# Worms!

Generated by Doxygen 1.8.1.2

Thu Nov 27 2014 14:58:47

# Contents

# Chapter 1

# Worms!

Worms! is an ncurses based worms game.

# Chapter 2

# Data Structure Index

## 2.1 Data Structures

Here are the data structures with brief descriptions:

# Chapter 3

# File Index

## 3.1 File List

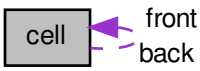
Here is a list of all files with brief descriptions:

# Chapter 4

# Data Structure Documentation

## 4.1 cell Struct Reference

Collaboration diagram for cell:




### Data Fields

- int x
- int y
- struct cell * front
- struct cell * back

### 4.1.1 Detailed Description

Structure to hold an individual cell of the worm's body

### 4.1.2 Field Documentation

#### 4.1.2.1 struct cell* cell::back

Pointer to next cell towards tail

#### 4.1.2.2 struct cell* cell::front

Pointer to next cell towards head

#### 4.1.2.3 int cell::x

X coordinate of the cell

#### 4.1.2.4 int cell::y

Y coordinate of the cell

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

- src/worms_worm.c

## 4.2 game_window Struct Reference

Structure to hold details of game windows.

### Data Fields

- WINDOW * window
- int rows
- int cols

### 4.2.1 Field Documentation

#### 4.2.1.1 int game_window::cols

Number of columns in the window

#### 4.2.1.2 int game_window::rows

Number of rows in the window

#### 4.2.1.3 WINDOW* game_window::window

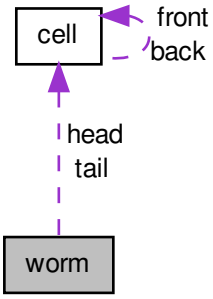
Pointer to curses WINDOW structure

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

- src/worms_screen.c

## 4.3 worm Struct Reference

Collaboration diagram for worm:




### Data Fields

- struct cell ∗ head
- struct cell ∗ tail
- enum worm_direction last_direction
- enum worm_direction next_direction

### 4.3.1 Detailed Description

Structure to hold the worm

### 4.3.2 Field Documentation

#### 4.3.2.1 struct cell∗ worm::head

Pointer to head cell

#### 4.3.2.2 enum worm_direction worm::last_direction

Next direction to move

#### 4.3.2.3 enum worm_direction worm::next_direction

Last direction moved

#### 4.3.2.4 struct cell∗ worm::tail

Pointer to tail cell

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

- src/worms_worm.c

# Chapter 5

# File Documentation

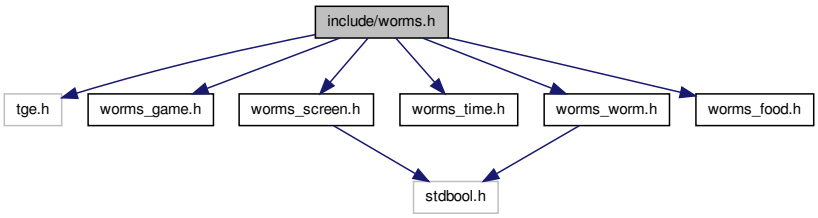
## 5.1 docs/worms.dox File Reference

## 5.2 include/worms.h File Reference

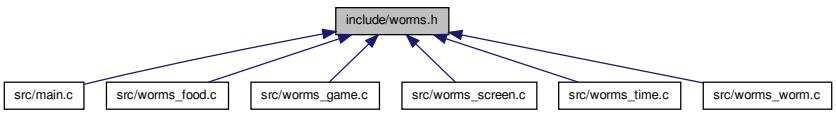
Aggregated header for worms game functions.

```
#include "tge.h"
#include "worms_game.h"
#include "worms_screen.h"
#include "worms_time.h"
#include "worms_worm.h"
#include "worms_food.h"
```

Include dependency graph for worms.h:




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




### 5.2.1 Detailed Description

Aggregated header for worms game functions.

**Author**

Paul Griffiths

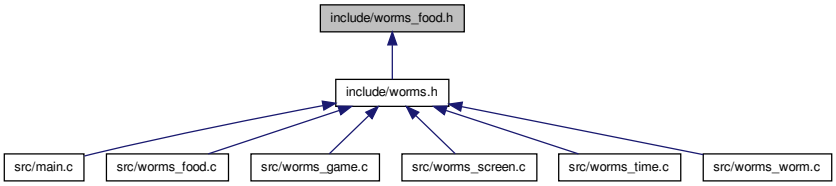
**Copyright**



## 5.3 include/worms_food.h File Reference

Interface to worm food functions.

