Roadrunner Coyote Simulation

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Hierarchical Index

Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Class Index

Class List

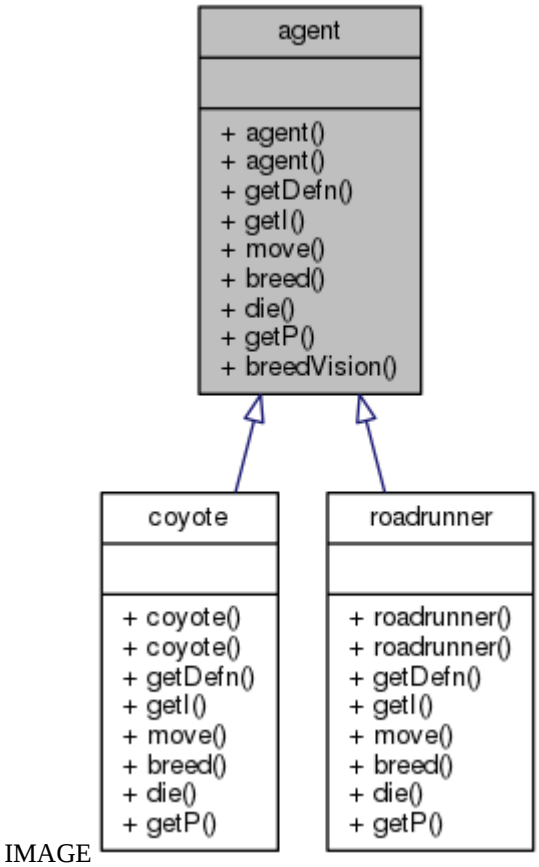
Here are the classes, structs, unions and interfaces with brief descriptions:

Class Documentation

agent Class Reference

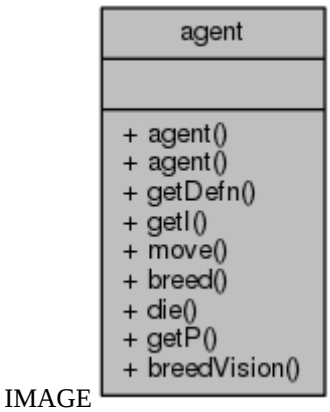
Agent class.

Inheritance diagram for agent:



IMAGE

Collaboration diagram for agent:



IMAGE

Public Member Functions

agent ()

Agent constructor without parameters Agents created this way are considered spaces.

agent (int iLoc)

Agent constructor with parameters. The agent will be defined as the parameter provided to this constructor.

int **getDefn** ()

Definition getter.

int **getI** ()

Gets the index of the agent.

void **move** ()

Handles the movement of the agent. For the agent class this function does nothing because we consider undefined agents to be spaces in this simulation.\ Function is defined for children.

void **breed** ()

Handles the breeding process of the agent For the agent class this function does nothing because we consider undefined agents to be spaces in this simulation. Function is defined for children.

void **die** ()

Handles the death of the agent For the agent class this function does nothing because we consider undefined agents to be spaces in this simulation. Function is defined for children.

int **getP** ()

Gets the previous location of the road-runner.

int **breedVision** (int i)

Function that helps the agent make a decision on where to breed.

Detailed Description

Agent class.

A template for agent. An agent in this simulation has a definition of 0 which is equivalent to a space in the grid.

Constructor & Destructor Documentation

agent.agent (int *iLoc*)

Agent constructor with parameters. The agent will be defined as the parameter provided to this constructor.

Parameters:

d	The agent will be defined as d.

Note: Use of a custom definition requires manually changing configuration values. Use not advised.

Member Function Documentation

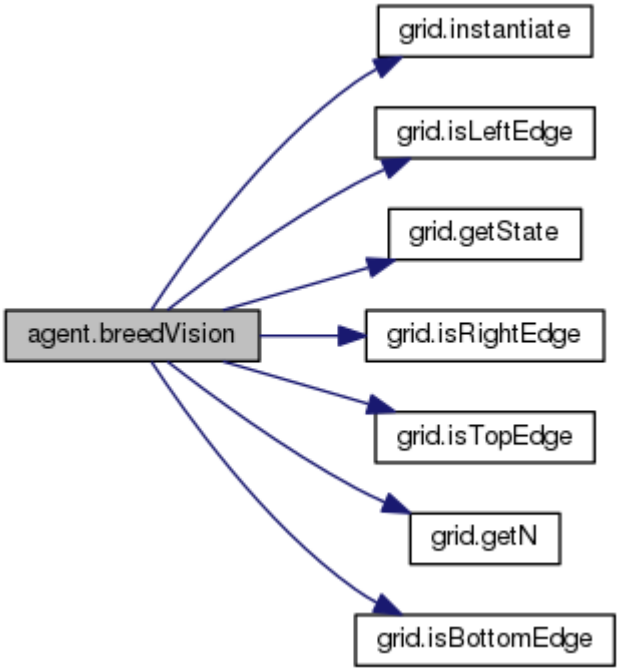
int agent.breedVision (int *i*)

Function that helps the agent make a decision on where to breed.

Returns:

void

Here is the call graph for this function:



IMAGE

int agent.getDefn ()

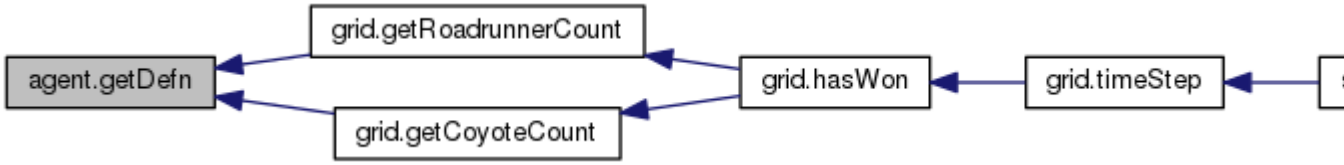
Definition getter.

Returns:

Integer definition of the agent

Here is the caller graph for this function:

IMAGE



int agent.getI ()

Gets the index of the agent.

