labo_11_schaufelberger_yannick_gallay_david

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Contents

Chapter 1

File Index

1.1 File List

Here is a list of all files with brief descriptions:

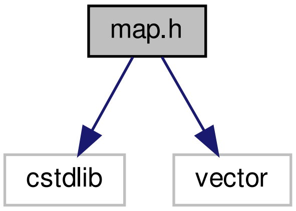
Chapter 2

File Documentation

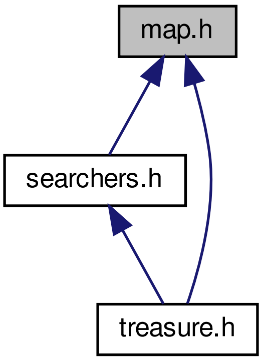
2.1 map.h File Reference

```
#include <cstdlib>
#include <vector>
```

Include dependency graph for map.h:



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



Typedefs

- typedef std::vector< MapState > Axe
- typedef std::vector< Axe > Map

Enumerations

- enum MapState {
MS_OUT, MS_EARTH, MS_WATER, MS_TREASURE,
MS_START }

Functions

- size_t getHeight (const Map &map)
- size_t getWidth (const Map &map)
- Map getEmptyMap (size_t height, size_t width)
- MapState getMapValue (const Map &map, size_t x, size_t y)
- bool setMapValue (Map &map, size_t x, size_t y, MapState value)
- bool addTreasure (Map &map, size_t height, size_t width)
- void addRandomTreasure (Map &map)
- bool addLake (Map &map, size_t originX, size_t originY, size_t radius)
- void addRandomLake (Map &map)
- void addRandomLake (Map &map, size_t maxRadius)
- bool addStart (Map &map, size_t x, size_t y)
- void addRandomStart (Map &map)
- void addRandomStart (Map &map, size_t &x, size_t &y)
- Map initWorld (size_t heigth, size_t width, size_t &x, size_t &y)
- void displayWorld (const Map &map)

Variables

- const int NUMBER_OF_LAKE = 3

2.1.1 Typedef Documentation

2.1.1.1 Axe

```
typedef std::vector<MapState> Axe
```

2.1.1.2 Map

```
typedef std::vector<Axe> Map
```

2.1.2 Enumeration Type Documentation

2.1.2.1 MapState

```
enum MapState
```

Enumerator

MS_OUT	
MS_EARTH	
MS_WATER	
MS_TREASURE	
MS_START	

2.1.3 Function Documentation

2.1.3.1 addLake()

```
bool addLake (
            Map & map,
            size_t originX,
            size_t originY,
            size_t radius )
```

2.1.3.2 addRandomLake() [1/2]

```
void addRandomLake (
            Map & map )
```

2.1.3.3 addRandomLake() [2/2]

```
void addRandomLake (
            Map & map,
            size_t maxRadius )
```

2.1.3.4 addRandomStart() [1/2]

```
void addRandomStart (
            Map & map )
```

2.1.3.5 addRandomStart() [2/2]

```
void addRandomStart (
            Map & map,
            size_t & x,
            size_t & y )
```

2.1.3.6 addRandomTreasure()

```
void addRandomTreasure (
            Map & map )
```

2.1.3.7 addStart()

```
bool addStart (
            Map & map,
            size_t x,
            size_t y )
```

2.1.3.8 addTreasure()

```
bool addTreasure (
            Map & map,
            size_t height,
            size_t width )
```

2.1.3.9 displayWorld()

```
void displayWorld (
            const Map & map )
```

2.1.3.10 getEmptyMap()

```
Map getEmptyMap (
            size_t height,
            size_t width )
```

2.1.3.11 getHeight()

```
size_t getHeight (
             const Map & map )
```

2.1.3.12 getMapValue()

```
MapState getMapValue (
             const Map & map,
             size_t x,
             size_t y )
```

2.1.3.13 getWidth()

```
size_t getWidth (
             const Map & map )
```

2.1.3.14 initWorld()

```
Map initWorld (
             size_t heigth,
             size_t width,
             size_t & x,
             size_t & y )
```

2.1.3.15 setMapValue()

```
bool setMapValue (
             Map & map,
             size_t x,
             size_t y,
             MapState value )
```

2.1.4 Variable Documentation

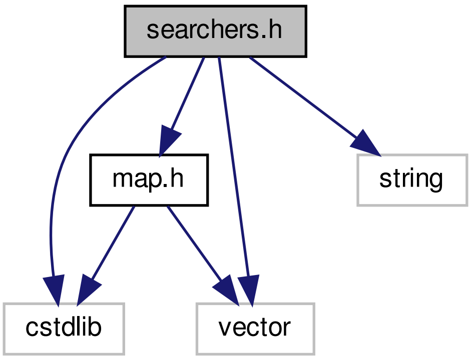
2.1.4.1 NUMBER_OF_LAKE

```
const int NUMBER_OF_LAKE = 3
```

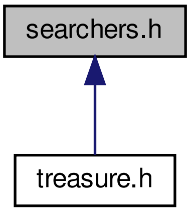
2.2 searchers.h File Reference

```
#include "map.h"
#include <cstdlib>
#include <vector>
#include <string>
```

Include dependency graph for searchers.h:



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



Typedefs

- typedef std::vector< int > Searcher
- typedef std::vector< Searcher > SearcherList

