Reference Manual

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Contents

Chapter 1

Gridhunt2: The famous Gridhunt game

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1.1 Objective

The objective of gridhunt is to implement a hunter (i.e., a subclass of Hunter) who can catch the monster faster than all other hunters. Gridhunt uses a 30x30 grid of squares. A monster moves on this grid (see class Monster for how exactly the monster moves). Gridhunt is turn based. Each turn each hunter gets between 1 and 5 points which she/he can use for actions (e.g., move to an adjacent square, find out where the monster is; teleport to a random location on the grid). A hunter catches the monster if she/he moves on the same square the monster currently occupies. If the monster survives 100 rounds it wins.

1.2 How to Start

Download the code from `the Gridhunt2 web site.` Make sure you check out the copyright notice below. Start with a copy of HunterRandom, give it a new class name. Then edit gridhunt_start.cc to include your new hunter in the hunting party. Modify the new hunter's makeMove() function to make her/him smarter.

1.3 Compilation and Running the Game

Add your class to the Makefile (line 29) and type make in your teminal. Run the game with ./gridhunt. Alternatively you can import the project into NetBeans and run it from there.

Good luck!

1.4 Copyright

Chapter 2

Class Index

2.1 Class Hierarchy

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

Chapter 3

Class Index

3.1 Class List

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

Chapter 4

File Index

4.1 File List

Here is a list of all documented files with brief descriptions:

Chapter 5

Class Documentation

5.1 Coord Class Reference

`#include <Coord.h>`

Public Member Functions

- Coord (int n=0, int e=0)
- int **getN** () const
- int **getE** () const
- void **setCoord** (int, int)
- int distance (const Coord &) const
- bool **operator==** (const Coord &) const
- bool **operator!=** (const Coord &right) const
- Coord **operator+** (const Coord &) const

Friends

- ostream & operator<< (ostream &, const Coord &)

5.1.1 Detailed Description

Coordinates

5.1.2 Constructor & Destructor Documentation

5.1.2.1 Coord::Coord (int *n* = *0*, int *e* = *0*)

Create a coordinate object (North/East)

5.1.3 Member Function Documentation

5.1.3.1 int Coord::distance (const Coord & *arg2*) const

Get distance to another Coord.

5.1.4 Friends And Related Function Documentation

5.1.4.1 ostream& operator<< (ostream & *o*, const Coord & *c*) `[friend]`

global insertion operator for Coord

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

- Coord.h
- Coord.cc

5.2 Die Class Reference

`#include <Die.h>`

Public Member Functions

- int roll (int max=6) const

5.2.1 Detailed Description

simple multi-sided die.

5.2.2 Member Function Documentation

5.2.2.1 int Die::roll (int *max* = *6*) const

get a random number between 1 and max.

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

- Die.h
- Die.cc

5.3 Grid Class Reference

`#include <Grid.h>`

Public Member Functions

- **Grid** (int, int)
- bool checkCoord (const Coord &) const
- Coord randomCoord () const
- int getMaxN () const
- int getMaxE () const

Public Attributes

- const Die die

5.3.1 Detailed Description

Some helper functions needed for the grid

5.3.2 Member Function Documentation

5.3.2.1 bool Grid::checkCoord (const Coord & *aCoord*) const

check if some coordinates are inside the grid

5.3.2.2 int Grid::getMaxE ( ) const

get the number of squares along the y-axis. The squares are numbered 0 to maxY-1.

5.3.2.3 int Grid::getMaxN ( ) const

get the number of squares along the x-axis. The squares are numbered 0 to maxX-1.

5.3.2.4 Coord Grid::randomCoord ( ) const

produce a random location

5.3.3 Member Data Documentation

5.3.3.1 const Die Grid::die

the grid has its die

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

- Grid.h
- Grid.cc

5.4 Gridhunt Class Reference

`#include <Gridhunt.h>`

Public Member Functions

- Gridhunt (int maxN=30, int maxE=30, int maxRounds=100)
- void run (bool visual=true)
- void show () const
- void leaderBoard () const
- void **setHunters** (Hunter ∗[ ], int)
- void **setMonster** (Monster ∗)

5.4.1 Detailed Description

Main class of the game.