Returns:

Integer index of the agent

Here is the caller graph for this function:

IMAGE

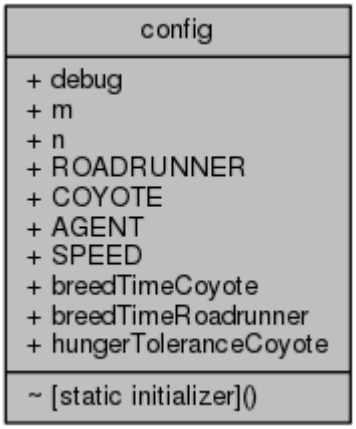
The documentation for this class was generated from the following file:

0 agent.java

config Class Reference

Configuration class.

Collaboration diagram for config:

IMAGE 

Static Public Attributes

static int **debug**
static int **m**
static int **n**
static int **ROADRUNNER**
static int **COYOTE**
static int **AGENT**
static int **SPEED**
static int **breedTimeCoyote**
static int **breedTimeRoadrunner**
static int **hungerToleranceCoyote**

Detailed Description

Configuration class.

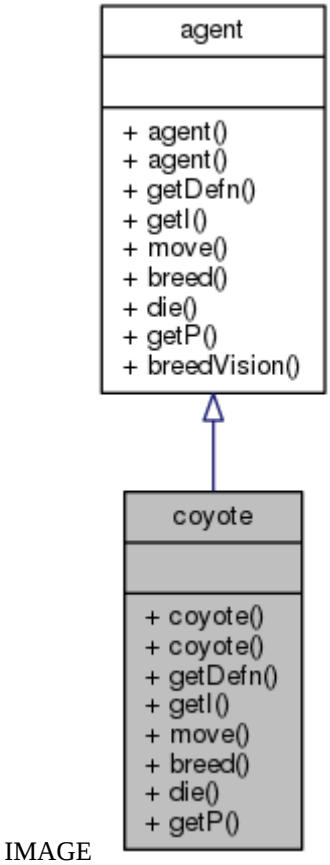
The documentation for this class was generated from the following file:

1 config.java

coyote Class Reference

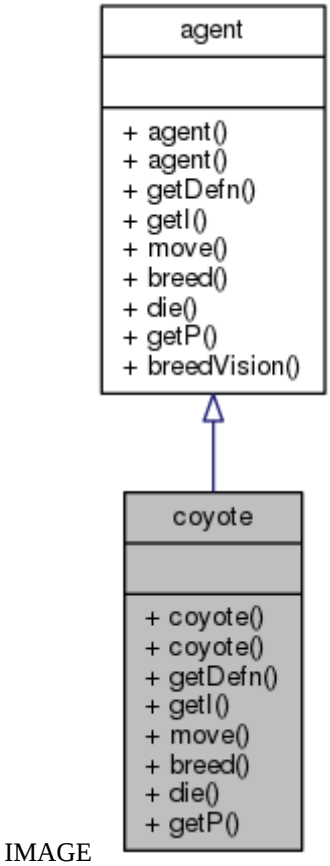
Coyote class.

Inheritance diagram for coyote:



IMAGE

Collaboration diagram for coyote:



IMAGE

Public Member Functions

coyote (int iLoc)

Coyote constructor with parameters.

coyote ()

Road-runner constructor without parameters. Reports error if invoked without the location.

int **getDefn** ()

Definition getter.

int **getI** ()

Gets the index for the coyote.

void **move** ()

Function that helps the coyote decide where to move and move there.

void **breed** ()

Handles the breeding action of the coyote.

void **die** ()

Coyote dies if it hasn't eaten a road-runner in 4 time-steps.

int **getP** ()

Gets the previous location of the road-runner.

Detailed Description

Coyote class.

A template for a coyote. A coyote in this simulation inherits from agent and has a definition of 2.

Constructor & Destructor Documentation

coyote.coyote (int *iLoc*)

Coyote constructor with parameters.

Parameters:

iLoc	The location of the coyote in the grid.

Member Function Documentation

int coyote.getDefn ()

Definition getter.

Returns:

Integer definition of the coyote

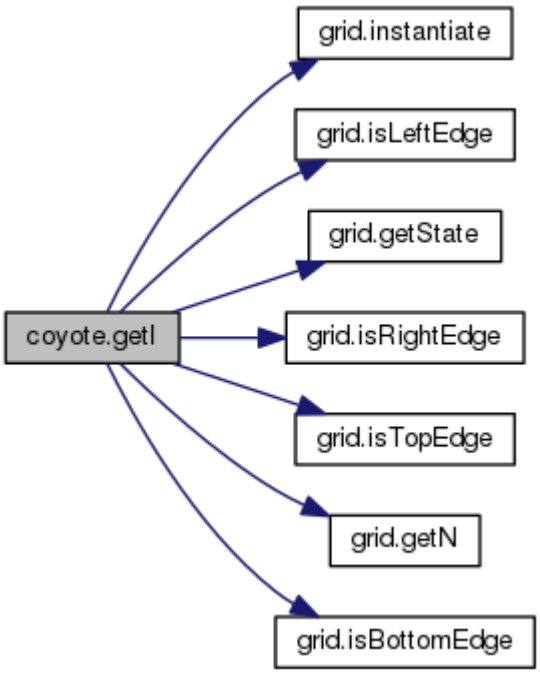
int coyote.getI ()

Gets the index for the coyote.

