Tux vs Bloatware

Generated by Doxygen 1.14.0

Chapter 1

Namespace Index

1.1 Namespace List

Here is a list of all namespaces with brief descriptions:

Chapter 2

Hierarchical 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 files with brief descriptions:

Chapter 5

Namespace Documentation

5.1 globalVars Namespace Reference

Variables

- bool inInterLevel = false
- int points = 0
- std::string usernameGlobal = ""

5.1.1 Variable Documentation

5.1.1.1 inInterLevel

```
bool globalVars::inInterLevel = false
```

5.1.1.2 points

```
int globalVars::points = 0
```

5.1.1.3 usernameGlobal

```
std::string globalVars::usernameGlobal = ""
```

Chapter 6

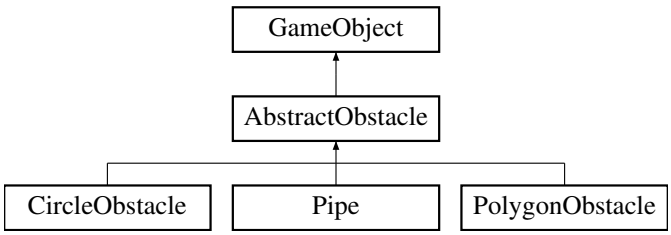
Class Documentation

6.1 AbstractObstacle Class Reference

Classe base abstrata para todos os tipos de obstáculos no jogo.

`#include <abstract_obstacle.hpp>`

Inheritance diagram for AbstractObstacle:



Public Member Functions

- virtual void draw ()=0
- virtual void update ()=0
- virtual bool checkCollisionWithPlayer (BrokenShip &player)=0
- virtual ~AbstractObstacle ()=default

Public Member Functions inherited from GameObject

- GameObject ()

  Create a new default GameObject.
- GameObject (Vector position)

  Create a new GameObject on given position.
- Vector get_position ()

  Get the position of a GameObject.
- void set_position (const Vector &position)

  Sets the position of a GameObject.
- virtual ~GameObject ()=0

  Game Object empty destructor.
- void set_bitmap (const char *path)

  Sets the sprite of the GameObject.

Protected Member Functions

- void setSpeed (Vector speed)

  Define a velocidade do obstáculo.
- Vector getSpeed ()

  Obtém a velocidade atual do obstáculo.

Additional Inherited Members

Public Attributes inherited from GameObject

- ALLEGRO_BITMAP * objectSprite = NULL

Protected Attributes inherited from GameObject

- Vector _position

6.1.1 Detailed Description

Classe base abstrata para todos os tipos de obstáculos no jogo.

Esta classe define o contrato que todas as classes de obstáculo concretas devem seguir. Ela herda de GameObject e adiciona funcionalidades específicas de obstáculos, como velocidade e métodos virtuais puros para desenho, atualização e detecção de colisão. Não pode ser instanciada diretamente.

6.1.2 Constructor & Destructor Documentation

6.1.2.1 ~AbstractObstacle()

```
virtual AbstractObstacle::~AbstractObstacle ()  [virtual], [default]
```

6.1.3 Member Function Documentation

6.1.3.1 checkCollisionWithPlayer()

```
virtual bool AbstractObstacle::checkCollisionWithPlayer (
            BrokenShip & player)  [pure virtual]
```

Implemented in CircleObstacle, Pipe, and PolygonObstacle.

6.1.3.2 draw()

```
virtual void AbstractObstacle::draw ()  [pure virtual]
```

Implemented in CircleObstacle, Pipe, and PolygonObstacle.

6.1.3.3 getSpeed()

```
Vector AbstractObstacle::getSpeed ()  [protected]
```

Obtém a velocidade atual do obstáculo.

Returns

O vetor de velocidade atual (_speed) do obstáculo.

6.1.3.4 setSpeed()

```
void AbstractObstacle::setSpeed (
            Vector speed)  [protected]
```

Define a velocidade do obstáculo.

Este método atualiza o vetor de velocidade do objeto

Parameters

speed	O novo vetor de velocidade a ser atribuído ao obstáculo.

6.1.3.5 update()

```
virtual void AbstractObstacle::update ()  [pure virtual]
```

Implemented in CircleObstacle, Pipe, and PolygonObstacle.

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

- include/abstract_obstacle.hpp
- src/abstract_obstacle.cpp

6.2 Background Class Reference

moving background logic

```
#include <levels.hpp>
```

Public Member Functions

- Background ()
- void renderBackground ()

  renders the moving background

6.2.1 Detailed Description

moving background logic

6.2.2 Constructor & Destructor Documentation

6.2.2.1 Background()

```
Background::Background ()
```

6.2.3 Member Function Documentation

6.2.3.1 renderBackground()

```
void Background::renderBackground ()
```

renders the moving background

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

- include/levels.hpp
- src/levels.cpp

6.3 Ball Class Reference

represents a ball-shaped shot.

6.3.1 Detailed Description

represents a ball-shaped shot.

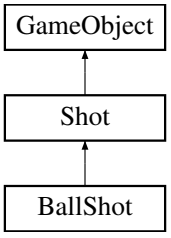
The documentation for this class was generated from the following file:

- src/shots.cpp

6.4 BallShot Class Reference

```
#include <shots.hpp>
```

Inheritance diagram for BallShot:



Public Member Functions

- BallShot (Vector initialPosi, Vector direction, float radius, float speed=40)

  Constructs a ball-shaped shot and inserts it into the shot list.
- void draw () override

  Draw a ball.
- void update () override

  Add to the position of the ball (shot), the direction vector multiplied by the velocity. (normally the direction vectors are unitary)
- bool isItActive () override

  Checks if the ball (shot) positions are within the game region.
- bool shotCollidedWithBoss (WindowsBoss &boss) override

  Checks if the ball (shot) collided with the boss. (Circle-square collision.)
- bool shotCollidedWithPlayer (FixedShip &player) override

  Check if the ball (shot) collided with the player. (Circle-to-circle collision.)

Public Member Functions inherited from Shot

- Shot (Vector position, Vector direction, ALLEGRO_COLOR shotColor)

  Build a standard shot.
- virtual ~Shot ()=default

Public Member Functions inherited from GameObject

- GameObject ()

  Create a new default GameObject.
- GameObject (Vector position)

  Create a new GameObject on given position.
- Vector get_position ()

  Get the position of a GameObject.
- void set_position (const Vector &position)

  Sets the position of a GameObject.
- virtual ~GameObject ()=0

  Game Object empty destructor.
- void set_bitmap (const char *path)

  Sets the sprite of the GameObject.

Additional Inherited Members

Static Public Member Functions inherited from Shot

- static void updateShots (FixedShip *player, WindowsBoss &boss, bool &playing)

  For all shots, from the shot list, they are updated and then it is checked if the shot is active or if it collided with something (boss or the player)
- static void drawShots ()

  Calls the draw() function of all active shots.
- static void cleanShots ()

  Destroys all shots.

Public Attributes inherited from GameObject

- ALLEGRO_BITMAP * objectSprite = NULL

Protected Attributes inherited from Shot

- Vector _direction
- ALLEGRO_COLOR _shotColor

Protected Attributes inherited from GameObject

- Vector _position

Static Protected Attributes inherited from Shot

- static std::list< Shot * > ShotsList

6.4.1 Constructor & Destructor Documentation

6.4.1.1 BallShot()

```
BallShot::BallShot (
            Vector initialPosi,
            Vector direction,
            float radius,
            float speed = 40)
```

Constructs a ball-shaped shot and inserts it into the shot list.

Parameters

initialPosi	The initial position of the shot.
direction	A vector in which the shot moves.
radius	Radius of the shot.
speed	Speed of the shot.

6.4.2 Member Function Documentation

6.4.2.1 draw()

```
void BallShot::draw ()  [override], [virtual]
```

Draw a ball.

Implements Shot.

6.4.2.2 isItActive()

```
bool BallShot::isItActive ()  [override], [virtual]
```

Checks if the ball (shot) positions are within the game region.

Returns

If the ball shot is still active.

Implements Shot.

6.4.2.3 shotCollidedWithBoss()

```
bool BallShot::shotCollidedWithBoss (
            WindowsBoss & boss)  [override], [virtual]
```

Checks if the ball (shot) collided with the boss. (Circle-square collision.)

Parameters

boss	Boss address(windows).

Returns

If the ball shot collided like the boss.

Implements Shot.

6.4.2.4 shotCollidedWithPlayer()

```
bool BallShot::shotCollidedWithPlayer (
            FixedShip & player)  [override], [virtual]
```

Check if the ball (shot) collided with the player. (Circle-to-circle collision.)

Parameters

player	Player address.

Returns

If the ball shot collided like the player.

Implements Shot.

6.4.2.5 update()

```
void BallShot::update ()  [override], [virtual]
```

Add to the position of the ball (shot), the direction vector multiplied by the velocity. (normally the direction vectors are unitary)

Implements Shot.

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

- include/shots.hpp
- src/shots.cpp

6.5 Bootstrap Class Reference

Static class that encapsulates initialization and cleanup of allegro components.

```
#include <bootstrap.hpp>
```

Static Public Member Functions

- static bool initialize_allegro ()
  Fully initializes Allegro.
- static bool init_allegro_libs ()
  Initializes allegro libs one by one while checking if sucessfull, if not, print an error.
- static void register_allegro_events ()
  Regiester all allegro event sources used in the game.
- static void cleanup_allegro ()
  Frees the memory deleting all pointers and destroys allegro components.
- static bool file_exists (const char *path)
  utility class that checks if a file exists
- static void start_sprite (ALLEGRO_BITMAP *&bitm, const char *path)
  utility member function to check if the sprite is loadable
- static void start_font (ALLEGRO_FONT *&font, const char *path, int size)
  utility member function to check if the font is loadable

6.5.1 Detailed Description

Static class that encapsulates initialization and cleanup of allegro components.

6.5.2 Member Function Documentation

6.5.2.1 cleanup_allegro()

```
void Bootstrap::cleanup_allegro ()  [static]
```

Frees the memory deleting all pointers and destroys allegro components.

6.5.2.2 file_exists()

```
bool Bootstrap::file_exists (
            const char * path)  [static]
```

utility class that checks if a file exists

Parameters

path	Path to the file

Returns

boolean indicating if the file exists

6.5.2.3 init_allegro_libs()

```
bool Bootstrap::init_allegro_libs ()  [static]
```

Initialializes allegro libs one by one while checking if sucessfull, if not, print an error.

Returns

true if all initializes correctly, false if not

6.5.2.4 initialize_allegro()

```
bool Bootstrap::initialize_allegro ()  [static]
```

Fully initializes Allegro.

6.5.2.5 register_allegro_events()

```
void Bootstrap::register_allegro_events ()  [static]
```

Regiester all allegro event sources used in the game.

6.5.2.6 start_font()

```
void Bootstrap::start_font (
            ALLEGRO_FONT *& font,
            const char * path,
            int size)  [static]
```

utility member function to check if the font is loadable

Parameters

font	reference to a ALLEGRO_FONT pointer that will be loaded
path	path to the ttf font file

6.5.2.7 start_sprite()

```
void Bootstrap::start_sprite (
            ALLEGRO_BITMAP *& bitm,
            const char * path)  [static]
```

utility member function to check if the sprite is loadable

Parameters

bitm	reference to a ALLEGRO_BITMAP pointer that will be loaded
path	path to the image file

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

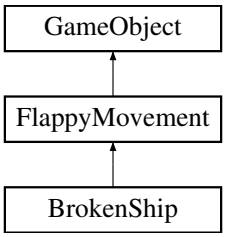
- include/bootstrap.hpp
- src/bootstrap.cpp

6.6 BrokenShip Class Reference

Player of phases 1 and 2, implements Flappy Movement.

`#include <game_object.hpp>`

Inheritance diagram for BrokenShip:



Public Member Functions

- BrokenShip ()
- BrokenShip (const Vector &pos)

  Create a new BrokenShip at given position.
- float get_radius () const

  Get the radius of the BrokenShip.
- void set_radius (float r)

  Sets the radius of the BrokenShip Hitbox's.
- void update ()

  Updates the physics of the BrokenShip by gravity and then re-draw it on the screen.
- void draw ()

  Draw the BrokenShip on the screen.
- void restart ()

  Moves the BrokenShip back to default position.

Public Member Functions inherited from FlappyMovement

- void apply_gravity ()

  Apply gravity physics on the object.
- void move_flappy ()

  Apply movement physics on the object.
- Vector getMoveForce ()

  Get the Move Force of a flappy movement.

Public Member Functions inherited from GameObject

- GameObject ()

  Create a new default GameObject.
- GameObject (Vector position)

  Create a new GameObject on given position.
- Vector get_position ()

  Get the position of a GameObject.
- void set_position (const Vector &position)

  Sets the position of a GameObject.
- virtual ~GameObject ()=0

  Game Object empty destructor.
- void set_bitmap (const char *path)

  Sets the sprite of the GameObject.

Additional Inherited Members

Public Attributes inherited from GameObject

- ALLEGRO_BITMAP * objectSprite = NULL

Protected Attributes inherited from GameObject

- Vector _position

6.6.1 Detailed Description

Player of phases 1 and 2, implements Flappy Movement.

- _radius: Object's Hitbox radius

6.6.2 Constructor & Destructor Documentation

6.6.2.1 BrokenShip() [1/2]

```
BrokenShip::BrokenShip ()
```

6.6.2.2 BrokenShip() [2/2]

```
BrokenShip::BrokenShip (
            const Vector & pos)
```

Create a new BrokenShip at given position.

6.6.3 Member Function Documentation

6.6.3.1 draw()

```
void BrokenShip::draw ()
```

Draw the BrokenShip on the screen.

