Package ‘AMOeba’

February 19, 2015

Version 1.1
Date 2013-09-18
Title A Multidirectional Optimum Ecotope-Based Algorithm
Author Guillermo Valles
Maintainer Guillermo Valles <amoeba.spatial.cluster@yahoo.com>
Description A function to calculate spatial clusters using the Getis-Ord local statistic. It searches irregular clusters (ecotopes) on a map.
Depends snowfall, rlecuyer, spdep
Suggests maptools, plotrix,
License GPL (>= 2)
Repository CRAN
NeedsCompilation no
Date/Publication 2014-08-23 14:59:26

R topics documented:

AMOEBA

Index

Description

A function to calculate spatial clusters using the Getis-Ord local statistic (Ord and Getis, 1995). It searches irregular clusters (ecotopes) on a map through boundaries or grid of it.

Usage

AMOEBA(outc, neig, power = 1, cpu = 1)
Arguments

outc Numeric vector with the study outcome
neig Neighbours object from "spdep" package
power Number of times to apply AMOEBA
cpu Total number of cpu to run faster the algorithm

Details

outc must be the same length as the total number of units in neig.

power must be a positive integer. This value tell us how many times the AMOEBA is applied. When you apply the algorithm one time, the algorithm is called AMOEBA (Aldstadt and Getis, 2006; Duque et al., 2011), but when you apply more than one time, the algorithm is called AMOEBA+.

cpu must be a positive integer. Also, be careful and no put a cpu bigger than you have in your computer because it still will work but it probably will take long time. This value helps the function with his computational time, because it is used in the parallelization of the algorithm (Widener et al, 2012).

Value

Return a vector with the classification of the outcome. The classification is ordered from lowest (low risk) to high (high risk). Also, it has as much $3^{power}$ levels of risk.

Acknowledgments

This work is included within the project "A longitudinal multilevel analysis of socioeconomic disparities in cardiovascular diseases: questioning past evidence with new methodological approaches" supported by a grant from The Swedish Research Council (#D054740, PI: Juan Merlo).

Note

power should satisfy that $3^{power} < length(outc)$, because otherwise it is meaningless and the algorithm will fail. For example in the columbus example, the map have length of 49 so you can put a power as much of 3. More than this value it will fail.

In cpu you should use more than 1 CPU when your area of study is huge, because otherwise it will increase the computation time in a small area. If you decide to change the value here an advice, put 80% of your computer’s CPU for more efficient performance of the algorithm. For example, if your computer have 8 CPU, you should input "cpu=6".

Author(s)

Guillermo Valles.

References

Widener, M. J., Crago, N. C., and Aldstadt, J. (2012). Developing a parallel computational implementation of AMOEBA.

Examples

```r
# Shiny App
# Visit: http://amoeba-spatial-cluster.shinyapps.io/AMOEBA/

# R App
require(AMOEBA)

# Columbus OH spatial analysis data set (spdep package)
data(columbus)
require(maptools)
map<-readShapePoly(system.file('etc/shapes/columbus.shp',package='spdep')[1])

# Application of AMOEBA
res<-AMOEBA(columbus$CRIME,col.gal.nb,1,1)

# Plot
color<rev(rainbow(length(table(res)),start=0,end=2/6))
plot(map,col=color[as.factor(res)])
title('Clustering of crimes at Columbus (OH)')
names<-c('\nLow','\nMedium','\nHigh')
require(plotrix)
color.legend(map@bbox[1,1],map@bbox[2,1]-0.2,map@bbox[1,2],map@bbox[2,1]-0.4,names,color,align='rb')
```
Index

* Topic **cluster**
  AMOEBA, 1

* Topic **spatial**
  AMOEBA, 1