

Package ‘ash’

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Title David Scott’s ASH routines

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Description David Scotts ASH routines

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ash-internal *Internal ash functions*

Description

Internal ash functions

Details

These functions are not intended to be called by the user.

ash1 *univariate ASH*

Description

Computes univariate averaged shifted histogram (polynomial kernel)

Usage

```
ash1(bins, m, kopt)
```

Arguments

bins	(input list) \$nc=integer vector of bin counts and \$ab=bin interval
m	(input) optional integer smoothing parameter; default=5.
kopt	(input) vector of length 2 specifying the kernel, which is proportional to $(1 - \text{abs}(i/m)^k \text{opt}(1))^{k \text{opt}(2)}$; (2,2)=biweight (default); (0,0)=uniform; (1,0)=triangle; (2,1)=Epanechnikov; (2,3)=triweight.

Value

returns structure suitable for input to plot dd

x=t	vector of bin center locations
y=f	vector of ash estimates
ier	0=normal exit; 1=estimate nonzero outside interval ab

See Also

[bin1](#)

Examples

```
x <- rnorm(100)                      # data
f <- ash1(bin1(x,nbin=50),5) # compute ash estimate
plot( f , type="l" )                # line plot of estimate
```

ash2	<i>bivariate ASH</i>
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Description

Compute bivariate ASH estimate (product polynomial kernel)

Usage

```
ash2(bins, m, kopt)
```

Arguments

bins	(input list) bin count matrix <code>nc</code> and interval matrix <code>ab</code> from <code>bin2</code>
m	(input integer vector of length 2) x and y direction smoothing parameters. Default is 5 by 5.
kopt	see ash1

Value

Matrix of ASH estimates returned. Components `x,y,z` can be given to the contour function directly. Other input variables returned in list for record keeping.

See Also

[bin2](#)

Examples

```
# Continuing example from help(bin2)
m <- c(5,5)
f <- ash2(bins,m)
image(f$x, f$y, f$z)
contour(f$x, f$y, f$z, add=TRUE)
```

bin1 *univariate binning*

Description

Function to compute array of bin counts for a data vector

Usage

```
bin1(x, ab, nbin=50)
```

Arguments

x (input) data vector
ab (input vector of length 2): half-open interval for bins $[a, b)$. If no value is specified, the range of x is stretched by 5% at each end and used the interval.
nbin (input integer): number of bins desired. Default 50.

Value

bin1 returns a list including the vector of integer bin counts and the ab vector and the number of points outside the ab interval.

See Also

[ash1](#)

Examples

```
x <- rnorm(100)      # data vector  
ab <- c(-5,5)       # bin interval  
bins <- bin1(x,ab,10) # bin x into 10 bins over ab
```

bin2 *2D binning*

Description

Bin bivariate data x

Usage

```
bin2(x, ab, nbin)
```

Arguments

x	(input matrix with 2 columns) data sample
ab	(input 2 x 2 matrix) rows 1 and 2 contain x and y axis bin intervals, respectively. If not specified, the ranges are stretched by 5% at each end for each dimension.
nbin	(input vector of length 2) number of bins along x and y axes. Default is 20 by 20.

Value

bin2 returns a list including the bivariate bin matrix and the number of points outside the ab rectangle.

See Also

[ash2](#)

Examples

```
x <- matrix( rnorm(200), 100 , 2)      # bivariate normal n=100
ab <- matrix( c(-5,-5,5,5), 2, 2)      # interval [-5,5) x [-5,5)
nbin <- c( 20, 20)                    # 400 bins
bins <- bin2(x, ab, nbin)              # bin counts,ab,nskip
```

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*Topic **nonparametric**

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