

Package ‘swfscMisc’

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Type Package

Title Miscellaneous Functions for Southwest Fisheries Science Center

Description Collection of conversion, analytical, geodesic, mapping, and plotting functions. Used to support packages and code written by researchers at the Southwest Fisheries Science Center of the National Oceanic and Atmospheric Administration.

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URL <https://github.com/EricArcher/swfscMisc>

BugReports <https://github.com/EricArcher/swfscMisc/issues>

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affin.prop

Affinity Propagation

Description

Runs the Affinity Propagation clustering algorithm of Frey and Dueck, 2007.

Usage

```
affin.prop(  
  sim.mat,  
  num.iter = 100,  
  stable.iter = 10,  
  shared.pref = "min",  
  lambda = 0.5  
)
```

Arguments

sim.mat	a similarity matrix between individuals to be clustered.
num.iter	maximum number of iterations to attempt.
stable.iter	number of sequential iterations for which consistent clustering is considered acceptable.
shared.pref	type of shared preference to use. Can be one of "min", "median", or a numeric value.
lambda	damping factor.

Value

A matrix with one row per sample in 'sim.mat' and one column for each iteration. Values in columns indicate cluster assignment (arbitrary numbers) for each sample.

Author(s)

Eric Archer <eric.archer@noaa.gov>

References

Frey, B.J., and D. Dueck. 2007. Clustering by passing messages between data points. *Science* 315:972-976

Examples

```
data(iris)  
  
# Take 75 random iris rows for example  
iris <- iris[sample(1:nrow(iris), 75), ]  
iris <- droplevels(iris)  
  
iris.sim <- -dist(iris[, -5])  
  
iris.affin <- affin.prop(iris.sim, stable.iter = 5)  
table(iris$Species, iris.affin[, ncol(iris.affin)])
```

autoUnits	<i>Auto Time Interval Units</i>
-----------	---------------------------------

Description

Convert time interval units to natural values based on magnitude of difference.

Usage

```
autoUnits(x)
```

Arguments

x an object inheriting from class `difftime`

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
autoUnits(as.difftime("0:3:35"))
autoUnits(as.difftime("15:3:35"))
autoUnits(ISOdate(2000, 5, 1) - ISOdate(2000, 4, 20))
```

bearing	<i>Calculate Bearing Between Two Positions</i>
---------	--

Description

Calculates the bearing between two points, given each point's latitude and longitude coordinates

Usage

```
bearing(lat1, lon1, lat2, lon2)
```

Arguments

lat1, lon1 numeric. The latitude and longitude of the starting coordinate in decimal degrees.

lat2, lon2 numeric. The latitude and longitude of the ending coordinate in decimal degrees.

Value

vector with initial and final bearings.

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
# What is the bearing from San Diego, CA to Honolulu, HI?
bearing(32.87, -117.25, 21.35, -157.98)
```

box.area

Area of a Box

Description

Calculate the area of a square on the earth.

Usage

```
box.area(lat, lon, edge, units = "nm")
```

Arguments

lat, lon	The latitude and longitude of the lower right corner of the box in decimal degrees.
edge	The length of one side of the square in decimal degrees.
units	units of distance. Can be "km" (kilometers), "nm" (nautical miles), or "mi" (statute miles).

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
#What is the area of a 5 degree grid off of San Diego, CA?
box.area(32.87, -117.25, edge = 1, units = "nm")
box.area(32.87, -117.25, edge = 1, units = "km")
box.area(32.87, -117.25, edge = 1, units = "mi")
```

braces

*Braces***Description**

Adds curly braces to a plot.

Usage

```
braces(
  xfrom,
  xto,
  yfrom,
  yto,
  radius = 1,
  col = par("fg"),
  lty = par("lty"),
  lwd = par("lwd")
)
```

Arguments

`xfrom`, `xto`, `yfrom`, `yto` start and end points of braces. Direction of brace determined by from and to arguments.

`radius` radius of curve in brace.

`col`, `lty`, `lwd` color, line type, and line width of braces. See [par](#) for more details.

Note

Orientation of brace is either horizontal or vertical, with axis along largest range of x or y in plotting units.

Author(s)

Tim Gerrodette <tim.gerrodette@noaa.gov>

Examples

