Fisher sim

0.0.1

Technical Documentation

Software Engineering Project

Group 12

Generated by Doxygen 1.8.9.1

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Contents

Introduction

Fisher Sim is being developed as part of a Software Engineering project at Rutgers University for the spring semester of 2015.

Group 12

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Project Goals

The Fisher Sim project seeks to build off of the classic El Farol Bar problem in game theory. In the El Farol Bar problem models for decisions that a based on others are examined. In the original formulation, the question is whether or not to go to a bar. Going to the bar is a good decision only if most people decide it is a bad decision, and vice versa.

Fisher Sim adds additional metrics to this problem in an attempt to better understand and predict people's disision to go fishing.

Compiling the software

Fisher sim currently consists of two separate programs. The primary component is located under the CrowdAnalysys folder in in the project root directory. This folder contains the main project as a QT application along with the technical documentation (this file). The other components of the Fisher sim program are located under the /spot and /Agent folders. These folders contain work on the simulation engine and contain basic console c++ applications. They are currently separated from the primary GUI application in order to simplify debugging.

To build the primary application you will need a working installation of the QT creator framework. The community edition obtained for free from their website located here: `https://www.qt.io/download/` In addition to QT creator, you will need a c++ complier for your system. If you do not already have a complier installed and are on a Windows system then a suitable complier can be obtained by installing a version of Microsoft's visual studio express. On Debian Linux systems, a c++ complier can be installed by installing the buildutils package from your package manager.

Updating Documentation

Technical documentation is maintained through the Doxygen tool by loading the Doxyfile located under /Crowd↩ Analysys/docs. Using Doxygen allows for the documentation to be included along with the code which can assist in keeping things up to date. When changes to the code / documentation are made the Doxygen tool must be run to rebuild the Technical Documentation. This will create an additional 2 folders in the docs folder each one containing an html edition and the other containing a Latex / pdf version.

If you wish to build the pdf version you will need an installation of latex on your system and to have its binaries in your system path. Linux editions of latex can be installed through the package manager and a windows edition can be obtained from the Miktex project located at `http://miktex.org/`. In order to generate class relation images your system will need GraphViz installed.

Tools needed summery

Software Build

- MSVS or GNU Build system
- Qt Creator

Documentation Build

- Doxygen
- Latex
- GraphViz

Adding Documentation

Documentation can be added in two general styles. Most documentation will mostly be general explanations for programming constructs which can be added as explained `http://www.stack.nl/~dimitri/doxygen/manual/docblocks.↩ html`.

More extensive comments can take advantage of Markdown formatting and Latex style mathematical expressions. Supported markdown formatting can be seen here: `http://www.stack.nl/~dimitri/doxygen/manual/markdown.↩ html`.

Chapter 1

Algorithms & Data Structures

Algorithms

Decision Making

The algorithm is made to compute a unique decision for every agent. The decision is either to go fishing (denoted as 1) or stay at home (denoted as -1). At first every decision of an agent is randomly chosen from a random strategy. Then, every decision may change by the percentage of influence threshold, p. The decision is determine using the logic below:

```
if p < 70
    decision that is made by the strategy is kept.
else if p > 70
    decision will be change to 1-go to fishing.
```

The value of influence threshold depends on the factors below:

- Skill and experience rank
- Frequency of communication
- Amount of each type of fish
- Fishing duration
- Weather pattern

Since some of the factors above are unique for each agents, it will be able to preserve the uniqueness of every decision. Every factors will contribute 20% to the influence threshold.

Strategy

Every agent will have a short-term memory and a long-term memory. Short-term memory is limited to 3 previous outcomes of the agent winning and losing. Long-term memory is the strategy that is used by the agent to make the initial decision before taking into account of influence threshold.

Since there are 8 possible outcomes from the short-term memory, the strategy that can be generated from these outcome is 256. Every agent is allow to have 3 strategies, this will result in 2,763,520 different combinations of strategies. Every agent will get a random combination of 3 strategies and it will be likely that every combination is unique.

The process to make the early decision is shown below: strategy=choose the strategy that has a higher score

```
for i=1 →8

    if history==strategy history [i]

        early decision=strategy action [i]

    return early decision
```

At the beginning of every simulation, all the strategies' score are zero. So, it can be conclude that the initial strategy of every agent is random. If the agent won the round the strategy score will increase by one point. Conversely, every losing round the strategy score is lowered by one. The early decision will be passed to the decision making where the influence threshold of the agent will be calculated and the early decision may be changed.

Overall process

Below is the overall process of how every decision of an agent being made:

```
strategy=choose the strategy that has a higher score
for i=1 →8
    if history==strategy history [i]
        early decision=strategy action [i]
if p<70
    decision=early decision
else if p>70
    decision=1
```

Strategy score will be calculated when all the decisions have been made. Plus for a strategy to earn the score the decision must not be changed by the influence threshold. The logic is shown below:

```
if p<70
    if majority go to fishing and decision == -1
        strategy score increase by one point
    else strategy score lower by one point
    if majority stay at home and decision==1
        strategy score increase by one point
    else strategy score lower by one point
```

Chapter 2

Namespace Index

2.1 Namespace List

Here is a list of all namespaces with brief descriptions:

Chapter 3

Hierarchical Index

3.1 Class Hierarchy

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

Chapter 4

Class Index

4.1 Class List

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

Chapter 5

File Index

5.1 File List

Here is a list of all files with brief descriptions:

Chapter 6

Namespace Documentation

6.1 Ui Namespace Reference

Chapter 7

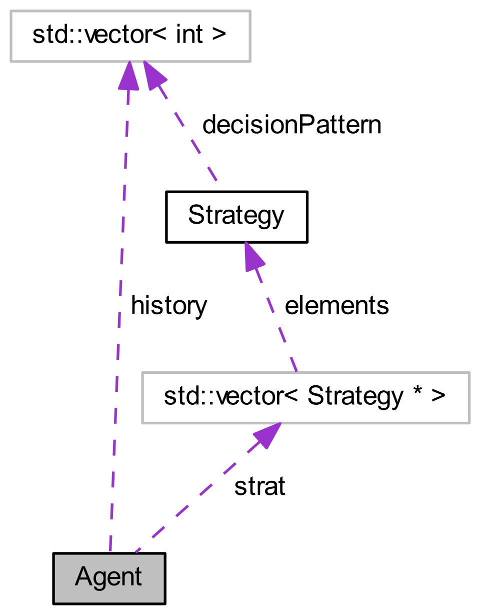
Class Documentation

7.1 Agent Class Reference

agent represents 1 agent's experience and decisions

`#include <agent.h>`

Collaboration diagram for Agent:



Public Member Functions

- Agent (vector< Strategy ∗ > strat)

  default constructor
- void updateStrategyScore (int winnigScore)
- void calcThreshold ()
- void makeEarlyDecision ()
- void makeDecision ()

  will be based on earlydecision and threshold
- void updateHistory ()

  push new decision on
- void setTemp (float newTemp)
- void setSkill (int newskill)

  can be randomize
- void setFishduration (float newFishDuration)

  can be randomize
- void setCommunication (int newCommunication)
- vector< int > getHistory ()
- int getDecision ()
- int getCommunication ()

  Returns the amount the agent communicates with other agents.
- int getSkill ()

  Returns the current skill of the agent.
- float getTemp ()
- float getFishDuration ()
- int getEarlyDecision ()
- float getThreshold ()
- vector< Strategy ∗ > getStrat ()

Private Attributes

- vector< Strategy ∗ > strat

  holds the 3 unique strategies
- vector< int > history

  holds the last 3 outcomes
- int decision

  new decision ∗have to calculate, use makeDecision
- int earlydecison

  based on history sequence and strategy
- double skill

  will be 1-5 ∗from input
- float fishduration

  ∗from input
- float temp

  ∗from input
- int communication

  ∗from input
- float threshold

7.1.1 Detailed Description

agent represents 1 agent's experience and decisions

records the total number of agents created.
influence threshold,

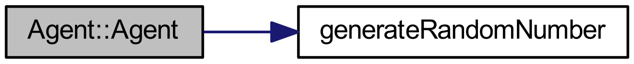
```
if based on report > 70
    will make agent's decison change to 1
if < 70
    agent's decision remain the same

new rule: p => 85 change decision to 1
    40 < p < 85 decision remain
    p <= 40 decision change to -1
```

7.1.2 Constructor & Destructor Documentation

7.1.2.1 Agent::Agent (vector< Strategy * > *strat*)

default constructor

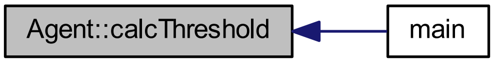
Here is the call graph for this function:



7.1.3 Member Function Documentation

7.1.3.1 void Agent::calcThreshold ( )

Here is the caller graph for this function:



7.1.3.2 int Agent::getCommunication ( )

Returns the amount the agent communicates with other agents.