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




### Functions

- void worms_place_new_food (void)
- void worms_draw_food (void)
- bool worms_food_here (const int x, const int y)

  *Tests if a piece of food is at the specified coordinates.*
- int worms_get_food_eaten (void)

  *Returns the total number of pieces of food eaten.*

### 5.3.1 Detailed Description

Interface to worm food functions for curses worms game.

**Author**

Paul Griffiths

**Copyright**



### 5.3.2 Function Documentation

#### 5.3.2.1 void worms_draw_food ( void )

Draws the current piece of food.

#### 5.3.2.2 bool worms_food_here ( const int *x*, const int *y* )

Tests if a piece of food is at the specified coordinates.

**Parameters**

| | |
|---|---|
| *x* | The specified x coordinate. |
| *y* | The specified y coordinate. |

**Returns**

`true` if a piece of food is at the specified coordinates, `false` otherwise.

#### 5.3.2.3 int worms_get_food_eaten ( void )

Returns the total number of pieces of food eaten since the start of the game.

**Returns**

The total number of pieces of food eaten since the start of the game.

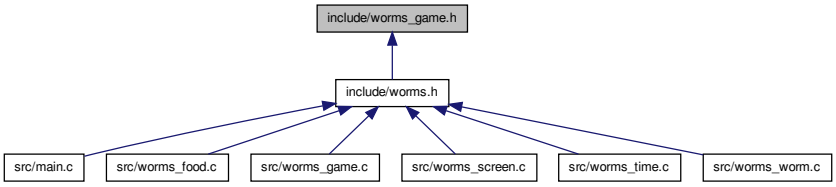
#### 5.3.2.4 void worms_place_new_food ( void )

Places a new piece of food at a random location.

## 5.4 include/worms_game.h File Reference

Interface to TGE game engine callback functions.

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




### Enumerations

- enum worms_exit_status { WORMS_EXIT_NORMAL, WORMS_EXIT_HITWALL, WORMS_EXIT_HITSELF }

### Functions

- void worms_game_setup (void)

  *Initializes the game.*
- void worms_game_teardown (const int end_status)

  *Cleans up after the game ends.*

- void worms_draw_screen (void)
- void worms_process_input (const int ch)

  *Processes keyboard input.*

### 5.4.1 Detailed Description

Interface to TGE game engine callback functions, along with general game data structures and constants.

**Author**

Paul Griffiths

**Copyright**



### 5.4.2 Enumeration Type Documentation

#### 5.4.2.1 enum worms_exit_status

Enumeration constants for game exit status.

**Enumerator:**

***WORMS_EXIT_NORMAL*** Player chose to quit

***WORMS_EXIT_HITWALL*** Worm ran into the arena wall

***WORMS_EXIT_HITSELF*** Worm ran into its own body

### 5.4.3 Function Documentation

#### 5.4.3.1 void worms_draw_screen ( void )

Draws the game screen at each timer interval.

#### 5.4.3.2 void worms_game_setup ( void )

Initializes the game area, worm, worm food, and game time.

#### 5.4.3.3 void worms_game_teardown ( const int *end_status* )

Destroys the worm and the game area.

**Parameters**

| | |
|---|---|
| *end_status* | Status code for end-of-game reason. |

#### 5.4.3.4 void worms_process_input ( const int *ch* )

Processes keyboard input to move the worm or quit the game.

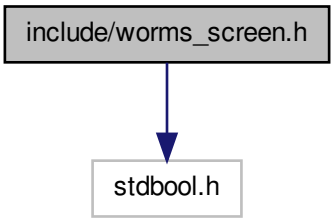
**Parameters**

| | |
|---|---|
| *ch* | Character code representing the key pressed. |

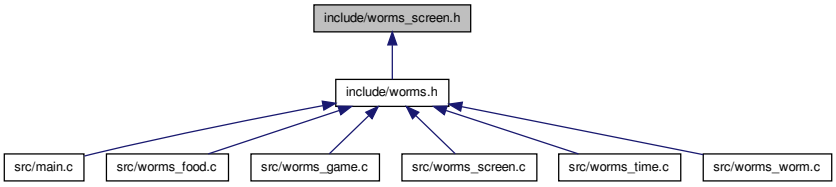
## 5.5 include/worms_screen.h File Reference

Interface to worms game screen functions.