6.6.3.2 get_radius()

```
float BrokenShip::get_radius () const
```

Get the radius of the BrokenShip.

Returns

Float that represents the BrokenShip's Hitbox radius

6.6.3.3 restart()

```
void BrokenShip::restart ()
```

Moves the BrokenShip back to default position.

6.6.3.4 set_radius()

```
void BrokenShip::set_radius (
            float r)
```

Sets the radius of the BrokenShip Hitbox's.

6.6.3.5 update()

```
void BrokenShip::update ()
```

Updates the physics of the BrokenShip by gravity and then re-draw it on the screen.

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

- include/game_object.hpp
- src/game_object.cpp

6.7 Button Class Reference

simple button logic with draw, click checking and setText functions

```
#include <interface.hpp>
```

Public Member Functions

- Button (Coordinates coords, ALLEGRO_COLOR color, std::string text, ALLEGRO_FONT *font, bool drawBackground=true)

  Button constructor.
- void drawButton ()

  Draws the button using its attributes.
- bool gotClicked (int mx, int my)

  checks if the mouse coordinates (when click occurs) matches the button region
- void setText (const char *txt)

  set a new text to the button

6.7.1 Detailed Description

simple button logic with draw, click checking and setText functions

- _coords: x and y coordinates, width and height of the created button
- _text: button text
- _font: pointer to an allegro font
- _drawBackground: option to draw or not to draw the background

6.7.2 Constructor & Destructor Documentation

6.7.2.1 Button()

```
Button::Button (
            Coordinates coords,
            ALLEGRO_COLOR color,
            std::string text,
            ALLEGRO_FONT * font,
            bool drawBackground = true)
```

Button constructor.

Parameters

coords	button dimensions using the Coordinates class
color	allegro-typed rgb color
text	button center text
font	center text font
drawBackground	bool that sets if the background will be displayed

6.7.3 Member Function Documentation

6.7.3.1 drawButton()

```
void Button::drawButton ()
```

Draws the button using its attributes.

6.7.3.2 gotClicked()

```
bool Button::gotClicked (
            int mx,
            int my)
```

checks if the mouse coordinates (when click occurs) matches the button region

Parameters

mx	mouse x coordinates
my	mouse y coordinates

6.7.3.3 setText()

```
void Button::setText (
            const char * txt)
```

set a new text to the button

Parameters

txt	new text to substitute the old one

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

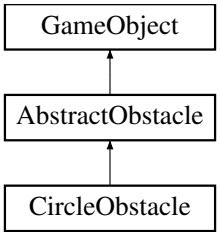
- include/interface.hpp
- src/interface.cpp

6.8 CircleObstacle Class Reference

Representa um obstáculo com uma forma de colisão perfeitamente circular.

`#include <circle_obstacle.hpp>`

Inheritance diagram for CircleObstacle:



Public Member Functions

- CircleObstacle (const Vector &pos, const char *path)

  Construtor da classe CircleObstacle.
- float get_radius () const

  Obtém o raio do obstáculo circular.
- void draw () override

  Desenha o obstáculo na tela.
- void update () override

  Atualiza a posição do obstáculo.
- bool checkCollisionWithPlayer (BrokenShip &player) override

  Verifica se há colisão entre este obstáculo e a nave do player.

Public Member Functions inherited from AbstractObstacle

- virtual ~AbstractObstacle ()=default

Public Member Functions inherited from GameObject

- GameObject ()

  Create a new default GameObject.
- GameObject (Vector position)

  Create a new GameObject on given position.
- Vector get_position ()

  Get the position of a GameObject.
- void set_position (const Vector &position)

  Sets the position of a GameObject.
- virtual ~GameObject ()=0

  Game Object empty destructor.
- void set_bitmap (const char *path)

  Sets the sprite of the GameObject.

Additional Inherited Members

Public Attributes inherited from GameObject

- ALLEGRO_BITMAP * objectSprite = NULL

Protected Member Functions inherited from AbstractObstacle

- void setSpeed (Vector speed)

  Define a velocidade do obstáculo.
- Vector getSpeed ()

  Obtém a velocidade atual do obstáculo.

Protected Attributes inherited from GameObject

- Vector _position

6.8.1 Detailed Description

Representa um obstáculo com uma forma de colisão perfeitamente circular.

Esta classe herda de AbstractObstacle e implementa a lógica para um obstáculo simples cuja detecção de colisão é baseada em um raio.

6.8.2 Constructor & Destructor Documentation

6.8.2.1 CircleObstacle()

```
CircleObstacle::CircleObstacle (
            const Vector & pos,
            const char * path)
```

Construtor da classe CircleObstacle.

Inicializa um obstáculo circular com uma posição, uma imagem (bitmap) e uma velocidade vertical aleatória, selecionada a partir de um vetor de velocidades predefinido, com velocidades plausiveis para o jogo.

Parameters

pos	A posição inicial (Vetor x, y) do obstáculo.
path	O caminho para o arquivo de imagem (sprite) do obstáculo.

6.8.3 Member Function Documentation

6.8.3.1 checkCollisionWithPlayer()

```
bool CircleObstacle::checkCollisionWithPlayer (
            BrokenShip & player)  [override], [virtual]
```

Verifica se há colisão entre este obstáculo e a nave do player.

A detecção é feita comparando a distância entre os centros do obstáculo e do jogador com a soma de seus raios.

Parameters

player	Uma referência ao objeto do jogador (BrokenShip) para verificar a colisão.

Returns

Retorna 'true' se a distância for menor que a soma dos raios (houve colisão), e 'false' caso contrário.

Implements AbstractObstacle.

6.8.3.2 draw()

```
void CircleObstacle::draw ()  [override], [virtual]
```

Desenha o obstáculo na tela.

Calcula as coordenadas de desenho com base na posição central e no raio, ajustando sua escala para corresponder ao diâmetro do obstáculo.

Implements AbstractObstacle.

6.8.3.3 get_radius()

```
float CircleObstacle::get_radius () const
```

Obtém o raio do obstáculo circular.

Returns

O valor do raio (_radius) do obstáculo.

6.8.3.4 update()

```
void CircleObstacle::update ()  [override], [virtual]
```

Atualiza a posição do obstáculo.

Move o obstáculo de acordo com sua velocidade. Se ele sair da parte inferior da tela é reposicionado na parte superior com uma coordenada na largura aleatória, criando um efeito de loop contínuo.

Implements AbstractObstacle.

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

- include/circle_obstacle.hpp
- src/circle_obstacle.cpp

6.9 Coordinates Struct Reference

Extremely basic coordinates struct. Takes x and y coordinates, width and height as paramenters. Mostly used to keep better logic in buttons.

```
#include <interface.hpp>
```

Public Member Functions

- Coordinates (double x, double y, double width, double heigth)

  Coordinates constructor.
- Coordinates ()

Public Attributes

- double _x
- double _y
- double _width
- double _heigth

6.9.1 Detailed Description

Extremely basic coordinates struct. Takes x and y coordinates, width and height as paramenters. Mostly used to keep better logic in buttons.

6.9.2 Constructor & Destructor Documentation

6.9.2.1 Coordinates() [1/2]

```
Coordinates::Coordinates (
            double x,
            double y,
            double width,
            double heigth)
```

Coordinates constructor.

Parameters

x	x coordinates in the display
y	y coordinates in the display
width	region width
heigth	region heigth

6.9.2.2 Coordinates() [2/2]

```
Coordinates::Coordinates ()  [inline]
```

6.9.3 Member Data Documentation

6.9.3.1 _heigth

```
double Coordinates::_heigth
```

6.9.3.2 _width

```
double Coordinates::_width
```

6.9.3.3 _x

```
double Coordinates::_x
```

6.9.3.4 _y

```
double Coordinates::_y
```

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

- include/interface.hpp
- src/interface.cpp

6.10 DatabaseUsers Class Reference

Gerencia todas as operações de banco de dados relacionadas a usuários.

```
#include <database_users.hpp>
```

Public Member Functions

- DatabaseUsers ()

  Construtor da classe DatabaseUsers.
- ~DatabaseUsers ()

  Destrutor da classe DatabaseUsers.
- bool registerUser (const std::string &name, const std::string &username, const std::string &password, int initialScore=0, int initialGames=0)

  Registra um novo usuário no banco de dados.
- bool deleteUser (const std::string &username)

  Exclui um usuário do banco de dados com base no nome de usuário.
- std::vector< User > listUsers ()

  Retorna uma lista de todos os usuários cadastrados.
- bool updateScore (const std::string &username, int new_score)

  Atualiza a pontuação de um usuário específico.
- bool updateGamesNumber (const std::string &username, int new_games)

  Atualiza o número total de jogos de um usuário.
- std::unique_ptr< User > getUserByUsername (const std::string &username)

  Busca e retorna os dados completos de um usuário pelo seu nome de usuário.
- bool authenticateUser (const std::string &username, const std::string &password)

  Autentica um usuário com base no nome de usuário e senha.
- void addValuesGameOverScreen (std::string &username, gameOverScreen &game_over_screen)

  Processa e atualiza os dados de fim de um dos mini-jogos para um usuário.

6.10.1 Detailed Description

Gerencia todas as operações de banco de dados relacionadas a usuários.

Encapsula a conexão com o banco de dados PostgreSQL (usando pqxx) e implementa uma API para criar, autenticar, atualizar, deletar e listar usuários.

6.10.2 Constructor & Destructor Documentation

6.10.2.1 DatabaseUsers()

```
DatabaseUsers::DatabaseUsers ()
```

Construtor da classe DatabaseUsers.

Inicializa a conexão com o banco de dados PostgreSQL. Lê a string de conexão a partir de um arquivo .env, estabelece a conexão e lança uma exceção se a conexão não puder ser estabelecida com sucesso.

Exceptions

std::runtime_error	Se a conexão com o banco de dados falhar por um motivo genérico.
pqxx::sql_error	Se ocorrer um erro específico do SQL durante a tentativa de conexão.

6.10.2.2 ~DatabaseUsers()

```
DatabaseUsers::~DatabaseUsers ()
```

Destrutor da classe DatabaseUsers.

Fecha a conexão com o banco de dados, se ela estiver ativa, para liberar os recursos de forma segura.

6.10.3 Member Function Documentation

6.10.3.1 addValuesGameOverScreen()

```
void DatabaseUsers::addValuesGameOverScreen (
            std::string & username,
            gameOverScreen & game_over_screen)
```

Processa e atualiza os dados de fim de um dos mini-jogos para um usuário.

Esta função é chamada ao final de uma partida. Ela atualiza o número de jogos do usuário, verifica se a pontuação da partida é um novo recorde pessoal (e atualiza se for), e preenche um objeto de tela de game over com todas as informações relevantes (pontuação obtida nesse exato momento, recorde pessoal, recorde geral do jogo).

Parameters

username	O nome de usuário do jogador.
game_over_screen	Referência ao objeto da tela de "Game Over" que conterá os dados.

6.10.3.2 authenticateUser()

```
bool DatabaseUsers::authenticateUser (
            const std::string & username,
            const std::string & password)
```

Autentica um usuário com base no nome de usuário e senha.

Parameters

username	O nome de usuário para autenticação.
password	A senha fornecida pelo usuário.

Returns

'true' se o nome de usuário e a senha corresponderem, 'false' caso contrário.

6.10.3.3 deleteUser()

```
bool DatabaseUsers::deleteUser (
            const std::string & username)
```

Exclui um usuário do banco de dados com base no nome de usuário.

Parameters

username	O nome de usuário a ser excluído.

Returns

'true' se o usuário foi encontrado e excluído com sucesso, 'false' caso contrário.

6.10.3.4 getUserByUsername()

```
std::unique_ptr< User > DatabaseUsers::getUserByUsername (
            const std::string & username)
```

Busca e retorna os dados completos de um usuário pelo seu nome de usuário.

Parameters

username	O nome de usuário a ser buscado.

Returns

Um ponteiro único (`std::unique_ptr`) para um objeto `User` se o usuário for encontrado. Retorna `nullptr` se o usuário não for encontrado ou em caso de erro.

6.10.3.5 listUsers()

```
std::vector< User > DatabaseUsers::listUsers ()
```

Retorna uma lista de todos os usuários cadastrados.

Executa uma consulta para buscar todos os usuários, ordenando o resultado pela pontuação (score) em ordem decrescente, o que facilita a obter a maior pontuação geral depois.

Returns

Um vetor de objetos 'User'. Retorna um vetor vazio se não houver usuários ou em caso de erro.

6.10.3.6 registerUser()

```
bool DatabaseUsers::registerUser (
            const std::string & name,
            const std::string & username,
            const std::string & password,
            int initialScore = 0,
            int initialGames = 0)
```

Registra um novo usuário no banco de dados.

Insere um novo registro na tabela 'users'.

Parameters

name	O nome do usuário.
username	O nome de login do usuário (deve ser único).
password	A senha do usuário.
initial_score	A pontuação inicial a ser definida para o usuário, 0 de default.
initial_games	O número inicial de jogos a ser definido para o usuário, 0 de default.

Returns

'true' se o usuário for registrado com sucesso, 'false' se ocorrer um erro (ex: username já existe).

6.10.3.7 updateGamesNumber()

```
bool DatabaseUsers::updateGamesNumber (
            const std::string & username,
            int new_games)
```

Atualiza o número total de jogos de um usuário.

Parameters

username	O nome de usuário cujo número de jogos será atualizado.
new_games	O novo número total de jogos.

Returns

'true' se a atualização for bem-sucedida, 'false' se o usuário não for encontrado ou em caso de erro.