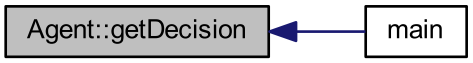
7.1.3.3 int Agent::getDecision ( )

Returns the Decision of the Agent

Returns

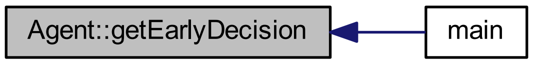
the decision of the Agent

Here is the caller graph for this function:



7.1.3.4 int Agent::getEarlyDecision ( )

Here is the caller graph for this function:



7.1.3.5 float Agent::getFishDuration ( )

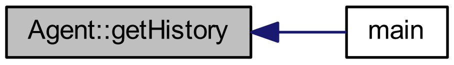
Returns the decay of the fish population

Returns

the decay value used

7.1.3.6 vector< int > Agent::getHistory ( )

Here is the caller graph for this function:



7.1.3.7 int Agent::getSkill ( )

Returns the current skill of the agent.

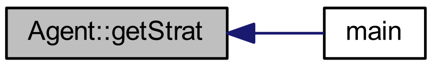
7.1.3.8 vector< Strategy * > Agent::getStrat ( )

Returns the statagies used by this agent Agents can change stratagies as they learn

Returns

a vector containing the stratagies. This will normally return 3 items.

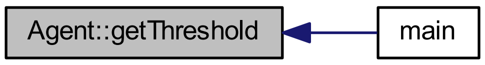
Here is the caller graph for this function:



7.1.3.9 float Agent::getTemp ( )

7.1.3.10 float Agent::getThreshold ( )

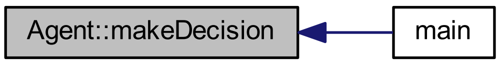
Here is the caller graph for this function:



7.1.3.11 void Agent::makeDecision ( )

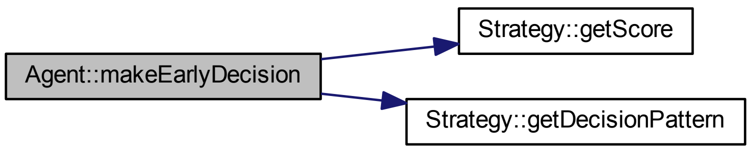
will be based on earlydecision and threshold

Here is the caller graph for this function:

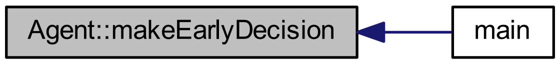


7.1.3.12 void Agent::makeEarlyDecision ( )

Here is the call graph for this function:

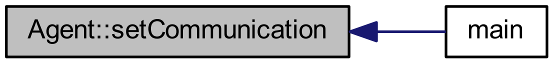


Here is the caller graph for this function:



7.1.3.13 void Agent::setCommunication (int *newCommunication*)

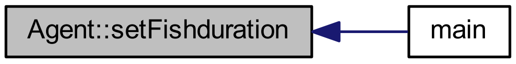
Here is the caller graph for this function:



7.1.3.14 void Agent::setFishduration (float *newFishDuration*)

can be randomize

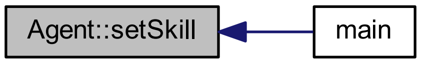
Here is the caller graph for this function:



7.1.3.15 void Agent::setSkill (int *newskill*)

can be randomize

Here is the caller graph for this function:



7.1.3.16 void Agent::setTemp (float *newTemp*)

Sets the temperature of the water

Parameters

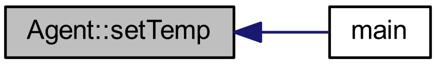
newTemp	the new temperature in degrees Celsius

Sets the temperature of the water

Parameters

newTemp	the new temperature in degrees celsius

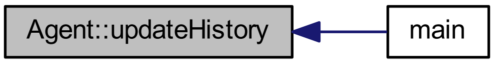
Here is the caller graph for this function:



7.1.3.17 void Agent::updateHistory ( )

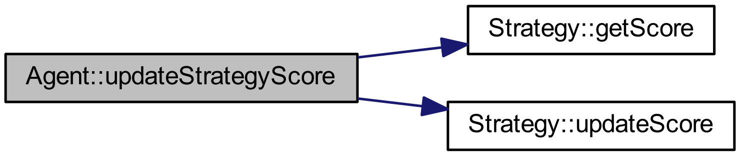
push new decision on

Here is the caller graph for this function:

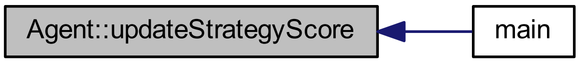


7.1.3.18 void Agent::updateStrategyScore (int *winnigScore*)

Here is the call graph for this function:



Here is the caller graph for this function:



7.1.4 Member Data Documentation

7.1.4.1 int Agent::communication `[private]`

∗from input

7.1.4.2 int Agent::decision `[private]`

new decision ∗have to calculate, use makeDecision

7.1.4.3 int Agent::earlydecison `[private]`

based on history sequence and strategy

7.1.4.4 float Agent::fishduration `[private]`

∗from input

7.1.4.5 vector<int> Agent::history `[private]`

holds the last 3 outcomes

7.1.4.6 double Agent::skill `[private]`

will be 1-5 ∗from input

7.1.4.7 vector< Strategy ∗> Agent::strat `[private]`

holds the 3 unique strategies

7.1.4.8 float Agent::temp `[private]`

∗from input

7.1.4.9 float Agent::threshold `[private]`

influence threshold, if based on report > 70 will make agent's decison change to 1 < 70 agent's decision remain the same new rule: p => 85 change decision to 1 40 < p < 85 decision remain p <= 40 decision change to -1

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

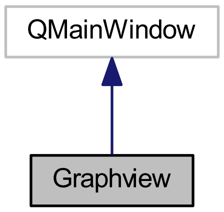
- agent.h
- agent.cpp

7.2 Graphview Class Reference

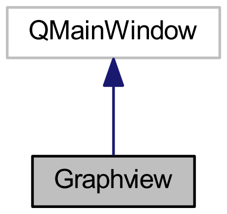
provides a view that shows the collected graphs and allows them to be inserted into a report.

`#include <graphview.h>`

Inheritance diagram for Graphview:



Collaboration diagram for Graphview:



Public Member Functions

- Graphview (QWidget ∗parent=0)

    constructor for the Graphview class
- ∼Graphview ()
- void setupPlot ()

    setupPlot

Private Slots

- void on_actionInsert_Plot_triggered ()

    Graphview::on_actionInsert_Plot_triggered.
- void on_actionSave_Document_triggered ()

Private Attributes

- Ui::Graphview ∗ ui

7.2.1 Detailed Description

provides a view that shows the collected graphs and allows them to be inserted into a report.

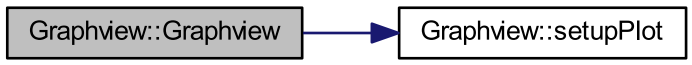
Graphview is intended to be used after the simulation has finished. It will accept data from the simulation module defining plots and display them to the users. There is also a report view on the left side that allows users to insert selected graphs to compile a final report.

7.2.2 Constructor & Destructor Documentation

7.2.2.1 Graphview::Graphview (QWidget ∗ *parent* = 0) `[explicit]`

constructor for the Graphview class

Here is the call graph for this function:



7.2.2.2 Graphview::∼Graphview ( )

7.2.3 Member Function Documentation

7.2.3.1 void Graphview::on_actionInsert_Plot_triggered ( ) [private], [slot]

Graphview::on_actionInsert_Plot_triggered.

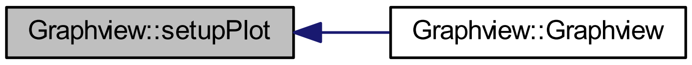
7.2.3.2 void Graphview::on_actionSave_Document_triggered ( ) [private], [slot]

7.2.3.3 void Graphview::setupPlot ( )

setupPlot

configures the plots

Here is the caller graph for this function:



7.2.4 Member Data Documentation

7.2.4.1 Ui::Graphview∗ Graphview::ui [private]

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

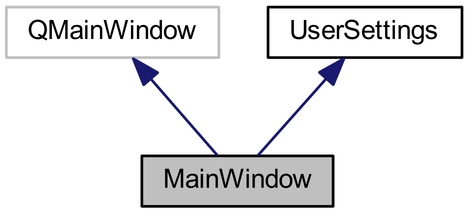
- graphview.h
- graphview.cpp

7.3 MainWindow Class Reference

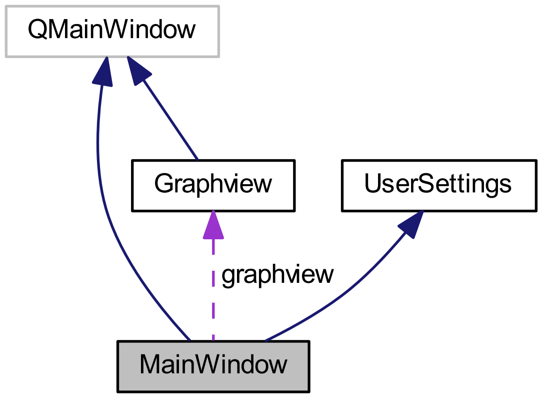
The MainWindow class Provides the Main windows for the Fisher sim project.

```
#include <mainwindow.h>
```

Inheritance diagram for MainWindow:



Collaboration diagram for MainWindow:



Public Member Functions

- MainWindow (QWidget ∗parent=0)
- ∼MainWindow ()
- void log (const QString &text)

    Sends a string to the simulation log.

