2048 EDD

Generated by Doxygen 1.8.6

Mon Apr 20 2015 18:19:31

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Data Structure Documentation

3.1 game Struct Reference

Data Fields

- state **st**
- bool **disable_play_mouse**
- Uint32 **time**
- int **fps**
- grid **g**

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

- src/2048-gui.c

3.2 grid_s Struct Reference

Data Fields

- tile **g** [GRID_SIDE][GRID_SIDE]
- unsigned long int **score**

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

- src/grid.c

3.3 strategy_s Struct Reference

```
#include <strategy.h>
```

Data Fields

- void * **mem**
- char * name
- dir(* play_move)(strategy, grid)
- void(* free_strategy)(strategy)

3.3.1 Detailed Description

Structure that contains a strategy.

A strategy is essentially a function (play_move) which, given a partially filled grid, picks the next direction to be played. More advanced strategies may require a history of previously played moves (or even games) ; in such cases, a strategy may use the <mem> field to store such information.

3.3.2 Field Documentation

3.3.2.1 void(* free_strategy)(strategy)

A function which returns the direction chosen by the strategy. The first parameter is a pointer to the current strategy (useless for memoryless strategies). The second one is the current grid.

3.3.2.2 char* name

Points the the data stored by the strategy.

3.3.2.3 dir(* play_move)(strategy, grid)

The strategy's name. This will be used to display the tournament scores.

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

- include/strategy.h

3.4 vars_draw Struct Reference

Data Fields

- SDL_Surface * **screen**
- TTF_Font ** **fonts**

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

- src/2048-gui.c

Chapter 4

File Documentation

4.1 include/grid.h File Reference

Contains structures and functions needed to play 2048 game.

`#include <stdbool.h>`

Macros

- #define GRID_SIDE 4

Typedefs

- typedef struct grid_s * grid

  Contain game's status: tiles and current score.
- typedef unsigned int tile

  *Log_2-encoded tile : 0 is empty, i is 2**i.*
- typedef enum dir_e dir

  List of accepted movement in the game.

Enumerations

- enum dir_e { **UP**, **LEFT**, **DOWN**, **RIGHT** }

  List of accepted movement in the game.

Functions

- grid new_grid ()

  Initialize grid structure.
- void delete_grid (grid g)

  Destroy the grid and free allocated memory.
- void copy_grid (grid src, grid dst)

  Clone the grid.
- unsigned long int grid_score (grid g)

  Get game's score.
- tile get_tile (grid g, int x, int y)

Get tile (log_2-encoded) from the grid by specifying his coordinates.

- void set_tile (grid g, int x, int y, tile t)

  Change tile's value.
- bool can_move (grid g, dir d)

  Verify if a given movement is possible.
- bool game_over (grid g)

  Verify game's status, if no more movement is possible the game is over.
- void do_move (grid g, dir d)

  Move every tiles of the grid in the direction specified by the user.
- void add_tile (grid g)

  Randomly add a tile in the grid in a free space when a movement is finished. With probability 9/10 the new tile has value 2 and with probability 1/10 the new tile has value 4.
- void play (grid g, dir d)

  Play a direction in the grid.

4.1.1 Detailed Description

Contains structures and functions needed to play 2048 game.

4.1.2 Macro Definition Documentation

4.1.2.1 #define GRID_SIDE 4

Grid dimension

4.1.3 Typedef Documentation

4.1.3.1 typedef struct grid_s* grid

Contain game's status: tiles and current score.

X 0 1 ... GRID_SIDE-1 +–+–+- ... -+–+ | | | ... + | 0 +–+–+- ... -+–+ | | | ... | | 1 +–+–+- ... -+–+ Y ... ... +–+–+- ... -+–+ | | | ... | | GRID_SIDE-1 +–+–+- ... -+–+

4.1.4 Function Documentation

4.1.4.1 void add_tile (grid *g*)

Randomly add a tile in the grid in a free space when a movement is finished. With probability 9/10 the new tile has value 2 and with probability 1/10 the new tile has value 4.

Parameters

g	the grid

Precondition

grid g must contain at least one empty tile.

4.1.4.2 bool can_move (grid *g*, dir *d*)

Verify if a given movement is possible.

Parameters

g	the grid
d	movement's direction

Returns

true if the movement is possible, false else

4.1.4.3 void copy_grid (grid *src*, grid *dst*)

Clone the grid.

Parameters

src	the grid to copy
dst	the copied grid

4.1.4.4 void delete_grid (grid *g*)

Destroy the grid and free allocated memory.

Parameters

g	the grid to destroy

4.1.4.5 void do_move (grid *g*, dir *d*)

Move every tiles of the grid in the direction specified by the user.

Parameters

g	the grid
d	the chosen direction

Precondition

the movement d must be possible (i.e. can_move(g,d) == true).

4.1.4.6 bool game_over (grid *g*)

Verify game's status, if no more movement is possible the game is over.

Parameters

g	the grid

Returns

true if there is no more possible movements, false else

4.1.4.7 tile get_tile (grid *g*, int *x*, int *y*)

Get tile (log_2-encoded) from the grid by specifying his coordinates.

Parameters

g	the grid
x	and y tile's coordinates

Returns

the tile

Precondition

0 <= x < GRID_SIDE and 0 <= y < GRID_SIDE

4.1.4.8 unsigned long int grid_score (grid *g*)

Get game's score.

Parameters

g	the grid

Returns

the computed score during the game

4.1.4.9 grid new_grid ( )

Initialize grid structure.

Returns

created an empty grid with score equal to 0

4.1.4.10 void play (grid *g*, dir *d*)

Play a direction in the grid.

Parameters

g	the grid
d	the direction

Precondition

the movement d must be possible (i.e. can_move(g,d) == true).

4.1.4.11 void set_tile (grid *g*, int *x*, int *y*, tile *t*)

Change tile's value.

Parameters

g	the grid
x	and y tile's coordinates
t	new tile's value

4.2 include/strategy.h File Reference

Defines the "strategy" structure.

```
#include "grid.h"
#include <stdlib.h>
```

Data Structures

- struct strategy_s

Typedefs

- typedef struct strategy_s * strategy

Functions

- strategy **firstStratConstruct** ()
- void free_memless_strat (strategy strat)
- dir FirstStrat (strategy s, grid g)

  choose the first direction possible in this order: LEFT, DOWN, UP, RIGHT

Variables

- strategy(* **listFunctionsStrat** [])()
- char * **listNamesStrat** []

4.2.1 Detailed Description

Defines the "strategy" structure. 1.0

4.2.2 Typedef Documentation

4.2.2.1 typedef struct strategy_s* strategy

strategy is a pointer to a strategy_s structure

4.2.3 Function Documentation

4.2.3.1 dir FirstStrat (strategy *s*, grid *g*)

choose the first direction possible in this order: LEFT, DOWN, UP, RIGHT

Parameters

strategy	s, a structure strategy
grid	g, the grid

4.2.3.2 void free_memless_strat (strategy *strat*)

Naively frees the <strat> pointer.

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