ArduMaze

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Chapter 1

Data Structure Index

1.1 Data Structures

Here are the data structures with brief descriptions:

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Chapter 2

File Index

2.1 File List

Here is a list of all files with brief descriptions:

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Chapter 3

Data Structure Documentation

3.1 cell Struct Reference

`#include <MazeGenerator.h>`

Data Fields

- char x
- char y
- int x
- int y

3.1.1 Field Documentation

3.1.1.1 x [1/2]

```
char x
```

3.1.1.2 x [2/2]

```
int x
```

3.1.1.3 y [1/2]

```
char y
```

3.1.1.4 y [2/2]

```
int y
```

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

- MazeGenerator.h
- MazeGenerator/main.cpp

Chapter 4

File Documentation

4.1 ArduMaze.ino File Reference

4.2 Graphics.cpp File Reference

```
#include "Arduino.h"
#include "Graphics.h"
#include "U8g2lib.h"
#include "Joystick.h"
#include "MazeGenerator.h"
#include "Menu.h"
```

Functions

- U8G2_PCD8544_84X48_F_4W_SW_SPI u8g2 (U8G2_R2, 13, 11, 10, 9, 8)
- void setFontDefault ()
- void drawMenu ()
- void writeScore ()
- void drawLeaderboard ()
- void drawHelp ()
- char getViewedCell (char x, char y)
- void drawSerial ()
- void draw2DPlayer ()
- void draw2D ()
- void drawGrid ()
- void draw3D ()
- void drawEndScreen ()
- void drawPause ()

Variables

- char view = NORTH

4.2.1 Function Documentation

4.2.1.1 draw2D()

```
void draw2D ( )
```

4.2.1.2 draw2DPlayer()

```
void draw2DPlayer ( )
```

4.2.1.3 draw3D()

```
void draw3D ( )
```

4.2.1.4 drawEndScreen()

```
void drawEndScreen ( )
```

4.2.1.5 drawGrid()

```
void drawGrid ( )
```

4.2.1.6 drawHelp()

```
void drawHelp ( )
```

4.2.1.7 drawLeaderboard()

```
void drawLeaderboard ( )
```

4.2.1.8 drawMenu()

```
void drawMenu ( )
```

4.2.1.9 drawPause()

```
void drawPause ( )
```

4.2.1.10 drawSerial()

```
void drawSerial ( )
```

4.2.1.11 getViewedCell()

```
char getViewedCell (
            char x,
            char y )
```

Checks a location of a cell realtive to player view and returns its actual location in maze

- x x-coordinate
- y y-coordinate

Returns

what is on coordinate [x,y]

4.2.1.12 setFontDefault()

```
void setFontDefault ( )
```

4.2.1.13 u8g2()

```
U8G2_PCD8544_84X48_F_4W_SW_SPI u8g2 (
            U8G2_R2 ,
            13 ,
            11 ,
            10 ,
            9 ,
            8  )
```

4.2.1.14 writeScore()

```
void writeScore ( )
```

4.2.2 Variable Documentation

4.2.2.1 view

```
char view = NORTH
```

4.3 Graphics.h File Reference

```
#include "Arduino.h"
#include "U8g2lib.h"
#include "MazeGenerator.h"
```

Macros

- #define NORTH 0
- #define EAST 1
- #define SOUTH 2
- #define WEST 3

Functions

- void setFontDefault ()
- void drawMenu ()
- void writeScore ()
- void drawLeaderboard ()
- void drawHelp ()
- char getViewedCell ()
- void drawSerial ()
- void draw2DPlayer ()
- void draw2D ()
- void drawGrid ()
- void draw3D ()
- void drawEndScreen ()
- void drawPause ()

Variables

- struct cell playerPos
- char exitPosX
- int steps
- char menuPosition
- char pausePosition
- const char * menuItems [ ]
- const char * pauseItems [ ]