Private Slots

- void on_fishers_valueChanged (int value)
- void on_locations_valueChanged (int value)
- void on_fishtypes_valueChanged (int value)
- void on_fishpop_valueChanged (int value)
- void on_runtime_valueChanged (int value)
- void on_lineEdit_0_textEdited (const QString &arg1)
- void on_lineEdit_1_textEdited (const QString &arg1)
- void on_lineEdit_2_textEdited (const QString &arg1)
- void on_lineEdit_3_textEdited (const QString &arg1)
- void on_lineEdit_4_textEdited (const QString &arg1)
- void on_weather_clicked ()
- void on_reportButton_clicked ()
- void on_simulateButton_clicked ()

Private Attributes

- Ui::MainWindow $*$ ui
- Graphview graphview

Additional Inherited Members

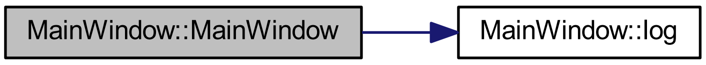
7.3.1 Detailed Description

The MainWindow class Provides the Main windows for the Fisher sim project.

7.3.2 Constructor & Destructor Documentation

7.3.2.1 MainWindow::MainWindow (QWidget $*$ *parent* = `0`) `[explicit]`

Here is the call graph for this function:



7.3.2.2 MainWindow::∼MainWindow ( )

7.3.3 Member Function Documentation

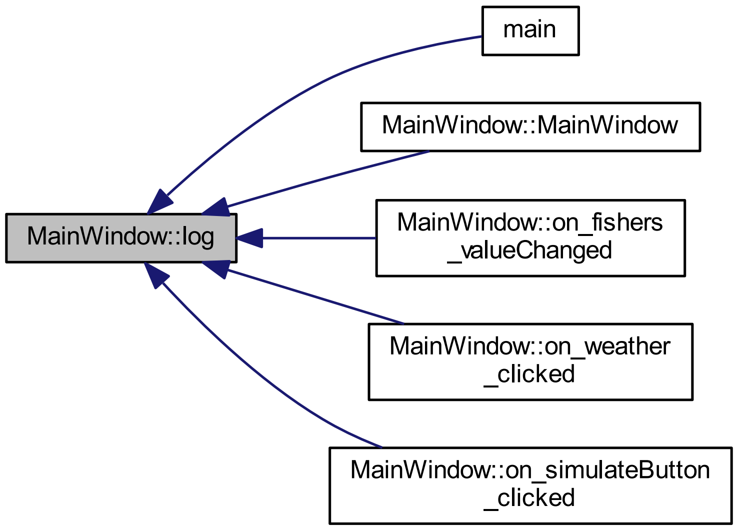
7.3.3.1 void MainWindow::log (const QString & *text*)

Sends a string to the simulation log.

Parameters

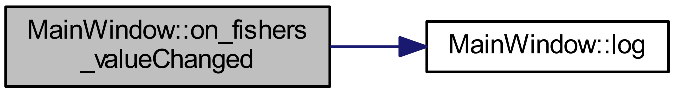
text	to display in the log.

Here is the caller graph for this function:


main
MainWindow::MainWindow
MainWindow::on_fishers_valueChanged
MainWindow::log
MainWindow::on_weather_clicked
MainWindow::on_simulateButton_clicked

7.3.3.2 void MainWindow::on_fishers_valueChanged (int *value*) [private], [slot]

Here is the call graph for this function:



7.3.3.3 void MainWindow::on_fishpop_valueChanged (int *value*) [private], [slot]

7.3.3.4 void MainWindow::on_fishtypes_valueChanged (int *value*) [private], [slot]

7.3.3.5 void MainWindow::on_lineEdit_0_textEdited (const QString & *arg1*) [private], [slot]

7.3.3.6 void MainWindow::on_lineEdit_1_textEdited (const QString & *arg1*) `[private], [slot]`

7.3.3.7 void MainWindow::on_lineEdit_2_textEdited (const QString & *arg1*) `[private], [slot]`

7.3.3.8 void MainWindow::on_lineEdit_3_textEdited (const QString & *arg1*) `[private], [slot]`

7.3.3.9 void MainWindow::on_lineEdit_4_textEdited (const QString & *arg1*) `[private], [slot]`

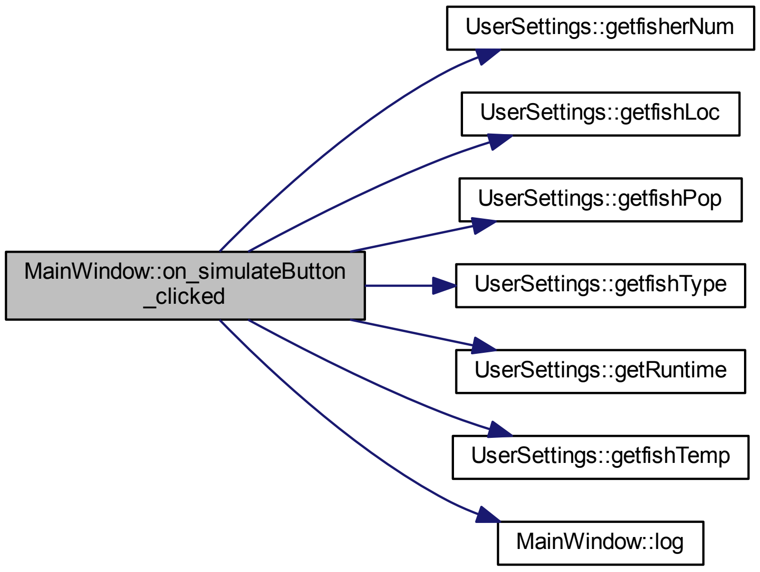
7.3.3.10 void MainWindow::on_locations_valueChanged (int *value*) `[private], [slot]`

7.3.3.11 void MainWindow::on_reportButton_clicked ( ) `[private], [slot]`

7.3.3.12 void MainWindow::on_runtime_valueChanged (int *value*) `[private], [slot]`

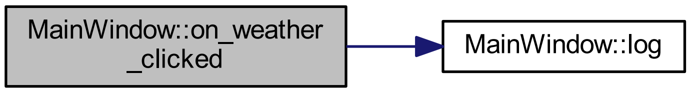
7.3.3.13 void MainWindow::on_simulateButton_clicked ( ) `[private], [slot]`

Here is the call graph for this function:


UserSettings::getfisherNum
UserSettings::getfishLoc
UserSettings::getfishPop
MainWindow::on_simulateButton_clicked
UserSettings::getfishType
UserSettings::getRuntime
UserSettings::getfishTemp
MainWindow::log

7.3.3.14 void MainWindow::on_weather_clicked ( ) `[private], [slot]`

Here is the call graph for this function:



7.3.4 Member Data Documentation

7.3.4.1 Graphview MainWindow::graphview `[private]`

7.3.4.2 Ui::MainWindow* MainWindow::ui `[private]`

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

- mainwindow.h
- mainwindow.cpp

7.4 Spot Class Reference

Spot is used to create a location and calculate how crowded it is.

`#include <spot.h>`

Public Member Functions

- Spot ()
- void setCap (double cap)
- double getSpotCapacity ()
- void setAgentNum (int fisherNum)
- int getAgentNum ()
- double crowdness (double goFish)

Private Attributes

- double maxcapacity

  max agents per spot
- int numAgent

  number of agents possibly going fishing per spot

7.4.1 Detailed Description

Spot is used to create a location and calculate how crowded it is.