6.10.3.8 updateScore()

```
bool DatabaseUsers::updateScore (
            const std::string & username,
            int new_score)
```

Atualiza a pontuação de um usuário específico.

Parameters

username	O nome de usuário cujo score será atualizado.
new_score	A nova pontuação a ser registrada.

Returns

'true' se a atualização for bem-sucedida, 'false' se o usuário não for encontrado ou em caso de erro.

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

- include/database_users.hpp
- src/database_users.cpp

6.11 dotenv Class Reference

`#include <dotenv.h>`

Public Member Functions

- dotenv ()=delete
- ∼dotenv ()=delete

Static Public Member Functions

- static void init (const char ∗filename=".env")
- static void init (int flags, const char ∗filename=".env")
- static std::string getenv (const char ∗name, const std::string &def="")

Static Public Attributes

- static const unsigned char Preserve = 1 << 0
- static const int OptionsNone = 0

6.11.1 Detailed Description

Utility class for loading environment variables from a file.

6.11.1.0.1 Typical use

Given a file `.env`

```
DATABASE_HOST=localhost
DATABASE_USERNAME=user
DATABASE_PASSWORD="antipasto"
```

and a program `example.cpp`

```
// example.cpp
#include <iostream>
#include <dotenv.h>

int main()
{
    dotenv::init();

    std::cout « std::getenv("DATABASE_USERNAME") « std::endl;
    std::cout « std::getenv("DATABASE_PASSWORD") « std::endl;

    return 0;
}
```

Compile and run the program, e.g. using,

```
c++ example.cpp -o example -I/usr/local/include/laserpants/dotenv-0.9.3 && ./example
```

and the output is:

```
user
antipasto
```

See also

https://github.com/laserpants/dotenv-cpp

6.11.2 Constructor & Destructor Documentation

6.11.2.1 dotenv()

```
dotenv::dotenv ()  [delete]
```

6.11.2.2 ~dotenv()

```
dotenv::~dotenv ()  [delete]
```

6.11.3 Member Function Documentation

6.11.3.1 getenv()

```
std::string dotenv::getenv (
            const char * name,
            const std::string & def = "")  [inline], [static]
```

Wrapper for std::getenv() which also takes a default value, in case the variable turns out to be empty.

Parameters

name	the name of the variable to look up
def	a default value

Returns

the value of the environment variable *name*, or *def* if the variable is not set

6.11.3.2 init() [1/2]

```
void dotenv::init (
            const char * filename = ".env")  [inline], [static]
```

Read and initialize environment variables from the `.env` file, or a file specified by the *filename* argument.

Parameters

filename	a file to read environment variables from

6.11.3.3 init() [2/2]

```
void dotenv::init (
            int flags,
            const char * filename = ".env")  [inline], [static]
```

Read and initialize environment variables using the provided configuration flags.

By default, if a name is already present in the environment, `dotenv::init()` will replace it with the new value. To preserve existing variables, you must pass the `Preserve` flag.

```
dotenv::init(dotenv::Preserve);
```

Parameters

flags	configuration flags
filename	a file to read environment variables from

6.11.4 Member Data Documentation

6.11.4.1 OptionsNone

```
const int dotenv::OptionsNone = 0  [static]
```

6.11.4.2 Preserve

```
const unsigned char dotenv::Preserve = 1 << 0  [static]
```

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

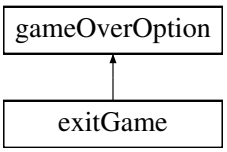
- include/dotenv.h

6.12 exitGame Class Reference

Ação para sair do jogo.

```
#include <game_over.hpp>
```

Inheritance diagram for exitGame:



Public Member Functions

- ~exitGame () override=default
- void execute () override

  Função virtual pura que será sobrescrita pelas classes derivadas.

Public Member Functions inherited from gameOverOption

- virtual ~gameOverOption ()=default

  Destrutor virtual padrão para que a memória seja liberada corretamente nas classes derivadas.

6.12.1 Detailed Description

Ação para sair do jogo.

6.12.2 Constructor & Destructor Documentation

6.12.2.1 ~exitGame()

```
exitGame::~exitGame ()  [override], [default]
```

6.12.3 Member Function Documentation

6.12.3.1 execute()

```
void exitGame::execute ()  [override], [virtual]
```

Função virtual pura que será sobrescrita pelas classes derivadas.

Implements gameOverOption.

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

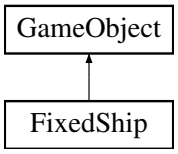
- include/game_over.hpp
- src/gameover.cpp

6.13 FixedShip Class Reference

Player of phase 3, implements 2D movement.

```
#include <game_object.hpp>
```

Inheritance diagram for FixedShip:



Public Member Functions

- FixedShip ()
- FixedShip (const Vector &pos)

  Creates a new FixedShip.
- float get_radius () const

  Get FixedShip(player)'s Hitbox radius.
- void set_radius (float r)

  Sets a radius to the player.
- void moveShip (char direction)

  Implements 2D movement on FixedShip.
- void draw ()

  Draw the player on the screen.
- void setCanTakeDamage (bool canTakeDamage)

  Method of setting whether or not the player can take damage.
- void takeDamage (bool &playing, int damage=1)

  Removes a life from the player, if the life is zero, the game is over.

Public Member Functions inherited from GameObject

- GameObject ()

  Create a new default GameObject.
- GameObject (Vector position)

  Create a new GameObject on given position.
- Vector get_position ()

  Get the position of a GameObject.
- void set_position (const Vector &position)

  Sets the position of a GameObject.
- virtual ~GameObject ()=0

  Game Object empty destructor.
- void set_bitmap (const char *path)

  Sets the sprite of the GameObject.

Additional Inherited Members

Public Attributes inherited from GameObject

- ALLEGRO_BITMAP * objectSprite = NULL

Protected Attributes inherited from GameObject

- Vector _position

6.13.1 Detailed Description

Player of phase 3, implements 2D movement.

- move_force: Vector that represents the force object can exerce on himself
- _radius: Object's Hitbox radius

6.13.2 Constructor & Destructor Documentation

6.13.2.1 FixedShip() [1/2]

```
FixedShip::FixedShip ()
```

6.13.2.2 FixedShip() [2/2]

```
FixedShip::FixedShip (
            const Vector & pos)
```

Creates a new FixedShip.

6.13.3 Member Function Documentation

6.13.3.1 draw()

```
void FixedShip::draw ()
```

Draw the player on the screen.

6.13.3.2 get_radius()

```
float FixedShip::get_radius () const
```

Get FixedShip(player)'s Hitbox radius.

Returns

A float that indicates the player's Hitbox Radius

6.13.3.3 moveShip()

```
void FixedShip::moveShip (
            char direction)
```

Implements 2D movement on FixedShip.

6.13.3.4 set_radius()

```
void FixedShip::set_radius (
            float r)
```

Sets a radius to the player.

6.13.3.5 setCanTakeDamage()

```
void FixedShip::setCanTakeDamage (
            bool canTakeDamage)
```

Method of setting whether or not the player can take damage.

Parameters

canTakeDamage	Boolean using to set.

6.13.3.6 takeDamage()

```
void FixedShip::takeDamage (
            bool & playing,
            int damage = 1)
```

Removes a life from the player, if the life is zero, the game is over.

Parameters

playing	Variable that controls whether the game is active.
damage	Integer that informs the damage taken.

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

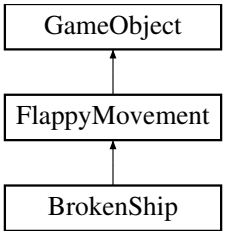
- include/game_object.hpp
- src/game_object.cpp

6.14 FlappyMovement Class Reference

Base class that implements Flappy-Bird-like movement.

`#include <game_object.hpp>`

Inheritance diagram for FlappyMovement:



Public Member Functions

- void apply_gravity ()

  Apply gravity physics on the object.
- void move_flappy ()

  Apply movement physics on the object.
- Vector getMoveForce ()

  Get the Move Force of a flappy movement.

Public Member Functions inherited from GameObject

- GameObject ()

  Create a new default GameObject.
- GameObject (Vector position)

  Create a new GameObject on given position.
- Vector get_position ()

  Get the position of a GameObject.
- void set_position (const Vector &position)

  Sets the position of a GameObject.
- virtual ~GameObject ()=0

  Game Object empty destructor.
- void set_bitmap (const char *path)

  Sets the sprite of the GameObject.

Additional Inherited Members

Public Attributes inherited from GameObject

- ALLEGRO_BITMAP * objectSprite = NULL

Protected Attributes inherited from GameObject

- Vector _position

6.14.1 Detailed Description

Base class that implements Flappy-Bird-like movement.

- gravity: Vector that represents the force that pulls the main character
- move_force: Vector that represents the force object applies on itself to move

6.14.2 Member Function Documentation

6.14.2.1 apply_gravity()

```
void FlappyMovement::apply_gravity ()
```

Apply gravity physics on the object.

6.14.2.2 getMoveForce()

```
Vector FlappyMovement::getMoveForce ()
```

Get the Move Force of a flappy movement.

Returns

A Vector that represents the mount of force the object applies on itself in order to move

6.14.2.3 move_flappy()

```
void FlappyMovement::move_flappy ()
```

Apply movement physics on the object.

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

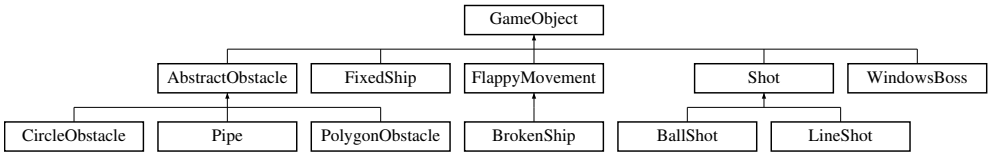
- include/game_object.hpp
- src/game_object.cpp

6.15 GameObject Class Reference

Base class to objects of the game.

`#include <game_object.hpp>`

Inheritance diagram for GameObject:



Public Member Functions

- GameObject ()

  Create a new default GameObject.
- GameObject (Vector position)

  Create a new GameObject on given position.
- Vector get_position ()

  Get the position of a GameObject.
- void set_position (const Vector &position)

  Sets the position of a GameObject.
- virtual ~GameObject ()=0

  Game Object empty destructor.
- void set_bitmap (const char *path)

  Sets the sprite of the GameObject.

Public Attributes

- ALLEGRO_BITMAP * objectSprite = NULL

Protected Attributes

- Vector _position

6.15.1 Detailed Description

Base class to objects of the game.

- _position: Vector that represents object's current position on screen

6.15.2 Constructor & Destructor Documentation

6.15.2.1 GameObject() [1/2]

```
GameObject::GameObject ()
```

Create a new default GameObject.

6.15.2.2 GameObject() [2/2]

```
GameObject::GameObject (
            Vector position)
```

Create a new GameObject on given position.

6.15.2.3 ~GameObject()

```
GameObject::~GameObject ()  [pure virtual]
```

Game Object empty destructor.

6.15.3 Member Function Documentation

6.15.3.1 get_position()

```
Vector GameObject::get_position ()
```

Get the position of a GameObject.

Returns

A vector that represents the GameObject position

6.15.3.2 set_bitmap()

```
void GameObject::set_bitmap (
            const char * path)
```

Sets the sprite of the GameObject.

6.15.3.3 set_position()

```
void GameObject::set_position (
            const Vector & position)
```

Sets the position of a GameObject.

6.15.4 Member Data Documentation

6.15.4.1 _position

```
Vector GameObject::_position  [protected]
```

6.15.4.2 objectSprite

```
ALLEGRO_BITMAP* GameObject::objectSprite = NULL
```

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

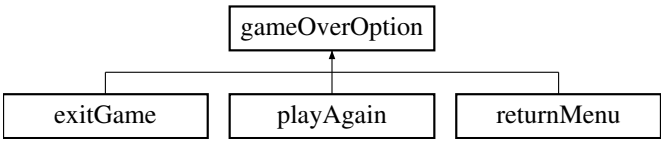
- include/game_object.hpp
- src/game_object.cpp

6.16 gameOverOption Class Reference

Classe base abstrata para as opções de ação na tela de Game Over.

```
#include <game_over.hpp>
```

Inheritance diagram for gameOverOption:



Public Member Functions

- virtual ~gameOverOption ()=default

  Destrutor virtual padrão para que a memória seja liberada corretamente nas classes derivadas.
- virtual void execute ()=0

  Função virtual pura que será sobrescrita pelas classes derivadas.

6.16.1 Detailed Description

Classe base abstrata para as opções de ação na tela de Game Over.

6.16.2 Constructor & Destructor Documentation

6.16.2.1 ~gameOverOption()

```
virtual gameOverOption::~gameOverOption ()  [virtual], [default]
```

Destrutor virtual padrão para que a memória seja liberada corretamente nas classes derivadas.

6.16.3 Member Function Documentation

6.16.3.1 execute()

```
virtual void gameOverOption::execute ()  [pure virtual]
```

Função virtual pura que será sobrescrita pelas classes derivadas.

Implemented in exitGame, playAgain, and returnMenu.

