat.multiple'
plot(x,
    type=c('fb', 'fp', 'fd',
          'rfb', 'rfp', 'rfd',
          'rfpb', 'rfpp', 'rfpd',
          'cfb', 'cfp', 'cfd',
          'rfpb', 'rfpp', 'rfpd',
          'pa'),
    v=FALSE,
    v.round=2,
    v.pos=3,
    xlab=NULL,
    xlas=0,
    ylab=NULL,
    y2lab=NULL,
    y2cfp=seq(0, 100, 25),
    col=gray(.4),
    xlim=NULL,
    ylim=NULL,
    main=NULL,
    main.vars=TRUE,
    box=FALSE, ...)

Arguments

x A 'fdt' object.

type The type of the plot:
'fb:' Absolute frequency barplot,
'fh:' Absolute frequency histogram,
'fp:' Absolute frequency polygon,
'fd:' Absolute frequency dotchart,
.rfb:' Relative frequency barplot,
.rfh:' Relative frequency histogram,
.rfp:' Relative frequency polygon,
'rfd:' Relative frequency dotchart,
.rfpb:' Relative frequency (%) barplot,
.rfph:' Relative frequency (%) histogram,
.rfpp:' Relative frequency (%) polygon,
.rfpd:' Relative frequency (%) dotchart,
'd:' Density,
'cdh:' Cumulative density histogram,
'cdp:' Cumulative density polygon,
 cf:' Cumulative frequency barplot,
'cfh:' Cumulative frequency histogram,
'cfp:' Cumulative frequency polygon,
'cfd:' Cumulative frequency dotchart,

'cdpb:' Cumulative frequency (%) barplot,
'cdph:' Cumulative frequency (%) histogram,
'cfpp:' Cumulative frequency (%) polygon,
'cfpd:' Cumulative frequency (%) dotchart.

'pa:' Pareto chart.

v Logical flag: should the values be added to the plot?
v.round If v=TRUE, it rounds the values to the specified number of decimal places (default 0).
v.pos If v=TRUE, a position specifier for the text. Values of 1, 2, 3 and 4, respectively indicate positions below, to the left of, above and to the right of the coordinates (default 3).

xlab A label for the ‘x’ axis.

xlas An integer which controls the orientation of the ‘x’ axis labels:
‘0:’ parallel to the axes,
‘2:’ perpendicular to the axes.

ylab A label for the ‘y’ axis.

y2lab A label for the ‘y2’ axis.

y2cfp A cumulative percent frequency for the ‘y2’ axis. The default is seq(0,100,25).

col A vector of colors.

xlim The ‘x’ limits of the plot.

ylim The ‘y’ limits of the plot.

main Title of the plot(s). This option has priority over ‘main.vars’, i.e, if any value is informed, the variable names will not be used as title of the plot(s). For fdt.multiple, the value should be a vector of characters, in this case, the R’s recycling rule will be used.

main.vars Logical flag: should the variables names be added as title of each plot (default TRUE)?

x.round A numeric value to round the ‘x’ ticks: ‘0:’ parallel to the axes,
‘1:’ horizontal,
‘2:’ perpendicular to the axes,
‘3:’ vertical.

box If TRUE (the default!), a box will be placed on the graphics. Only to categorical variable.

grouped If TRUE, the lines of the polygon types will be plotted in the same graphics. It’s work only if the "by" argument is used.

args.legend List of additional arguments to be passed to legend; names of the list are used as argument names. Only used if grouped=TRUE. The default is NULL.

... Optional plotting parameters.
Details

The result is a single histogram or polygon (absolute, relative or cumulative) for `fdt.default` or a set of histograms or polygon (absolute, relative or cumulative) for `fdt.multiple` objects. Both ‘default and multiple’ try to compute the maximum number of histograms that will fit on one page, then it draws a matrix of histograms. More than one graphical device may be opened to show all histograms.