```
plot(x = c(0, 1), y = c(0, 1000), type = "n", xlab = "", ylab = "")
braces(xfrom = 0.2, xto = 0.8, yfrom = c(400, 600), yto = c(300, 700))
plot(x = c(0, 100), y = c(0, 17), type = "n", xlab = "x", ylab = "y")
text(10, 16, "radius =")
for (i in 1:8) {
  braces(xfrom = 10 * i + 10, xto = 10 * i + 18, yfrom = 1,
        yto = 15, radius = i / 4, lwd = 2)
  text(10 * i + 12, 16, round(i / 4, 2))
}
```

```

plot(c(0, 100), c(0, 17), type = "n", xlab = "x", ylab = "y")
braces(30, 80, 13, 11, 1)

plot(c(0, 100), c(0, 17), type = "n", xlab = "x", ylab = "y")
braces(c(20, 80, 30), c(10,75,40), 1, 15, radius = c(0.2, 0.5, 0.1),
       lwd = c(1, 2, 3), col = 1:2, lty = 1)

plot(c(0, 100), c(0, 17), type = "n")
braces(20, 80, 7, 5, 1)
braces(20, 80, 13, 15, 1)

```

catSpatInterp

Categorical Spatial Interpolation

Description

Create a raster of probability of categorical values interpolated across a 2-dimensional space given a set of points where each is assigned to one of several classes.

Usage

```

catSpatInterp(
  data,
  x.col = "x",
  y.col = "y",
  group.col = "group",
  num.grid = 100,
  knn = 10,
  hull.buffer = 0.1,
  num.cores = 1,
  num.batches = NULL
)

```

Arguments

data	matrix or data.frame containing points and grouping designation.
x.col, y.col, group.col	numbers or characters identifying which columns in data are the x and y values and grouping designation.
num.grid	number of grid cells for k-nearest neighbor interpolation.
knn	number of nearest neighbors to consider for interpolation.
hull.buffer	percent increase of convex hull to use as spatial area to interpolate over.
num.cores	number of cores to distribute interpolations over.
num.batches	number of batches to divide grid cell interpolations into.

Value

A list containing a raster and points of buffered convex hull.

Author(s)

Eric Archer <eric.archer@noaa.gov>

References

Adapted from code originally presented in a blog post on Categorical Spatial Interpolation by Timo Grossenbacher <https://timogrossenbacher.ch/2018/03/categorical-spatial-interpolation-with-r/>

Examples

```
## Not run:
iris.mds <- stats::cmdscale(dist(iris[, 1:4]), k = 2)
mds.df <- setNames(
  cbind(iris.mds, data.frame(iris$Species)),
  c("dim1", "dim2", "Species")
)

result <- catSpatInterp(
  mds.df, x.col = "dim1", y.col = "dim2", group.col = "Species",
  num.grid = 300, knn = 20, hull.buffer = 0.05,
  num.cores = 5, num.batches = NULL
)

library(ggplot2)
ggplot(mapping = aes(dim1, dim2)) +
  geom_raster(
    aes(fill = Species, alpha = prob),
    data = result$raster
  ) +
  geom_polygon(data = result$hull.poly, fill = NA, col = "black") +
  geom_hline(yintercept = 0, col = "white") +
  geom_vline(xintercept = 0, col = "white") +
  geom_point(
    aes(fill = Species),
    data = mds.df,
    col = "black",
    shape = 21,
    size = 4
  ) +
  theme(
    axis.ticks = element_blank(),
    axis.text = element_blank(),
    axis.title = element_blank(),
    legend.position = "top",
    panel.grid = element_blank(),
    panel.background = element_blank()
  )
)
```



```
## End(Not run)
```

`central.quantile` *Central Quantile*

Description

Upper and lower values of central quantile

Usage

```
central.quantile(x, pct = 0.95)
```

Arguments

<code>x</code>	numeric vector.
<code>pct</code>	central percentile desired.

Value

a two element vector giving the lower and upper quantiles.

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
x <- runif(1000)
central.quantile(x)
central.quantile(x, pct = 0.75)
```

`circle.polygon` *Circle Polygon (on Earth)*

Description

Creates a circular polygon (optionally on the earth) centered at a given point with a constant radius.