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

- include/game_over.hpp

6.17 gameOverScreen Class Reference

Gerencia a exibição da mensagem de Game Over, scores, botões de ação e a interação do jogador. _current↩ Score: pontuação na partida _highScore: maior pontuação (recorde pessoal) _bestScore: Melhor pontuação (recorde geral) ALLEGRO_FONT∗ _font: fonte dos textos da tela _playAgainButton: botão jogar novamente ↩ _returnToMenuButton: botão para retornar para a tela inicial _exitGameButton: botão para sair do jogo.

```
#include <game_over.hpp>
```

Public Member Functions

- gameOverScreen (ALLEGRO_FONT ∗font)

  Construtor da classe gameOverScreen.
- void setCurrentScore (int score)

  metodos para acessar e modificar as pontuações do jogo e desenhar os elementos visuais na tela.
- void setHighScore (int score)

  Define o recorde (maior pontuação) a ser exibido na tela.
- void setbestScore (int score)

  Define o recorde global a ser exibido na tela.
- void setnumGames (int games)

  Define o numero de games jogados pelo usuario.
- void draw ()

  Desenha todos os elementos visuais na tela de Game Over.
- gameOverOption ∗ run (ALLEGRO_EVENT_QUEUE ∗event_queue, ALLEGRO_TIMER ∗timer)

  Gerencia o loop de eventos da tela de Game Over e a interação do jogador.

6.17.1 Detailed Description

Gerencia a exibição da mensagem de Game Over, scores, botões de ação e a interação do jogador. _current↩ Score: pontuação na partida _highScore: maior pontuação (recorde pessoal) _bestScore: Melhor pontuação (recorde geral) ALLEGRO_FONT∗ _font: fonte dos textos da tela _playAgainButton: botão jogar novamente ↩ _returnToMenuButton: botão para retornar para a tela inicial _exitGameButton: botão para sair do jogo.

6.17.2 Constructor & Destructor Documentation

6.17.2.1 gameOverScreen()

```
gameOverScreen::gameOverScreen (
            ALLEGRO_FONT * font)
```

Construtor da classe gameOverScreen.

Construtor da tela de Game Over. Inicializa os membros da classe, incluindo a fonte e os botões com suas posições e textos.

6.17.3 Member Function Documentation

6.17.3.1 draw()

```
void gameOverScreen::draw ()
```

Desenha todos os elementos visuais na tela de Game Over.

Inclui a imagem de fundo, textos informativos e os botões.

6.17.3.2 run()

```
gameOverOption * gameOverScreen::run (
            ALLEGRO_EVENT_QUEUE * event_queue,
            ALLEGRO_TIMER * timer)
```

Gerencia o loop de eventos da tela de Game Over e a interação do jogador.

A tela permanece ativa, desenhando e capturando cliques, até que o jogador

Parameters

event_queue	Fila de eventos Allegro para capturar input.
timer	Timer Allegro para controlar o redesenho da tela.

Returns

Um ponteiro para o objeto 'gameOverOption' que representa a ação escolhida pelo jogador.

Parameters

event_queue	Ponteiro para a fila de eventos Allegro do jogo.
timer	Ponteiro para o timer Allegro do jogo.

Returns

Ponteiro para o objeto gameOverOption que representa a ação escolhida pelo jogador.

6.17.3.3 setbestScore()

```
void gameOverScreen::setbestScore (
            int score)
```

Define o recorde global a ser exibido na tela.

6.17.3.4 setCurrentScore()

```
void gameOverScreen::setCurrentScore (
            int score)
```

metodos para acessar e modificar as pontuações do jogo e desenhar os elementos visuais na tela.

Define a pontuação da partida atual a ser exibida na tela..

6.17.3.5 setHighScore()

```
void gameOverScreen::setHighScore (
            int score)
```

Define o recorde (maior pontuação) a ser exibido na tela.

6.17.3.6 setnumGames()

```
void gameOverScreen::setnumGames (
            int games)
```

Define o numero de games jogados pelo usuario.

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

- include/game_over.hpp
- src/gameover.cpp

6.18 Interface Class Reference

Base game start interface using button class.

```
#include <interface.hpp>
```

Public Member Functions

- Interface (ALLEGRO_FONT *font)

  Construct the main menu interface using pre-setted buttons.
- void drawOffGameInterface ()

  Draws the main menu interface.

Public Attributes

- Button playButton
- Button stopSongButton
- Button returnToMenuButton
- Button exitGameButton

6.18.1 Detailed Description

Base game start interface using button class.

6.18.2 Constructor & Destructor Documentation

6.18.2.1 Interface()

```
Interface::Interface (
            ALLEGRO_FONT * font)
```

Construct the main menu interface using pre-setted buttons.

6.18.3 Member Function Documentation

6.18.3.1 drawOffGameInterface()

```
void Interface::drawOffGameInterface ()
```

Draws the main menu interface.

6.18.4 Member Data Documentation

6.18.4.1 exitGameButton

```
Button Interface::exitGameButton
```

6.18.4.2 playButton

```
Button Interface::playButton
```

6.18.4.3 returnToMenuButton

```
Button Interface::returnToMenuButton
```

6.18.4.4 stopSongButton

```
Button Interface::stopSongButton
```

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

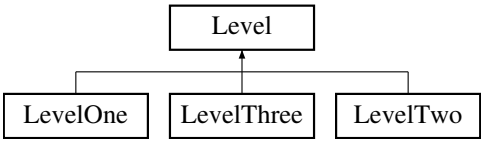
- include/interface.hpp
- src/interface.cpp

6.19 Level Class Reference

Base class for the game levels, encapsulates the bare minimum logic to maintain a level.

`#include <levels.hpp>`

Inheritance diagram for Level:



Static Protected Attributes

- static GameObject * _player = nullptr
- static Background _bg
- static ALLEGRO_EVENT _event

Friends

- void interLevelHandling (std::vector< AbstractObstacle * > &obstacles, ALLEGRO_BITMAP *sprite, const char *message, float bitmapScale)

  Clears the obstacles, draw a selected sprite with a user controlled scale and a message.

6.19.1 Detailed Description

Base class for the game levels, encapsulates the bare minimum logic to maintain a level.

- _music: pointer to the level's music
- _player: pointer to the level's player (either BrokenShip or FixedShip)
- _bg: Parallax background
- _event: level's Allegro event

6.19.2 Friends And Related Symbol Documentation

6.19.2.1 interLevelHandling

```
void interLevelHandling (
            std::vector< AbstractObstacle * > & obstacles,
            ALLEGRO_BITMAP * sprite,
            const char * message,
            float bitmapScale)  [friend]
```

Clears the obstacles, draw a selected sprite with a user controlled scale and a message.

Parameters

obstacles	vector of abstract obstacles to be cleared
sprite	allegro-typed bitmap of sprite
message	message in the screen
bitmapScale	new width and heigth scale

6.19.3 Member Data Documentation

6.19.3.1 _bg

```
Background Level::_bg  [static], [protected]
```

6.19.3.2 _event

```
ALLEGRO_EVENT Level::_event  [static], [protected]
```

6.19.3.3 _player

```
GameObject * Level::_player = nullptr  [static], [protected]
```

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

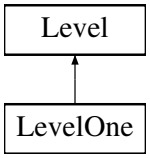
- include/levels.hpp
- src/levels.cpp

6.20 LevelOne Class Reference

First phase of the game, basic vertically-oriented flappy bird with satellites as pipes.

```
#include <levels.hpp>
```

Inheritance diagram for LevelOne:



Static Public Member Functions

- static BrokenShip * setLevelOne ()

  Initializes Level One.
- static void cleanLevel ()

  Frees memory used on Level Two.
- static void mainLoop (bool &playing, bool &isAlive)

  MainLoop of game's second phase.
- static void handleTimerEvents (bool &playing, BrokenShip *player, std::vector< AbstractObstacle * > &obstacles, bool &isAlive)

  Controls automatic events and events trigerred by time, implements DeltaTime.
- static void handleKeyPressEvents (bool &playing, BrokenShip *player, bool &isAlive)
- static void handleKeyReleaseEvents ()

  Simple method for debug and logging.

Additional Inherited Members

Static Protected Attributes inherited from Level

- static GameObject * _player = nullptr
- static Background _bg
- static ALLEGRO_EVENT _event

6.20.1 Detailed Description

First phase of the game, basic vertically-oriented flappy bird with satellites as pipes.

6.20.2 Member Function Documentation

6.20.2.1 cleanLevel()

```
void LevelOne::cleanLevel ()  [static]
```

Frees memory used on Level Two.

6.20.2.2 handleKeyPressEvents()

```
void LevelOne::handleKeyPressEvents (
            bool & playing,
            BrokenShip * player,
            bool & isAlive)  [static]
```

6.20.2.3 handleKeyReleaseEvents()

```
void LevelOne::handleKeyReleaseEvents ()  [static]
```

Simple method for debug and logging.

6.20.2.4 handleTimerEvents()

```
void LevelOne::handleTimerEvents (
            bool & playing,
            BrokenShip * player,
            std::vector< AbstractObstacle * > & obstacles,
            bool & isAlive)  [static]
```

Controls automatic events and events trigerred by time, implements DeltaTime.

Parameters

playing	loop control variable to close the game on collision
player	the player object of this phase (Brokenship class)
obstacles	Reference to vector of AbstractObstacles of this phase

6.20.2.5 mainLoop()

```
void LevelOne::mainLoop (
            bool & playing,
            bool & isAlive)  [static]
```

MainLoop of game's second phase.

Parameters

playing	Loop control variable to finish the level on collision or quit

6.20.2.6 setLevelOne()

```
BrokenShip * LevelOne::setLevelOne ()  [static]
```

Initializes Level One.

Returns

Pointer to the player object, in this case BrokenShip

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

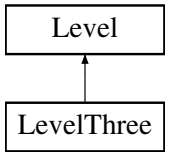
- include/levels.hpp
- src/levels.cpp

6.21 LevelThree Class Reference

Third phase of the game, a free-movement, shooter boss fight against Windows (The biggest piece of bloatware in earth)

```
#include <levels.hpp>
```

Inheritance diagram for LevelThree:



Static Public Member Functions

- static FixedShip * setLevelThree ()

  Initializes Level Three.
- static void cleanLevel ()

  Delete the player and clear the shots.
- static void mainLoop (bool &playing, bool &isAlive)
- static void updatePlayerPosition (FixedShip *player)
- static void handleTimerEvents (bool &playing, FixedShip *player, WindowsBoss &windows, bool &isAlive)
- static void handleKeyPressEvents (bool &playing, FixedShip *player, WindowsBoss &boss, bool &isAlive)
- static void handleKeyReleaseEvents (bool &playing)
- static void handleKeyPressEvents (bool &playing, FixedShip *player)
- static void handleKeyReleaseEvents ()

Additional Inherited Members

Static Protected Attributes inherited from Level

- static GameObject * _player = nullptr
- static Background _bg
- static ALLEGRO_EVENT _event

6.21.1 Detailed Description

Third phase of the game, a free-movement, shooter boss fight against Windows (The biggest piece of bloatware in earth)

- Key_pressed:

6.21.2 Member Function Documentation

6.21.2.1 cleanLevel()

```
void LevelThree::cleanLevel ()  [static]
```

Delete the player and clear the shots.

6.21.2.2 handleKeyPressEvents() [1/2]

```
void LevelThree::handleKeyPressEvents (
            bool & playing,
            FixedShip * player)  [static]
```

6.21.2.3 handleKeyPressEvents() [2/2]

```
void LevelThree::handleKeyPressEvents (
            bool & playing,
            FixedShip * player,
            WindowsBoss & boss,
            bool & isAlive)  [static]
```

6.21.2.4 handleKeyReleaseEvents() [1/2]

```
void LevelThree::handleKeyReleaseEvents ()  [static]
```

6.21.2.5 handleKeyReleaseEvents() [2/2]

```
void LevelThree::handleKeyReleaseEvents (
            bool & playing)  [static]
```

6.21.2.6 handleTimerEvents()

```
void LevelThree::handleTimerEvents (
            bool & playing,
            FixedShip * player,
            WindowsBoss & windows,
            bool & isAlive)  [static]
```

6.21.2.7 mainLoop()

```
void LevelThree::mainLoop (
            bool & playing,
            bool & isAlive)  [static]
```

6.21.2.8 setLevelThree()

```
FixedShip * LevelThree::setLevelThree ()  [static]
```

Initializes Level Three.

Returns

Pointer to the player object, in this case FixedShip

6.21.2.9 updatePlayerPosition()

```
void LevelThree::updatePlayerPosition (
            FixedShip * player)  [static]
```

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

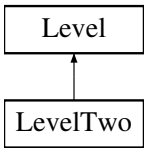
- include/levels.hpp
- src/levels.cpp

6.22 LevelTwo Class Reference

Second phase of the game, vertically-oriented flappy bird with moving obstacles (asteroids)

`#include <levels.hpp>`

Inheritance diagram for LevelTwo:



Static Public Member Functions

- static BrokenShip * setLevelTwo ()

  Initializes Level One.
- static void cleanLevel ()

  Frees memory used on Level two.
- static void mainLoop (bool &playing, bool &isAlive)
- static void handleTimerEvents (bool &playing, BrokenShip *player, std::vector< AbstractObstacle * > &obstacles, bool &isAlive)
- static void handleKeyPressEvents (bool &playing, BrokenShip *player, bool &isAlive)
- static void handleKeyReleaseEvents ()

Additional Inherited Members

Static Protected Attributes inherited from Level

- static GameObject * _player = nullptr
- static Background _bg
- static ALLEGRO_EVENT _event

6.22.1 Detailed Description

Second phase of the game, vertically-oriented flappy bird with moving obstacles (asteroids)

- _obstaclesList: level's list of Obstacles objects

6.22.2 Member Function Documentation

6.22.2.1 cleanLevel()

`void LevelTwo::cleanLevel () [static]`

Frees memory used on Level two.