4.3.1 Macro Definition Documentation

4.3.1.1 EAST

```
#define EAST 1
```

4.3.1.2 NORTH

```
#define NORTH 0
```

4.3.1.3 SOUTH

```
#define SOUTH 2
```

4.3.1.4 WEST

```
#define WEST 3
```

4.3.2 Function Documentation

4.3.2.1 draw2D()

```
void draw2D ( )
```

4.3.2.2 draw2DPlayer()

```
void draw2DPlayer ( )
```

4.3.2.3 draw3D()

```
void draw3D ( )
```

4.3.2.4 drawEndScreen()

```
void drawEndScreen ( )
```

4.3.2.5 drawGrid()

```
void drawGrid ( )
```

4.3.2.6 drawHelp()

```
void drawHelp ( )
```

4.3.2.7 drawLeaderboard()

```
void drawLeaderboard ( )
```

4.3.2.8 drawMenu()

```
void drawMenu ( )
```

4.3.2.9 drawPause()

```
void drawPause ( )
```

4.3.2.10 drawSerial()

```
void drawSerial ( )
```

4.3.2.11 getViewedCell()

```
char getViewedCell ( )
```

4.3.2.12 setFontDefault()

```
void setFontDefault ( )
```

4.3.2.13 writeScore()

```
void writeScore ( )
```

4.3.3 Variable Documentation

4.3.3.1 exitPosX

```
char exitPosX  [extern]
```

4.3.3.2 menuItems

```
const char* menuItems[]  [extern]
```

4.3.3.3 menuPosition

```
char menuPosition  [extern]
```

4.3.3.4 pauseItems

```
const char* pauseItems[]  [extern]
```

4.3.3.5 pausePosition

```
char pausePosition  [extern]
```

4.3.3.6 playerPos

```
struct cell playerPos  [extern]
```

4.3.3.7 steps

```
int steps  [extern]
```

4.4 Graphics.h

Go to the documentation of this file.

```
1 #ifndef Graphics_h
2 #define Graphics_h
3
4 #include "Arduino.h"
5 #include "U8g2lib.h"
6 #include "MazeGenerator.h"
7
8 //== View Values ==//
9 #define NORTH 0
10 #define EAST 1
11 #define SOUTH 2
12 #define WEST 3
13
14 extern struct cell playerPos;
15 extern char exitPosX;
16 extern int steps;
17 extern char menuPosition;
18 extern char pausePosition;
19 extern const char *menuItems[];
20 extern const char *pauseItems[];
21
22 void setFontDefault();
23 void drawMenu();
24 void writeScore();
25 void drawLeaderboard();
26 void drawHelp();
27 char getViewedCell();
28 void drawSerial();  //only for debugging
29 void draw2DPlayer();
30 void draw2D();
31 void drawGrid();
32 void draw3D();
33 void drawEndScreen();
34 void drawPause();
35 #endif
```

4.5 Joystick.cpp File Reference

```
#include "Arduino.h"
#include "joystick.h"
```

Functions

- void setupJoystick ()
- char read_joystick ()
- void waitForNoInput ()
- void waitForAnyInput ()
- void waitForSelect ()

4.5.1 Function Documentation

4.5.1.1 read_joystick()

```
char read_joystick ( )
```

4.5.1.2 setupJoystick()

```
void setupJoystick ( )
```

4.5.1.3 waitForAnyInput()

```
void waitForAnyInput ( )
```

4.5.1.4 waitForNoInput()

```
void waitForNoInput ( )
```

4.5.1.5 waitForSelect()

```
void waitForSelect ( )
```

4.6 Joystick.h File Reference

```
#include "Arduino.h"
```

Macros

- #define X_PIN A0
- #define Y_pin A1
- #define Joy_switch 7
- #define NONE 0
- #define SELECT 1
- #define UP 2
- #define DOWN 4
- #define LEFT 8
- #define RIGHT 16

Functions

- char read_joystick ()
- void setupJoystick ()
- void waitForAnyInput ()
- void waitForNoInput ()
- void waitForSelect ()