7.4.2 Constructor & Destructor Documentation

7.4.2.1 Spot::Spot ( )

Constructor for a spot

Precondition

none

Postcondition

numAgent and maxcapacity is initialized to zero

Returns

none

7.4.3 Member Function Documentation

7.4.3.1 double Spot::crowdness (double *goFish*)

Calculate how crowded a spot is

Precondition

Give number of agents that decided to go fishing

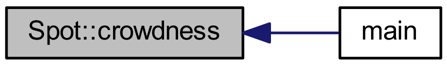
Postcondition

Percentage of crowd is calculated

Returns

Percentage of fisherman going fishing

Here is the caller graph for this function:



7.4.3.2 int Spot::getAgentNum ( )

Get back total number agents

Precondition

Number of agents is already set

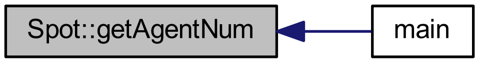
Postcondition

none

Returns

Integer number of total agents (numAgent)

Here is the caller graph for this function:



7.4.3.3 double Spot::getSpotCapacity ( )

Get the maxcapacity

Precondition

A capacity is already set

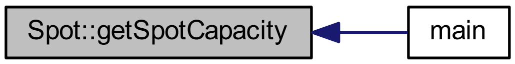
Postcondition

none

Returns

The number of maxcapacity

Here is the caller graph for this function:



7.4.3.4 void Spot::setAgentNum (int *fisherNum*)

Set the number of agents possibly going to spot

Precondition

Give the number of agents called fisherNum

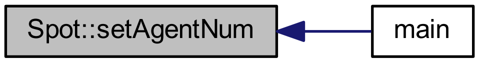
Postcondition

The numAgent is equal to given fisherNum

Returns

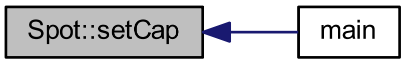
none

Here is the caller graph for this function:



7.4.3.5 void Spot::setCap (double *cap*)

Here is the caller graph for this function:



7.4.4 Member Data Documentation

7.4.4.1 double Spot::maxcapacity [private]

max agents per spot

7.4.4.2 int Spot::numAgent `[private]`

number of agents possibly going fishing per spot

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

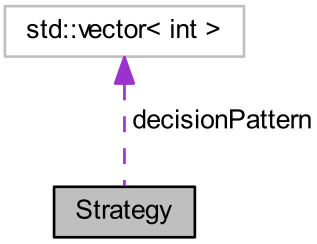
- spot.h
- spot.cpp

7.5 Strategy Class Reference

represents a strategy for determining the conditions of going fishing. since each startegy depends on 3 previous outcomes, so posiible output for one strategy is 8. the sequence for the 3 previous outcomes would be: 000,001,010,...,111 special case for starategy: 0->stay at home, 1->go fishing

`#include <strategy.h>`

Collaboration diagram for Strategy:



Public Member Functions

- Strategy (vector< int > randDecision)

    Strategy constructor.
- vector< int > getDecisionPattern ()
- int getScore ()

    returns the score This value represents the number of wins that an agent has made using this strategy
- void updateScore (int point)

    records the secess of this strategy

Private Attributes

- int score

    hold score for strategy
- vector< int > decisionPattern

    contains the record of past decisions

7.5.1 Detailed Description

represents a strategy for determining the conditions of going fishing. since each startegy depends on 3 previous outcomes, so posiible output for one strategy is 8. the sequence for the 3 previous outcomes would be: 000,001,010,...,111 special case for starategy: 0->stay at home, 1->go fishing

7.5.2 Constructor & Destructor Documentation

7.5.2.1 Strategy::Strategy (vector< int > *randDecision*)

Strategy constructor.

7.5.3 Member Function Documentation

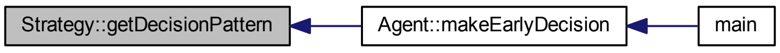
7.5.3.1 vector< int > Strategy::getDecisionPattern ( )

Returns the decision pattern used by this strategy

Returns

a vector containing the decision pattern used. 0 represents staying home and 1 going fishing.

Here is the caller graph for this function:



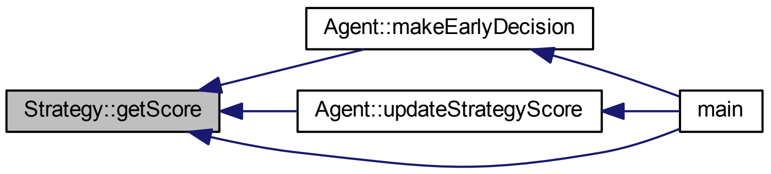
7.5.3.2 int Strategy::getScore ( )

returns the score This value represents the number of wins that an agent has made using this strategy

Returns

the strategy score

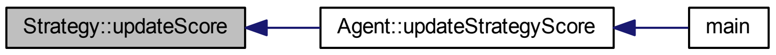
Here is the caller graph for this function:



7.5.3.3 void Strategy::updateScore (int *point*)

records the secess of this strategy

Here is the caller graph for this function:



7.5.4 Member Data Documentation

7.5.4.1 vector<int> Strategy::decisionPattern `[private]`

contains the record of past decisions

7.5.4.2 int Strategy::score `[private]`

hold score for strategy

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

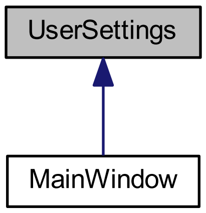
- strategy.h
- strategy.cpp

7.6 UserSettings Class Reference

contains the users global simulation parameters.

```
#include <UserSettings.h>
```

Inheritance diagram for UserSettings:



Public Member Functions

- UserSettings ()
- int getfisherNum ()
- int getfishLoc ()
- int getfishType ()
- int getfishPop ()
- int getfishTemp ()
- int getRuntime ()

Protected Attributes

- int fisherNum
- int fishLoc
- int fishType
- int fishPop
- int fishTemp
- int runtime

7.6.1 Detailed Description

contains the users global simulation parameters.

7.6.2 Constructor & Destructor Documentation

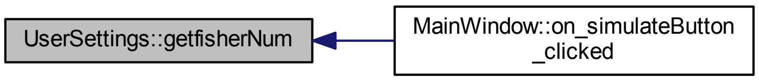
7.6.2.1 UserSettings::UserSettings ( )

7.6.3 Member Function Documentation

7.6.3.1 int UserSettings::getfisherNum ( )

Returns the number of Fishers to use in the simulation

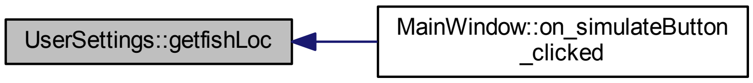
Here is the caller graph for this function:


UserSettings::getfisherNum
MainWindow::on_simulateButton _clicked

7.6.3.2 int UserSettings::getfishLoc ( )

Returns the number of different locations

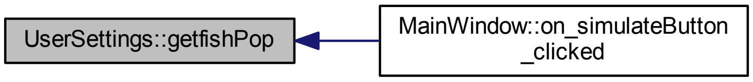
Here is the caller graph for this function:



7.6.3.3 int UserSettings::getfishPop ( )

Returns the inital population of fish when the simulation starts.

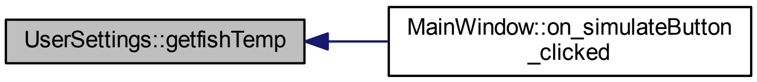
Here is the caller graph for this function:



7.6.3.4 int UserSettings::getfishTemp ( )

Returns the conditions: overcast, snow, rain.

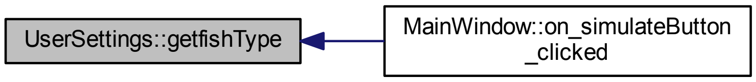
Here is the caller graph for this function:


UserSettings::getfishTemp
MainWindow::on_simulateButton _clicked

7.6.3.5 int UserSettings::getfishType ( )

Returns the number of fish types.

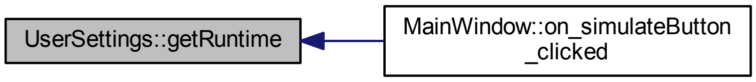
Here is the caller graph for this function:


UserSettings::getfishType
MainWindow::on_simulateButton _clicked

7.6.3.6 int UserSettings::getRuntime ( )

Returns the number of days to run the simulation.

Here is the caller graph for this function:



7.6.4 Member Data Documentation

7.6.4.1 int UserSettings::fisherNum `[protected]`

The number of Fishers to use in the simulation

7.6.4.2 int UserSettings::fishLoc `[protected]`

The number of different locations

7.6.4.3 int UserSettings::fishPop `[protected]`

The inital population of fish when the simulation starts.

7.6.4.4 int UserSettings::fishTemp `[protected]`

The conditions: overcast, snow, rain

7.6.4.5 int UserSettings::fishType `[protected]`

The number of fish types.