`#include <stdbool.h>`
Include dependency graph for worms_screen.h:




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




### Enumerations

- enum worms_cell_character { WORM_BODY_CHARACTER, WORM_EMPTY_CHARACTER, WORM_FOOD_CHARACTER }

### Functions

- void worms_game_area_init (void)
- void worms_game_area_destroy (void)
- void worms_draw_arena_border (void)
- void worms_draw_sidebar (void)
- void worms_refresh_game_area (void)
- int worms_game_arena_cols (void)

  *Returns the number of columns in the game arena.*
- int worms_game_arena_rows (void)

  *Returns the number of rows in the game arena.*

- void worms_write_arena_character (const enum worms_cell_character ch, const int x, const int y)

  *Writes a character to the game arena.*
- enum worms_cell_character worms_get_arena_character (const int x, const int y)

  *Returns the character at the specified arena coordinates.*
- bool worms_coords_in_game_arena (const int x, const int y)

  *Tests if the specified coordinates are within the arena.*

### 5.5.1 Detailed Description

Interface to worms game screen functions. The game screen consists of two parts: the "arena", where the worm moves, and the "sidebar", containing the game title and game statistics. "Game area" can also refer to the entire game screen.

**Author**

Paul Griffiths

**Copyright**



### 5.5.2 Enumeration Type Documentation

#### 5.5.2.1 enum worms_cell_character

Enumeration constants for game cell characters

**Enumerator:**

***WORM_BODY_CHARACTER*** Character for worm body

***WORM_EMPTY_CHARACTER*** Character for empty cell

***WORM_FOOD_CHARACTER*** Character for piece of food

### 5.5.3 Function Documentation

#### 5.5.3.1 bool worms_coords_in_game_arena ( const int *x*, const int *y* )

Tests if the specified coordinates are within the arena. The coordinates are *not* considered to be within the arena if they are within the arena's border, so this test is suitable for determining whether the worm has hit the border at the edge of the arena.

**Parameters**

| | |
|---|---|
| *x* | The specified x coordinate. |
| *y* | The specified y coordinate. |

**Returns**

`true` if the specified coordinates are within the arena, excluding the arena border, and `false` otherwise.

#### 5.5.3.2 void worms_draw_arena_border ( void )

Draws a border around the game arena.

#### 5.5.3.3 void worms_draw_sidebar ( void )

Draws the sidebar.

#### 5.5.3.4 void worms_game_area_destroy ( void )

Destroys the game area, including the sidebar.

#### 5.5.3.5 void worms_game_area_init ( void )

Initializes the game area, including the sidebar.

#### 5.5.3.6 int worms_game_arena_cols ( void )

Returns the number of columns in the game arena. The number of columns *includes* the arena border, which is one character wide on all sides.

**Returns**

The number of columns in the game arena.

#### 5.5.3.7 int worms_game_arena_rows ( void )

Returns the number of rows in the game arena. The number of rows *includes* the arena border, which is one character wide on all sides.

**Returns**

The number of rows in the game arena.

#### 5.5.3.8 enum worms_cell_character worms_get_arena_character ( const int *x*, const int *y* )

Returns the character at the specified arena coordinates.

**Parameters**

| | |
|---|---|
| *x* | The specified x coordinate. |
| *y* | The specified y coordinate. |

**Returns**

The character at the specified coordinates in the arena.

#### 5.5.3.9 void worms_refresh_game_area ( void )

Refreshes the main arena and the sidebar.

#### 5.5.3.10 void worms_write_arena_character ( const enum worms_cell_character *ch*, const int *x*, const int *y* )

Writes a character to the game arena.

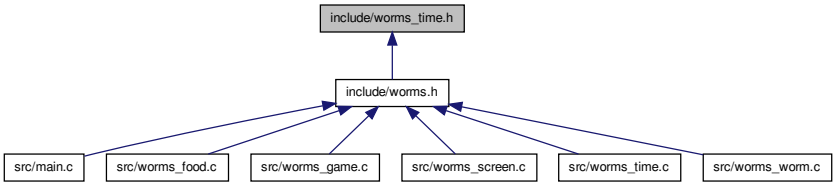
**Parameters**

| | |
|---|---|
| *ch* | The character to write. |
| *x* | The x coordinate at which to write the character. |
| *y* | The y coordinate at which to write the character. |

## 5.6 include/worms_time.h File Reference

Interface to worms game duration timer functions.

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




### Functions

- void worms_time_init (void)
- long worms_game_time (void)

  *Returns the number of seconds since the game started.*
- char * worms_game_time_string (const bool long_format)

  *Returns a string representation of total game time.*

### 5.6.1 Detailed Description

Interface to worms game duration timer functions.