4.6.1 Macro Definition Documentation

4.6.1.1 DOWN

```
#define DOWN 4
```

4.6.1.2 Joy_switch

```
#define Joy_switch 7
```

4.6.1.3 LEFT

```
#define LEFT 8
```

4.6.1.4 NONE

```
#define NONE 0
```

4.6.1.5 RIGHT

```
#define RIGHT 16
```

4.6.1.6 SELECT

```
#define SELECT 1
```

4.6.1.7 UP

```
#define UP 2
```

4.6.1.8 X_PIN

```
#define X_PIN A0
```

4.6.1.9 Y_pin

```
#define Y_pin A1
```

4.6.2 Function Documentation

4.6.2.1 read_joystick()

```
char read_joystick ( )
```

4.6.2.2 setupJoystick()

```
void setupJoystick ( )
```

4.6.2.3 waitForAnyInput()

```
void waitForAnyInput ( )
```

4.6.2.4 waitForNoInput()

```
void waitForNoInput ( )
```

4.6.2.5 waitForSelect()

```
void waitForSelect ( )
```

4.7 Joystick.h

Go to the documentation of this file.

```
1 #ifndef Joystick_h
2 #define Joystick_h
3
4 #include "Arduino.h"
5
6 //== Joystick pins ==//
7 #define X_PIN A0
8 #define Y_pin A1
9 #define Joy_switch 7
10
11 //== Joystick values ==// (representated by individual bits)
12 #define NONE 0    //deafult value for no input
13 #define SELECT 1  // 1. bit
14 #define UP 2      // 2. bit
15 #define DOWN 4    // 3. bit
16 #define LEFT 8    // 4. bit
17 #define RIGHT 16  // 5. bit
18 //example for input RIGHT and UP while button IS PRESSED: 00010011 = 2^0 + 2^1 + 2^5 = 19, so the output
       would be 19
19
20 char read_joystick();
21 void setupJoystick();
22 void waitForAnyInput();
23 void waitForNoInput();
24 void waitForSelect();
25 #endif
```

4.8 MazeGenerator.cpp File Reference

```
#include "Arduino.h"
#include "MazeGenerator.h"
#include "Menu.h"
#include "U8g2lib.h"
#include "Joystick.h"
#include "Graphics.h"
#include <stdio.h>
#include <time.h>
#include <stdlib.h>
```

Functions

- void setupMaze ()
- void startGame ()

Variables

- char maze [MAXX][MAXY]
- char startPosX
- char exitPosX
- struct cell pillar [plrsmax]
- int steps
- int games

4.8.1 Function Documentation

4.8.1.1 setupMaze()

```
void setupMaze ( )
```

Fills maze with walls and empty space.

4.8.1.2 startGame()

```
void startGame ( )
```

4.8.2 Variable Documentation

4.8.2.1 exitPosX

```
char exitPosX
```

4.8.2.2 games

```
int games
```

4.8.2.3 maze

```
char maze[MAXX][MAXY]
```

4.8.2.4 pillar

```
struct cell pillar[plrsmax]
```

4.8.2.5 startPosX

```
char startPosX
```

4.8.2.6 steps

```
int steps
```

4.9 MazeGenerator.h File Reference

```
#include "U8g2lib.h"
#include "Arduino.h"
```

Data Structures

- struct cell

Macros

- #define MAXX 11
- #define MAXY 11
- #define WALL -1
- #define EMPTY -2
- #define PILLAR -3
- #define EXIT -4

Functions

- void setupMaze ()
- void startGame ()

Variables

- struct cell playerPos
- char maze [MAXX][MAXY]
- char view
- const char zoom = 4
- const char plrsmax = ((MAXX - 3) / 2) ∗ ((MAXY - 3) / 2)

4.9.1 Macro Definition Documentation

4.9.1.1 EMPTY

```
#define EMPTY -2
```

4.9.1.2 EXIT

```
#define EXIT -4
```

4.9.1.3 MAXX

```
#define MAXX 11
```

4.9.1.4 MAXY

```
#define MAXY 11
```

4.9.1.5 PILLAR

```
#define PILLAR -3
```

4.9.1.6 WALL

```
#define WALL -1
```

4.9.2 Function Documentation

4.9.2.1 setupMaze()

```
void setupMaze ( )
```

Fills maze with walls and empty space.