Returns:

The index of the coyote

Here is the call graph for this function:



IMAGE

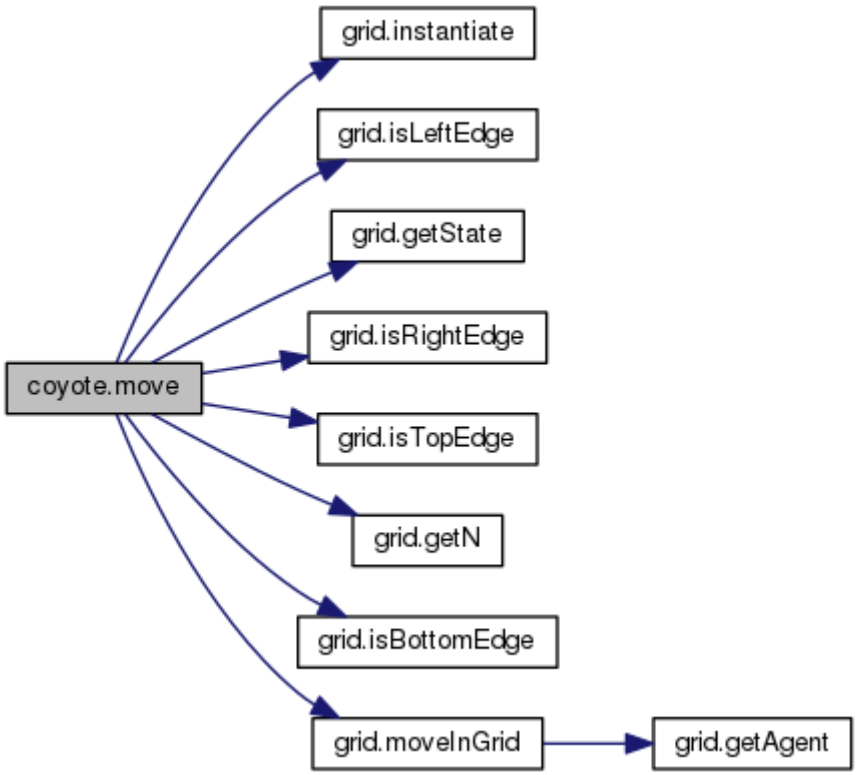
void coyote.move ()

Function that helps the coyote decide where to move and move there.

Print statement for debugging purposes

Print statement for debugging purposes

Here is the call graph for this function:



IMAGE

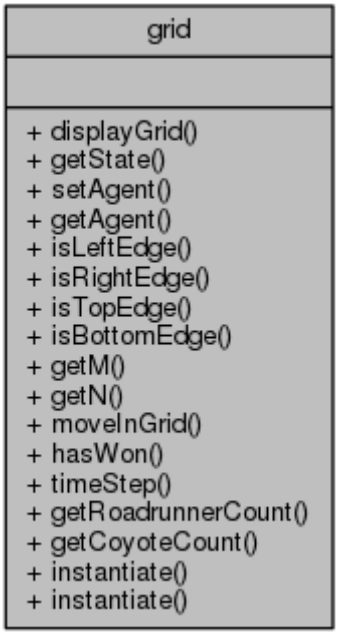
The documentation for this class was generated from the following file:

2 coyote.java

grid Class Reference

Grid class of type singleton.

Collaboration diagram for grid:

IMAGE 

Public Member Functions

void **displayGrid** ()

Displays the grid on-screen.

int **getState** (int j)

Returns the state at a certain index. Useful when checking what kind of agent occupies the space.

void **setAgent** (int j, int defn)

Sets the state at a certain index.

agent getAgent (int j)

Returns a reference to the agent at certain index.

boolean **isLeftEdge** (int j)

Whether or not the given index is a left edge in the grid.

boolean **isRightEdge** (int j)

Whether or not the given index is a right edge in the grid.

boolean **isTopEdge** (int j)

Whether or not the given index is a top edge in the grid.

boolean **isBottomEdge** (int j)

Whether or not the given index is a bottom edge in the grid.

int **getM** ()

Gets the m dimension of the grid.

int **getN** ()

Get the n dimension of the grid.

void **moveInGrid** (int pLoc, int iLoc)

Updates the grid for new updated indexes of the agents.

boolean **hasWon** ()

Checks if someone has won the simulation. A win is considered if all coyote or all road-runner remains in the space.

void **timeStep** (int speed)

Take a time step. Iterates through the entire grid and invokes agent actions.

int **getRoadrunnerCount** ()

Get number of road-runners.

int **getCoyoteCount** ()

Get the number of coyotes.

Static Public Member Functions

static **grid instantiate** (int j, int k)

Instantiates a grid object.

static **grid instantiate** ()

Returns error if dimension is not provided as argument or else returns the singleton grid instance already created.

Detailed Description

Grid class of type singleton.

A template for the grid.

Member Function Documentation

agent grid.getAgent (int *j*)

Returns a reference to the agent at certain index.

Parameters:

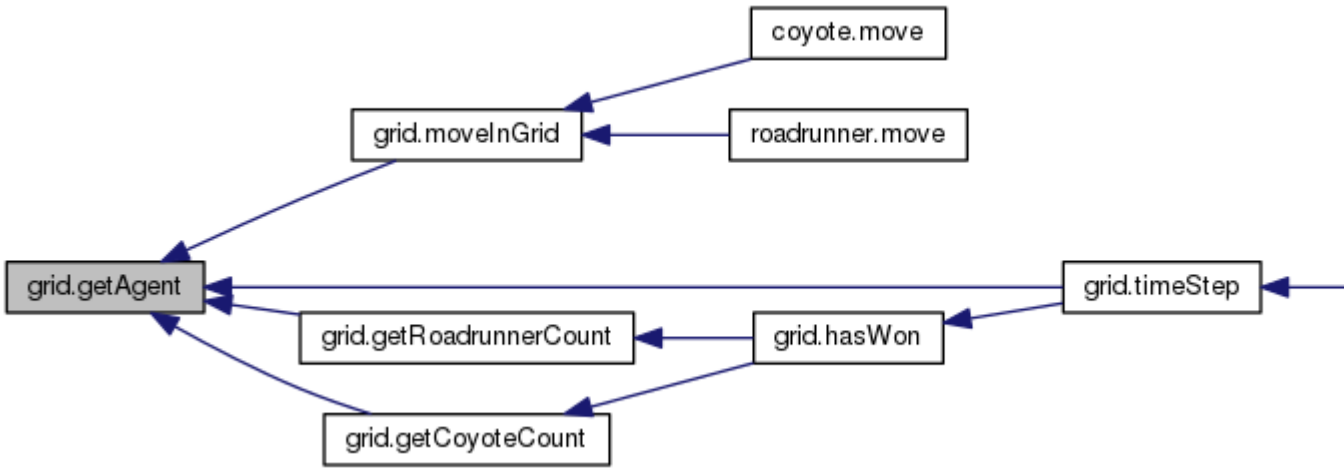
j	The index for which the agent is to be returned