The result is a single barplot, polygon, dotchar (absolute, relative or cumulative) and Pareto chart for `fdt_cat.default` or a set of the same graphs for `fdt_cat.multiple` objects. Both ‘default and multiple’ try to compute the maximum number of histograms that will fit on one page, then it draws a matrix of graphs listed above. More than one graphical device may be opened to show all graphs.

Author(s)

José Cláudio Faria
Enio G. Jelihovschi
Ivan B. Allaman

Examples

```r
library(fdth)
#================================
# Vectors: univariated numerical
#================================
x <- rnorm(n=1e3,
    mean=5,
    sd=1)
(d <- fdt(x))
# Histograms
plot(d) # Absolute frequency histogram
plot(d, main='My title')
plot(d, x.round=3,
    col='darkgreen')
plot(d, xlas=2)
plot(d, x.round=3,
    xlas=2,
    xlab=NULL)
plot(d, v=TRUE,
```
```r
plot.dft

cex=.8,
x.round=3,
xlas=2,
xlab=FALSE,
col=rainbow(11))

plot(d,
type='fh')  # Absolute frequency histogram

plot(d,
type='rfh')  # Relative frequency histogram

plot(d,
type='rfph')  # Relative frequency (%) histogram

plot(d,
type='cdh')  # Cumulative density histogram

plot(d,
type='cfh')  # Cumulative frequency histogram

plot(d,
type='cfph')  # Cumulative frequency (%) histogram

# Poligons
plot(d,
type='fp')  # Absolute frequency polygon

plot(d,
type='rfp')  # Relative frequency polygon

plot(d,
type='rfpp')  # Relative frequency (%) polygon

plot(d,
type='cdp')  # Cumulative density polygon

plot(d,
type='cfp')  # Cumulative frequency polygon

plot(d,
type='cfpp')  # Cumulative frequency (%) polygon

# Density
plot(d,
type='d')  # Density

# Theoretical curve and fdt
x <- rnorm(1e5,
  mean=5,
  sd=1)

plot(fdt(x,
```
```r
k=100),
type='d',
col=heat.colors(100))

curve(dnorm(x,
    mean=5,
    sd=1),
col='darkgreen',
add=TRUE,
lwd=2)

#==================================
# Vectors: univariate categorical
#==================================
x <- sample(letters[1:5],
        1e3,
        rep=TRUE)
(dc <- fdt_cat(x))

# Barplot: the default
plot(dc)

# Barplot
plot(dc,
    type='fb')

# Polygon
plot(dc,
    type='fp')

# Dotchart
plot(dc,
    type='fd')

# Pareto chart
plot(dc,
    type='pa')

#=============================================  
# Data.frames: multivariate with categorical
#=============================================  
mdf <- data.frame(X1=rep(LETTERS[1:4], 25),
    X2=as.factor(rep(1:10, 10)),
    Y1=c(NA, NA, rnorm(96, 10, 1), NA, NA),
    Y2=rnorm(100, 60, 4),
    Y3=rnorm(100, 50, 4),
    Y4=rnorm(100, 40, 4),
    stringsAsFactors=TRUE)

# Histograms
(d <- fdt(mdf))
```
plot(d, 
v=TRUE, 
cex=.8)

plot(d, 
col='darkgreen', 
ylim=c(0, 40))

plot(d, 
col=rainbow(8), 
ylim=c(0, 40), 
main=LETTERS[1:4])

plot(d, 
type='fh')

plot(d, 
type='rfh')

plot(d, 
type='rfph')

plot(d, 
type='cdh')

plot(d, 
type='cfh')

plot(d, 
type='cfph')

# Polygons
plot(d, 
v=TRUE, 
type='fp')

plot(d, 
type='rfp')

plot(d, 
type='rfpp')

plot(d, 
type='cdp')

plot(d, 
type='cfp')

plot(d, 
type='cfpp')