6.22.2.2 handleKeyPressEvents()

```
void LevelTwo::handleKeyPressEvents (
            bool & playing,
            BrokenShip * player,
            bool & isAlive)  [static]
```

6.22.2.3 handleKeyReleaseEvents()

```
void LevelTwo::handleKeyReleaseEvents ()  [static]
```

6.22.2.4 handleTimerEvents()

```
void LevelTwo::handleTimerEvents (
            bool & playing,
            BrokenShip * player,
            std::vector< AbstractObstacle * > & obstacles,
            bool & isAlive)  [static]
```

6.22.2.5 mainLoop()

```
void LevelTwo::mainLoop (
            bool & playing,
            bool & isAlive)  [static]
```

6.22.2.6 setLevelTwo()

```
BrokenShip * LevelTwo::setLevelTwo ()  [static]
```

Initializes Level One.

Returns

Pointer to the player object, in this case BrokenShip

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

- include/levels.hpp
- src/levels.cpp

6.23 Line Class Reference

represents a line-shaped shot, like a laser.

6.23.1 Detailed Description

represents a line-shaped shot, like a laser.

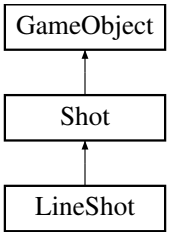
The documentation for this class was generated from the following file:

- src/shots.cpp

6.24 LineShot Class Reference

`#include <shots.hpp>`

Inheritance diagram for LineShot:



Public Member Functions

- LineShot (Vector initialPosi, Vector direction, float espessura, float comprimento, double tempoAtivacao)

  Build a shot in the form of a line, initializing the values, placing its address in the list of shots and making the variable _direction store the end point of the half-line.
- void draw () override

  Draw a line.
- void update () override

  It makes the line thinner over time, and when the activation time ends, the line turns red and starts to deal damage.
- bool isItActive () override

  Checks if line thickness is greater than 0.4.
- bool shotCollidedWithBoss (WindowsBoss &boss) override

  We haven't implemented the line shot for the player, so it doesn't make sense to implement this function.
- bool shotCollidedWithPlayer (FixedShip &player) override

  Check if the ball (line) collided with the player. (Circle-to-line collision.)

Public Member Functions inherited from Shot

- Shot (Vector position, Vector direction, ALLEGRO_COLOR shotColor)

  Build a standard shot.
- virtual ~Shot ()=default

Public Member Functions inherited from GameObject

- GameObject ()

  Create a new default GameObject.
- GameObject (Vector position)

  Create a new GameObject on given position.
- Vector get_position ()

  Get the position of a GameObject.
- void set_position (const Vector &position)

  Sets the position of a GameObject.
- virtual ~GameObject ()=0

  Game Object empty destructor.
- void set_bitmap (const char *path)

  Sets the sprite of the GameObject.

Additional Inherited Members

Static Public Member Functions inherited from Shot

- static void updateShots (FixedShip *player, WindowsBoss &boss, bool &playing)

  For all shots, from the shot list, they are updated and then it is checked if the shot is active or if it collided with something (boss or the player)
- static void drawShots ()

  Calls the draw() function of all active shots.
- static void cleanShots ()

  Destroys all shots.

Public Attributes inherited from GameObject

- ALLEGRO_BITMAP * objectSprite = NULL

Protected Attributes inherited from Shot

- Vector _direction
- ALLEGRO_COLOR _shotColor

Protected Attributes inherited from GameObject

- Vector _position

Static Protected Attributes inherited from Shot

- static std::list< Shot * > ShotsList

6.24.1 Constructor & Destructor Documentation

6.24.1.1 LineShot()

```
LineShot::LineShot (
            Vector initialPosi,
            Vector direction,
            float thickness,
            float length,
            double activationTime)
```

Build a shot in the form of a line, initializing the values, placing its address in the list of shots and making the variable _direction store the end point of the half-line.

Parameters

initialPosi	Starting point of the line segment.
direction	Vector that indicates the direction of the line.
thickness	line thickness. (Unit vector normally.)
length	Length of the semi-straight.
activationTime	Time for the shot to cause damage.

6.24.2 Member Function Documentation

6.24.2.1 draw()

```
void LineShot::draw ()  [override], [virtual]
```

Draw a line.

Implements Shot.

6.24.2.2 isItActive()

```
bool LineShot::isItActive ()  [override], [virtual]
```

Checks if line thickness is greater than 0.4.

Returns

If the ball shot is still active.

Implements Shot.

6.24.2.3 shotCollidedWithBoss()

```
bool LineShot::shotCollidedWithBoss (
            WindowsBoss & boss)  [override], [virtual]
```

We haven't implemented the line shot for the player, so it doesn't make sense to implement this function.

Parameters

boss	Boss address(windows).

Returns

If the line shot collided like the boss.

Implements Shot.

6.24.2.4 shotCollidedWithPlayer()

```
bool LineShot::shotCollidedWithPlayer (
            FixedShip & player)  [override], [virtual]
```

Check if the ball (line) collided with the player. (Circle-to-line collision.)

Parameters

player	Player address.

Returns

If the line shot collided like the player.

Implements Shot.

6.24.2.5 update()

```
void LineShot::update ()  [override], [virtual]
```

It makes the line thinner over time, and when the activation time ends, the line turns red and starts to deal damage.

Implements Shot.

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

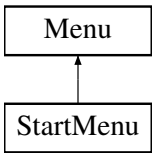
- include/shots.hpp
- src/shots.cpp

6.25 Menu Class Reference

base menu class

```
#include <menu.hpp>
```

Inheritance diagram for Menu:



Static Protected Attributes

- static ALLEGRO_EVENT event
- static ALLEGRO_FONT * font = nullptr
- static Interface * interface = nullptr

6.25.1 Detailed Description

base menu class

6.25.2 Member Data Documentation

6.25.2.1 event

```
ALLEGRO_EVENT Menu::event  [static], [protected]
```

6.25.2.2 font

```
ALLEGRO_FONT * Menu::font = nullptr  [static], [protected]
```

6.25.2.3 interface

```
Interface * Menu::interface = nullptr  [static], [protected]
```

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

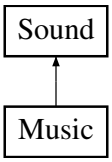
- include/menu.hpp
- src/menu.cpp

6.26 Music Class Reference

represents a sound in a more complex way, with pause and playback methods with fade-in and fade-out systems.

```
#include <music.hpp>
```

Inheritance diagram for Music:



Public Member Functions

- Music (const char *sound_address, float volume_parameter=0.6f, float fade_speed_parameter=2.0f)

  Construct a music.
- ~Music () override

  Destroy the music. (If the destroyer of music is called, the destroyer of sound will not be called, because ALLEGRO SAMPLE INSTANCE is just a more robust ALLEGRO SAMPLE, when we destroy ALLEGRO SAMPLE INSTANCE the ALLEGRO SAMPLE is destroyed together.)
- void play ()

  Play the music, starting where it left off.
- void pause ()

  Pause the music, setting the volume to zero.

Public Member Functions inherited from Sound

- Sound (const char *sound_address)

  Construct a sound.
- virtual ~Sound ()

  Destroys the sound.
- void play (float volume=1.0)

  Create and play a new sound.

Static Public Member Functions

- static void update_fade_in_fade_out ()

  Performs fade-in and fade-out (this method must be called cyclically to work correctly)
- static void muteMusic ()

  Pauses the currently playing music. (By definition it should only play one song at a time, that's why this works.)
- static void unMuteMusic ()

  Play the last song that tried to be played.

Static Public Member Functions inherited from Sound

- static void muteSounds ()

  Disables sounds and mutes music.
- static void unmuteSounds ()

  Enables sounds and plays music.

Additional Inherited Members

Static Public Attributes inherited from Sound

- static float volumeMester = 1.0f

Protected Attributes inherited from Sound

- ALLEGRO_SAMPLE * sound_sample = nullptr

Static Protected Attributes inherited from Sound

- static bool isSoundMuted = false

6.26.1 Detailed Description

represents a sound in a more complex way, with pause and playback methods with fade-in and fade-out systems.

6.26.2 Constructor & Destructor Documentation

6.26.2.1 Music()

```
Music::Music (
            const char * sound_address,
            float volume_parameter = 0.6f,
            float fade_speed_parameter = 2.0f)
```

Construct a music.

Parameters

sound_address	The address of the music.
ballast_volume_parameter	Initializes the ballast_volume of the object.
fade_speed_parameter	Initializes the fade_speed of the object.

6.26.2.2 ~Music()

```
Music::~Music () [override]
```

Destroy the music. (If the destroyer of music is called, the destroyer of sound will not be called, because ALLEGRO SAMPLE INSTANCE is just a more robust ALLEGRO SAMPLE, when we destroy ALLEGRO SAMPLE INSTANCE the ALLEGRO SAMPLE is destroyed together.)

6.26.3 Member Function Documentation

6.26.3.1 muteMusic()

```
void Music::muteMusic () [static]
```

Pauses the currently playing music. (By definition it should only play one song at a time, that's why this works.)

6.26.3.2 pause()

```
void Music::pause ()
```

Pause the music, setting the volume to zero.

6.26.3.3 play()

```
void Music::play ()
```

Play the music, starting where it left off.

6.26.3.4 unMuteMusic()

```
void Music::unMuteMusic () [static]
```

Play the last song that tried to be played.

6.26.3.5 update_fade_in_fade_out()

```
void Music::update_fade_in_fade_out () [static]
```

Performs fade-in and fade-out (this method must be called cyclically to work correctly)

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

- include/music.hpp
- src/music.cpp

6.27 ObstaclesList Class Reference

Gerencia uma coleção polimórfica de múltiplos obstáculos.

`#include <obstacles_list.hpp>`

Public Member Functions

- void setPolygonsObstaclesList (const std::vector< Vector > &verts, const char *path)
  Adiciona novos obstáculos a uma lista de obstáculos poligonais.
- void setCircleObstaclesList (const char *path)
  Popula a lista com novos obstáculos do tipo obstáculos circulares.
- std::vector< AbstractObstacle * > & getList ()
  Obtém uma referência para a lista de obstáculos.
- void updateAll (std::vector< AbstractObstacle * > obstaclesList)
  Atualiza o estado de todos os obstáculos em uma lista fornecida.
- void drawAll (std::vector< AbstractObstacle * > obstaclesList)
  Desenha todos os obstáculos de uma lista fornecida na tela.
- void clear ()
  Limpa a lista de obstáculos, liberando toda a memória alocada.
- ~ObstaclesList ()
  Destrutor da classe ObstaclesList.

6.27.1 Detailed Description

Gerencia uma coleção polimórfica de múltiplos obstáculos.

Atua como uma lista para diferentes tipos de obstáculos herdados de AbstractObstacle. É responsável por criar, destruir, atualizar e desenhar todos os obstáculos contidos em sua lista interna.

Warning

Esta classe gerencia a memória dos obstáculos. A posse dos ponteiros pertence à lista, que os deletará em seu destrutor ou no método clear().

6.27.2 Constructor & Destructor Documentation

6.27.2.1 ~ObstaclesList()

`ObstaclesList::~ObstaclesList ()`

Destrutor da classe ObstaclesList.

Responsável por liberar a memória de todos os obstáculos que foram alocados dinamicamente.

6.27.3 Member Function Documentation

6.27.3.1 clear()

```
void ObstaclesList::clear ()
```

Limpa a lista de obstáculos, liberando toda a memória alocada.

deleta cada ponteiro de obstáculo e, em seguida, limpa o vetor. É útil para reiniciar o estado da lista.

6.27.3.2 drawAll()

```
void ObstaclesList::drawAll (
            std::vector< AbstractObstacle * > obstaclesList)
```

Desenha todos os obstáculos de uma lista fornecida na tela.

Parameters

obstaclesList	A lista de obstáculos a ser desenhada.

6.27.3.3 getList()

```
std::vector< AbstractObstacle * > & ObstaclesList::getList ()
```

Obtém uma referência para a lista de obstáculos.

Returns

Uma referência para o vetor `_obstaclesList`.

6.27.3.4 setCircleObstaclesList()

```
void ObstaclesList::setCircleObstaclesList (
            const char * path)
```

Popula a lista com novos obstáculos do tipo obstáculos circulares.

Limpa a lista atual e a preenche com uma quantidade determinada de novos obstáculos circulares, posicionados aleatoriamente na parte superior da tela.

Parameters

path	Caminho para o arquivo de imagem/sprite dos obstáculos.

6.27.3.5 setPolygonsObstaclesList()

```
void ObstaclesList::setPolygonsObstaclesList (
            const std::vector< Vector > & verts,
            const char * path)
```

Adiciona novos obstáculos a uma lista de obstáculos poligonais.

Limpa a lista atual e a preenche com uma quantidade determinada de novos obstáculos poligonais, posicionados aleatoriamente na parte superior da tela.

Parameters

verts	Vetor de Pontos que define a forma do polígono do obstáculo.
path	Caminho para o arquivo de imagem/sprite dos obstáculos.

6.27.3.6 updateAll()

```
void ObstaclesList::updateAll (
            std::vector< AbstractObstacle * > obstaclesList)
```

Atualiza o estado de todos os obstáculos em uma lista fornecida.

Parameters

obstaclesList	A lista de obstáculos a ser atualizada.

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

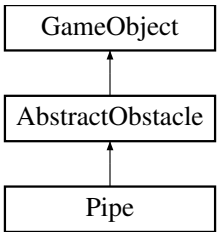
- include/obstacles_list.hpp
- src/obstacles_list.cpp

6.28 Pipe Class Reference

Representa um par de obstáculos (canos) que se movem em conjunto.

```
#include <pipe.hpp>
```

Inheritance diagram for Pipe:



Public Member Functions

- Pipe (const Vector &startPosition, const std::vector< Vector > &shapeLeft, const std::vector< Vector > &shapeRight, const char *imagePathLeft, const char *imagePathRight)

  Construtor da classe Pipe.
- void update () override

  Atualiza a posição do par de canos.
- void draw () override

  Desenha ambos os canos (esquerdo e direito) na tela.
- bool checkCollisionWithPlayer (BrokenShip &player) override

  Verifica se o jogador colidiu com algum dos canos.

