

# Package: ash (via r-universe)

August 22, 2024

**Version** 1.0-15

**Title** David Scott's ASH Routines

**Author** S original by David W. Scott R port by Albrecht Gebhardt

<albrecht.gebhardt@aau.at> adopted to recent S-PLUS by Stephen  
Kaluzny <spk@insightful.com>

**Maintainer** Albrecht Gebhardt <albrecht.gebhardt@aau.at>

**Description** David Scott's ASH routines ported from S-PLUS to R.

**License** GPL (>= 2)

**Date** 2015-08-27

**NeedsCompilation** yes

**Repository** CRAN

**Date/Publication** 2015-09-01 17:56:55

## Contents

|                        |   |
|------------------------|---|
| ash-internal . . . . . | 1 |
| ash1 . . . . .         | 2 |
| ash2 . . . . .         | 3 |
| bin1 . . . . .         | 3 |
| bin2 . . . . .         | 4 |

|              |          |
|--------------|----------|
| <b>Index</b> | <b>6</b> |
|--------------|----------|

---

|              |                               |
|--------------|-------------------------------|
| ash-internal | <i>Internal ash functions</i> |
|--------------|-------------------------------|

---

## Description

Internal ash functions

## Details

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

---

|      |                       |
|------|-----------------------|
| ash1 | <i>univariate ASH</i> |
|------|-----------------------|

---

### 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 $(1 - \text{abs}(i/m)^{k_{opt}(1)})^{k_{opt}(2)}$ ; (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> |
|------|----------------------|

---

**Description**

Compute bivariate ASH estimate (product polynomial kernel)

**Usage**

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

**Arguments**

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

**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 | <i>univariate binning</i> |
|------|---------------------------|

---

**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
```

# Index

## \* nonparametric

ash-internal, 1

ash1, 2

ash2, 3

bin1, 3

bin2, 4

ash-internal, 1

ash1, 2, 3, 4

ash2, 3, 5

bin1, 2, 3

bin2, 3, 4

center (ash-internal), 1

nicerange (ash-internal), 1