# Density
plot(d,
    type='d')

levels(mdf$X1)

plot(fdt(mdf,
    k=5,
    by='X1'),
    ylim=c(0, 12))

levels(mdf$X2)

plot(fdt(mdf,
    breaks='FD',
    by='X2'))

plot(fdt(mdf,
    k=5,
    by='X2')) # It is difficult to compare

plot(fdt(mdf,
    k=5,
    by='X2'),
    ylim=c(0, 8)) # Easy

plot(fdt(iris,
    k=5))

plot(fdt(iris,
    k=5),
    col=rainbow(5))

plot(fdt(iris,
    k=5,
    by='Species'),
    v=TRUE)

d <- fdt(iris,
    k=10)

plot(d)

plot(d,
    type='d')

# Categorical data
(dc <- fdt_cat(mdf))
plot(dc)

plot(dc,
    type='fd',
    pch=19)
# Matrices: multivariated

```r
plot(fdt(state.x77))
plot(fdt(volcano))
```

## Description

S3 methods to return a `data.frame` (the frequency distribution table - `fdt`) for `fdt.default` and `fdt.multiple` objects; `data.frame` (the frequency distribution table - `fdt_cat`) for `fdt_cat.default` and `fdt_cat.multiple` objects.

## Usage

```r
## S3 methods
## S3 method for class 'fdt.default'
print(x,
      columns=1:6,
      round=2,
      format.classes=FALSE,
      pattern='%.09.3e',
      row.names=FALSE,
      right=TRUE, ...)

## S3 method for class 'fdt.multiple'
print(x,
      columns=1:6,
      round=2,
      format.classes=FALSE,
      pattern='%.09.3e',
      row.names=FALSE,
      right=TRUE, ...)

## S3 method for class 'fdt_cat.default'
print(x,
      columns=1:6,
      round=2,
      row.names=FALSE,
      right=TRUE, ...)

## S3 method for class 'fdt_cat.multiple'
print(x,
      columns=1:6,
```
print.fdt

    round=2,
   row.names=FALSE,
   right=TRUE, ...)

Arguments

x        A ‘fdt’ object.
columns  A vector of integers to select columns of the data.frame table.
round    Rounds ‘fdt’ columns to the specified number of decimal places (default 2).
format.classes  Logical, if TRUE the first column of the data.frame table will be formatted using
                 regular expression. The default is “%09.3e”.
pattern   Same as fmt in sprintf.
row.names Logical (or character vector), indicating whether (or what) row names should be printed. The default is FALSE.
right     Logical, indicating whether or not strings should be right-aligned. The default is right-alignment.
...       Potential further arguments (require by generic).

Details

For print.fdt, it is possible to select what columns of the table (a data.frame) will be shown, as well as the pattern of the first column, for print.fdt_cat it is only possible to select what columns of the table (a data.frame) will be shown. The columns are:

1. ‘Class limits’
2. ‘f’ - Absolute frequency
3. ‘rf’ - Relative frequency
4. ‘rf(%)’ - Relative frequency, %
5. ‘cf’ - Cumulative frequency
6. ‘cf(%)’ - Cumulative frequency, %

The available parameters offer an easy and powerful way to format the ‘fdt’ for publications and other purposes.

Value

A single data.frame for fdt.default and fdt.default or multiple data.frames for fdt.multiple
and fdt_cat.multiple.

Author(s)

José Cláudio Faria
Enio G. Jelihovschi
Ivan B. Allaman
Examples

library (fdth)

#======================
# Vectors: univariated
#======================
set.seed(1)

x <- rnorm(n=1e3,
            mean=5,
            sd=1)

d <- fdt(x)

str(d)

d

print(d) # the same

print(d, 
      format=TRUE) # It can not be what you want to publications!

print(d, 
      format=TRUE, 
      pattern='%.2f') # Huum ... good, but ... Can it be better?

print(d, 
      col=c(1:2, 4, 6), 
      format=TRUE, 
      pattern='%.2f') # Yes, it can!

range(x) # To know x

print(fdt(x, 
         start=1, 
         end=9, 
         h=1), 
         col=c(1:2, 4, 6), 
         format=TRUE, 
         pattern='%d') # Is it nice now?