Returns:

The reference to the agent at index j

Here is the caller graph for this function:

IMAGE



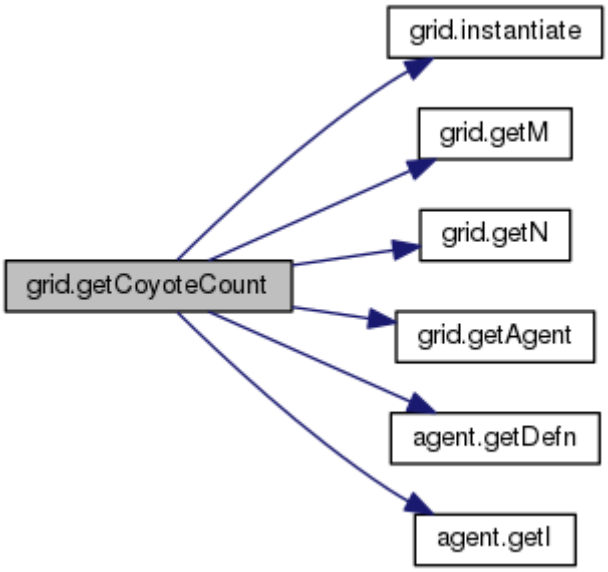
int grid.getCoyoteCount ()

Get the number of coyotes.

Returns:

The integer of the number of coyotes

Here is the call graph for this function:



IMAGE

Here is the caller graph for this function:

IMAGE

int grid.getM ()

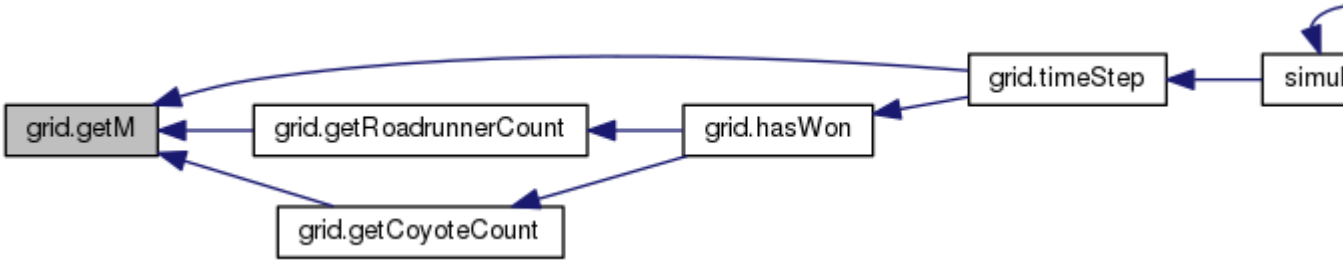
Gets the m dimension of the grid.

Returns:

Integer variable representing the dimension

Here is the caller graph for this function:

IMAGE



int grid.getN ()

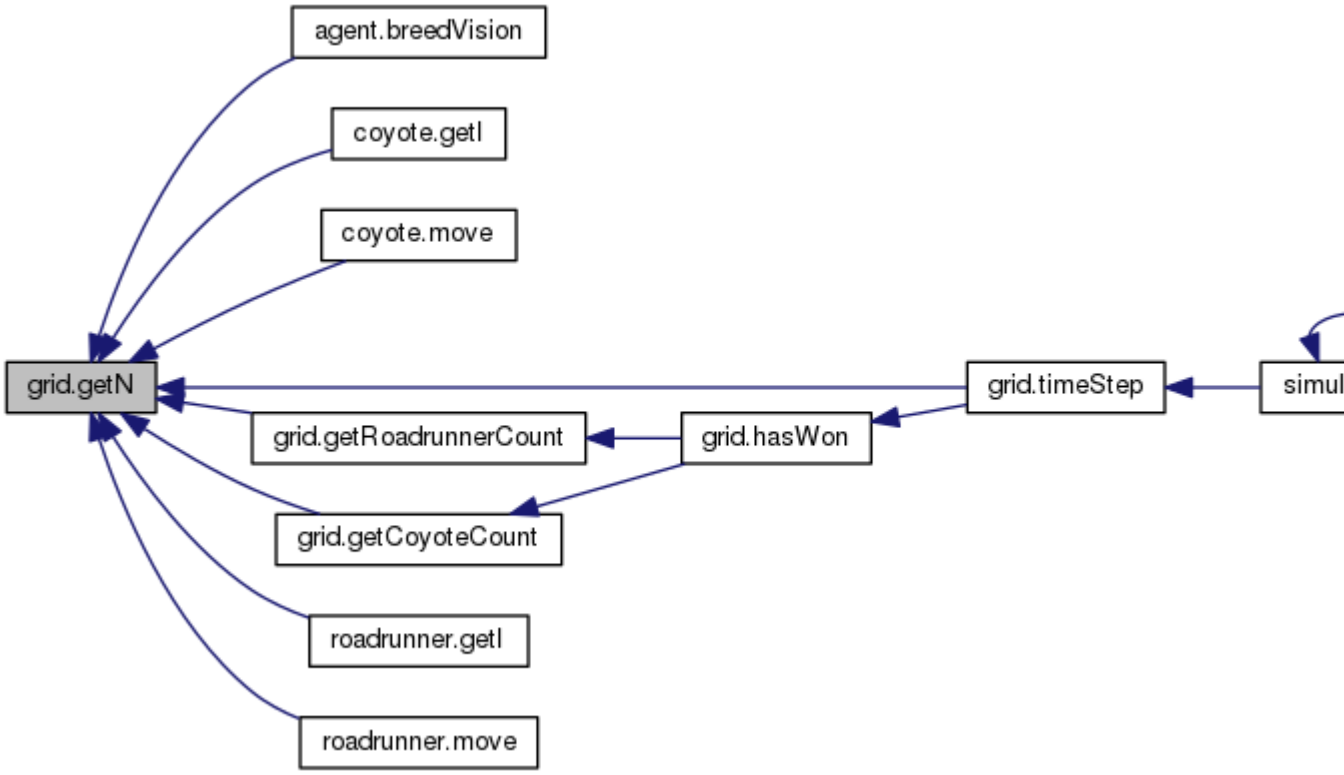
Get the n dimension of the grid.

