

mad {stats}
R Documentation

Median Absolute Deviation

Description

Compute the median absolute deviation, i.e., the (lo-/hi-) median of the absolute deviations from the median, and (by default) adjust by a factor for asymptotically normal consistency.

Usage

```
mad(x, center = median(x), constant = 1.4826, na.rm =  
FALSE,  
    low = FALSE, high = FALSE)
```

Arguments

`x`

a numeric vector.

`center`

Optionally, the centre: defaults to the median.

`constant`

scale factor.

`na.rm`

if TRUE then NA values are stripped from `x` before computation takes place.

`low`

if TRUE, compute the “lo-median”, i.e., for even sample size, do not average the two middle values, but take the smaller one.

`high`

if TRUE, compute the “hi-median”, i.e., take the larger of the two middle values for even sample size.

Details

The actual value calculated is `constant * cMedian(abs(x - center))` with the default value of `center` being `median(x)`, and `cMedian` being the usual, the “low” or “high” median, see the arguments description for `low` and `high` above.

The default `constant = 1.4826` (approximately $1 / \Phi^{-1}(3/4) = 1 / \text{qnorm}(3/4)$) ensures consistency, i.e.,

$$E[\text{mad}(X_1, \dots, X_n)] = \sigma$$

for X_i distributed as $N(\mu, \sigma^2)$ and large n .

If `na.rm` is `TRUE` then `NA` values are stripped from `x` before computation takes place. If this is not done then an `NA` value in `x` will cause `mad` to return `NA`.

See Also

[IQR](#) which is simpler but less robust, [median](#), [var](#).

Examples

```
mad(c(1:9))
print(mad(c(1:9), constant=1)) ==
      mad(c(1:8,100), constant=1) # = 2 ; TRUE
x <- c(1,2,3, 5,7,8)
sort(abs(x - median(x)))
c(mad(x, co=1), mad(x, co=1, lo = TRUE), mad(x, co=1, hi
= TRUE))
```

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