d[['table']] # Stores the freq. dist. table (fdt)
d[['breaks']] # Stores the breaks of fdt
d[['breaks']]$['start'] # Stores the left value of the first class
d[['breaks']]$['end'] # Stores the right value of the last class
d[['breaks']]$['h'] # Stores the class interval
as.logical(d[['breaks']]$['right']) # Stores the right option

#============================================= 
# Data.frames: multivariated with categorical 
#=============================================
mdf <- data.frame(X1=rep(LETTERS[1:4], 25),
                  X2=as.factor(rep(1:10, 10)),
                  Y1=c(NA, NA, rnorm(96, 10, 1), NA, NA),
                  Y2=rnorm(100, 60, 4),
                  Y3=rnorm(100, 50, 4),
                  Y4=rnorm(100, 40, 4),
                  stringsAsFactors=TRUE)

(d <- fdt_cat(mdf))
print(d)

(d <- fdt(mdf))
print(d)
str(d)
print(d, # the s
      format=TRUE)
print(d,
      format=TRUE,
      pattern='%05.2f') # regular expression
print(d,
      col=c(1:2, 4, 6),
      format=TRUE,
      pattern='%05.2f')
print(d,
      col=c(1:2, 4, 6))
print(d,
      col=c(1:2, 4, 6),
      format=TRUE,
      pattern='%05.2f')

levels(mdf$X1)
print(fdt(mdf,
         k=5,
         by='X1'))

levels(mdf$X2)
print(fdt(mdf,
         breaks='FD',
         by='X2',
         round=3)
print(fdt(mdf,
         k=5,
         by='X2'))
quantile.fdt

Quantile of frequency distribution table (numerical variable)

Description
S3 methods for the quantile of a fdt.
Useful to estimate the quantile (when the real data vector is not known) from a previous fdt.

Usage
## S3 methods: numerical
## S3 method for class 'fdt'
quantile(x,
  \ldots,
  i=1,
  probs=seq(0, 1, 0.25))

## S3 method for class 'fdt.multiple'
quantile(x, \ldots)
Arguments

- **x**: A fdt (simple or multiple) object.
- **i**: A vector of length up to the length of `probs`
- **probs**: vector of probabilities defining the quantiles
- **...**: Potencial further arguments (required by generic).

Details

`quantile.fdt` calculates the quantiles based on a known formula for class intervals. `quantile.fdt.multiple` calls `quantile.fdt` for each variable, that is, each column of the data.frame.

Value

`quantile.fdt` returns a numeric vector containing the value(s) of the quantile(s) from `fdt`. `quantile.fdt.multiple` returns a list, where each element is a numeric vector containing the quantile(s) of the `fdt` for each variable.

Author(s)

José Cláudio Faria
Enio G. Jelihovschi
Ivan B. Allaman

See Also

`median.fdt`, `var.fdt`.

Examples

```r
mdf <- data.frame(x=rnorm(1e2, 20, 2),
y=rnorm(1e2, 30, 3),
z=rnorm(1e2, 40, 4))

head(mdf)

apply(mdf, 2, quantile)[2,] # The first quartile
quantile(fdt(mdf)) # Notice that the i default is 1 (the first quartile)

## A small (but didactic) joke
quantile(fdt(mdf), i=2,
```

```
probs=seq(0, 1, 0.25)) # The quartile 2
quantile(fdt(mdf), i=5, probs=seq(0, 1, 0.10)) # The decile 5
quantile(fdt(mdf), i=50, probs=seq(0, 1, 0.01)) # The percentile 50
quantile(fdt(mdf), i=500, probs=seq(0, 1, 0.001)) # The permile 500
median(fdt(mdf)) # The median (all the results are the same) ;)

---

**sd**

*Standard deviation of frequency distribution table (numerical variable)*

**Description**

S3 methods for the standard deviation of a `fdt`. Useful to estimate the standard deviation (when the real data vector is not known) from a previous `fdt`.

**Usage**