Usage

```
circle.polygon(
  x,
  y,
  radius,
  brng.limits = 0,
  sides = 1,
  by.length = TRUE,
  units = "nm",
  ellipsoid = datum(),
  dist.method = "lawofcosines",
  destination.type = "ellipsoid",
  poly.type = "cart.earth"
)
```

Arguments

<code>x, y</code>	number specifying the coordinates of the center of the circle in decimal degrees. If <code>poly.type</code> is "simple.earth" or "complex.earth", this will be longitude and latitude respectively.
<code>radius</code>	radius of sphere.
<code>brng.limits</code>	number, or vector of two numbers. If one value is given, it is used as the starting bearing in degrees for the first point of the circle. If a vector of two values is given, then they are used as the start and end bearings of arc.
<code>sides</code>	number that represents either length of sides or number of sides, as specified by the 'by.length' argument.
<code>by.length</code>	logical. If TRUE, then sides is the length of sides, if FALSE, then sides is number of sides.
<code>units</code>	character for units of distance: Can be "km" (kilometers), "nm" (nautical miles), "mi" (statute miles).
<code>ellipsoid</code>	ellipsoid model parameters as returned from a call to datum .
<code>dist.method</code>	character specifying method for calculating distance for <code>type = "cart.earth"</code> . See method argument of distance for more information.
<code>destination.type</code>	character specifying type of surface for <code>type = "gc.earth"</code> . See type argument of destination for more information.
<code>poly.type</code>	character specifying the type of polygon calculation to use. Can be one of "cartesian" using basic cartesian coordinates, "cart.earth" for a simple polygon on the earth's surface treating latitude and longitude as cartesian coordinates, or "gc.earth" for a more precise calculation keeping a constant great-circle radius.

Value

A matrix representing the desired circle polygon centered at lat, lon of radius.

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
cart.earth <- circle.polygon(-117.24, 32.86, 40, poly.type = "cart.earth")

lat.range <- c(32, 34)
lon.range <- c(-118.5, -116)

op <- par(mar = c(3, 5, 5, 5) + 0.1, oma = c(1, 1, 1, 1))

maps::map("mapdata::worldHires", fill = TRUE, col = "wheat3", xlim = lon.range, ylim = lat.range)
points(-117.24, 32.86, pch = 19, col = "red")
polygon(cart.earth, border = "red", lwd = 3)
lat.lon.axes(n = 3)
box(lwd = 2)
mtext("poly.type = 'cart.earth'", line = 3)

par(op)
```

color.name

Color Name

Description

Return the name of a color listed given the number.

Usage

```
color.name(i)
```

Arguments

i integer specifying color .

Value

character value of 'i' color.

Author(s)

Eric Archer <eric.archer@noaa.gov>

convert.angle *Angle Conversion*

Description

Converts angles between radians and degrees.

Usage

```
convert.angle(x, from = c("degrees", "radians"), to = c("radians", "degrees"))
```

Arguments

x numeric. The angle to be converted.
from, to character. Units to convert from and to. Can be "radians" or "degrees" or any partial match (case-sensitive).

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
convert.angle(45, "deg", "rad")  
convert.angle(4.5, "r", "d")
```

convert.distance *Distance Conversion*

Description

Convert distances between kilometers, nautical miles, and statute miles.

Usage

```
convert.distance(x, from = c("nm", "km", "mi"), to = c("km", "nm", "mi"))
```

Arguments

x numeric. The distance to be converted.
from, to character. Units to convert from and to. Can be "km" (kilometers), "nm" (nautical miles), or "mi" (statute miles), or any partial match thereof (case sensitive).

