Package 'BMLGrid'

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Type Package

Title BMLGrid: package to simulate the Biham-Middleton-Levine Traffic Model

Version 1.1

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Description This version is meant to provide a comparison between the performance of BML simulation with R vectorized operation and c++ for loop.

URL http://eeyore.ucdavis.edu/stat242/Homeworks/BML_C.html

License GPL (>=3)

LinkingTo Rcpp

Imports animation, Rcpp

Suggests testthat

NeedsCompilation yes

R topics documented:

BMLGrid-package *BMLGrid: a package to simulate the Biham-Middleton-Levine Traffic Model.*

Description

The BMLGrid provides a constructor function `createBMLGrid` for the S3 class BMLGrid, two S3 methods `plot.BMLGrid` and `summary.BMLGrid`. The workhorse function that simulate the moving process of BML model from a given initial step thoughout a given number of steps are `runBMLGrid` and `crunBMLGrid`

Details

Package:	BMLGrid
Type:	Package
Version:	1.1
Date:	2015-05-08
License:	GPL (>=3)

Author(s)

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References

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createBMLGrid *Constructor for S3 class BMLGrid*

Description

Constructor for S3 class BMLGrid

Usage

```
createBMLGrid(r, c, ncars)
```

Arguments

r	A non-negative integer, the number of rows of the grid.
c	A non-negative integer, the number of columns of the grid.
ncars	A named vector of 2 non-negative integers where ncars['red'], ncars['blue'] represent the number of red/blue cars in the grid, respectively.

Value

A BMLGrid class object which is essentially a matrix.

Examples

```
library(BMLGrid)
g = createBMLGrid(r = 100, c = 99, ncars = c(red = 100, blue = 100))
```

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crunBMLGrid *Simulator for Biham-Middleton-Levine Traffic Model written in c++.*

Description

The function that actually runs the Biham-Middleton-Levine Traffic Model from an initial state by a given number of steps.

Usage

```
crunBMLGrid(g, numSteps)
```

Arguments

g	A BMLGrid class object representing the initial state of the grid.
numSteps	Number of moves/periods.

Examples

```
library(BMLGrid)
g = createBMLGrid(r = 100, c = 99, ncars = c(red = 100, blue = 100))
g.out = crunBMLGrid(g, 10000)
plot(g.out)
```

plot.BMLGrid *plot method for BMLGrid class object*

Description

Plot the cars on the grid as red/blue squares over a white background.

Usage

```
## S3 method for class 'BMLGrid'
plot(x, ...)
```

Arguments

x	A BMLGrid class object.
...	Other input arguments are simply ignored.

Examples

```
library(BMLGrid)
g = createBMLGrid(r = 100, c = 99, ncars = c(red = 100, blue = 100))
plot(g)
```

runBMLGrid *Simulator for Biham-Middleton-Levine Traffic Model.*

Description

The function that actuall runs the Biham-Middleton-Levine Traffic Model from an initial state by a given number of steps.

Usage

```
runBMLGrid(g, numSteps, movieName = NULL, recordSpeed = FALSE)
```

Arguments

g	A BMLGrid class object representing the initial state of the grid.
numSteps	Number of moves/periods.
movieName	If specified as a non-NULL string, functions from package 'animation' will be used to record the BML process as a movie.
recordSpeed	The flag value indicating whether to record and return the average speed of the red and blue cars ar each step.

Value

If recordSpeed is unspecified or specified as FALSE, returns a BMLGrid object representing the final state of the simulation; otherwise return a list where the first element is the final-state grid object and the 2nd and 3rd elements record the average speed of red cars and blue cars, respectively.

Examples

```
library(BMLGrid)
g = createBMLGrid(r = 100, c = 99, ncars = c(red = 100, blue = 100))
g.out = runBMLGrid(g, numSteps = 10000)
plot(g.out)
g.out = runBMLGrid(g, numSteps = 50, movieName = 'movieBMLGrid', recordSpeed = TRUE)
plot(g.out$g)
summary(g.out$v.blue)
summary(g.out$v.red)
```

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summary.BMLGrid *summary method for BMLGrid class object*

Description

The summary includes information on the grid size and the number of red and blue cars in the grid.

Usage

```
## S3 method for class 'BMLGrid'
summary(object, ...)
```

Arguments

object	A BMLGrid class object.
...	Other input arguments are simply ignored.

Examples

```
library(BMLGrid)
g = createBMLGrid(r = 100, c = 99, ncars = c(red = 100, blue = 100))
summary(g)
```

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