```r
## S3 generic
sd(x, ...)
```

```r
## S3 methods: numerical
## Default S3 method:
sd(x, ...)
```

```r
## S3 method for class 'fdt'
sd(x, ...)
```

```r
## S3 method for class 'fdt.multiple'
sd(x, ...)
```
Arguments

x  A fdt (simple or multiple) object.

...  Required to be generic.

Details

sd.fdt calculates the value of the variance based on a known formula. sd.fdt.multiple calls
sd.fdt for each variable, that is, each column of the data.frame.

Value

sd.fdt returns a numeric vector containing the value of the median of the fdt. median.fdt.multiple
returns a list, where each element is a numeric vector containing the value of the variance of the
fdt for each variable.

Author(s)

José Cláudio Faria
Enio G. Jelihovschi
Ivan B. Allaman

See Also

var.fdt, mean.fdt.

Examples

mdf <- data.frame(x=rnorm(1e3,
  20,
  2),
y=rnorm(1e3,
  30,
  3),
z=rnorm(1e3,
  40,
  4))

head(mdf)

apply(mdf,
  2,
  sd)

sd(fdt(mdf))
Summary methods for fdt objects

Description

S3 methods to return a data.frame (the frequency distribution table - 'fdt') for fdt.default, fdt.multiple, fdt_cat.default and fdt_cat.multiple objects.

Usage

```r
## S3 methods
## S3 method for class 'fdt.default'
summary(object, 
          columns=1:6, 
          round=2, 
          format.classes=FALSE, 
          pattern="%09.3e", 
          row.names=FALSE, 
          right=TRUE, ...) 

## S3 method for class 'fdt.multiple'
summary(object, 
          columns=1:6, 
          round=2, 
          format.classes=FALSE, 
          pattern="%09.3e", 
          row.names=FALSE, 
          right=TRUE, ...) 

## S3 method for class 'fdt_cat.default'
summary(object, 
          columns=1:6, 
          round=2, 
          row.names=FALSE, 
          right=TRUE, ...) 

## S3 method for class 'fdt_cat.multiple'
summary(object, 
          columns=1:6, 
          round=2, 
          row.names=FALSE, 
          right=TRUE, ...) 
```

Arguments

- `object` A fdt or fdt_cat object.
- `columns` A vector of integers to select columns of the data.frame table.
**round**

Rounds ‘fdt’ columns to the specified number of decimal places (default 2).

**format.classes**

Logical, if TRUE the first column of the data.frame table will be formatted using regular expression. The default is “%09.3e”.

**pattern**

Same as fmt in `sprintf`.

**row.names**

Logical (or character vector), indicating whether (or what) row names should be printed. The default is FALSE.

**right**

Logical, indicating whether or not strings should be right-aligned. The default is right-alignment.

**...**

Optional further arguments (require by generic).

**Details**

It is possible to select what columns of the table (a data.frame) will be shown, as well as the pattern of the first column. The columns are:

1. ‘Class limits’
2. ‘f’ - Absolute frequency
3. ‘rf’ - Relative frequency
4. ‘rf(%)’ - Relative frequency, %
5. ‘cf’ - Cumulative frequency
6. ‘cf(%)’ - Cumulative frequency, %

The available parameters offer an easy and powerful way to format the ‘fdt’ for publications and other purposes.

**Value**

A single data.frame for fdt.default or multiple data.frames for fdt.multiple.

**Author(s)**

José Cláudio Faria
Enio G. Jelihovschi
Ivan B. Allaman

**Examples**

```r
library (fdth)