**Author**

Paul Griffiths

**Copyright**

Copyright 2014 Paul Griffiths. Distributed under the terms of the GNU General Public License. http://www.gnu.org/licenses/

### 5.6.2 Function Documentation

#### 5.6.2.1 long worms_game_time ( void )

Returns the number of seconds since the game started.

**Returns**

The number of seconds since the game started.

#### 5.6.2.2 char* worms_game_time_string ( const bool *long_format* )

Returns a string representation of total game time.

**Parameters**

| | |
|---|---|
| *long_format* | If this parameter is `true`, the string representation is of the form "[H] hours, [M] minutes, and [S] seconds". If `false`, the string representation is of the form "HH:MM:SS". |

**Returns**

A string representation of the total game time. The returned pointer points to statically allocated storage, and is overwritten each time this function is called.

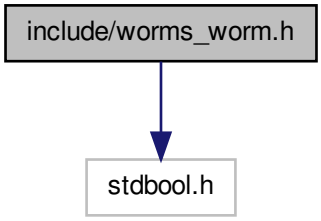
#### 5.6.2.3 void worms_time_init ( void )

Initializes the game duration timer.

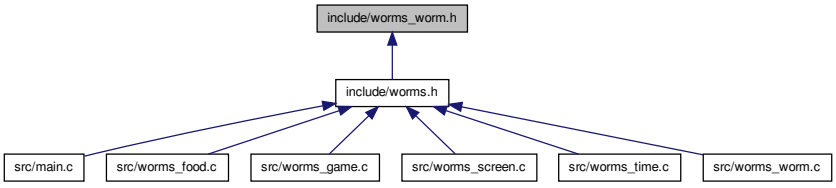
## 5.7 include/worms_worm.h File Reference

Interface to worms game worm functions.

`#include <stdbool.h>`
Include dependency graph for worms_worm.h:




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




### Enumerations

- enum worm_direction { WORM_DIR_UP, WORM_DIR_RIGHT, WORM_DIR_DOWN, WORM_DIR_LEFT }

*Enumeration constants for worm movement direction.*

## Functions

- void worm_init (void)

  *Initializes the worm.*
- void worm_destroy (void)

  *Destroys the worm.*
- void worm_set_direction (enum worm_direction direction)

  *Attempts to change the next direction of the worm.*
- bool worm_move_and_draw (void)

  *Moves and draws the worm.*

### 5.7.1 Detailed Description

Interface to worms game worm functions.

**Author**

Paul Griffiths

**Copyright**



### 5.7.2 Enumeration Type Documentation

#### 5.7.2.1 enum worm_direction

Enumeration constants for worm movement direction. The order in which these are defined is meaningful to the implementation, namely that pairs of opposing directions (i.e. up versus down, left versus right) have values with an absolute difference of 2.

**Enumerator:**

***WORM_DIR_UP*** Up direction

***WORM_DIR_RIGHT*** Right direction

***WORM_DIR_DOWN*** Down direction

***WORM_DIR_LEFT*** Left direction

### 5.7.3 Function Documentation

#### 5.7.3.1 void worm_destroy ( void )

Destroys and deallocates memory for the worm.

#### 5.7.3.2 void worm_init ( void )

Initializes and allocates memory for the worm.

#### 5.7.3.3 bool worm_move_and_draw ( void )

Moves and draws the worm.

**Returns**

`true` if the movement that was performed caused the worm to eat a piece of food, `false` in all other situations.

#### 5.7.3.4 void worm_set_direction ( enum worm_direction *direction* )

Attempts to change the next direction of the worm. The worm will not actually change direction until the game next updates, and a second call to this function in the interim will nullify the effect of any previous calls, so it is safe to call this function an arbitrary number of times in between game updates. This function will ignore any attempt to change the direction in a way which is not allowed, particularly that the worm is not allowed to turn 180 degrees as this would cause it to hit its own body, so it is safe to call this function with any direction, and to trust it to ignore any direction changes which are not allowed.

**Parameters**

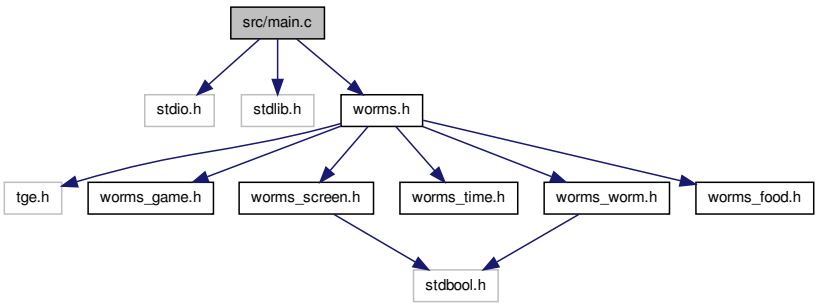
| | |
|---|---|
| *direction* | The desired direction of the worm on the next update. |