5.4.2 Constructor & Destructor Documentation

5.4.2.1 Gridhunt::Gridhunt (int *maxN* = `30`, int *maxE* = `30`, int *maxRounds* = `100`)

Create a game with a grid (default: 30x30) and run the game for a maximum of maxRounds rounds

5.4.3 Member Function Documentation

5.4.3.1 void Gridhunt::leaderBoard ( ) const

Display current leader borad

5.4.3.2 void Gridhunt::run (bool *visual* = `true`)

Run the game. Turn detailed display on/off with visual.

5.4.3.3 void Gridhunt::show ( ) const

Display Mobile objects on Grid

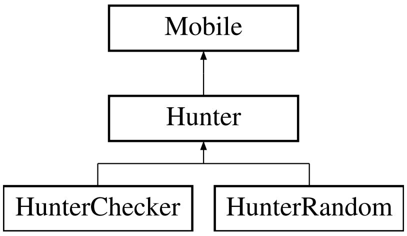
The documentation for this class was generated from the following files:

- Gridhunt.h
- Gridhunt.cc

5.5 Hunter Class Reference

`#include <Hunter.h>`

Inheritance diagram for Hunter:



Public Member Functions

- **Hunter** (const string &name="A player", char decal= 'x')
- virtual void makeMove ()=0
- int distanceToMonster ()
- Coord positionOfMonster ()
- void setMonster (Monster ∗monster)

5.5.1 Detailed Description

A Hunter. Inherit from this class to implement your player class

5.5.2 Member Function Documentation

5.5.2.1 int Hunter::distanceToMonster ( )

get the distance to the monster in moves. Cost: 1 point.

5.5.2.2 virtual void Hunter::makeMove ( ) `[pure virtual]`

Overwrite this function to implement your player's behavior. You can use the public member functions in Mobile and Hunter or in other classes. Remember that you only have 1-5 points per round and move, teleport, getPosition, distanceToMonster and positionOfMonster (some of them are inherited from Mobile) cost points.

Implements Mobile.

Implemented in HunterChecker, and HunterRandom.

5.5.2.3 Coord Hunter::positionOfMonster ( )

get the position of the monster. Cost: 2 points.

5.5.2.4 void Hunter::setMonster (Monster ∗ *monster*) `[inline]`

this is only used by the game to initialize your "monster scanner" which allows you to use distanceToMonster() and positionOfMonster().

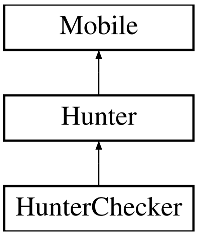
The documentation for this class was generated from the following files:

- Hunter.h
- Hunter.cc

5.6 HunterChecker Class Reference

`#include <HunterChecker.h>`

Inheritance diagram for HunterChecker:



Public Member Functions

- **HunterChecker** (const string &name="Checker", char decal= 'x')
- void makeMove ()

5.6.1 Detailed Description

This player checks constantly where the monster is but is to lazy to go anywhere.

5.6.2 Member Function Documentation

5.6.2.1 void HunterChecker::makeMove ( ) `[virtual]`

I'm just checking where the monster is.

Implements Hunter.

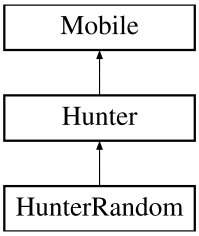
The documentation for this class was generated from the following files:

- HunterChecker.h
- HunterChecker.cc

5.7 HunterRandom Class Reference

`#include <HunterRandom.h>`

Inheritance diagram for HunterRandom:



Public Member Functions

- **HunterRandom** (const string &name="Random Hunter", char decal= 'x')
- void makeMove ()

5.7.1 Detailed Description

This player randomly moves around and hopes to catch the monster

5.7.2 Member Function Documentation

5.7.2.1 void HunterRandom::makeMove ( ) `[virtual]`

If I only run around fast enough then I will surely catch the monster!

Implements Hunter.

