Package 'TOC'

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Type Package

Title TOC

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Description Construct the Total Operating Characteristic (TOC) Curve

License GPL (>= 2)

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`TOC-package` *Construct the Total Operating Characteristic (TOC) Curve*

Description

Construct the Total Operating Characteristic (TOC) Curve

Details

Package:	TOC
Type:	Package
Version:	0.0-1
Date:	2014-10-29
License:	GPL (>= 2)
LazyLoad:	yes

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See Also

TOC, plot.TOC

`plot.ROC` *Plot the ROC curve*

Description

Plot the Relative Operating Characteristic (ROC) curve

Usage

```
plot.ROC(roc, labelThres=FALSE, digits, modelLeg="Model", ...)
```

Arguments

`roc`	an object of class ROC
`labelThres`	logical, default to FALSE. If TRUE, thresholds are labeled in the ROC plot
`digits`	integer indicating the number of decimal places (round) or significant digits (signif) to be used for labeling the thresholds. Negative values are allowed. See Details in the round function
`modelLeg`	a string for labeling the model in the legend
`...`	additional parameters to be passed to `plot`

Value

a plot showing the ROC curve

See Also

ROC

Examples

```
index <- raster(system.file("external/p_built01_suitability_1.rst", package="TOC"))
boolean <- raster(system.file("external/BuiltGain1985_1999.rst", package="TOC"))
mask <- raster(system.file("external/1985NonBuilt01.rst", package="TOC"))
rocd <- ROC(index, boolean, mask, NAval=0, uncertainty=TRUE)
rocd
plot.ROC(rocd, labelThres=FALSE)

## Not run:
index <- raster(system.file("external/Prob_Map2.rst", package="TOC"))
boolean <- raster(system.file("external/Change_Map2b.rst", package="TOC"))
mask <- raster(system.file("external/MASK3.rst", package="TOC"))
rocd <- ROC(index, boolean, mask, nthres=100, NAval=0, uncertainty=TRUE)
rocd
plot.ROC(rocd, labelThres=FALSE)

## End(Not run)
```

`plot.TOC` *Plot the TOC curve*

Description

Plot the Total Operating Characteristic (TOC) curve

Usage

```
plot.TOC(toc, labelThres=FALSE, digits, modelLeg="Model", ...)
```

Arguments

`toc`	an object of class TOC
`labelThres`	logical, default to FALSE. If TRUE, thresholds are labeled in the TOC plot
`digits`	integer indicating the number of decimal places (round) or significant digits (signif) to be used for labeling the thresholds. Negative values are allowed. See Details in the round function
`modelLeg`	a character string for labeling the model in the legend
`...`	additional parameters to be passed to `plot`

Value

a plot showing the TOC curve

See Also

TOC

Examples

```
index <- raster(system.file("external/p_built01_suitability_1.rst", package="TOC"))
boolean <- raster(system.file("external/BuiltGain1985_1999.rst", package="TOC"))
mask <- raster(system.file("external/1985NonBuilt01.rst", package="TOC"))
tocd <- TOC(index, boolean, mask, NAval=0, uncertainty=TRUE)
tocd
plot.TOC(tocd, labelThres=FALSE)

## Not run:
index <- raster(system.file("external/Prob_Map2.rst", package="TOC"))
boolean <- raster(system.file("external/Change_Map2b.rst", package="TOC"))
mask <- raster(system.file("external/MASK3.rst", package="TOC"))
tocd <- TOC(index, boolean, mask, nthres=100, NAval=0, uncertainty=TRUE)
tocd
plot.TOC(tocd, labelThres=FALSE)

## End(Not run)
```

ROC *Construct the table for the ROC curve*

Description

Construct the table for the Relative Operating Characteristic (ROC) curve

Usage

```
ROC(index, boolean, mask=NULL, nthres=NULL, thres=NULL, NAval=0, ranking=FALSE,
P=NA, Q=NA, uncertainty=TRUE, progress=FALSE)
```

Arguments

index	index Raster map
boolean	boolean Raster map
mask	mask Raster map
nthres	an optional integer indicating the number of equal-interval thresholds to be evaluated for the ROC curve. See Details below
thres	an optional numeric vector of thresholds to be evaluated for the ROC curve. See Details below
NAval	value for nodata (NA values) in the mask map
ranking	logical; default to FALSE. If TRUE, cell values are ranked to solve ties
P	count of reference presence observations in the population
Q	count of reference absence observations in the population
uncertainty	logical; if TRUE, uncertainty in AUC calculation is computed and maximum AUC and minimum AUC, given the uncertainty, are provided in the output. See Details below
progress	logical; if TRUE, a progress bar is shown

Details

thresholds are calculated as the unique values of the index map after masking out NA values (default option), if neither nthres nor thres is provided. The default option can be time-consuming if the amount of unique values in the index map (after masking out NA values) is large (e.g., > 1000). In the latter case, the user may prefer to enter specified thresholds (with the thres argument), or to indicate the number of equal-interval thresholds to be evaluated for the ROC curve (with the nthres argument)

Value

a list of class ROC containing the ROC table, the area under the curve (AUC) and the map coordinate units. Maximum AUC and minimum AUC are also provided if uncertainty is set to TRUE