## 5.8 src/main.c File Reference

main() function for worms game.

```
#include <stdio.h>
#include <stdlib.h>
#include "worms.h"
```

Include dependency graph for main.c:




### Functions

- static void print_quit_message (const int end_status)

  *Prints a quit message.*
- int main (void)

  *main() function.*

### 5.8.1 Detailed Description

**Author**

Paul Griffiths

**Copyright**



### 5.8.2 Function Documentation

#### 5.8.2.1 int main ( void )

main() function.

**Returns**

The exit status of the program.

#### 5.8.2.2 static void print_quit_message ( const int *end_status* ) [static]

Prints a quit message.

**Parameters**

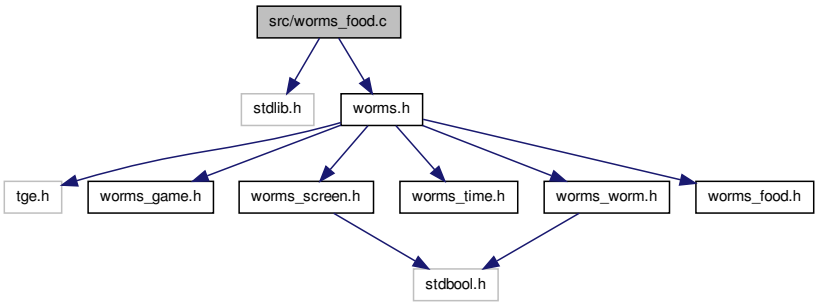
| | |
|---|---|
| *end_status* | The exit status of the game. |

## 5.9 src/worms_food.c File Reference

Implementation of worm food functions.

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

Include dependency graph for worms_food.c:




### Functions

- void worms_place_new_food (void)
- void worms_draw_food (void)
- bool worms_food_here (const int x, const int y)

*Tests if a piece of food is at the specified coordinates.*

- int worms_get_food_eaten (void)

  *Returns the total number of pieces of food eaten.*

## Variables

- static int food_x = 0
- static int food_y = 0
- static int food_eaten = -1

### 5.9.1 Detailed Description

**Author**

Paul Griffiths

**Copyright**



### 5.9.2 Function Documentation

#### 5.9.2.1 void worms_draw_food ( void )

Draws the current piece of food.

#### 5.9.2.2 bool worms_food_here ( const int *x*, const int *y* )

Tests if a piece of food is at the specified coordinates.

**Parameters**

| | |
|---|---|
| *x* | The specified x coordinate. |
| *y* | The specified y coordinate. |

**Returns**

`true` if a piece of food is at the specified coordinates, `false` otherwise.

#### 5.9.2.3 int worms_get_food_eaten ( void )

Returns the total number of pieces of food eaten since the start of the game.

**Returns**

The total number of pieces of food eaten since the start of the game.

#### 5.9.2.4 void worms_place_new_food ( void )

Places a new piece of food at a random location.

### 5.9.3 Variable Documentation

#### 5.9.3.1 int food_eaten = -1 [static]

File scope variable for total food eaten since start of game

#### 5.9.3.2 int food_x = 0 [static]

File scope variable for x coordinate of current food piece

#### 5.9.3.3 int food_y = 0 [static]

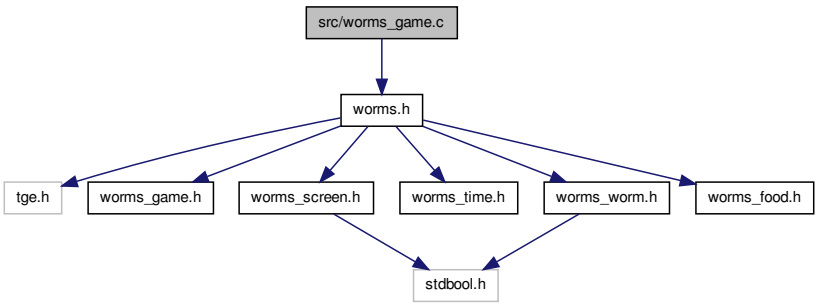
File scope variable for y coordinate of current food piece

## 5.10 src/worms_game.c File Reference

Implementation of TGE game engine callback functions.

```
#include "worms.h"
```

Include dependency graph for worms_game.c:




### Functions

- void worms_game_setup (void)

  *Initializes the game.*
- void worms_game_teardown (const int end_status)

  *Cleans up after the game ends.*
- void worms_draw_screen (void)
- void worms_process_input (const int ch)

  *Processes keyboard input.*

### 5.10.1 Detailed Description

**Author**

Paul Griffiths

**Copyright**



### 5.10.2 Function Documentation

#### 5.10.2.1 void worms_draw_screen ( void )

Draws the game screen at each timer interval.