Author(s)

Eric Archer <eric.archer@noaa.gov>

`copy.tri`*Copy Matrix Triangles*

Description

Copy between lower left and upper right triangles of a matrix.

Usage

```
copy.tri(x, from = "lower")
```

Arguments

<code>x</code>	a matrix.
<code>from</code>	triangle to copy from. Can be "lower" or "upper".

Value

a matrix.

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
x <- matrix(1:9, nrow = 3)
print(x)
copy.tri(x)
```

`crossing.point`*Crossing Point*

Description

Return point where two lines cross

Usage

```
crossing.point(l1, l2)
```

Arguments

<code>l1, l2</code>	matrices representing two lines, where first two columns are x and y values respectively
---------------------	--

Value

a data.frame of x and y values of points where lines cross

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
x <- 1:100
line1 <- cbind(x, 3 + 3 * x)
line2 <- cbind(x, 10 - 3 * x)
plot(line1[, 1], line1[, 2], type = "l", col = "red")
lines(line2[, 1], line2[, 2], col = "blue")
cr.pt <- crossing.point(line1, line2)
print(cr.pt)
```

datum

Datum

Description

Return parameters specifying ellipsoid datum model.

Usage

```
datum(model = c("wgs84", "grs80", "airy", "international", "clarke", "grs67"))
```

Arguments

model character, specifying which model to use for ellipsoid model. Options are: "wgs84", "grs80", "airy", "international", "clarke", "grs67", or partial matches thereof (case-sensitive).

Value

vector of a, b, and f parameters.

Note

Model parameters are based on distances in km.

Author(s)

Eric Archer <eric.archer@noaa.gov>

destination	<i>Destination on Sphere or Ellipsoid</i>
-------------	---

Description

Calculates latitude and longitude of the destination along a sphere or ellipsoid.

Usage

```
destination(  
  lat,  
  lon,  
  brng,  
  distance,  
  units = c("nm", "km", "mi"),  
  ellipsoid = datum(),  
  radius = convert.distance(6371, "km", "nm"),  
  type = c("ellipsoid", "sphere", "vincenty")  
)
```

Arguments

lat, lon	numeric. The latitude and longitude of the coordinate in decimal degrees.
brng	numeric. The bearing, ranging from 0 to 360 degrees.
distance	numeric. The distance travelled, in units specified by <code>units</code> .
units	units of distance. Can be "km" (kilometers), "nm" (nautical miles), or "mi" (statute miles), or any partial match thereof (case sensitive).
ellipsoid	ellipsoid model parameters as returned from a call to <code>datum</code> .
radius	numeric. Define the radius for <code>type = "sphere"</code> . In units of <code>units</code> .
type	Character defining type of surface. Can be "sphere", "ellipsoid", "vincenty", or partial match thereof (case-sensitive).

Value

latitude and longitude of destination.

Author(s)

Eric Archer <eric.archer@noaa.gov>

References

Ellipsoid code adapted from JavaScript by [Larry Bogan](#).
Vincenty code adapted from JavaScript by [Chris Veness](#).
Vincenty, T. 1975. Direct and inverse solutions of geodesics on the ellipsoid with application of nested equations. [Survey Review 22\(176\):88-93](#).

Examples

```

destination(32.87, -117.25, 262, 4174, units = "km", type = "sphere")
destination(32.87, -117.25, 262, 4174, units = "km", type = "ellipsoid")
destination(32.87, -117.25, 262, 4174, units = "km", type = "vincenty")

```

distance	<i>Distance Between Coordinates</i>
----------	-------------------------------------

Description

Calculates the distance between two coordinates using the Law of Cosines, Haversine, or Vincenty methods.