#======================
# Vectors: univariated
#======================
set.seed(1)

x <- rnorm(n=1e3,
            mean=5,
            sd=1)
```
summary.fdt

\[ d \leftarrow \text{fdt}(x) \]

\text{str}(d)

d

\text{summary}(d) \quad \# \text{the same}

\text{summary}(d, \\
    \text{format}=\text{TRUE}) \quad \# \text{It can not be what you want to publications!}

\text{summary}(d, \\
    \text{format}=\text{TRUE}, \\
    \text{pattern}='\%2f') \quad \# \text{Huumm ... good, but ... Can it be better?}

\text{summary}(d, \\
    \text{col}=c(1:2, 4, 6), \\
    \text{format}=\text{TRUE}, \\
    \text{pattern}='\%d') \quad \# \text{Yes, it can!}

\text{range}(x) \quad \# \text{To know} \ x

\text{summary}(\text{fdt}(x, \\
    \text{start}=1, \\
    \text{end}=9, \\
    \text{h}=1), \\
    \text{col}=c(1:2, 4, 6), \\
    \text{format}=\text{TRUE}, \\
    \text{pattern}='\%d') \quad \# \text{Is it nice now?}

d[['\text{table}']] \quad \# \text{Stores the freq. dist. table (fdt)}

d[['\text{breaks}']] \quad \# \text{Stores the breaks of fdt}

d[['\text{breaks}'][['\text{start}']] \quad \# \text{Stores the left value of the first class}

d[['\text{breaks}'][['\text{end}']] \quad \# \text{Stores the right value of the last class}

d[['\text{breaks}'][['\text{h}']] \quad \# \text{Stores the class interval}

\text{as.logical}(d[['\text{breaks}'][['\text{right}']]]) \quad \# \text{Stores the right option}

# Data.frames: multivariated with categorical
#=============================================
mdf <- \text{data.frame}(X1=\text{rep}(\text{LETTERS}[1:4], 25), \\
    X2=\text{as.factor}(\text{rep}(1:10, 10)), \\
    Y1=\text{c}(\text{NA, NA, rnorm(96, 10, 1), NA, NA}), \\
    Y2=\text{rnorm}(100, 60, 4), \\
    Y3=\text{rnorm}(100, 50, 4), \\
    Y4=\text{rnorm}(100, 40, 4), \\
    \text{stringsAsFactors}=\text{TRUE})

dcat <- \text{fdt}\_\text{cat}(\text{mdf})

\text{summary}(\text{dcat})

d <- \text{fdt}(\text{mdf})
str(d)

summary(d)  # the same

summary(d, format=TRUE)

summary(d, format=TRUE, pattern='%05.2f')  # regular expression

summary(d, col=c(1:2, 4, 6), format=TRUE, pattern='%05.2f')

print(d, col=c(1:2, 4, 6))

print(d, col=c(1:2, 4, 6), format=TRUE, pattern='%05.2f')

levels(mdf$X1)

summary(fdt(mdf, k=5, by='X1'))

levels(mdf$X2)

summary(fdt(mdf, breaks='FD', by='X2'), round=3)

summary(fdt(mdf, k=5, by='X2'), format=TRUE, round=3)

summary(fdt(iris, k=5), format=TRUE, pattern='%04.2f')

levels(iris$Species)

summary(fdt(iris, k=5),
var

by='Species'),
format=TRUE,
patter='%.2f')

#=========================
# Matrices: multivariated
#=========================
summary(fdt(state.x77),
col=c(1:2, 4, 6),
format=TRUE)
summary(fdt(volcano,
  right=TRUE),
col=c(1:2, 4, 6),
round=3,
format=TRUE,
pattern='%.1f')

---

var Variance of frequency distribution table (numerical variable)

Description
S3 methods for the variance of a fdt.
Useful to estimate the variance (when the real data vector is not known) from a previous fdt.

Usage
## S3 generic
def var(x, ...)

## S3 methods: numerical
## Default S3 method:
def var(x, ...)

## S3 method for class 'fdt'
def var(x, ...)

## S3 method for class 'fdt.multiple'
def var(x, ...)

Arguments
x A fdt (simple or multiple) object.
...
Required to be generic.

Details
var.fdt calculates the value of the variance based on a known formula. var.fdt.multiple calls
var.fdt for each variable, that is, each column of the data.frame.
Value

var.fdt returns a numeric vector containing the value of the median of the fdt. median.fdt.multiple returns a list, where each element is a numeric vector containing the value of the variance of the fdt for each variable.

Author(s)

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See Also

sd.fdt, mean.fdt.

Examples