Public Member Functions inherited from AbstractObstacle

- virtual ~AbstractObstacle ()=default

Public Member Functions inherited from GameObject

- GameObject ()

  Create a new default GameObject.
- GameObject (Vector position)

  Create a new GameObject on given position.
- Vector get_position ()

  Get the position of a GameObject.
- void set_position (const Vector &position)

  Sets the position of a GameObject.
- virtual ~GameObject ()=0

  Game Object empty destructor.
- void set_bitmap (const char *path)

  Sets the sprite of the GameObject.

Additional Inherited Members

Public Attributes inherited from GameObject

- ALLEGRO_BITMAP * objectSprite = NULL

Protected Member Functions inherited from AbstractObstacle

- void setSpeed (Vector speed)

  Define a velocidade do obstáculo.
- Vector getSpeed ()

  Obtém a velocidade atual do obstáculo.

Protected Attributes inherited from GameObject

- Vector _position

6.28.1 Detailed Description

Representa um par de obstáculos (canos) que se movem em conjunto.

Esta classe encapsula dois objetos PolygonObstacle (leftPipe e rightPipe) para criar um único obstáculo composto, como os canos em jogos no estilo Flappy Bird. Ela gerencia a lógica de atualização e desenho de ambos os canos como uma unidade, mantendo um gap fixo entre eles.

6.28.2 Constructor & Destructor Documentation

6.28.2.1 Pipe()

```
Pipe::Pipe (
            const Vector & startPosition,
            const std::vector< Vector > & shapeLeft,
            const std::vector< Vector > & shapeRight,
            const char * imagePathLeft,
            const char * imagePathRight)
```

Construtor da classe Pipe.

Cria um par de obstáculos (cano esquerdo e direito) que se movem em conjunto. A posição do cano direito é calculada com base na posição inicial do esquerdo. Uma velocidade vertical de 5 unidaes para baixo é definida como padrão para o par.

Parameters

startPosition	A posição inicial do cano esquerdo.
shapeLeft	Os vértices que definem a forma do polígono do cano esquerdo.
shapeRight	Os vértices que definem a forma do polígono do cano direito.
imagePathLeft	O caminho para o arquivo de imagem do cano esquerdo.
imagePathRight	O caminho para o arquivo de imagem do cano direito.

6.28.3 Member Function Documentation

6.28.3.1 checkCollisionWithPlayer()

```
bool Pipe::checkCollisionWithPlayer (
            BrokenShip & player)  [override], [virtual]
```

Verifica se o jogador colidiu com algum dos canos.

Parameters

player	Uma referência ao objeto da nave do jogador a ser verificado.

Returns

'true' se houver colisão com o cano esquerdo OU o direito, 'false' caso contrário.

Implements AbstractObstacle.

6.28.3.2 draw()

```
void Pipe::draw ()  [override], [virtual]
```

Desenha ambos os canos (esquerdo e direito) na tela.

Implements AbstractObstacle.

6.28.3.3 update()

```
void Pipe::update ()  [override], [virtual]
```

Atualiza a posição do par de canos.

Move o par de canos verticalmente para baixo. Se os canos ultrapassam o limite inferior da tela, eles são reposicionados no topo com uma nova posição horizontal aleatória. A lógica de reposicionamento garante que o gap entre eles seja mantido e que permaneçam dentro dos limites da tela.

Implements AbstractObstacle.

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

- include/pipe.hpp
- src/pipe.cpp

6.29 PipeList Class Reference

```
#include <obstacles_list.hpp>
```

Public Member Functions

- PipeList ()=default
- ~PipeList ()

  Destrutor da classe PipeList.
- void generatePipes (const std::vector< Vector > &shapeLeft, const std::vector< Vector > &shapeRight, const char *imagePathLeft, const char *imagePathRight)

  Gera e adiciona um par de canos a uma lista de pipes.
- std::vector< AbstractObstacle * > & getList ()

  Obtém uma referência para a lista de canos.
- void clear ()

  Limpa a lista de canos, liberando a memória.

6.29.1 Constructor & Destructor Documentation

6.29.1.1 PipeList()

```
PipeList::PipeList ()  [default]
```

6.29.1.2 ~PipeList()

```
PipeList::~PipeList ()
```

Destrutor da classe PipeList.

Libera a memória de todos os objetos Canos armazenados na lista.

6.29.2 Member Function Documentation

6.29.2.1 clear()

```
void PipeList::clear ()
```

Limpa a lista de canos, liberando a memória.

6.29.2.2 generatePipes()

```
void PipeList::generatePipes (
            const std::vector< Vector > & shapeLeft,
            const std::vector< Vector > & shapeRight,
            const char * imagePathLeft,
            const char * imagePathRight)
```

Gera e adiciona um par de canos a uma lista de pipes.

Cria e insere dois novos objetos na lista, esses dois preimeiros canos, possuem posições pré-definidas, para formar os obstáculos do jogo.

Parameters

shapeLeft	O vetor de Pontos do cano esquerdo.
shapeRight	O vetor de Pontos do cano direito.
imagePathLeft	O caminho da imagem para o cano esquerdo.
imagePathRight	O caminho da imagem para o cano direito.

6.29.2.3 getList()

```
std::vector< AbstractObstacle * > & PipeList::getList ()
```

Obtém uma referência para a lista de canos.

Returns

Uma referência para o vetor pipes contendo ponteiros AbstractObstacle, permitindo polimorfismo.

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

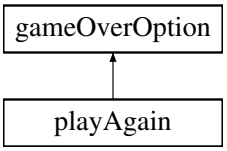
- include/obstacles_list.hpp
- src/obstacles_list.cpp

6.30 playAgain Class Reference

Ação para reiniciar o jogo.

`#include <game_over.hpp>`

Inheritance diagram for playAgain:



Public Member Functions

- ~playAgain () override=default
- void execute () override

  Função virtual pura que será sobrescrita pelas classes derivadas.

Public Member Functions inherited from gameOverOption

- virtual ~gameOverOption ()=default

  Destrutor virtual padrão para que a memória seja liberada corretamente nas classes derivadas.

6.30.1 Detailed Description

Ação para reiniciar o jogo.

6.30.2 Constructor & Destructor Documentation

6.30.2.1 ~playAgain()

```
playAgain::~playAgain ()  [override], [default]
```

6.30.3 Member Function Documentation

6.30.3.1 execute()

```
void playAgain::execute ()  [override], [virtual]
```

Função virtual pura que será sobrescrita pelas classes derivadas.

Implements gameOverOption.

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

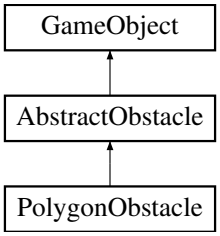
- include/game_over.hpp
- src/gameover.cpp

6.31 PolygonObstacle Class Reference

Representa um obstáculo com uma forma de colisão poligonal customizável.

`#include <polygon_obstacle.hpp>`

Inheritance diagram for PolygonObstacle:



Public Member Functions

- PolygonObstacle (const Vector &pos, const std::vector< Vector > &verts, float scale, const char *imagePath)

  Construtor da classe PolygonObstacle.
- void draw () override

  Desenha o obstáculo na tela.
- std::vector< Vector > getVertices ()

  Obtém os vértices que definem a forma do polígono.
- void update () override

  Atualiza a posição do obstáculo.
- bool checkCollisionWithPlayer (BrokenShip &player) override

  Verifica a colisão entre o obstáculo poligonal e a nave do jogador.

Public Member Functions inherited from AbstractObstacle

- virtual ~AbstractObstacle ()=default

Public Member Functions inherited from GameObject

- GameObject ()

  Create a new default GameObject.
- GameObject (Vector position)

  Create a new GameObject on given position.
- Vector get_position ()

  Get the position of a GameObject.
- void set_position (const Vector &position)

  Sets the position of a GameObject.
- virtual ~GameObject ()=0

  Game Object empty destructor.
- void set_bitmap (const char *path)

  Sets the sprite of the GameObject.

Additional Inherited Members

Public Attributes inherited from GameObject

- ALLEGRO_BITMAP * objectSprite = NULL

Protected Member Functions inherited from AbstractObstacle

- void setSpeed (Vector speed)

  Define a velocidade do obstáculo.
- Vector getSpeed ()

  Obtém a velocidade atual do obstáculo.

Protected Attributes inherited from GameObject

- Vector _position

6.31.1 Detailed Description

Representa um obstáculo com uma forma de colisão poligonal customizável.

Esta classe herda de AbstractObstacle e é usada para criar obstáculos cujos limites de colisão são definidos por um conjunto de vértices. Foi utilizado para formas complexas como asteroides ou os pipes.

6.31.2 Constructor & Destructor Documentation

6.31.2.1 PolygonObstacle()

```
PolygonObstacle::PolygonObstacle (
            const Vector & pos,
            const std::vector< Vector > & verts,
            float scale,
            const char * imagePath)  [inline]
```

Construtor da classe PolygonObstacle.

Inicializa o obstáculo, definindo sua posição, forma, escala e imagem. A escala fornecida é aplicada a cada um dos vértices no momento da construção.

Parameters

pos	A posição inicial do obstáculo.
verts	Um vetor de Vetores definindo a forma do polígono antes da escala.
scale	O fator de escala a ser aplicado nos vértices e no sprite.
imagePath	O caminho para o arquivo de imagem (sprite) do obstáculo.

6.31.3 Member Function Documentation

6.31.3.1 checkCollisionWithPlayer()

```
bool PolygonObstacle::checkCollisionWithPlayer (
            BrokenShip & player)  [override], [virtual]
```

Verifica a colisão entre o obstáculo poligonal e a nave do jogador.

Este método implementa a detecção de colisão entre um polígono e um círculo. Ele itera sobre cada aresta do polígono e calcula a menor distância do centro da nave até essa aresta. Se a distância for menor ou igual ao raio da nave para qualquer uma das arestas, considera-se que houve colisão.

Parameters

player	Uma referência ao objeto da nave do jogador, que é tratado como um círculo.

Returns

'true' se houver colisão, 'false' caso contrário.

Implements AbstractObstacle.

6.31.3.2 draw()

```
void PolygonObstacle::draw ()  [override], [virtual]
```

Desenha o obstáculo na tela.

Renderiza o sprite associado ao obstáculo. O sprite é desenhado de forma centralizada na posição do obstáculo e sua escala é ajustada de acordo com o membro _scale, para evitar que a imagem fique muito grande.

Implements AbstractObstacle.

6.31.3.3 getVertices()

```
std::vector< Vector > PolygonObstacle::getVertices ()
```

Obtém os vértices que definem a forma do polígono.

Returns

Um vetor de Vetores(coordenadas X e Y) contendo os vértices do polígono.

6.31.3.4 update()

```
void PolygonObstacle::update ()  [override], [virtual]
```

Atualiza a posição do obstáculo.

Move o obstáculo verticalmente para baixo, de acordo com sua velocidade. Se o obstáculo ultrapassar o limite inferior da tela, ele é reposicionado no topo com uma nova coordenada X aleatória.

Implements AbstractObstacle.

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

- include/polygon_obstacle.hpp
- src/polygon_obstacle.cpp

6.32 RegisterInterface Class Reference

Gerencia a interface gráfica e a lógica para registro e login de usuários.

`#include <register_interface.hpp>`

Public Member Functions

- RegisterInterface (ALLEGRO_FONT *font)
  Construtor da classe RegisterInterface.
- ~RegisterInterface ()
  Destrutor da classe RegisterInterface.
- void draw ()
  Desenha todos os elementos da interface na tela.
- void handleKeyInput (int keycode, unsigned char unicode)
  Processa a entrada de teclado para os campos de texto.
- void handleMouseClick (int mx, int my)
  Gerencia cliques do mouse para ativar os campos de texto.
- std::string getUsername () const
  Obtém o nome de usuário inserido.
- std::string getName () const
  Obtém o nome inserido.
- std::string getPassword () const
  Obtém a senha inserida.
- void resetFields ()
  Limpa todos os campos de texto e redefine o estado de digitação.
- int mainLoop (bool &inRegister, bool &playing, DatabaseUsers &db)
  Executa o loop principal da interface de registro e login.

6.32.1 Detailed Description

Gerencia a interface gráfica e a lógica para registro e login de usuários.

Esta classe encapsula todos os elementos da interface (campos de texto, botões), processa a entrada do usuário (teclado e mouse) e interage com o banco de dados para autenticar ou criar novos usuários.

6.32.2 Constructor & Destructor Documentation

6.32.2.1 RegisterInterface()

```
RegisterInterface::RegisterInterface (
            ALLEGRO_FONT * font)
```

Construtor da classe RegisterInterface.

Inicializa a interface de registro e login, definindo a fonte, as áreas dos campos de texto (nome, username, senha) e os botões de interação (Login, Register, Sair).

Parameters

font	Um ponteiro para o ALLEGRO_FONT que será usado para renderizar os textos na interface.

6.32.2.2 ~RegisterInterface()

```
RegisterInterface::~RegisterInterface ()
```

Destrutor da classe RegisterInterface.

Libera a memoria alocada para o BitMap da Imagem

6.32.3 Member Function Documentation

6.32.3.1 draw()

```
void RegisterInterface::draw ()
```

Desenha todos os elementos da interface na tela.

Renderiza as caixas de texto para nome, username e senha, e cada botão da interface.

6.32.3.2 getName()

```
std::string RegisterInterface::getName () const
```

Obtém o nome inserido.

Returns

A string do nome.