Usage

```

distance(
  lat1,
  lon1,
  lat2,
  lon2,
  radius = convert.distance(6371, "km", "nm"),
  units = c("nm", "km", "mi"),
  ellipsoid = datum(),
  iter.limit = 20,
  method = c("lawofcosines", "haversine", "vincenty")
)

```

Arguments

lat1, lon1, lat2, lon2	The latitude and longitude of the first and second points in decimal degrees.
radius	radius of sphere.
units	units of distance. Can be "km" (kilometers), "nm" (nautical miles), or "mi" (statute miles), or any partial match thereof (case sensitive).
ellipsoid	ellipsoid model parameters as returned from a call to datum .
iter.limit	An integer value defining the limit of iterations for Vincenty method.
method	Character defining the distance method to use. Can be "lawofcosines", "haversine", "vincenty", or any partial match thereof (case sensitive).

Author(s)

Eric Archer <eric.archer@noaa.gov>

References

Code adapted from JavaScript by [Chris Veness](#)
Vincenty, T. 1975. Direct and inverse solutions of geodesics on the ellipsoid with application of nested equations. [Survey Review 22\(176\):88-93](#).

Examples

```
# What is the distance from San Diego, CA to Honolulu, HI?  
distance(32.87, -117.25, 21.35, -157.98, method = "lawofcosines")  
distance(32.87, -117.25, 21.35, -157.98, method = "haversine")  
distance(32.87, -117.25, 21.35, -157.98, method = "vincenty")
```

diversity

Unbiased Estimate of Diversity

Description

Calculate unbiased estimate of diversity for a vector of items

Usage

```
diversity(x)
```

Arguments

x character or numeric vector or factor

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
x <- sample(1:5, 100, replace = TRUE)  
diversity(x)
```

`fisher.method.p` *Fisher's Method p-value*

Description

Calculate Fisher's method p-value to summarize a vector of p-values based on a chi-squared distribution.

Usage

```
fisher.method.p(p.vals)
```

Arguments

`p.vals` vector of p-values.

Author(s)

Eric Archer <eric.archer@noaa.gov>

`geometric.mean` *Geometric Mean*

Description

Calculates the geometric mean of a vector.

Usage

```
geometric.mean(x)
```

Arguments

`x` a numeric vector.

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
x <- rlnorm(100)
mean(x)
median(x)
geometric.mean(x)
```

`ggBiplot`*ggBiplot*

Description

Plot a biplot of a Principal Components Analysis using ggplot2.

Usage

```
ggBiplot(pca, x = 1, y = 2, mult.fac = 0.8, arrow.size = 1.5, label.size = 6)
```

Arguments

<code>pca</code>	result from a call to princomp .
<code>x, y</code>	the number or column names of the components to plot.
<code>mult.fac</code>	multiplier factor for lengths of arrows from 0:1.
<code>arrow.size</code>	thickness of arrow lines.
<code>label.size</code>	size of labels.

Value

the ggplot2 object is invisibly returned.

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
pc.cr <- princomp(USArrests, cor = TRUE)
ggBiplot(pc.cr)
```

`harmonic.mean`*Harmonic Mean*

Description

Calculate the harmonic mean of a set of numbers.

Usage

```
harmonic.mean(x, w = NULL, na.rm = FALSE)
```

Arguments

x	a numeric vector.
w	an optional numerical vector of weights the same length as x.
na.rm	a logical value indicating whether NA values should be stripped before the computation proceeds.

Note

If zeroes are present in x, function will return approximation with a warning. In this case, weights will not be used.

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
x <- rlnorm(100)
mean(x)
median(x)
harmonic.mean(x)
```

isBetween

Between

Description

Is a numeric value between two other values?

Usage

```
isBetween(x, a, b = NULL, include.ends = FALSE, na.convert = TRUE)
```

Arguments

x	vector of numeric values to check.
a, b	numeric values describing range.
include.ends	logical. Should test include a and b? Is test > and < or >= and <= ?
na.convert	logical. If TRUE and result of test is NA because either x, a, or b is NA, return FALSE, otherwise return NA.

Details

Order of a and b does not matter. If b is NULL the range will be taken from values in a.

Author(s)

Eric Archer <eric.archer@noaa.gov>

lab.wid	<i>Label Width</i>
---------	--------------------

Description

Calculate width of labels for plots.