7.6.4.6 int UserSettings::runtime `[protected]`

The number of days to run the simulation

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

- UserSettings.h
- UserSettings.cpp

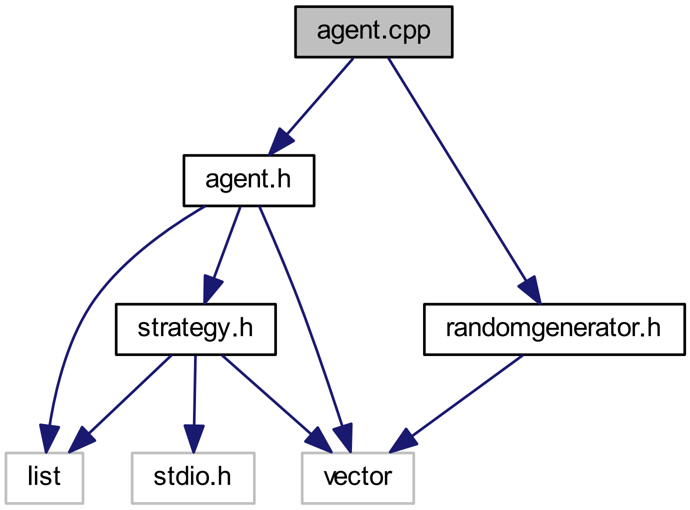
Chapter 8

File Documentation

8.1 agent.cpp File Reference

```
#include "agent.h"
#include "randomgenerator.h"
```

Include dependency graph for agent.cpp:



Functions

- void initAgent (list< Agent $*$ > $*$allAgent, int numAgent, list< Strategy $*$ > stratlist)

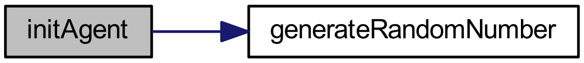
Variables

- static list< Agent > all_agent

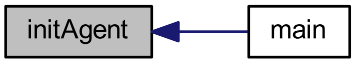
8.1.1 Function Documentation

8.1.1.1 void initAgent (list< **Agent** ∗ > ∗ ***allAgent,*** int ***numAgent,*** list< **Strategy** ∗ > ***stratlist***)

Here is the call graph for this function:



Here is the caller graph for this function:



8.1.2 Variable Documentation

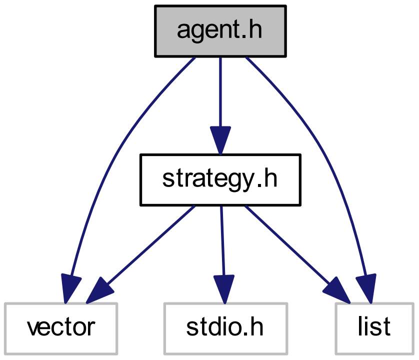
8.1.2.1 list<**Agent**> all_agent `[static]`

8.2 agent.h File Reference

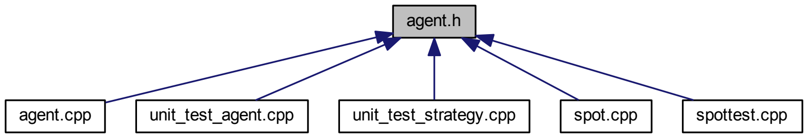
agent represents 1 agent's experience and decisions

```
#include "strategy.h"
#include <list>
#include <vector>
```

Include dependency graph for agent.h:



This graph shows which files directly or indirectly include this file:



Classes

- class Agent

    agent represents 1 agent's experience and decisions

Functions

- void initAgent (list< Agent ∗ > ∗allAgent, int numAgent, list< Strategy ∗ > stratlist)

Variables

- static int numOfAgent

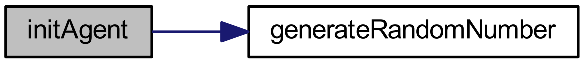
8.2.1 Detailed Description

agent represents 1 agent's experience and decisions

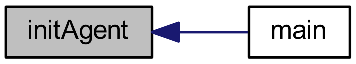
8.2.2 Function Documentation

8.2.2.1 void initAgent (list< Agent ∗ > ∗ *allAgent*, int *numAgent*, list< Strategy ∗ > *stratlist*)

Here is the call graph for this function:



Here is the caller graph for this function:



8.2.3 Variable Documentation

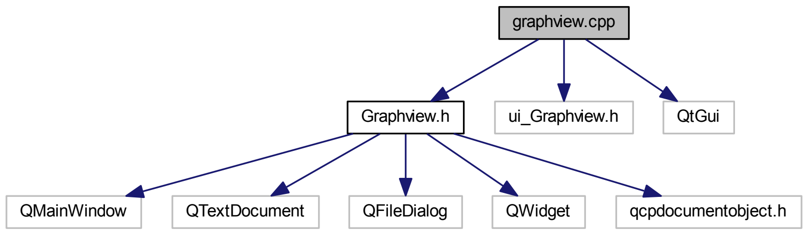
8.2.3.1 int numOfAgent [static]

8.3 Algorithms.dox File Reference

8.4 graphview.cpp File Reference

```
#include "Graphview.h"
#include "ui_Graphview.h"
#include <QtGui>
```

Include dependency graph for graphview.cpp:

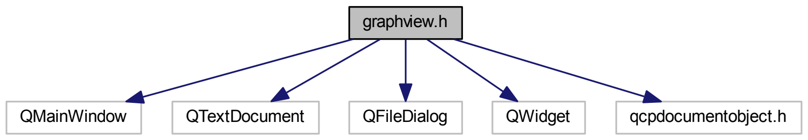


8.5 graphview.h File Reference

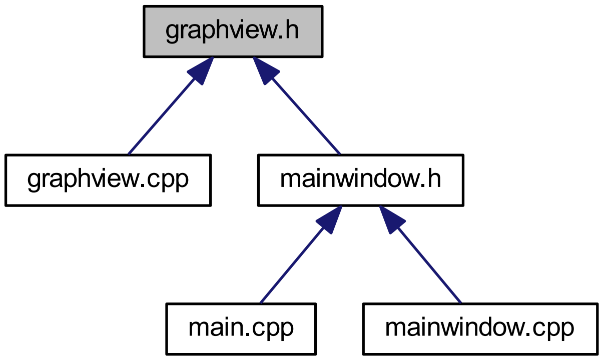
provides a view that shows the collected graphs and allows them to be inserted into a report.

```
#include <QMainWindow>
#include <QTextDocument>
#include <QFileDialog>
#include <QWidget>
#include "qcpdocumentobject.h"
```

Include dependency graph for graphview.h:



This graph shows which files directly or indirectly include this file:



Classes

- class Graphview

  provides a view that shows the collected graphs and allows them to be inserted into a report.

Namespaces

- Ui

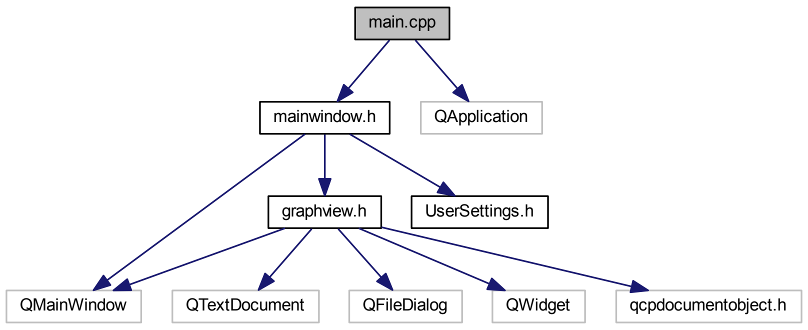
8.5.1 Detailed Description

provides a view that shows the collected graphs and allows them to be inserted into a report.

8.6 main.cpp File Reference

```
#include "mainwindow.h"
#include <QApplication>
```

Include dependency graph for main.cpp:



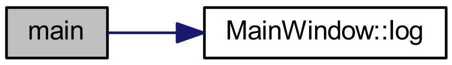
Functions

- int main (int argc, char ∗argv[ ])

8.6.1 Function Documentation

8.6.1.1 int main (int *argc*, char ∗ *argv[ ]*)

Here is the call graph for this function:

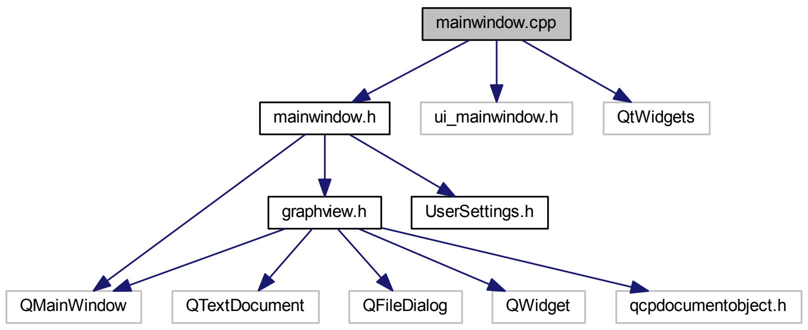


8.7 mainpage.dox File Reference

8.8 mainwindow.cpp File Reference

```
#include "mainwindow.h"
#include "ui_mainwindow.h"
#include <QtWidgets>
```

Include dependency graph for mainwindow.cpp:

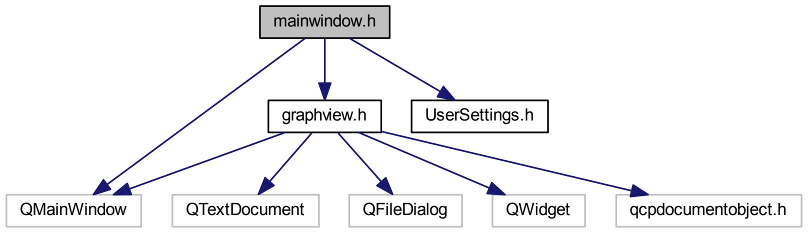


8.9 mainwindow.h File Reference

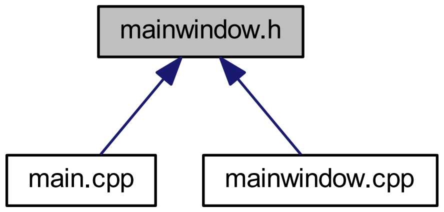
mainwindow creates the primary GUI display

```
#include <QMainWindow>
#include "graphview.h"
#include "UserSettings.h"
```

Include dependency graph for mainwindow.h:



This graph shows which files directly or indirectly include this file:



Classes

- class MainWindow

  The MainWindow class Provides the Main windows for the Fisher sim project.