Returns:

Integer variable representing the dimension

Here is the caller graph for this function:

IMAGE



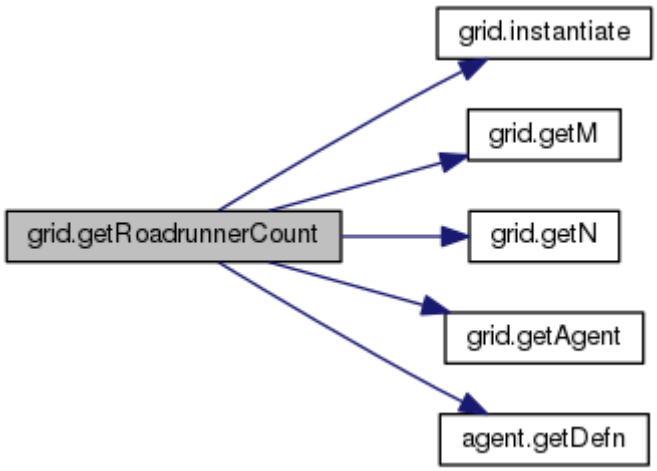
int grid.getRoadrunnerCount ()

Get number of road-runners.

Returns:

Integer of the number of road-runners

Here is the call graph for this function:



IMAGE

Here is the caller graph for this function:

IMAGE

int grid.getState (int *j*)

Returns the state at a certain index. Useful when checking what kind of agent occupies the space.

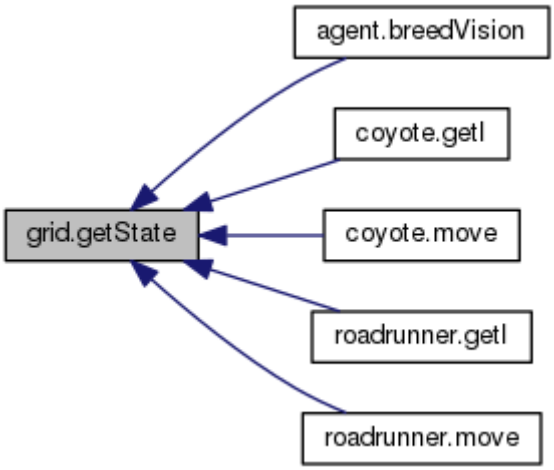
Parameters:

j	The location for which the state is asked for

Returns:

The definition of the agent.

Here is the caller graph for this function:



IMAGE

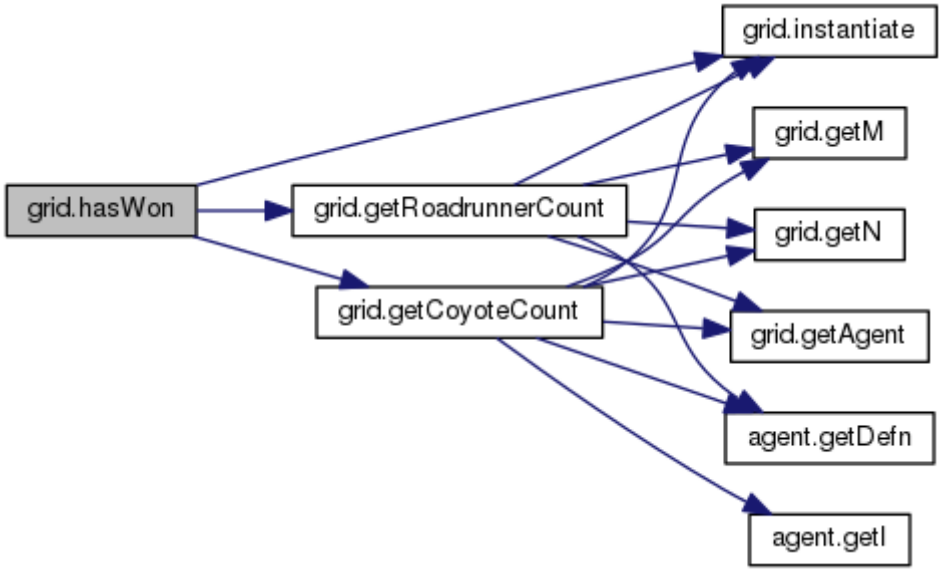
boolean grid.hasWon ()

Checks if someone has won the simulation. A win is considered if all coyote or all road-runner remains in the space.

Returns:

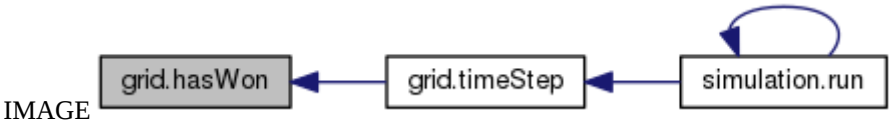
Boolean of true or false

Here is the call graph for this function:



IMAGE

Here is the caller graph for this function:



IMAGE

static grid grid.instantiate (int *j*, int *k*)[static]

Instantiates a grid object.