Usage

```
lab.wid(labels)
```

Arguments

labels vector of labels to be used on plots

lat.lon.axes	<i>Latitude and Longitude axes</i>
--------------	------------------------------------

Description

Add latitude and longitude axes to a map.

Usage

```
lat.lon.axes(n = 5, lon.n = n, lat.n = n)
```

Arguments

n, lon.n, lat.n the number of tick marks desired. Can be specified separately for longitude (lon.n) or latitude (lat.n). See [pretty](#) for more details.

Author(s)

Eric Archer <eric.archer@noaa.gov>

month2Season	<i>Convert Months to Seasons</i>
--------------	----------------------------------

Description

Convert numeric month to season: Winter = Dec-Feb, Spring = Mar-May, Summer = Jun-Aug, Fall = Sep-Nov

Usage

```
month2Season(x)
```

Arguments

x a vector of months from 1:12

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
months <- sample(1:12, 10, rep = TRUE)
months
month2Season(months)
```

na.count	<i>Count NAs</i>
----------	------------------

Description

Counts NAs in an object.

Usage

```
na.count(x)
```

Arguments

x a vector, data.frame, or matrix.

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
x <- sample(c(1:10, NA), 30, replace = TRUE)
na.count(x)
x.df <- do.call(data.frame, lapply(1:4, function(i) sample(c(1:10, NA), 30, replace = TRUE)))
colnames(x.df) <- paste("X", 1:4, sep = "")
na.count(x.df)
```

odds

*Odds Conversion***Description**

odds	converts probability to odds
logOdds	converts odds to log-odds
invOdds	converts odds to probability
invLogOdds	converts log-odds to odds

Usage

odds(x)

logOdds(x)

invOdds(x)

invLogOdds(x)

Arguments

x a numeric vector of probabilities (0 to 1), odds (0 to Inf), or log.odds (-Inf to Inf).

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
x <- sort(runif(10))
odds.df <- data.frame(x = x, odds = odds(x), logOdds = logOdds(x))
odds.df
invOdds(odds.df$odds)
invLogOdds(odds.df$logOdds)
```

`one.arg`*One Argument*

Description

Does the function have just one argument?

Usage

```
one.arg(f)
```

Arguments

`f` a function.

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
one.arg(mean)
one.arg(one.arg)
```

`plotAssignments`*Plot assignment distributions*

Description

Plot individual assignment probability distributions.

Usage

```
plotAssignments(
  probs,
  orig,
  type = NULL,
  ylab = NULL,
  freq.sep.line = TRUE,
  plot = TRUE
)
```


Arguments

probs	matrix or data.frame of individual assignment probabilities. Each column represents probability of assignment to that group and rows sum to one.
orig	vector of original group assignments
type	either area for stacked continuous area plot or bar for discrete stacked bar chart. The latter is preferred for small numbers of cases. If not specified, a bar chart will be used if all classes have ≤ 30 cases.
ylab	label for y-axis
freq.sep.line	put frequency of original group on second line in facet label? If FALSE, labels are single line. If NULL frequencies will not be included in labels.
plot	display the plot?

Value

the ggplot object is invisibly returned.

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
n <- 40
probs <- abs(c(rnorm(n, 80, 10), rnorm(n, 20, 10)))
probs <- (probs - min(probs)) / max(probs)
probs <- cbind(probs, 1 - probs)
colnames(probs) <- NULL
orig <- rep(c("Group.1", "Group.2"), each = n)

plotAssignments(probs, orig)

n <- 15
probs <- abs(c(rnorm(n, 80, 10), rnorm(n, 20, 10)))
probs <- (probs - min(probs)) / max(probs)
probs <- cbind(probs, 1 - probs)
colnames(probs) <- NULL
orig <- rep(c("Group.1", "Group.2"), each = n)

plotAssignments(probs, orig)
```

Description

Calculate the p-value for a permutation test.

Usage