```r
mdf <- data.frame(x=rnorm(1e2,
   20,
   2),
y=rnorm(1e2,
   30,
   3),
z=rnorm(1e2,
   40,
   4))

head(mdf)
apply(mdf,
   2,
   var)

var(fdt(mdf))
```

---

xtable.fdt

LaTeX table of the frequency distribution table

Description

This function returns a LaTeX table of the fdt, fdt.multiple and fdt_cat.multiple objects of the xtable class.

Usage

```r
xtable.fdt(x,
   caption = NULL,
   label = NULL,
```
align = NULL,
digits = NULL,
display = NULL,
auto = FALSE,
...

xtable.fdt.multiple(x,
caption = NULL,
label = NULL,
align = NULL,
digits = NULL,
display = NULL,
...

xtable.fdt_cat.multiple(x,
caption = NULL,
label = NULL,
align = NULL,
digits = NULL,
display = NULL,
...

Arguments

x
A fdt or fdt.multiple class object.
caption
Character vector of length 1 or 2 containing the table’s caption or title. See xtable function to more details.
label
Character vector of length 1 containing the LaTeX label or HTML anchor. See xtable function to more details.
align
Character vector of length equal to the number of columns of the resulting table, indicating the alignment of the corresponding columns. See xtable function to more details.
digits
Numeric vector of length equal to one (in which case it will be replicated as necessary) or to the number of columns of the resulting table or matrix of the same size as the resulting table, indicating the number of digits to display in the corresponding columns. See xtable function to more details.
display
Character vector of length equal to the number of columns of the resulting table, indicating the format for the corresponding columns. See xtable function to more details.
auto
Logical, indicating whether to apply automatic format when no value is passed to align, digits, or display
...
Additional arguments.

Details

The functions latex.fdt was deprecated. We understand over the years that creating a method for the generic xtable function would be inevitable, given the advancement of the xtable package and its support by the academic community.
Then, the \texttt{fdt}, \texttt{fdt.multiple} and \texttt{fdt_cat.multiple} methods were created for the generic \texttt{xtable} function. For object of the \texttt{fdt_cat} class, no methods were created, as they inherit the \texttt{data.frame} class, and therefore, the \texttt{xtable} functions can be used directly for such objects.

Objects of the \texttt{fdt.multiple} and \texttt{fdt_cat.multiple} class, when using the \texttt{xtable} function, will have the \texttt{xtableList} class. Although it may seem confusing, the \texttt{xtableList} function in the \texttt{xtable} package has no generic function and therefore it was not possible to create a method of type \texttt{xtableList.fdt.multiple}. Therefore, a method of the \texttt{xtable.fdt.multiple} class was created, but the function \texttt{xtableList} is being used internally.

More examples than those provided in the manual can be seen in the vignette.

It is possible to select what columns of the table (a \texttt{data.frame}) will be shown, as well as the pattern of the first column. The columns are:

1. ‘\texttt{Class limits}’
2. ‘\texttt{f}’ - Absolute frequency
3. ‘\texttt{rf}’ - Relative frequency
4. ‘\texttt{rf(\%)}’ - Relative frequency, \%
5. ‘\texttt{cf}’ - Cumulative frequency
6. ‘\texttt{cf(\%)}’ - Cumulative frequency, \%

\textbf{Value}

An object of the class \texttt{xtable.fdt} and \texttt{xtable.fdt.multiple}.

\textbf{Author(s)}

José Cláudio Faria  
Enio G. Jelihovschi  
Ivan B. Allaman

\textbf{See Also}

\texttt{xtable}, \texttt{xtableList}

\textbf{Examples}

```r
library(fdth)  
library(xtable)