4.9.2.2 startGame()

```
void startGame ( )
```

4.9.3 Variable Documentation

4.9.3.1 maze

```
char maze[MAXX][MAXY]  [extern]
```

4.9.3.2 playerPos

```
struct cell playerPos  [extern]
```

4.9.3.3 plrsmax

```
const char plrsmax = ((MAXX - 3) / 2) * ((MAXY - 3) / 2)
```

4.9.3.4 view

```
char view  [extern]
```

4.9.3.5 zoom

```
const char zoom = 4
```

4.10 MazeGenerator.h

Go to the documentation of this file.

```
1 #ifndef MazeGenerator_h
2 #define MazeGenerator_h
3
4 #include "U8g2lib.h"
5 #include "Arduino.h"
6
7 #define MAXX 11
8 #define MAXY 11
9 //both must be odd numbers because of the maze generation
10 //== Cell Values ==//
11 #define WALL -1
12 #define EMPTY -2
13 #define PILLAR -3
14 #define EXIT -4
15
16 extern struct cell playerPos;
17 extern char maze[MAXX][MAXY];
18 extern char view;
19
20 struct cell {
21   char x;
22   char y;
23 };
24
25 const char zoom = 4;  //size of a cell in pixels
26 const char plrsmax = ((MAXX - 3) / 2) * ((MAXY - 3) / 2);
27
28 void setupMaze();
29 void startGame();
30 #endif
```

4.11 MazeGenerator/main.cpp File Reference

Data Structures

- struct cell

Macros

- #define MAXX 11
- #define MAXY 11
- #define WALL -1
- #define EMPTY -2
- #define PILLAR -3
- #define PLAYER -4
- #define FINISH -5

Functions

- void setupMaze ()
- void printMaze ()
- int main ()

Variables

- char maze [MAXX][MAXY]
- const int plrsmax = ((MAXX-3)/2)∗((MAXY-3)/2)
- cell pillar [plrsmax]

4.11.1 Macro Definition Documentation

4.11.1.1 EMPTY

```
#define EMPTY -2
```

4.11.1.2 FINISH

```
#define FINISH -5
```

4.11.1.3 MAXX

```
#define MAXX 11
```

4.11.1.4 MAXY

```
#define MAXY 11
```

4.11.1.5 PILLAR

```
#define PILLAR -3
```

4.11.1.6 PLAYER

```
#define PLAYER -4
```

4.11.1.7 WALL

```
#define WALL -1
```

4.11.2 Function Documentation

4.11.2.1 main()

```
int main ( )
```

4.11.2.2 printMaze()

```
void printMaze ( )
```

4.11.2.3 setupMaze()

```
void setupMaze ( )
```

Fills maze with walls and empty space.

4.11.3 Variable Documentation

4.11.3.1 maze

```
char maze[MAXX][MAXY]
```

4.11.3.2 pillar

```
cell pillar[plrsmax]
```

4.11.3.3 plrsmax

```
const int plrsmax = ((MAXX-3)/2)*((MAXY-3)/2)
```

4.12 Menu.cpp File Reference

```
#include "Arduino.h"
#include "Menu.h"
#include "Joystick.h"
#include "Graphics.h"
```

Functions

- char doMenu ()
- char doPause ()

Variables

- char menuPosition = 0
- const char * menuItems [ ]
- char pausePosition = 0
- const char * pauseItems [ ]

4.12.1 Function Documentation

4.12.1.1 doMenu()

```
char doMenu ( )
```

4.12.1.2 doPause()

```
char doPause ( )
```

4.12.2 Variable Documentation

4.12.2.1 menuItems

```
const char* menuItems[]
```

Initial value:

```
=
{
  "Start Game",
  "Leaderboard",
  "Help",
}
```

4.12.2.2 menuPosition

```
char menuPosition = 0
```

4.12.2.3 pauseItems

```
const char* pauseItems[]
```

Initial value:

```
=
{
  "Resume",
  "Help",
  "Exit",
}
```

4.12.2.4 pausePosition

```
char pausePosition = 0
```

4.13 Menu.h File Reference

```
#include "U8g2lib.h"
#include "Arduino.h"
```

Macros

- #define ROW 12

Functions

- char doMenu ()
- char doPause ()

4.13.1 Macro Definition Documentation

4.13.1.1 ROW

```
#define ROW 12
```

4.13.2 Function Documentation

4.13.2.1 doMenu()

```
char doMenu ( )
```

4.13.2.2 doPause()

```
char doPause ( )
```

4.14 Menu.h

Go to the documentation of this file.

```
1 #ifndef Menu_h
2 #define Menu_h
3
4 #include "U8g2lib.h"
5 #include "Arduino.h"
6
7 #define ROW 12    //height of text in menu
8
9 char doMenu();
10 char doPause();
11 #endif
```

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