Parameters:

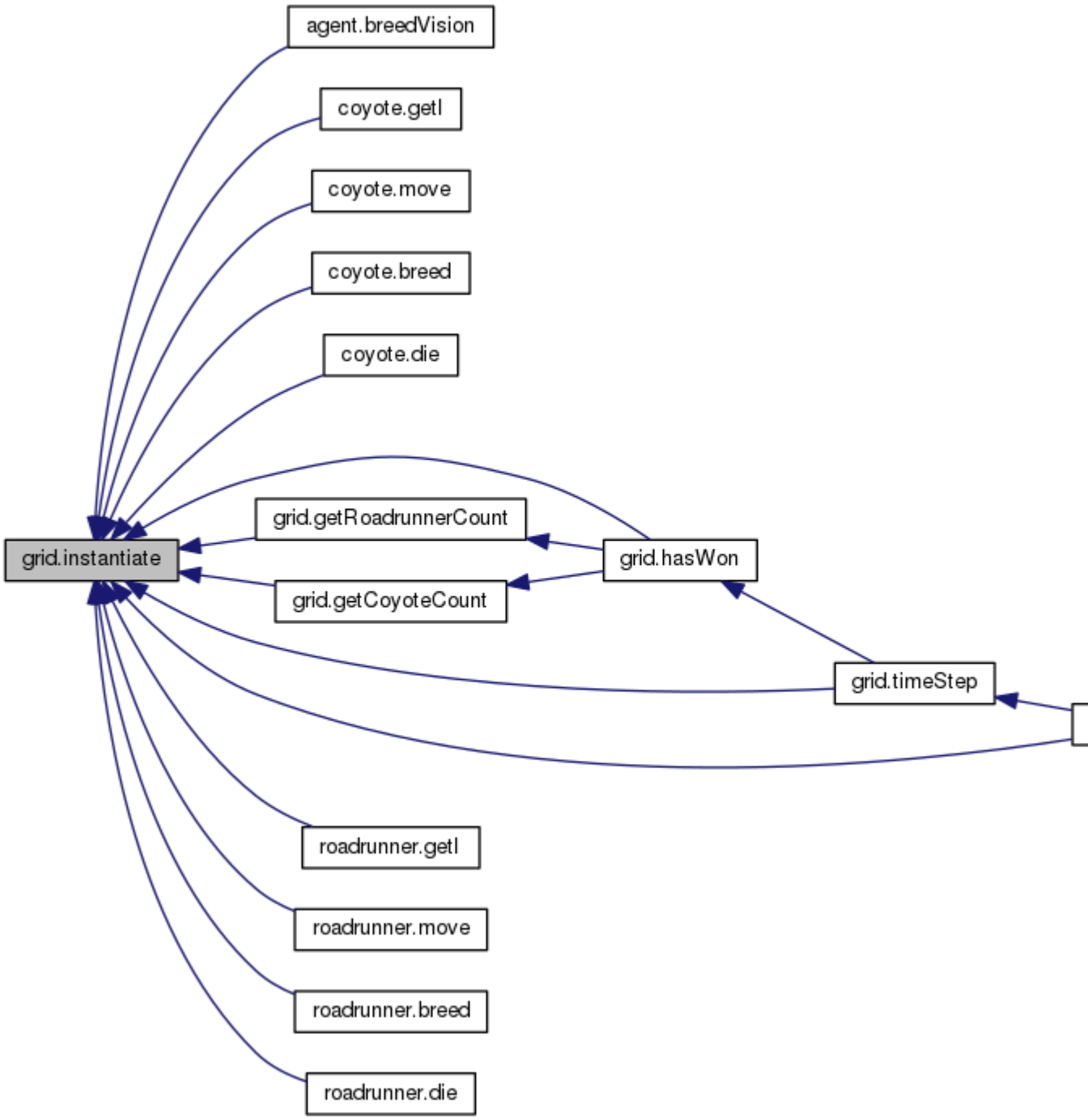
j	The n dimension
k	The m dimension

Returns:

The singleton grid instance

Here is the caller graph for this function:

IMAGE



static grid grid.instantiate ()[static]

Returns error if dimension is not provided as argument or else returns the singleton grid instance already created.

Returns:

The singleton grid instance.

boolean grid.isBottomEdge (int *j*)

Whether or not the given index is a bottom edge in the grid.

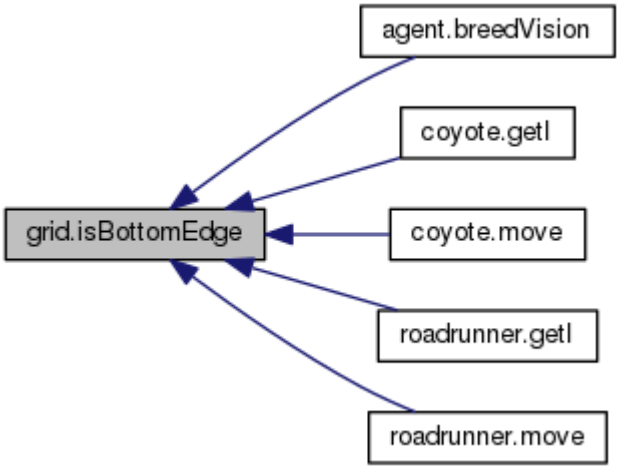
Parameters:

j	The index for which to check

Returns:

A boolean value of true or false

Here is the caller graph for this function:



IMAGE

boolean grid.isLeftEdge (int *j*)

Whether or not the given index is a left edge in the grid.

Parameters:

j	The index for which to check

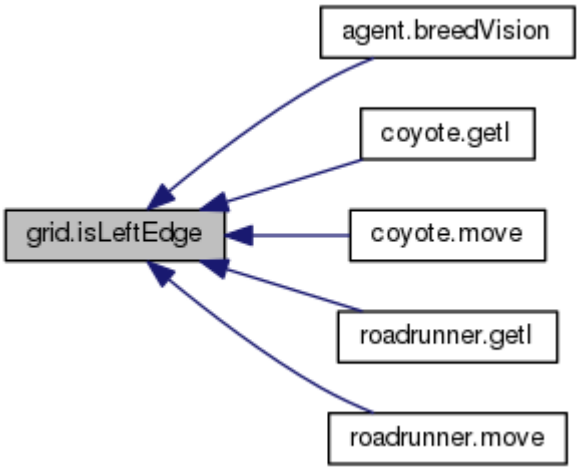
Returns:

A boolean value of true or false

If the index is 0, it is a left edge

If an out-of-range index is given, this function simply returns false

Here is the caller graph for this function:



IMAGE

boolean grid.isRightEdge (int *j*)

Whether or not the given index is a right edge in the grid.