Namespaces

- Ui

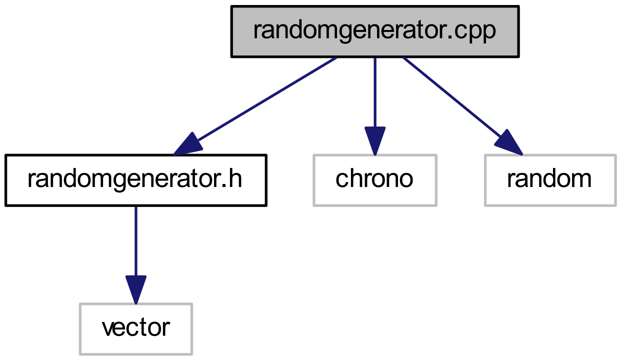
8.9.1 Detailed Description

mainwindow creates the primary GUI display

8.10 randomgenerator.cpp File Reference

```
#include "randomgenerator.h"
#include <chrono>
#include <random>
```

Include dependency graph for randomgenerator.cpp:



Functions

- vector< int > generateRandomNumber (int lowerBound, int upperBound, int length)

    Generates a vector of random numbers from some minimum bound to an upper bound.

8.10.1 Function Documentation

8.10.1.1 vector< int > generateRandomNumber (int *lowerBound,* int *upperBound,* int *length*)

Generates a vector of random numbers from some minimum bound to an upper bound.

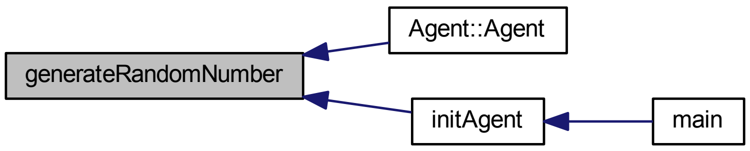
Parameters

lowerBound	the lower bound that the random numbers can have.
upperBound	the upper bound of the random numbers
length	the number of random numbers to generate.

Returns

a vector containing length number of elements from 0 - (length-1)

Here is the caller graph for this function:

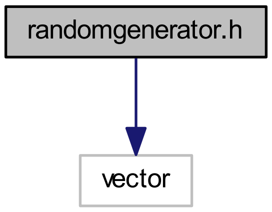


8.11 randomgenerator.h File Reference

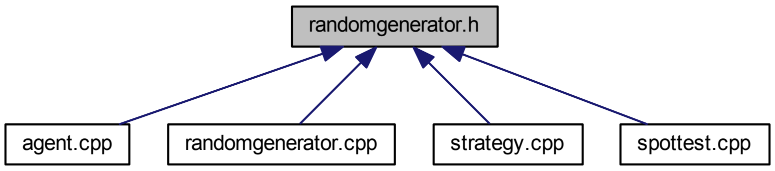
construct a trivial random generator engine from a time-based seed:

```
#include <vector>
```

Include dependency graph for randomgenerator.h:



This graph shows which files directly or indirectly include this file:



Functions

- vector< int > generateRandomNumber (int lowerBound, int upperBound, int length)

  Generates a vector of random numbers from some minimum bound to an upper bound.

8.11.1 Detailed Description

construct a trivial random generator engine from a time-based seed:

8.11.2 Function Documentation

8.11.2.1 vector<int> generateRandomNumber (int *lowerBound,* int *upperBound,* int *length*)

Generates a vector of random numbers from some minimum bound to an upper bound.

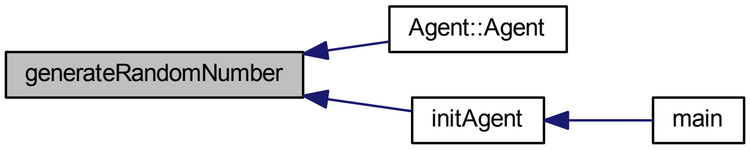
Parameters

lowerBound	the lower bound that the random numbers can have.
upperBound	the upper bound of the random numbers
length	the number of random numbers to generate.

Returns

a vector containing length number of elements from 0 - (length-1)

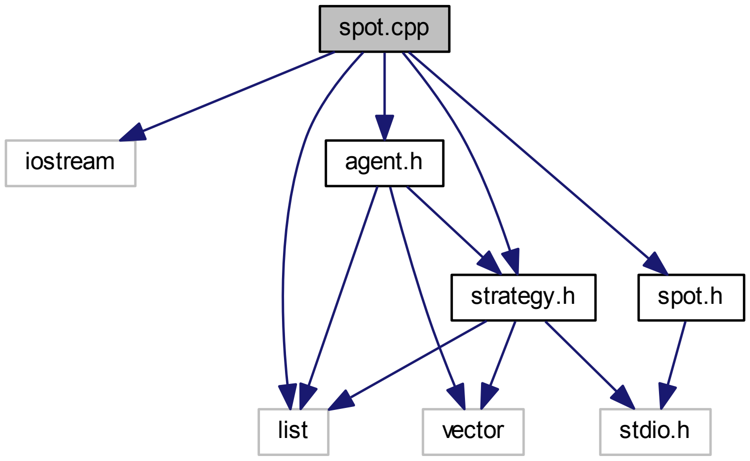
Here is the caller graph for this function:



8.12 spot.cpp File Reference

```
#include <iostream>
#include <list>
#include "agent.h"
#include "strategy.h"
#include "spot.h"
```

Include dependency graph for spot.cpp:

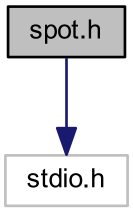


8.13 spot.h File Reference

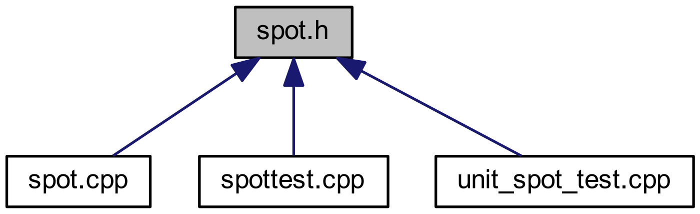
Used to create a spot and calculate how crowded a spot is.

`#include <stdio.h>`

Include dependency graph for spot.h:



This graph shows which files directly or indirectly include this file:



Classes

- class Spot

  Spot is used to create a location and calculate how crowded it is.

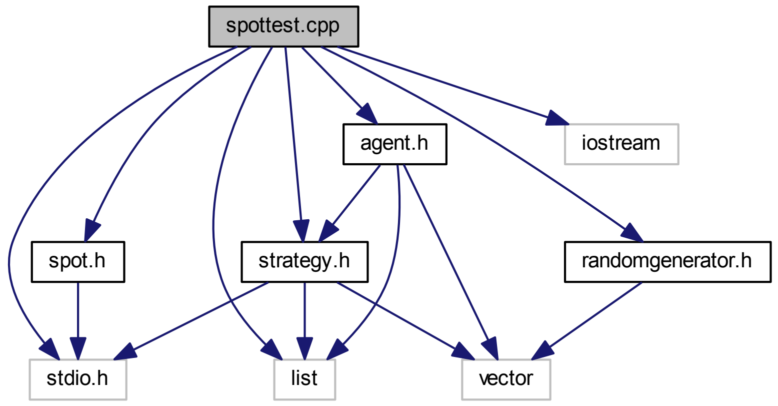
8.13.1 Detailed Description

Used to create a spot and calculate how crowded a spot is.