# ++++ Quantitative data

## Example 1: The simplest possible
tl <- fdt(rnorm(n=1e3,  
    mean=10,  
    sd=2))

tlx <- xtable(tl)
tlx
```

## Example 2
print(t1x,
     include.rownames=FALSE)

## Example 3
newclass <- gsub("\[\[\]","",t1x[,1],perl=TRUE)
t3x <- t1x
t3x[,1] <- newclass

caption3 <- xtable(t3x,
     include.rownames=FALSE,
     sanitize.text.function = function(x)gsub("","\dashv",
                                            x,
                                            perl = TRUE))

## Not run:
## Example 4
clim <- t1$table[1]
clim1 <- sapply(clim,
                 as.character)
right <- t1$breaks[4]
pattern <- "
clim2 <- make.fdt.format.classes(clim1,
                                    right,
                                    pattern)
clim3 <- sapply(clim2,function(x)paste0("$",x,"$"))
t4x <- t1x
t4x[,1] <- clim3

print(t4x,
     include.rownames=FALSE)

## End(Not run)
## Example 5
t5 <- fdt(iris,
           by="Species")
attr(t5, "subheadings") <- paste0("Variable = ",
                                    names(t5))
xtable(t5)

# +++++ Qualitative data

## Example 6
t6 <- fdt_cat(sample(LETTERS[1:3],
                replace=TRUE,
                size=30))
t6x <- xtable(t6)
t6x

t61 <- fdt_cat(data.frame(c1=sample(LETTERS[1:3],
                                replace=FALSE,
                                size=30))

attr(t61, "subheadings") <- paste0("Variable = ",
                                     names(t61))
xtable(t61)

# +++++ Qualitative data
replace=TRUE,
size=10),
c2=sample(letters[4:5],
replace=TRUE,
size=10),
stringsAsFactors=TRUE))
attr(t61, "subheadings") <- paste0("Variable = ",
names(t61))
t61x <- xtable(t61)
t61x
Index

*Topic **distribution**
  fdt, 9
  fdt_cat, 13
  fdth-package, 2
  plot.fdt, 22
  print.fdt, 31
  summary.fdt, 39
*Topic **fdt_cat**
  fdt, 9
  fdt_cat, 13
*Topic **fdt**
  fdt, 9
  fdt_cat, 13
  fdth-package, 2
  plot.fdt, 22
  print.fdt, 31
  summary.fdt, 39
  xtable.fdt, 44
*Topic **frequency**
  fdt, 9
  fdt_cat, 13
  fdth-package, 2
  plot.fdt, 22
  print.fdt, 31
  summary.fdt, 39
*Topic **histogram**
  fdth-package, 2
  plot.fdt, 22
*Topic **multivariate**
  xtable.fdt, 44
*Topic **plot**
  plot.fdt, 22
*Topic **print**
  print.fdt, 31
*Topic **summary**
  summary.fdt, 39
*Topic **table**
  fdt, 9
  fdt_cat, 13
  fdth-package, 2
  plot.fdt, 22
  print.fdt, 31
  summary.fdt, 39
*Topic **xtable**
  xtable.fdt, 44
cut, 3, 11, 14, 16
fdt, 9
fdt_cat, 13
fdth(fdth-package), 2
fdth-package, 2
hist, 3, 11, 14
make.fdt, 15
make.fdt_cat(make.fdt), 15
mean.fdt, 17
median.fdt, 19
mfv, 20
plot.fdt, 22
plot.fdt_cat.default(plot.fdt), 22
plot.fdt_cat.multiple(plot.fdt), 22
print.fdt, 31
print.fdt_cat.default(print.fdt), 31
print.fdt_cat.multiple(print.fdt), 31
quantile.fdt, 35
sd, 37
sprintf, 32, 40
summary.fdt, 39
summary.fdt_cat.default(summary.fdt), 39
summary.fdt_cat.multiple(summary.fdt), 39
table, 3, 11, 14, 16
var, 43
xtable, 46
xtable.fdt, 44
xtable.fdt_cat.multiple(xtable.fdt), 44
xtableList, 46