#### 5.10.2.2 void worms_game_setup ( void )

Initializes the game area, worm, worm food, and game time.

#### 5.10.2.3 void worms_game_teardown ( const int *end_status* )

Destroys the worm and the game area.

**Parameters**

| | |
|---|---|
| *end_status* | Status code for end-of-game reason. |

#### 5.10.2.4 void worms_process_input ( const int *ch* )

Processes keyboard input to move the worm or quit the game.

**Parameters**

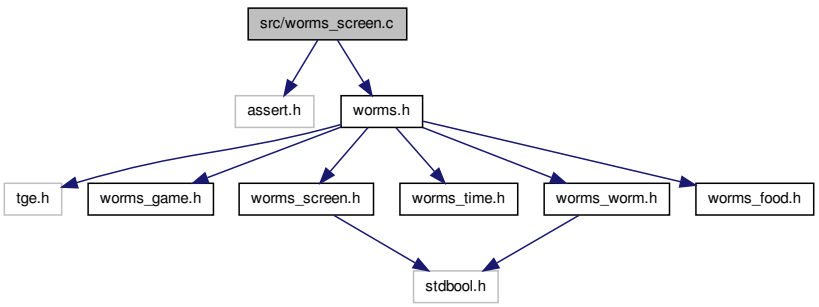
| | |
|---|---|
| *ch* | Character code representing the key pressed. |

## 5.11 src/worms_screen.c File Reference

Implementation of worms game screen functions.

```
#include <assert.h>
#include "worms.h"
```

Include dependency graph for worms_screen.c:



### Data Structures

- struct game_window

  *Structure to hold details of game windows.*

### Functions

- static void worms_draw_title_window (void)
- static void worms_draw_info_window (void)
- void worms_game_area_init (void)
- void worms_game_area_destroy (void)
- void worms_draw_arena_border (void)
- void worms_draw_sidebar (void)
- void worms_refresh_game_area (void)
- int worms_game_arena_cols (void)

  *Returns the number of columns in the game arena.*
- int worms_game_arena_rows (void)

  *Returns the number of rows in the game arena.*
- void worms_write_arena_character (const enum worms_cell_character ch, const int x, const int y)

  *Writes a character to the game arena.*
- enum worms_cell_character worms_get_arena_character (const int x, const int y)

  *Returns the character at the specified arena coordinates.*
- bool worms_coords_in_game_arena (const int x, const int y)

  *Tests if the specified coordinates are within the arena.*

### Variables

- static const int sidebar_cols = 20
- static const int title_rows = 7
- static struct game_window arena_window
- static struct game_window title_window
- static struct game_window info_window

#### 5.11.1 Detailed Description

The game screen consists of two parts: the "arena", where the worm moves, and the "sidebar", containing the game title and game statistics. "Game area" can also refer to the entire game screen.

**Author**

Paul Griffiths

**Copyright**

## 5.11.2 Function Documentation

### 5.11.2.1 bool worms_coords_in_game_arena ( const int *x*, const int *y* )

Tests if the specified coordinates are within the arena. The coordinates are *not* considered to be within the arena if they are within the arena's border, so this test is suitable for determining whether the worm has hit the border at the edge of the arena.

**Parameters**

| | |
|---|---|
| *x* | The specified x coordinate. |
| *y* | The specified y coordinate. |

**Returns**

`true` if the specified coordinates are within the arena, excluding the arena border, and `false` otherwise.

### 5.11.2.2 void worms_draw_arena_border ( void )

Draws a border around the game arena.

### 5.11.2.3 static void worms_draw_info_window ( void ) [static]

Draws the information window in the sidebar.

### 5.11.2.4 void worms_draw_sidebar ( void )

Draws the sidebar.

### 5.11.2.5 static void worms_draw_title_window ( void ) [static]

Draws the title window in the sidebar.

### 5.11.2.6 void worms_game_area_destroy ( void )

Destroys the game area, including the sidebar.

### 5.11.2.7 void worms_game_area_init ( void )

Initializes the game area, including the sidebar.

### 5.11.2.8 int worms_game_arena_cols ( void )

Returns the number of columns in the game arena. The number of columns *includes* the arena border, which is one character wide on all sides.