Enumerations

- enum ResearcherStatus {
  UNDEFINED, RICH, LOST, DROWNED,
  EXHAUSTED }

Functions

- Searcher initSearcher (int stepsValue=0, ResearcherStatus statusValue=UNDEFINED)

  initialize a searcher with given values
- int getSteps (const Searcher &searcher)
- int getStatus (const Searcher &searcher)
- std::string getStatusString (const Searcher &searcher)
- bool setSteps (Searcher &searcher, int value)

  sets the steps of a searcher to the given value
- bool setStatus (Searcher &searcher, ResearcherStatus value)

  sets the status of a searcher to the given value
- bool displaySearcherList (SearcherList &list)

  displays the information of every searcher in the list

2.2.1 Typedef Documentation

2.2.1.1 Searcher

```
typedef std::vector<int> Searcher
```

2.2.1.2 SearcherList

```
typedef std::vector<Searcher> SearcherList
```

2.2.2 Enumeration Type Documentation

2.2.2.1 ResearcherStatus

```
enum ResearcherStatus
```

Enumerator

UNDEFINED	
RICH	
LOST	
DROWNED	
EXHAUSTED	

2.2.3 Function Documentation

2.2.3.1 displaySearcherList()

```
bool displaySearcherList (
             SearcherList & list )
```

displays the information of every searcher in the list

Parameters

list	

Returns

true if success

2.2.3.2 getStatus()

```
int getStatus (
             const Searcher & searcher )
```

Parameters

searcher	

Returns

the status of a searcher

2.2.3.3 getStatusString()

```
std::string getStatusString (
             const Searcher & searcher )
```

Parameters

searcher	

Returns

a string containing the status of a searcher

2.2.3.4 getSteps()

```
int getSteps (
            const Searcher & searcher )
```

Parameters

searcher	

Returns

the amount of steps taken by a searcher

2.2.3.5 initSearcher()

```
Searcher initSearcher (
            int stepsValue = 0,
            ResearcherStatus statusValue = UNDEFINED )
```

initialize a searcher with given values

Parameters

stepsValue	
statusValue	

Returns

2.2.3.6 setStatus()

```
bool setStatus (
            Searcher & searcher,
            ResearcherStatus value )
```

sets the status of a searcher to the given value

Parameters

searcher	
value	

Returns

true if success

2.2.3.7 setSteps()

```
bool setSteps (
             Searcher & searcher,
             int value )
```

sets the steps of a searcher to the given value

Parameters

searcher	
value	

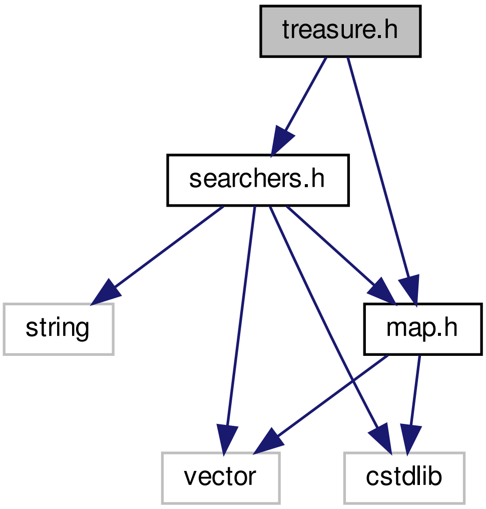
Returns

true if success

2.3 treasure.h File Reference

```
#include "map.h"
#include "searchers.h"
```

Include dependency graph for treasure.h:



Functions

- SearcherList runSimulation (const Map &map, size_t startX, size_t startY, int nbSimulation)

  Simulates nbSimulation searchers starting at the coordinates startX and startY on the map.
- void runSearcher (const Map &map, size_t startX, size_t startY, Searcher &searcher)

  walks a searcher on the map, defines the status and steps taken at the end.
- bool getStatistics (const SearcherList &list, double &probability, double &avgSteps)

  calculates the probability for a searcher to find the treasure, and the average steps taken to find it

2.3.1 Function Documentation

2.3.1.1 getStatistics()

```
bool getStatistics (
             const SearcherList & list,
             double & probability,
             double & avgSteps )
```

calculates the probability for a searcher to find the treasure, and the average steps taken to find it

Parameters

list	
probability	
avgSteps	

Returns

2.3.1.2 runSearcher()

```
void runSearcher (
            const Map & map,
            size_t startX,
            size_t startY,
            Searcher & searcher )
```

walks a searcher on the map, defines the status and steps taken at the end.

Parameters

map	
startX	
startY	
searcher	

2.3.1.3 runSimulation()

```
SearcherList runSimulation (
            const Map & map,
            size_t startX,
            size_t startY,
            int nbSimulation )
```

Simulates nbSimulation searchers starting at the coordinates startX and startY on the map.

Parameters

map	
startX	
startY	
nbSimulation	

Returns

a list containing the status and steps of every simulated searcher

2.4 utilities.h File Reference

Functions

- int getRandomInRange (int max, int min=0)

- bool askForRestart ()

  This function keeps asking as long as the user enters anything else than RESTART_CHAR or STOP_CHAR.
- int askForNumberOfSimulation ()

Variables

- const char RESTART_CHAR = 'Y'
- const char STOP_CHAR = 'N'

2.4.1 Function Documentation

2.4.1.1 askForNumberOfSimulation()

```
int askForNumberOfSimulation ( )
```

2.4.1.2 askForRestart()

```
bool askForRestart ( )
```

This function keeps asking as long as the user enters anything else than RESTART_CHAR or STOP_CHAR.

Returns

true if the user has entered RESTART_CHAR and false if the user has entered STOP_CHAR

2.4.1.3 getRandomInRange()

```
int getRandomInRange (
             int max,
             int min = 0 )
```

2.4.2 Variable Documentation

2.4.2.1 RESTART_CHAR

```
const char RESTART_CHAR = 'Y'
```

2.4.2.2 STOP_CHAR

```
const char STOP_CHAR = 'N'
```

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