```
pVal(obs, null.dist)
```

Arguments

```
obs          observed value.  
null.dist    vector of values from permutation null distribution.
```

Author(s)

```
Eric Archer <eric.archer@noaa.gov>
```

Examples

```
null.dist <- rnorm(1000)  
obs <- rnorm(1, mean = 1)  
  
plot(density(null.dist), xlim = range(c(obs, null.dist)), main = "")  
abline(v = obs)  
print(obs)  
pVal(obs, null.dist)
```

round

Rounding Numbers for Data Frames

Description

Rounds numeric columns in data.frames

Usage

```
## S3 method for class 'data.frame'  
ceiling(x)  
  
## S3 method for class 'data.frame'  
floor(x)  
  
## S3 method for class 'data.frame'  
trunc(x, ...)  
  
## S3 method for class 'data.frame'  
round(x, digits = 0)  
  
## S3 method for class 'data.frame'  
signif(x, digits = 6)
```

Arguments

x	a data.frame with numeric columns.
...	arguments to be passed to methods.
digits	integer indicating the number of decimal places (round) or significant digits (signif) to be used. See round for more details.

Details

Takes a data.frame and returns a data.frame with the specified function applied to each numeric column.

Author(s)

Eric Archer <eric.archer@noaa.gov>

See Also

[Round](#)

Examples

```
data(mtcars)
round(mtcars, 0)
signif(mtcars, 2)
```

row.col.page.fit *Number of Rows and Columns on Page*

Description

Return the number of rows and columns for n that best fits on a page of size width x height.

Usage

```
row.col.page.fit(n, width = 8.5, height = 11)
```

Arguments

n	number of items (e.g., plots) to fit on page.
width, height	dimensions of page.

Value

A vector listing the number of rows and columns to use.

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
# 9 frames on US letter paper
row.col.page.fit(9)

# 9 frames on a square
row.col.page.fit(9, width = 10, height = 10)
```

sample.map

Plot Samples on World Map

Description

Plot a set of samples on a world map.

Usage

```
sample.map(
  lat,
  lon,
  lat.range = NULL,
  lon.range = NULL,
  main = NULL,
  pch = 19,
  pt.cex = 1,
  col = "black",
  bg = col,
  n = 5,
  lon.n = n,
  lat.n = n
)
```

Arguments

lon, lat	vectors giving the longitude and latitude of points to plot.
lon.range, lat.range	vectors giving the minimum and maximum longitude and latitude of the map. If the first value in lon.range is greater than the second value, then a Pacific-centric map (world2Hires) is used and continents will not be filled in.
main	main title for the plot.
pch	point symbol to use.
pt.cex	point size to use.

col point color.
bg background color of point.
n, lon.n, lat.n the number of tick marks desired. Can be specified separately for longitude (lon.n) or latitude (lat.n). See [pretty](#) for more details.

Value

original [par](#) settings for mar and oma.

Author(s)

Eric Archer <eric.archer@noaa.gov>

See Also

[lat.lon.axes](#)

Examples

```
# Some random points around San Diego, CA
lat <- runif(30, 32.5, 33.3)
lon <- runif(30, -118.3, -117.5)
lat.range <- c(32.4, 33.6)
lon.range <- c(-118.6, -117)
sample.map(lat, lon, lat.range, lon.range)

# Some random points in the Pacific
lat <- runif(30, 20, 50)
lon <- c(runif(15, 150, 180), runif(15, -180, -120))
lat.range <- c(10, 75)
lon.range <- c(110, -110)
sample.map(lat, lon, lat.range, lon.range)
```

scatterdens

Scatter Plot with Density Margins

Description

Produce a scatter plot with a histogram or density plot in the margins

Usage

```
scatterdens(x, y, dens.frac = 1/5, ...)
```

```
scatterhist(x, y, xlab = "", ylab = "", dens.frac = 1/5, ...)
```

Arguments

`x, y` vectors of points to plot.
`dens.frac` fraction of screen to be taken up by density plots on margins.
`...` Arguments to be passed to `plot`.
`xlab, ylab` labels for x and y axes.