6.32.3.3 getPassword()

```
std::string RegisterInterface::getPassword () const
```

Obtém a senha inserida.

Returns

A string da senha.

6.32.3.4 getUsername()

```
std::string RegisterInterface::getUsername () const
```

Obtém o nome de usuário inserido.

Returns

A string do nome de usuário.

6.32.3.5 handleKeyInput()

```
void RegisterInterface::handleKeyInput (
            int keycode,
            unsigned char unicode)
```

Processa a entrada de teclado para os campos de texto.

Verifica qual campo de texto está ativo e modifica a string correspondente. Suporta a adição de caracteres ASCII imprimíveis e a remoção com a tecla Backspace.

Parameters

keycode	O código da tecla pressionada, usado para detectar teclas especiais como Backspace.
unicode	O caractere unicode correspondente à tecla, usado para adicionar texto.

6.32.3.6 handleMouseClick()

```
void RegisterInterface::handleMouseClick (
            int mx,
            int my)
```

Gerencia cliques do mouse para ativar os campos de texto.

Parameters

mx	A coordenada X do clique do mouse.
my	A coordenada Y do clique do mouse.

6.32.3.7 mainLoop()

```
int RegisterInterface::mainLoop (
            bool & inRegister,
            bool & playing,
            DatabaseUsers & db)
```

Executa o loop principal da interface de registro e login.

Gerencia o fluxo de eventos da tela, como entrada de teclado, cliques de mouse e fechamento da janela. Além disso, interage com a classe de banco de dados para logar ou registrar usuários. Ademais, controla a lógica de redesenho da tela e a animação do plano de fundo.

Parameters

inRegister	controla a permanência neste loop. É setado para false ao logar o usuário.
playing	Referência a um booleano que controla o loop principal do jogo. Ou seja, é false se o usuário fechar o jogo
db	Referência ao objeto DatabaseUsers para realizar operações de banco de dados.

Returns

Retorna 0 na conclusão normal ou ao fechar a janela.

6.32.3.8 resetFields()

```
void RegisterInterface::resetFields ()
```

Limpa todos os campos de texto e redefine o estado de digitação.

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

- include/register_interface.hpp
- src/register_interface.cpp

6.33 Represents Class Reference

6.33.1 Detailed Description

states that the boss, windows, can have.

types of attacks the boss can have.

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

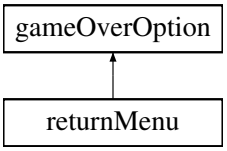
- include/boss_states.hpp

6.34 returnMenu Class Reference

Ação para retornar ao menu principal do jogo.

`#include <game_over.hpp>`

Inheritance diagram for returnMenu:



Public Member Functions

- ~returnMenu () override=default
- void execute () override

  Função virtual pura que será sobrescrita pelas classes derivadas.

Public Member Functions inherited from gameOverOption

- virtual ~gameOverOption ()=default

  Destrutor virtual padrão para que a memória seja liberada corretamente nas classes derivadas.

6.34.1 Detailed Description

Ação para retornar ao menu principal do jogo.

6.34.2 Constructor & Destructor Documentation

6.34.2.1 ~returnMenu()

`returnMenu::~returnMenu () [override], [default]`

6.34.3 Member Function Documentation

6.34.3.1 execute()

```
void returnMenu::execute ()  [override], [virtual]
```

Função virtual pura que será sobrescrita pelas classes derivadas.

Implements gameOverOption.

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

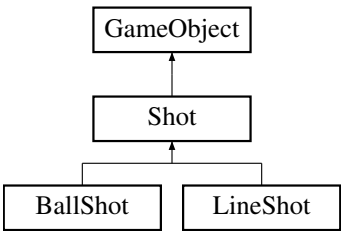
- include/game_over.hpp
- src/gameover.cpp

6.35 Shot Class Reference

represents a shot in a more abstract way, abstract class.

```
#include <shots.hpp>
```

Inheritance diagram for Shot:



Public Member Functions

- Shot (Vector position, Vector direction, ALLEGRO_COLOR shotColor)
  Build a standard shot.
- virtual ~Shot ()=default
- virtual bool isItActive ()=0
- virtual bool shotCollidedWithPlayer (FixedShip &player)=0
- virtual bool shotCollidedWithBoss (WindowsBoss &boss)=0
- virtual void draw ()=0
- virtual void update ()=0

Public Member Functions inherited from GameObject

- GameObject ()
  Create a new default GameObject.
- GameObject (Vector position)
  Create a new GameObject on given position.
- Vector get_position ()
  Get the position of a GameObject.
- void set_position (const Vector &position)
  Sets the position of a GameObject.
- virtual ~GameObject ()=0
  Game Object empty destructor.
- void set_bitmap (const char *path)
  Sets the sprite of the GameObject.

Static Public Member Functions

- static void updateShots (FixedShip *player, WindowsBoss &boss, bool &playing)

  For all shots, from the shot list, they are updated and then it is checked if the shot is active or if it collided with something (boss or the player)
- static void drawShots ()

  Calls the draw() function of all active shots.
- static void cleanShots ()

  Destroys all shots.

Protected Attributes

- Vector _direction
- ALLEGRO_COLOR _shotColor

Protected Attributes inherited from GameObject

- Vector _position

Static Protected Attributes

- static std::list< Shot * > ShotsList

Additional Inherited Members

Public Attributes inherited from GameObject

- ALLEGRO_BITMAP * objectSprite = NULL

6.35.1 Detailed Description

represents a shot in a more abstract way, abstract class.

6.35.2 Constructor & Destructor Documentation

6.35.2.1 Shot()

```
Shot::Shot (
            Vector position,
            Vector direction,
            ALLEGRO_COLOR shotColor)
```

Build a standard shot.

Parameters

position	The initial position of the shot.
direction	A vector in which the shot moves or points.
shotColor	A shot color.

6.35.2.2 ~Shot()

```
virtual Shot::~Shot ()  [virtual], [default]
```

6.35.3 Member Function Documentation

6.35.3.1 cleanShots()

```
void Shot::cleanShots ()  [static]
```

Destroys all shots.

6.35.3.2 draw()

```
virtual void Shot::draw ()  [pure virtual]
```

Implemented in BallShot, and LineShot.

6.35.3.3 drawShots()

```
void Shot::drawShots ()  [static]
```

Calls the draw() function of all active shots.

6.35.3.4 isItActive()

```
virtual bool Shot::isItActive ()  [pure virtual]
```

Implemented in BallShot, and LineShot.

6.35.3.5 shotCollidedWithBoss()

```
virtual bool Shot::shotCollidedWithBoss (
            WindowsBoss & boss)  [pure virtual]
```

Implemented in BallShot, and LineShot.

6.35.3.6 shotCollidedWithPlayer()

```
virtual bool Shot::shotCollidedWithPlayer (
            FixedShip & player)  [pure virtual]
```

Implemented in BallShot, and LineShot.

6.35.3.7 update()

```
virtual void Shot::update ()  [pure virtual]
```

Implemented in BallShot, and LineShot.

6.35.3.8 updateShots()

```
void Shot::updateShots (
            FixedShip * player,
            WindowsBoss & boss,
            bool & playing)  [static]
```

For all shots, from the shot list, they are updated and then it is checked if the shot is active or if it collided with something (boss or the player)

Parameters

player	Player pointer.
boss	Boss address(windows).
playing	Address of the variable that indicates whether the game is still active.

6.35.4 Member Data Documentation

6.35.4.1 _direction

```
Vector Shot::_direction  [protected]
```

6.35.4.2 _shotColor

```
ALLEGRO_COLOR Shot::_shotColor  [protected]
```

6.35.4.3 ShotsList

```
std::list< Shot * > Shot::ShotsList  [static], [protected]
```

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

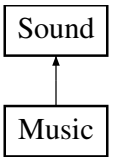
- include/shots.hpp
- src/shots.cpp

6.36 Sound Class Reference

class that represents a simple sound, with a musical object, ALLEGRO_SAMPLE, and a play method.

`#include <sound.hpp>`

Inheritance diagram for Sound:



Public Member Functions

- Sound (const char *sound_address)
  Construct a sound.
- virtual ~Sound ()
  Destroys the sound.
- void play (float volume=1.0)
  Create and play a new sound.

Static Public Member Functions

- static void muteSounds ()
  Disables sounds and mutes music.
- static void unmuteSounds ()
  Enables sounds and plays music.

Static Public Attributes

- static float volumeMester = 1.0f

Protected Attributes

- ALLEGRO_SAMPLE * sound_sample = nullptr

Static Protected Attributes

- static bool isSoundMuted = false

6.36.1 Detailed Description

class that represents a simple sound, with a musical object, ALLEGRO_SAMPLE, and a play method.

6.36.2 Constructor & Destructor Documentation

6.36.2.1 Sound()

```
Sound::Sound (
            const char * sound_address)
```

Construct a sound.

Parameters

sound_address	The address of the sound.

6.36.2.2 ~Sound()

```
Sound::~Sound ()  [virtual]
```

Destroys the sound.

6.36.3 Member Function Documentation

6.36.3.1 muteSounds()

```
void Sound::muteSounds ()  [static]
```

Disables sounds and mutes music.

6.36.3.2 play()

```
void Sound::play (
            float volume = 1.0)
```

Create and play a new sound.

Parameters

volume	Volume at which the new sound will play.

6.36.3.3 unmuteSounds()

```
void Sound::unmuteSounds ()  [static]
```

Enables sounds and plays music.

6.36.4 Member Data Documentation

6.36.4.1 isSoundMuted

```
bool Sound::isSoundMuted = false  [static], [protected]
```

6.36.4.2 sound_sample

```
ALLEGRO_SAMPLE* Sound::sound_sample = nullptr  [protected]
```

6.36.4.3 volumeMester

```
float Sound::volumeMester = 1.0f  [static]
```

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

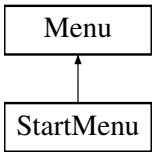
- include/sound.hpp
- src/sound.cpp

6.37 StartMenu Class Reference

main menu that inherits from the base menu class

```
#include <menu.hpp>
```

Inheritance diagram for StartMenu:



Static Public Member Functions

- static void mainLoopMenu (bool &playing)
  starts needed variables and handles needed events

Additional Inherited Members

Static Protected Attributes inherited from Menu

- static ALLEGRO_EVENT event
- static ALLEGRO_FONT * font = nullptr
- static Interface * interface = nullptr

6.37.1 Detailed Description

main menu that inherits from the base menu class

6.37.2 Member Function Documentation

6.37.2.1 mainLoopMenu()

```
void StartMenu::mainLoopMenu (
            bool & playing)  [static]
```

starts needed variables and handles needed events

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

- include/menu.hpp
- src/menu.cpp

6.38 User Struct Reference

Estrutura simples para armazenar os dados de um usuário.

`#include <database_users.hpp>`

Public Attributes

- int id
- std::string username
- int score
- std::string name
- int games

6.38.1 Detailed Description

Estrutura simples para armazenar os dados de um usuário.

6.38.2 Member Data Documentation

6.38.2.1 games

```
int User::games
```

6.38.2.2 id

```
int User::id
```

6.38.2.3 name

```
std::string User::name
```

6.38.2.4 score

```
int User::score
```

6.38.2.5 username

```
std::string User::username
```

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

- include/database_users.hpp

6.39 Vector Class Reference

Implements 2D vectors that represent cartesian coordinates.

`#include <movement.hpp>`

Public Member Functions

- Vector ()
  Creates a new default vector.
- Vector (float _xy)
  Creats a new vector based on one value.
- Vector (float _x, float _y)
  Creates a new vector based on x and y values.
- Vector operator+ (const Vector &other) const
  Implements vector sum using operator overload.
- Vector operator- (const Vector &other) const
  Implements vector subtraction using operator overload.
- Vector operator∗ (float value) const
  Implements vector multiplication by scalar using operator overload.

Static Public Member Functions

- static float dot (const Vector &a, const Vector &b)
  Calcula o produto escalar entre dois vetores.
- static float distance (const Vector &a, const Vector &b)
  Calcula a distância entre dois pontos (representados como vetores).
- static float shortestDistancePointToSegment (const Vector &p, const Vector &a, const Vector &b)
  Calcula a menor distância de um ponto a um segmento de reta.

Public Attributes

- float _x
- float _y

6.39.1 Detailed Description

Implements 2D vectors that represent cartesian coordinates.

6.39.2 Constructor & Destructor Documentation

6.39.2.1 Vector() [1/3]

`Vector::Vector ()`

Creates a new default vector.

6.39.2.2 Vector() [2/3]

```
Vector::Vector (
            float _xy)
```

Creats a new vector based on one value.

6.39.2.3 Vector() [3/3]

```
Vector::Vector (
            float _x,
            float _y)
```

Creates a new vector based on x and y values.

6.39.3 Member Function Documentation

6.39.3.1 distance()

```
float Vector::distance (
            const Vector & a,
            const Vector & b)  [static]
```

Calcula a distância entre dois pontos (representados como vetores).

Mede o comprimento do segmento de reta que conecta os dois pontos. A implementação calcula o vetor diferença d = a - b e então retorna seu módulo, que é a raiz quadrada do produto escalar de d por ele mesmo.

Parameters

a	O primeiro vetor.
b	O segundo vetor.

Returns

A distância em linha reta entre os pontos a e b.

6.39.3.2 dot()

```
float Vector::dot (
            const Vector & a,
            const Vector & b)  [static]
```

Calcula o produto escalar entre dois vetores.

Parameters

a	O primeiro vetor.
b	O segundo vetor.

Returns

O valor do produto escalar como um número de ponto flutuante.

6.39.3.3 operator∗()

```
Vector Vector::operator* (
            float value) const
```

Implements vector multiplication by scalar using operator overload.