**Returns**

The number of columns in the game arena.

#### 5.11.2.9 int worms_game_arena_rows ( void )

Returns the number of rows in the game arena. The number of rows *includes* the arena border, which is one character wide on all sides.

**Returns**

The number of rows in the game arena.

#### 5.11.2.10 enum worms_cell_character worms_get_arena_character ( const int *x*, const int *y* )

Returns the character at the specified arena coordinates.

**Parameters**

| | |
|---|---|
| *x* | The specified x coordinate. |
| *y* | The specified y coordinate. |

**Returns**

The character at the specified coordinates in the arena.

#### 5.11.2.11 void worms_refresh_game_area ( void )

Refreshes the main arena and the sidebar.

#### 5.11.2.12 void worms_write_arena_character ( const enum worms_cell_character *ch*, const int *x*, const int *y* )

Writes a character to the game arena.

**Parameters**

| | |
|---|---|
| *ch* | The character to write. |
| *x* | The x coordinate at which to write the character. |
| *y* | The y coordinate at which to write the character. |

### 5.11.3 Variable Documentation

#### 5.11.3.1 struct game_window arena_window [static]

File scope variable for main arena window

#### 5.11.3.2 struct game_window info_window [static]

File scope variable for information window

#### 5.11.3.3 const int sidebar_cols = 20 [static]

File scope variable for number of columns in sidebar

#### 5.11.3.4 const int title_rows = 7 [static]

File scope variable for number of rows in title window

#### 5.11.3.5 struct game_window title_window [static]

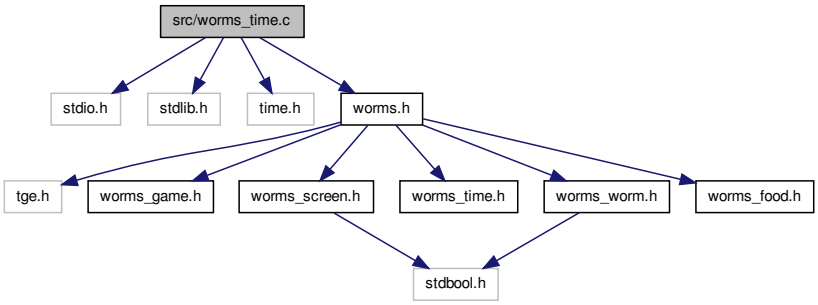
File scope variable for title window

## 5.12 src/worms_time.c File Reference

Implementation of worms game duration timer functions.

```
#include <stdio.h>
#include <stdlib.h>
#include <time.h>
#include "worms.h"
```

Include dependency graph for worms_time.c:




### Functions

- void worms_time_init (void)
- long worms_game_time (void)

  *Returns the number of seconds since the game started.*
- char * worms_game_time_string (const bool long_format)

  *Returns a string representation of total game time.*

### Variables

- static time_t start_time

### 5.12.1 Detailed Description

#### Author

Paul Griffiths

#### Copyright

Copyright 2014 Paul Griffiths. Distributed under the terms of the GNU General Public License. http://www.gnu.org/licenses/

### 5.12.2 Function Documentation

#### 5.12.2.1 long worms_game_time ( void )

Returns the number of seconds since the game started.

**Returns**

The number of seconds since the game started.

#### 5.12.2.2 char* worms_game_time_string ( const bool *long_format* )

Returns a string representation of total game time.

**Parameters**

| | |
|---|---|
| *long_format* | If this parameter is `true`, the string representation is of the form "[H] hours, [M] minutes, and [S] seconds". If `false`, the string representation is of the form "HH:MM:SS". |

**Returns**

A string representation of the total game time. The returned pointer points to statically allocated storage, and is overwritten each time this function is called.

#### 5.12.2.3 void worms_time_init ( void )

Initializes the game duration timer.

### 5.12.3 Variable Documentation

#### 5.12.3.1 time_t start_time [static]

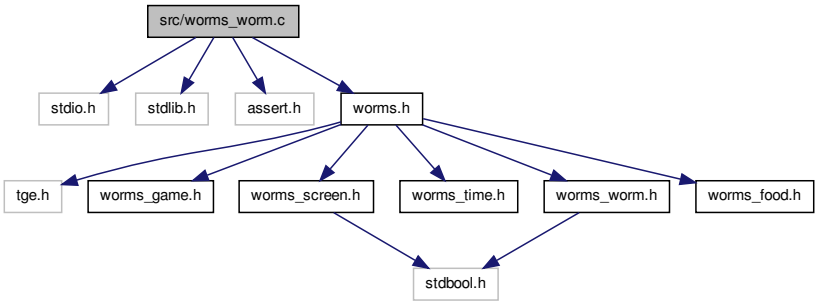
File scope variable to hold the time at the start of the game