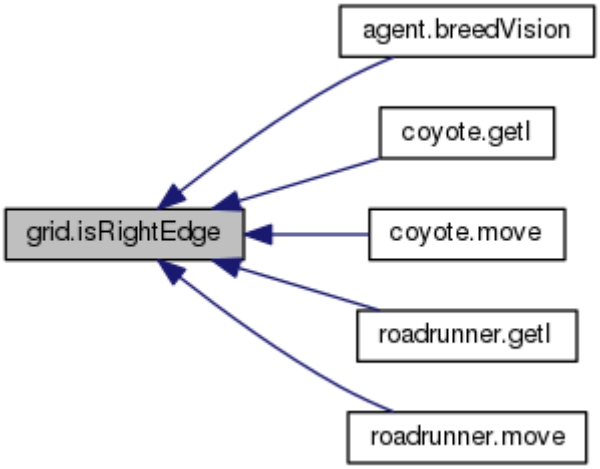
Parameters:

j	The index for which to check

Returns:

A boolean value of true or false

Here is the caller graph for this function:



IMAGE

boolean grid.isTopEdge (int *j*)

Whether or not the given index is a top edge in the grid.

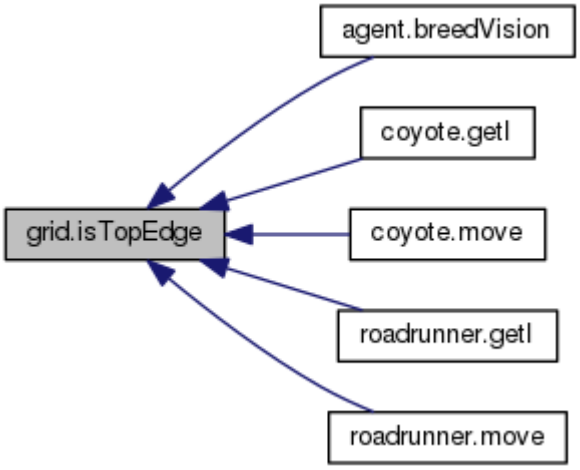
Parameters:

j	The index for which to check

Returns:

A boolean value of true or false

Here is the caller graph for this function:



IMAGE

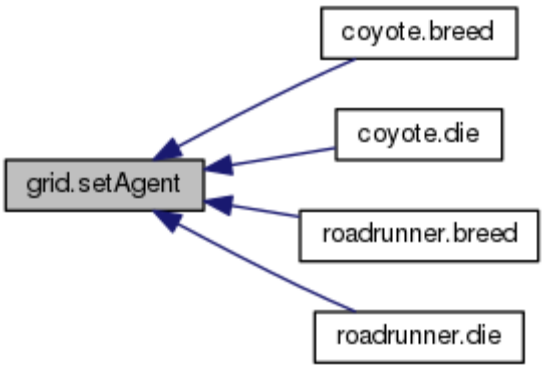
void grid.setAgent (int *j*, int *defn*)

Sets the state at a certain index.

Parameters:

j	The location for which the state is to be set
defn	The definition of the agent

Here is the caller graph for this function:



IMAGE

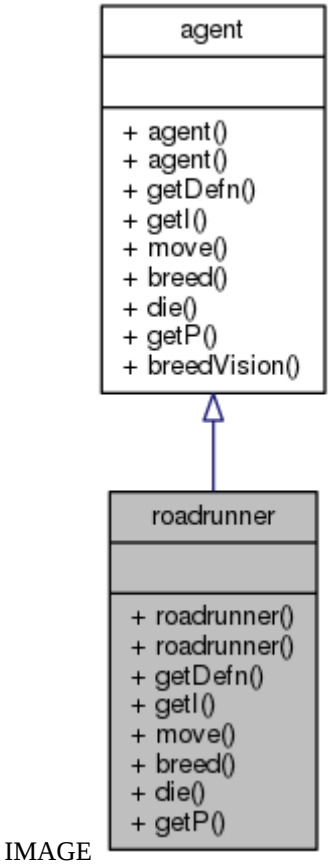
The documentation for this class was generated from the following file:

3 grid.java

roadrunner Class Reference

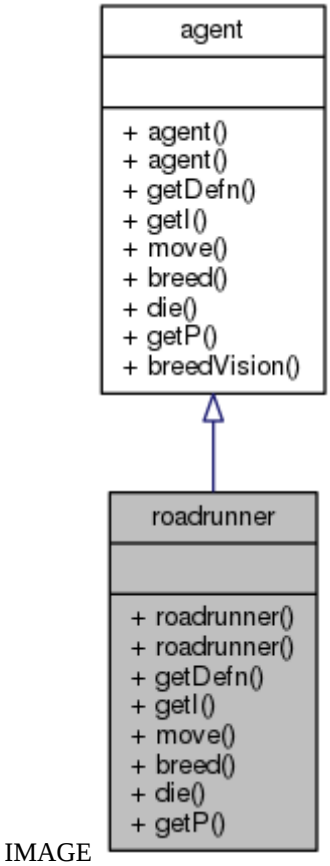
Road-runner class. A template for a road-runner.

Inheritance diagram for roadrunner:



IMAGE

Collaboration diagram for roadrunner:



IMAGE

Public Member Functions

roadrunner (int iLoc)

Keeps track of the steps a road-runner has taken.

roadrunner ()

Road-runner constructor without parameters. Reports error if invoked without the location.

int **getDefn** ()

Definition getter.

int **getI** ()

Gets the index of the agent.

void **move** ()

Function that helps the road-runner make a decision on where to move and move there.

void **breed** ()

Handles the breeding action of the road-runner.

void **die** ()

Kills a road-runner NOTE: This function is only useful for manual kills.

int **getP** ()

Gets the previous location of the road-runner.