Author(s)

Eric Archer <eric.archer@noaa.gov>

References

Original code by [Ken Kleiman](#)

Examples

```

x <- rnorm(100)
y <- rlnorm(100)
op <- par(ask = TRUE)
scatterdens(x, y, xlab = "x", ylab = "y")
par(op)

```

 setupClusters

Setup Clusters

Description

Setup parallel clusters for different operating systems.

Usage

```
setupClusters(num.cores = 1, max.cores = NULL)
```

Arguments

`num.cores` number of cores for multithreading. If NULL, the number used is set to the value of `parallel::detectCores() - 1`.
`max.cores` maximum number of cores to use.

Value

an object of class `c("SOCKcluster", "cluster")`.

Author(s)

Eric Archer <eric.archer@noaa.gov>

`sex.symbols`*Sex Symbols*

Description

Plots male and female symbols on current plot.

Usage

```
sex.symbols(x, y, sex = 1, col = par("fg"), lwd = par("lwd"), cex = 1)
```

Arguments

<code>x, y</code>	the x and y coordinates on the current plot.
<code>sex</code>	a numeric vector containing the values 1 (male) or 2 (female). If of length one, then value is recycled for all symbols.
<code>col, lwd, cex</code>	color, line width, and character expansion for each point. <code>lwd</code> and <code>col</code> are recycled as necessary to cover all points. See par for more details.

Author(s)

Tim Gerrodette <tim.gerrodette@noaa.gov>

Examples

```
x <- runif(20, 0, 10)
y <- runif(20, 0, 200)
plot(x, y, type = "n")
sex.symbols(x, y, sex = 1:2, cex = 1.5, lwd = c(1.5, 4), col = c("blue", "red"))
```

`swfscMisc`*swfscMisc package*

Description

SWFSC Miscellaneous Functions

transparent *Transparent Colors*

Description

Return transparent form of a named color.

Usage

```
transparent(col, percent = 50)
```

Arguments

col vector of colors as name, hexadecimal, or positive integer (see [col2rgb](#)).

percent percent of transparency (0 = solid, 100 = transparent).

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
pct <- seq(0, 100, by = 10)
plot(pct, pct, bg = transparent("red", pct), pch = 21, cex = 4, xlab = "X", ylab = "Y")
```

uniform.test *Uniform Distribution Test*

Description

Tests whether a histogram is significantly different from a uniform distribution.

Usage

```
uniform.test(hist.output, B = NULL)
```

Arguments

hist.output output from a call to hist.

B number of replicates for chi-squared permutation.

Value

result of chi-squared test.

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
x.unif <- runif(100)
uniform.test(hist(x.unif), B = 1000)
x.lnorm <- rlnorm(100)
uniform.test(hist(x.lnorm), B = 1000)
```

which.nearest	<i>Which Nearest</i>
---------------	----------------------

Description

Find values of one vector that are nearest to values in another vector.

Usage

```
which.nearest(x, y)
```

Arguments

x vector of values to be compared against.

y vector of values to examine relative to x. May be of length 1.

@return For each value in y, returns index of value of x which is nearest to y in absolute value. In the case of ties, the function returns the first index of x. If nearest value is `min(x)` or `max(x)`, a warning is issued. NAs and NaNs in x are ignored; NAs and NaNs in y are returned.

Author(s)

Tim Gerrodette <tim.gerrodette@noaa.gov>

Examples

```
x <- sort(sample(1:100, 20))
y <- sort(sample(min(x):max(x), 5))
i <- which.nearest(x, y)
x
y
x[i]
```

`zero.pad`*Zero Pad Integers*

Description

Return character representation of integers that are zero-padded to the left so all are the same length.

Usage

```
zero.pad(x)
```

Arguments

`x` a vector of integers.

Author(s)

Eric Archer <eric.archer@noaa.gov>

Examples

```
x <- c(0, 1, 3, 4, 10)
zero.pad(x)
x <- c(x, 11, 12, 100, 1000)
zero.pad(x)
```

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