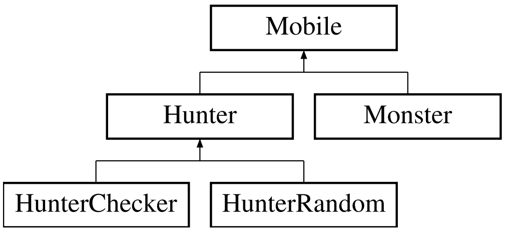
The documentation for this class was generated from the following files:

- HunterRandom.h
- HunterRandom.cc

5.8 Mobile Class Reference

`#include <Mobile.h>`

Inheritance diagram for Mobile:



Public Types

- enum Direction {
  N = 1, **NE**, **E**, **SE**,
  S, **SW**, **W**, **NW** }

Public Member Functions

- Mobile (const string &name="Some Mobile", char decal= 'x')
- void say (const string &) const
- bool pay (int)
- Coord getPosition ()

- bool teleport ()
- bool move (Direction)
- virtual void makeMove ()=0
- Die ∗ **getDie** () const
- string **getName** () const
- int **getWins** () const
- char **getDecal** () const
- int **getPoints** () const
- Grid ∗ **getGrid** () const
- int getRound () const

Static Public Attributes

- static const string directionName [ ]

Friends

- class Gridhunt
- class Hunter
- ostream & operator<< (ostream &, const Mobile &)

5.8.1 Detailed Description

Implements a mobile object (either Hunter or Monster).

5.8.2 Member Enumeration Documentation

5.8.2.1 enum Mobile::Direction

enumeration of possible directions.

5.8.3 Constructor & Destructor Documentation

5.8.3.1 Mobile::Mobile (const string & *name* = `"Some Mobile"`, char *decal* = `'x'`)

Simple constructor.

Parameters

name Name of the mobile.

decal Decal used for dispaying the mobile on a grid.

5.8.4 Member Function Documentation

5.8.4.1 Coord Mobile::getPosition ( )

get your own position. Cost: 1 point.

5.8.4.2 int Mobile::getRound ( ) const `[inline]`

get the round number (rounds start with 1)

5.8.4.3 virtual void Mobile::makeMove ( ) `[pure virtual]`

this member function will be called once per round. It is a pure virtual function and has to be overloaded in your subclass in order to implement the mobile's behavior.

Implemented in Hunter, HunterChecker, HunterRandom, and Monster.

5.8.4.4 bool Mobile::move (Direction *dir*)

move the mobile one square in a given direction. Cost: 1 point.

5.8.4.5 bool Mobile::pay (int *howMuch*)

reduce your available points for this round.

5.8.4.6 void Mobile::say (const string & *message*) const

say something (don't use cout)

5.8.4.7 bool Mobile::teleport ( )

teleport you to a random location on the grid. Cost: 2 points.

5.8.5 Friends And Related Function Documentation

5.8.5.1 ostream& operator<< (ostream & *o*, const Mobile & *m*) `[friend]`

displays mobile name and location

5.8.6 Member Data Documentation

5.8.6.1 const string Mobile::directionName `[static]`

Initial value:

```
{"X", "N", "NE", "E", "SE",
   "S", "SW", "W", "NW"}
```

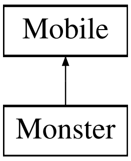
string representaion of directions for printing.

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

- Mobile.h
- Mobile.cc

5.9 Monster Class Reference

Inheritance diagram for Monster:



Public Member Functions

- **Monster** (const string &name="A nameless monster", char decal= ’M’)
- void makeMove ()

5.9.1 Member Function Documentation

5.9.1.1 void Monster::makeMove ( ) `[virtual]`

this member function will be called once per round. It is a pure virtual function and has to be overloaded in your subclass in order to implement the mobile’s behavior.

Implements Mobile.

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

- Monster.h
- Monster.cc

Chapter 6

File Documentation

6.1 constants.h File Reference

`#include "Coord.h"`

Functions

- const Coord ERROR_COORD (-1,-1)

Variables

- const int ERROR_DIST = -1

6.1.1 Detailed Description

6.1.2 Function Documentation

6.1.2.1 const Coord ERROR_COORD (- *1*, - *1*)

error coordinate returned by functions if getting the coordinate failed (e.g., you do not have enough points left).

6.1.3 Variable Documentation

6.1.3.1 const int ERROR_DIST = -1

error distance returned by functions if getting the distance failed (e.g., you do not have enough points left).

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