8.14 spottest.cpp File Reference

```
#include <stdio.h>
#include <iostream>
#include <list>
#include "randomgenerator.h"
#include "agent.h"
#include "strategy.h"
#include "spot.h"
```

Include dependency graph for spottest.cpp:



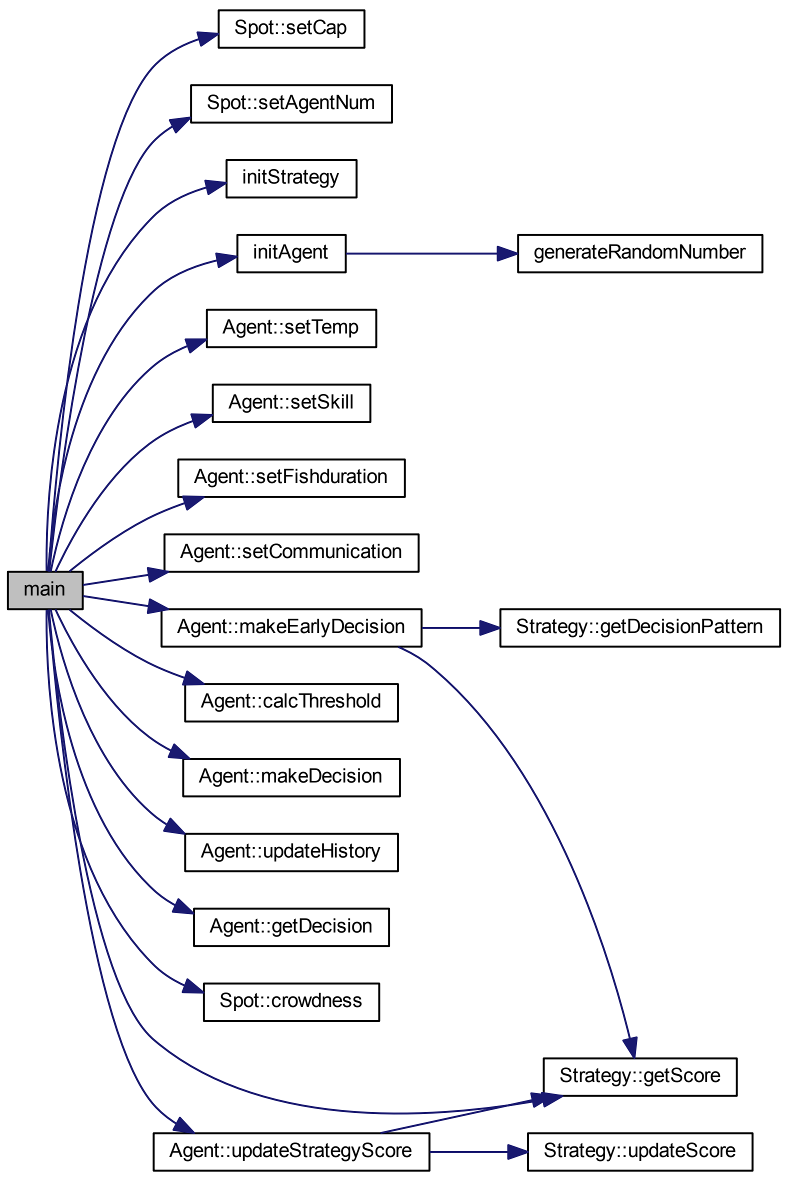
Functions

- int main ()

8.14.1 Function Documentation

8.14.1.1 int main ( )

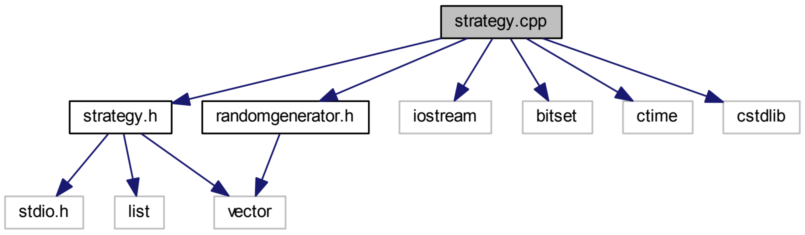
Here is the call graph for this function:



8.15 strategy.cpp File Reference

```
#include "strategy.h"
#include "randomgenerator.h"
#include <iostream>
#include <bitset>
#include <ctime>
#include <cstdlib>
```

Include dependency graph for strategy.cpp:



Functions

- void initStrategy (list< Strategy ∗ > ∗allStrategy)

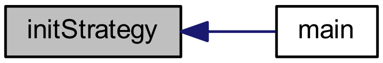
  initializes all of the strategies

8.15.1 Function Documentation

8.15.1.1 void initStrategy (list< **Strategy** ∗ > ∗ ***allStrategy***)

initializes all of the strategies

Here is the caller graph for this function:

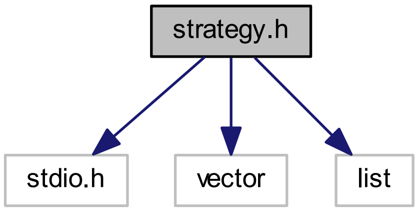


8.16 strategy.h File Reference

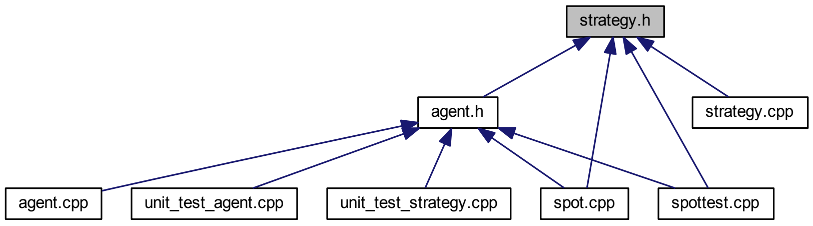
represents a strategy for determining the conditions of going fishing.

```
#include <stdio.h>
#include <vector>
#include <list>
```

Include dependency graph for strategy.h:



This graph shows which files directly or indirectly include this file:



Classes

- class Strategy

    represents a strategy for determining the conditions of going fishing. since each startegy depends on 3 previous outcomes, so posiible output for one strategy is 8. the sequence for the 3 previous outcomes would be: 000,001,010,...,111 special case for starategy: 0->stay at home, 1->go fishing

Functions

- void initStrategy (list< Strategy ∗ > ∗allStrategy)

    initializes all of the strategies

8.16.1 Detailed Description

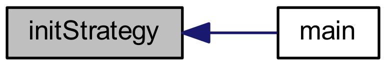
represents a strategy for determining the conditions of going fishing.

8.16.2 Function Documentation

8.16.2.1 void initStrategy (list< **Strategy** $*$ > $*$ ***allStrategy***)

initializes all of the strategies

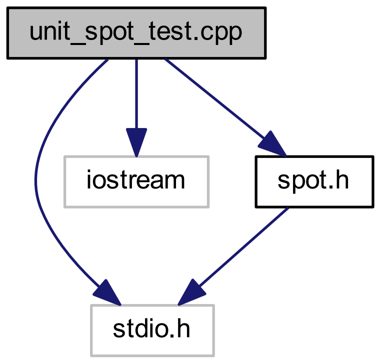
Here is the caller graph for this function:



8.17 unit_spot_test.cpp File Reference

```
#include <stdio.h>
#include <iostream>
#include "spot.h"
```

Include dependency graph for unit_spot_test.cpp:



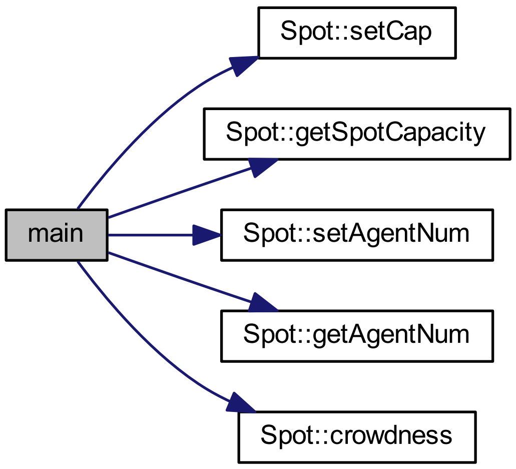
Functions

- int main ()

8.17.1 Function Documentation

8.17.1.1 int main ( )

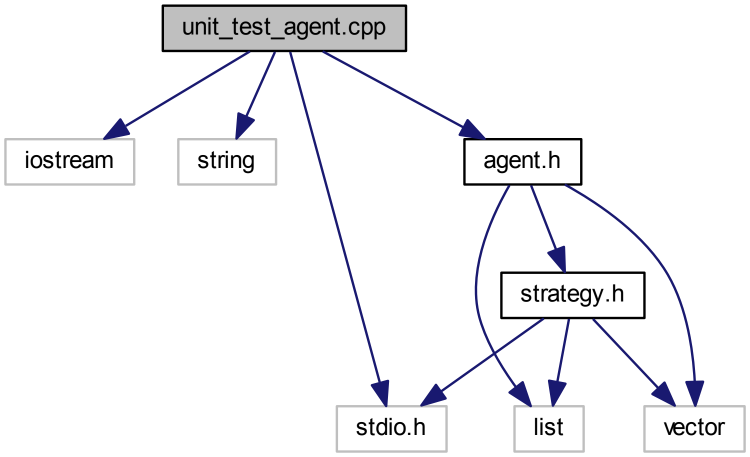
Here is the call graph for this function:



8.18 unit_test_agent.cpp File Reference

```
#include <iostream>
#include <string>
#include <stdio.h>
#include "agent.h"
```

Include dependency graph for unit_test_agent.cpp:



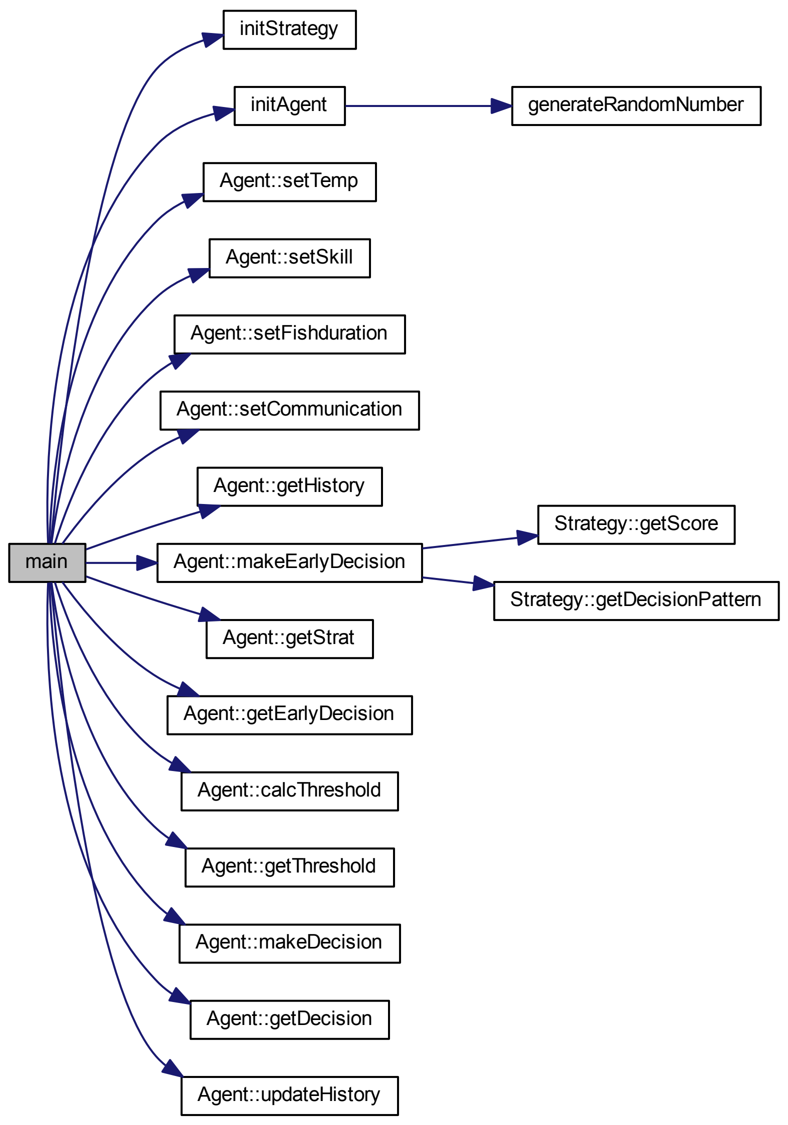
Functions

- void main ()

8.18.1 Function Documentation

8.18.1.1 void main ( )

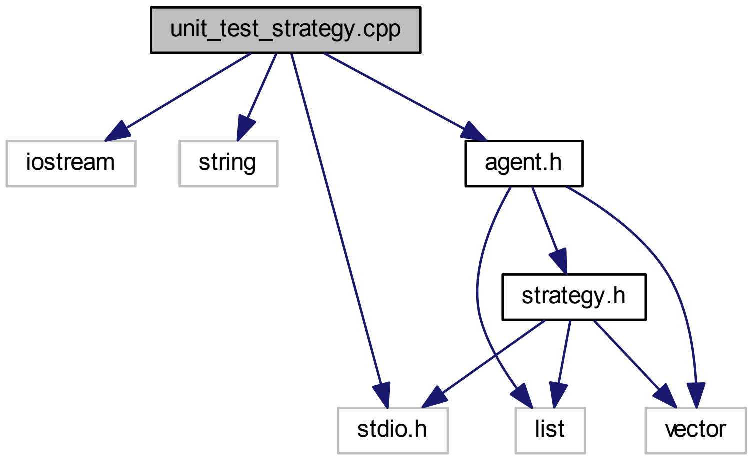
Here is the call graph for this function:



8.19 unit_test_strategy.cpp File Reference

```
#include <iostream>
#include <string>
#include <stdio.h>
#include "agent.h"
```

Include dependency graph for unit_test_strategy.cpp:



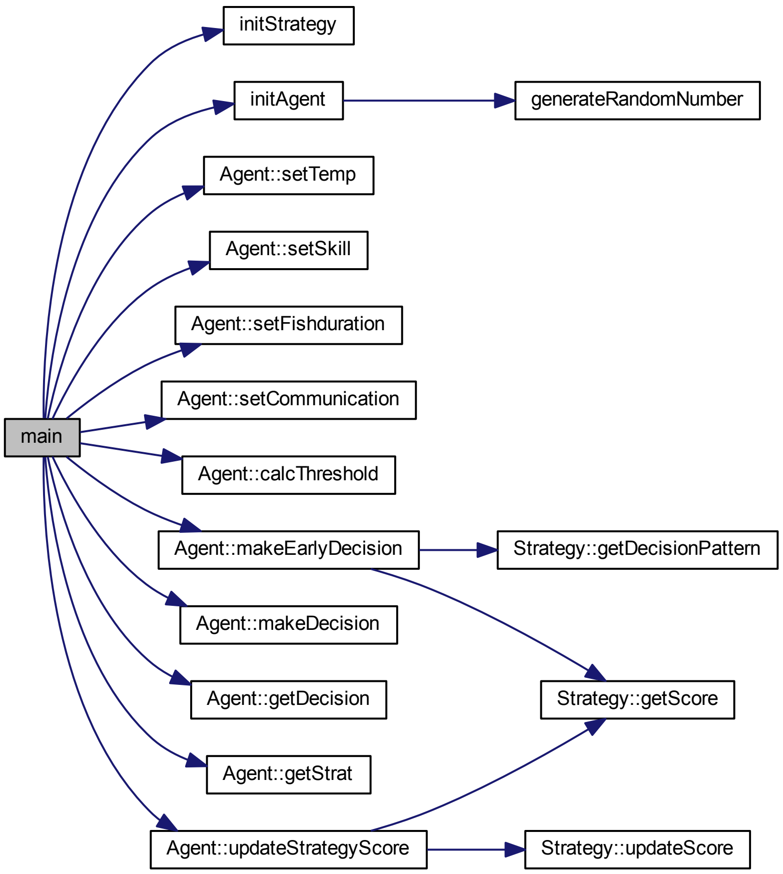
Functions

- void main ()

8.19.1 Function Documentation

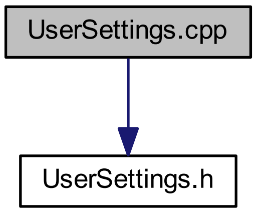
8.19.1.1 void main ( )

Here is the call graph for this function:



8.20 UserSettings.cpp File Reference

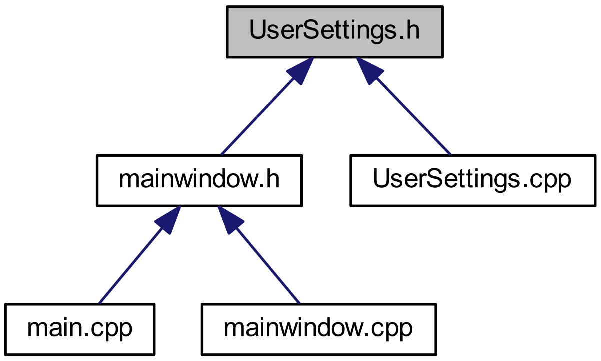
```
#include "UserSettings.h"
```
Include dependency graph for UserSettings.cpp:



8.21 UserSettings.h File Reference

contains the users global simulation parameters.

This graph shows which files directly or indirectly include this file:



Classes

- class UserSettings

  contains the users global simulation parameters.

8.21.1 Detailed Description

contains the users global simulation parameters.

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