See Also

plot.ROC

Examples

```
index <- raster(system.file("external/p_built01_suitability_1.rst", package="TOC"))
boolean <- raster(system.file("external/BuiltGain1985_1999.rst", package="TOC"))
mask <- raster(system.file("external/1985NonBuilt01.rst", package="TOC"))

# all unique values of the index map after applying the mask are used as thresholds (default
# option)
rocd <- ROC(index, boolean, mask, NAval=0, uncertainty=TRUE)
rocd

## Not run:
# thresholds can also be defined by indicating the number of equal-interval thresholds
rocd <- ROC(index, boolean, mask, nthres=10, NAval=0, uncertainty=TRUE)
rocd

# A vector of thresholds can be used to define the thresholds
rocd <- ROC(index, boolean, mask, thres=seq(0, 100, by=10), NAval=0, uncertainty=TRUE)
rocd

## End(Not run)

## Not run:
index <- raster(system.file("external/Prob_Map2.rst", package="TOC"))
boolean <- raster(system.file("external/Change_Map2b.rst", package="TOC"))
mask <- raster(system.file("external/MASK3.rst", package="TOC"))
rocd <- ROC(index, boolean, mask, nthres=10, NAval=0, uncertainty=TRUE)

## End(Not run)
```

TOC *Construct the table for the TOC curve*

Description

Construct the table for the Total Operating Characteristic (TOC) curve

Usage

```
TOC(index, boolean, mask=NULL, nthres=NULL, thres=NULL, NAval=0, ranking=FALSE,
P=NA, Q=NA, uncertainty=TRUE, progress=FALSE)
```

Arguments

index	index Raster map
boolean	boolean Raster map
mask	mask Raster map
nthres	an optional integer indicating the number of equal-interval thresholds to be evaluated for the TOC curve. See Details below
thres	an optional numeric vector of thresholds to be evaluated for the TOC curve. See Details below
NAval	value for nodata (NA values) in the mask map
ranking	logical; default to FALSE. If TRUE, cell values are ranked to solve ties
P	count of reference presence observations in the population
Q	count of reference absence observations in the population
uncertainty	logical; if TRUE, uncertainty in AUC calculation is computed and maximum AUC and minimum AUC, given the uncertainty, are provided in the output. See Details below
progress	logical; if TRUE, a progress bar is shown

Details

thresholds are calculated as the unique values of the index map after masking out NA values (default option), if neither nthres nor thres is provided. The default option can be time-consuming if the amount of unique values in the index map (after masking out NA values) is large (e.g., > 1000). In the latter case, the user may prefer to enter specified thresholds (with the thres argument), or to indicate the number of equal-interval thresholds to be evaluated for the TOC curve (with the nthres argument)

Value

a list of class TOC containing the TOC table, the prevalence, the population, the data units (for data in the TOC table, prevalence and population), and the area under the curve (AUC). Maximum AUC and minimum AUC are also provided if uncertainty is set to TRUE

See Also

plot.TOC

Examples

```
index <- raster(system.file("external/p_built01_suitability_1.rst", package="TOC"))
boolean <- raster(system.file("external/BuiltGain1985_1999.rst", package="TOC"))
mask <- raster(system.file("external/1985NonBuilt01.rst", package="TOC"))

# all unique values of the index map after applying the mask are used as thresholds (default
# option)
tocd <- TOC(index, boolean, mask, NAval=0, uncertainty=TRUE)
tocd
```

```
## Not run:
# thresholds can also be defined by indicating the number of equal-interval thresholds
tocd <- TOC(index, boolean, mask, nthres=10, NAval=0, uncertainty=TRUE)
tocd

# A vector of thresholds can be used to define the thresholds
tocd <- TOC(index, boolean, mask, thres=seq(0, 100, by=10), NAval=0, uncertainty=TRUE)
tocd

## End(Not run)

## Not run:
index <- raster(system.file("external/Prob_Map2.rst", package="TOC"))
boolean <- raster(system.file("external/Change_Map2b.rst", package="TOC"))
mask <- raster(system.file("external/MASK3.rst", package="TOC"))
tocd <- TOC(index, boolean, mask, nthres=10, NAval=0, uncertainty=TRUE)

## End(Not run)
```

`TOCscaling` *scale the TOC output values and change units*

Description

scale the 'Hits' and 'Hits+FalseAlarms' values in the TOC output table, as well as the prevalence and population, using a scaling factor. Labels for the modified units in the TOC object are changed to `newUnits`

Usage

```
TOCscaling(tocd, scalingFactor, newUnits)
```

Arguments

`tocd`	an object of class TOC
`scalingFactor`	numeric value to scale 'Hits' and 'Hits+FalseAlarms' values in the TOC output table, as well as the prevalence and population
`newUnits`	charater string for the new data units in the TOC object

Value

an object of class TOC

See Also

`TOC`

Examples

```
index <- raster(system.file("external/p_built01_suitability_1.rst", package="TOC"))
boolean <- raster(system.file("external/BuiltGain1985_1999.rst", package="TOC"))
mask <- raster(system.file("external/1985NonBuilt01.rst", package="TOC"))
tocd <- TOC(index, boolean, mask, NAval=0, uncertainty=TRUE)
plot.TOC(tocd, labelThres=FALSE)

# scale units from square m to square km
tocd_sqkm <- TOCscaling(tocd, scalingFactor=1000000, newUnits="square km")
plot.TOC(tocd_sqkm)

## Not run:
index <- raster(system.file("external/Prob_Map2.rst", package="TOC"))
boolean <- raster(system.file("external/Change_Map2b.rst", package="TOC"))
mask <- raster(system.file("external/MASK3.rst", package="TOC"))

# scale units from square m to thousand square km
tocd_sqkm <- TOCscaling(tocd, scalingFactor=1000000, newUnits="thousand square km")
plot.TOC(tocd_sqkm)

## End(Not run)
```

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