Detailed Description

Road-runner class. A template for a road-runner.

Constructor & Destructor Documentation

roadrunner.roadrunner (int *iLoc*)

Keeps track of the steps a road-runner has taken.

Road-runner constructor with parameters

Parameters:

iLoc	The location of the road-runner.

Member Function Documentation

int roadrunner.getDefn ()

Definition getter.

Returns:

Integer definition of the road-runner

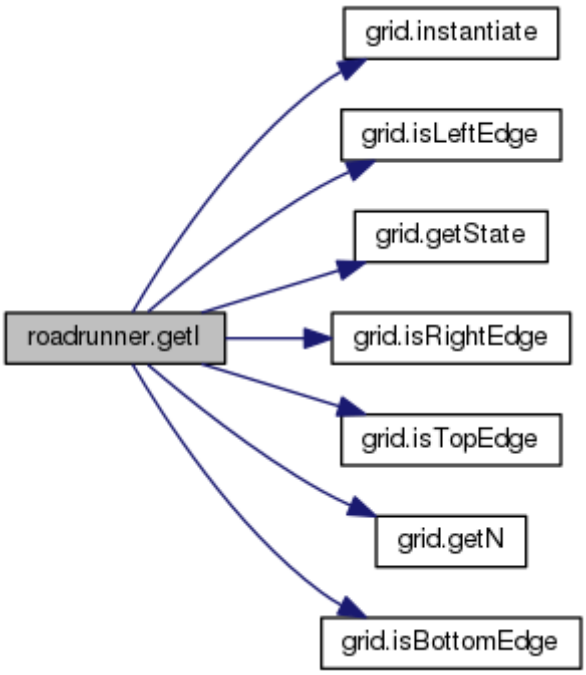
int roadrunner.getI ()

Gets the index of the agent.

Returns:

Integer index of the agent

Here is the call graph for this function:



IMAGE

void roadrunner.move ()

Function that helps the road-runner make a decision on where to move and move there.

Returns:

void

Make a random one cell movement if no coyote was seen around

If a coyote is seen, decide the best possible location to move to

Left movement is not required for the left edge

Look left to see if a move there is appropriate

Right movement is not required for the right edge

Look right to see if a move there is more appropriate

Up movement is not required for the top edge

Look up to see if a move there is more appropriate

Up-right movement is not required for the top-right edge

Look up-right to see if a move there is more appropriate

Up-left movement is not required for the top-left edge

Look up-left to see if a move there is more appropriate

Down movement is not required for the bottom edge

Look down to see if a move there is more appropriate

Down-right movement is not required for the bottom-right edge

Look down-right to see if a move there is more appropriate

Down-left movement is not required for the bottom-left edge

Look down-left to see if a move there is more appropriate

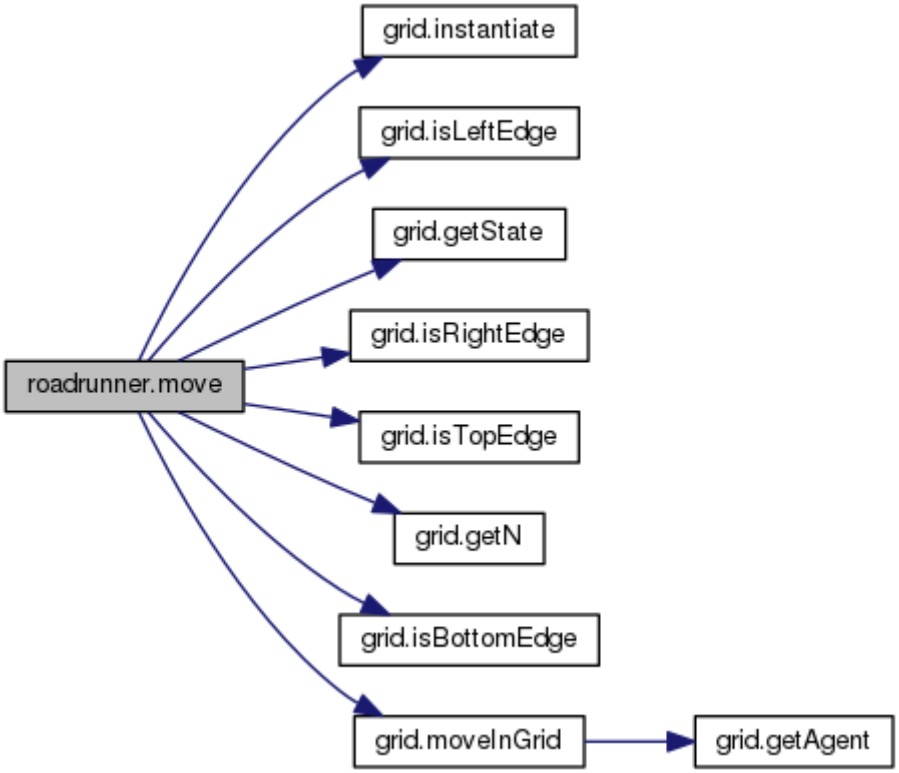
If an appropriate move is found

Update the road-runner's index

Update the timeStep for the road-runner

Print statement for debugging purposes

Here is the call graph for this function:



IMAGE

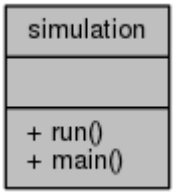
The documentation for this class was generated from the following file:

4 roadrunner.java

simulation Class Reference

Simulation class. A template for the simulation.

Collaboration diagram for simulation:

IMAGE 

Static Public Member Functions

static void **run** ()

Instantiates a grid, taking the dimensions from the configuration class and runs a timeStep at certain speed.

static void **main** (String[] args)

Detailed Description

Simulation class. A template for the simulation.

The documentation for this class was generated from the following file:

5 simulation.java

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