## 5.13 src/worms_worm.c File Reference

Implementation of worms game worm functions.

```
#include <stdio.h>
#include <stdlib.h>
#include <assert.h>
#include "worms.h"
```

Include dependency graph for worms_worm.c:




## Data Structures

- struct cell
- struct worm

## Functions

- static void worm_clear (void)

  *Erases the worm from the arena.*
- static bool worm_move (void)

  *Moves the worm.*
- static void worm_draw (void)
- static bool worm_cell_here (const int x, const int y)

  *Tests if the specified coordinates contain a worm body cell.*
- static void worm_add_cell_head (const int x, const int y)

  *Adds a cell at the head of the worm.*
- static void worm_delete_cell_head (void)
- static void worm_delete_cell_tail (void)
- void worm_init (void)

  *Initializes the worm.*
- void worm_destroy (void)

  *Destroys the worm.*
- void worm_set_direction (enum worm_direction direction)

  *Attempts to change the next direction of the worm.*
- bool worm_move_and_draw (void)

  *Moves and draws the worm.*

## Variables

- static struct worm worm = {NULL, NULL, WORM_DIR_RIGHT, WORM_DIR_RIGHT}
- static const size_t WORM_START_LENGTH = 8

### 5.13.1 Detailed Description

The worm is implemented as a double-ended, doubly-linked list.

**Author**

Paul Griffiths

**Copyright**



### 5.13.2 Function Documentation

#### 5.13.2.1 static void worm_add_cell_head ( const int *x*, const int *y* ) [static]

Adds a cell at the head of the worm.

**Parameters**

| | |
|---|---|
| *x* | The x coordinate of the new head. |
| *y* | The y coordinate of the new head. |

#### 5.13.2.2 static bool worm_cell_here ( const int *x*, const int *y* ) [static]

Tests if the specified coordinates contain a worm body cell. This function is used to test for collision with the worm's own body.

**Parameters**

| | |
|---|---|
| *x* | The specified x coordinate. |
| *y* | The specified y coordinate. |

**Returns**

`true` if the specified coordinates contain a worm body cell, `false` otherwise.

#### 5.13.2.3 static void worm_clear ( void ) [static]

Erases the worm from the arena, i.e. overwrites it with empty cell characters.

#### 5.13.2.4 static void worm_delete_cell_head ( void ) [static]

Deletes the cell at the head of the worm.

#### 5.13.2.5 static void worm_delete_cell_tail ( void ) [static]

Deletes the cell at the tail of the worm.

#### 5.13.2.6 void worm_destroy ( void )

Destroys and deallocates memory for the worm.

#### 5.13.2.7 static void worm_draw ( void ) [static]

Draws the worm.

#### 5.13.2.8 void worm_init ( void )

Initializes and allocates memory for the worm.

#### 5.13.2.9 static bool worm_move ( void ) [static]

Moves the worm. The worm moves in the next direction specified in the worm structure. The function detects if the move would cause the worm to eat some food, and whether it would cause the worm to hit the arena wall, or its own body. In the former case, the tail cell is not deleted, and the worm grows in length. In the latter case, the game is ended.

**Returns**

`true` if the move caused the worm to eat some food, `false` in all other situations.

#### 5.13.2.10 bool worm_move_and_draw ( void )

Moves and draws the worm.

**Returns**

`true` if the movement that was performed caused the worm to eat a piece of food, `false` in all other situations.

#### 5.13.2.11 void worm_set_direction ( enum worm_direction *direction* )

Attempts to change the next direction of the worm. The worm will not actually change direction until the game next updates, and a second call to this function in the interim will nullify the effect of any previous calls, so it is safe to call this function an arbitrary number of times in between game updates. This function will ignore any attempt to change the direction in a way which is not allowed, particularly that the worm is not allowed to turn 180 degrees as this would cause it to hit its own body, so it is safe to call this function with any direction, and to trust it to ignore any direction changes which are not allowed.

**Parameters**

| | |
|---|---|
| *direction* | The desired direction of the worm on the next update. |

### 5.13.3 Variable Documentation

#### 5.13.3.1 struct worm worm = {NULL, NULL, WORM_DIR_RIGHT, WORM_DIR_RIGHT} [static]

File scope variable to contain the worm

#### 5.13.3.2 const size_t WORM_START_LENGTH = 8 [static]

File scope constant containing initial length of worm

# Index