6.39.3.4 operator+()

```
Vector Vector::operator+ (
            const Vector & other) const
```

Implements vector sum using operator overload.

6.39.3.5 operator-()

```
Vector Vector::operator- (
            const Vector & other) const
```

Implements vector subtraction using operator overload.

6.39.3.6 shortestDistancePointToSegment()

```
float Vector::shortestDistancePointToSegment (
            const Vector & p,
            const Vector & a,
            const Vector & b)  [static]
```

Calcula a menor distância de um ponto a um segmento de reta.

Este método encontra o ponto em um segmento de reta (definido por a e b) que está mais próximo do ponto p e retorna a distância entre eles. A lógica consiste em projetar o vetor ap sobre o vetor ab e obter um triângulo retângulo.

Parameters

p	O ponto do qual se deseja calcular a distância.
a	O ponto inicial do segmento de reta.
b	O ponto final do segmento de reta.

Returns

A menor distância entre o ponto p e o segmento ab.

6.39.4 Member Data Documentation

6.39.4.1 _x

```
float Vector::_x
```

6.39.4.2 _y

```
float Vector::_y
```

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

- include/movement.hpp
- src/movement.cpp

6.40 victoryInterface Class Reference

interface to the "victory screen" after defeating the final boss (windows)

```
#include <interface.hpp>
```

Public Member Functions

- victoryInterface (ALLEGRO_FONT *font)
  victoryInterface constructor
- void drawVictoryScreen ()
  draws the victory screen

6.40.1 Detailed Description

interface to the "victory screen" after defeating the final boss (windows)

6.40.2 Constructor & Destructor Documentation

6.40.2.1 victoryInterface()

```
victoryInterface::victoryInterface (
            ALLEGRO_FONT * font)
```

victoryInterface constructor

Parameters

font	pointer to an ALLEGRO_FONT variable for the text to be drawn

6.40.3 Member Function Documentation

6.40.3.1 drawVictoryScreen()

```
void victoryInterface::drawVictoryScreen ()
```

draws the victory screen

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

- include/interface.hpp
- src/interface.cpp

6.41 Windows Class Reference

represents the game's boss, Windows.

6.41.1 Detailed Description

represents the game's boss, Windows.

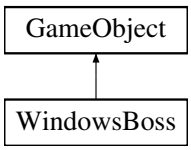
The documentation for this class was generated from the following file:

- src/windows_boss.cpp

6.42 WindowsBoss Class Reference

`#include <windows_boss.hpp>`

Inheritance diagram for WindowsBoss:



Public Member Functions

- WindowsBoss (float halfSide, float life)

  Build a windows boss and define the variables.
- void draw ()

  Draw the boss, first he draws the big square and then the 4 smaller ones inside and they are all made from the center point of the square.
- void update (FixedShip *player, bool &playing)

  Implements the boss states and checks if the player collided with it. The boss's states are, Descending, when he enters the screen, beginning of the stage, Attacking, main mode where he switches between different types of attack, Rising, when the boss's life is zero.
- float getHalfSide ()

  Returns the measurement of half the side of the square.
- bool isDead ()
- void takeDamage (FixedShip *player)

  Applies damage to the boss.

Public Member Functions inherited from GameObject

- GameObject ()

  Create a new default GameObject.
- GameObject (Vector position)

  Create a new GameObject on given position.
- Vector get_position ()

  Get the position of a GameObject.
- void set_position (const Vector &position)

  Sets the position of a GameObject.
- virtual ~GameObject ()=0

  Game Object empty destructor.
- void set_bitmap (const char *path)

  Sets the sprite of the GameObject.

Additional Inherited Members

Public Attributes inherited from GameObject

- ALLEGRO_BITMAP * objectSprite = NULL

Protected Attributes inherited from GameObject

- Vector _position

6.42.1 Constructor & Destructor Documentation

6.42.1.1 WindowsBoss()

```
WindowsBoss::WindowsBoss (
            float halfSide,
            float life)
```

Build a windows boss and define the variables.

6.42.2 Member Function Documentation

6.42.2.1 draw()

```
void WindowsBoss::draw ()
```

Draw the boss, first he draws the big square and then the 4 smaller ones inside and they are all made from the center point of the square.

6.42.2.2 getHalfSide()

```
float WindowsBoss::getHalfSide ()
```

Returns the measurement of half the side of the square.

Returns

Return half side of square.

6.42.2.3 isDead()

```
bool WindowsBoss::isDead ()
```

6.42.2.4 takeDamage()

```
void WindowsBoss::takeDamage (
            FixedShip * player)
```

Applies damage to the boss.

Parameters

player	The player's address, to disable player damage when necessary.

6.42.2.5 update()

```
void WindowsBoss::update (
            FixedShip * player,
            bool & playing)
```

Implements the boss states and checks if the player collided with it. The boss's states are, Descending, when he enters the screen, beginning of the stage, Attacking, main mode where he switches between different types of attack, Rising, when the boss's life is zero.

Parameters

player	Player memory address.
playing	Variable that controls whether the game is active or not.

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

- include/windows_boss.hpp
- src/windows_boss.cpp

Chapter 7

File Documentation

7.1 include/abstract_obstacle.hpp File Reference

```
#include "game_object.hpp"
```

Classes

- class AbstractObstacle

  Classe base abstrata para todos os tipos de obstáculos no jogo.

7.2 abstract_obstacle.hpp

Go to the documentation of this file.

```
00001 #pragma once
00002 #include "game_object.hpp"
00003
00012
00013 class AbstractObstacle : public GameObject {
00014 private:
00015   Vector _speed;
00016 protected:
00022     void setSpeed(Vector speed);
00023
00028     Vector getSpeed();
00029 public:
00030     virtual void draw() = 0;
00031     virtual void update() = 0;
00032     virtual bool checkCollisionWithPlayer(BrokenShip& player) = 0;
00033     virtual ~AbstractObstacle() = default;
00034
00035 };
```

7.3 include/bootstrap.hpp File Reference

```
#include <allegro5/allegro.h>
#include <allegro5/allegro_font.h>
#include <allegro5/allegro_primitives.h>
#include <allegro5/allegro_ttf.h>
#include <allegro5/mouse.h>
#include <allegro5/events.h>
#include <allegro5/timer.h>
#include <allegro5/color.h>
#include <allegro5/allegro_image.h>
#include "sound.hpp"
#include "music.hpp"
```

Classes

- class Bootstrap

  Static class that encapsulates initialization and cleanup of allegro components.

Namespaces

- namespace globalVars

Variables

- constexpr float FPS = 30
- constexpr int SCREEN_W = 800
- constexpr int SCREEN_H = 600
- constexpr int BUTTON_W = 400
- constexpr int BUTTON_H = 60
- constexpr int OBSTACLES_LIST_NUM = 4
- constexpr float SCALE_PIPES = 0.33f
- constexpr float SCALE_ASTEROID = 0.19f
- const float velocity [ ] = {9.0f, 9.3f, 9.7f, 10.2f, 10.8f, 11.5f, 12.0f, 12.8f, 13.5f}
- const int TAM_VECTOR_VELOCITY = sizeof(velocity)/sizeof(velocity[0])
- const ALLEGRO_COLOR BACKGROUND_COLOR
- ALLEGRO_DISPLAY * display
- ALLEGRO_EVENT_QUEUE * event_queue
- ALLEGRO_TIMER * timer
- ALLEGRO_FONT * gameFont
- ALLEGRO_FONT * levelFont
- ALLEGRO_BITMAP * gameOverBackground
- ALLEGRO_BITMAP * pinguimBandido
- ALLEGRO_BITMAP * backgroundImage
- ALLEGRO_BITMAP * pendrive
- ALLEGRO_BITMAP * ballShotSprite
- Sound * death_sound
- Sound * gunshot_sound1
- Sound * gunshot_sound2
- Sound * gunshot_sound3
- Sound * gunshot_sound4

- Music * menu_music
- Music * pause_game_music
- Music * level_one_music
- Music * level_two_music
- Music * level_three_music
- Music * defeat_music
- Music * victory_music

7.3.1 Variable Documentation

7.3.1.1 BACKGROUND_COLOR

```
const ALLEGRO_COLOR BACKGROUND_COLOR  [extern]
```

7.3.1.2 backgroundImage

```
ALLEGRO_BITMAP* backgroundImage  [extern]
```

7.3.1.3 ballShotSprite

```
ALLEGRO_BITMAP* ballShotSprite  [extern]
```

7.3.1.4 BUTTON_H

```
int BUTTON_H = 60  [constexpr]
```

7.3.1.5 BUTTON_W

```
int BUTTON_W = 400  [constexpr]
```

7.3.1.6 death_sound

```
Sound* death_sound  [extern]
```

7.3.1.7 defeat_music

```
Music* defeat_music  [extern]
```

7.3.1.8 display

```
ALLEGRO_DISPLAY* display  [extern]
```

7.3.1.9 event_queue

```
ALLEGRO_EVENT_QUEUE* event_queue  [extern]
```

7.3.1.10 FPS

```
float FPS = 30  [constexpr]
```

7.3.1.11 gameFont

```
ALLEGRO_FONT* gameFont  [extern]
```

7.3.1.12 gameOverBackground

```
ALLEGRO_BITMAP* gameOverBackground  [extern]
```

7.3.1.13 gunshot_sound1

```
Sound* gunshot_sound1  [extern]
```

7.3.1.14 gunshot_sound2

```
Sound* gunshot_sound2  [extern]
```

7.3.1.15 gunshot_sound3

```
Sound* gunshot_sound3  [extern]
```

7.3.1.16 gunshot_sound4

```
Sound* gunshot_sound4  [extern]
```

7.3.1.17 level_one_music

```
Music* level_one_music  [extern]
```

7.3.1.18 level_three_music

```
Music* level_three_music  [extern]
```

7.3.1.19 level_two_music

```
Music* level_two_music  [extern]
```

7.3.1.20 levelFont

```
ALLEGRO_FONT* levelFont  [extern]
```

7.3.1.21 menu_music

```
Music* menu_music  [extern]
```

7.3.1.22 OBSTACLES_LIST_NUM

```
int OBSTACLES_LIST_NUM = 4  [constexpr]
```

7.3.1.23 pause_game_music

```
Music* pause_game_music  [extern]
```

7.3.1.24 pendrive

```
ALLEGRO_BITMAP* pendrive  [extern]
```

7.3.1.25 pinguimBandido

```
ALLEGRO_BITMAP* pinguimBandido  [extern]
```

7.3.1.26 SCALE_ASTEROID

```
float SCALE_ASTEROID = 0.19f  [constexpr]
```

7.3.1.27 SCALE_PIPES

```
float SCALE_PIPES = 0.33f  [constexpr]
```

7.3.1.28 SCREEN_H

```
int SCREEN_H = 600  [constexpr]
```

7.3.1.29 SCREEN_W

```
int SCREEN_W = 800  [constexpr]
```

7.3.1.30 TAM_VECTOR_VELOCITY

```
const int TAM_VECTOR_VELOCITY = sizeof(velocity)/sizeof(velocity[0])
```

7.3.1.31 timer

```
ALLEGRO_TIMER* timer  [extern]
```

7.3.1.32 velocity

```
const float velocity[] = {9.0f, 9.3f, 9.7f, 10.2f, 10.8f, 11.5f, 12.0f, 12.8f, 13.5f}
```

7.3.1.33 victory_music

```
Music* victory_music  [extern]
```

7.4 bootstrap.hpp

Go to the documentation of this file.

```
00001 #ifndef BOOTSTRAP_HPP
00002 #define BOOTSTRAP_HPP
00003
00004 #include <allegro5/allegro.h>
00005 #include <allegro5/allegro_font.h>
00006 #include <allegro5/allegro_primitives.h>
00007 #include <allegro5/allegro_ttf.h>
00008 #include <allegro5/mouse.h>
00009 #include <allegro5/events.h>
00010 #include <allegro5/timer.h>
00011 #include <allegro5/color.h>
00012 #include <allegro5/events.h>
00013 #include <allegro5/allegro_image.h>
00014 #include <allegro5/allegro_image.h>
00015 #include <allegro5/allegro_ttf.h>
00016 #include <allegro5/allegro_font.h>
00017 #include "sound.hpp"
00018 #include "music.hpp"
00019
00020 /* -- Globals -- */
00021
00022 /* Consts */
00023 constexpr float FPS = 30;
00024 constexpr int SCREEN_W = 800;
00025 constexpr int SCREEN_H = 600;
00026 constexpr int BUTTON_W = 400;
00027 constexpr int BUTTON_H = 60;
00028 constexpr int OBSTACLES_LIST_NUM = 4;
00029 constexpr float SCALE_PIPES = 0.33f;
00030 constexpr float SCALE_ASTEROID = 0.19f;
00031 const float velocity[] = {9.0f, 9.3f, 9.7f, 10.2f, 10.8f, 11.5f, 12.0f, 12.8f, 13.5f};
00032 const int TAM_VECTOR_VELOCITY = sizeof(velocity)/sizeof(velocity[0]);
00033
00034 extern const ALLEGRO_COLOR BACKGROUND_COLOR;
00035 /* Allegro Components */
00036 extern ALLEGRO_DISPLAY* display;
00037 extern ALLEGRO_EVENT_QUEUE* event_queue;
```

```
00038 extern ALLEGRO_TIMER* timer;
00039
00040 /* Fonts */
00041 extern ALLEGRO_FONT* gameFont;
00042 extern ALLEGRO_FONT* levelFont;
00043
00044 namespace globalVars {
00045   extern bool inInterLevel;
00046   extern int points;
00047   extern std::string usernameGlobal;
00048 }
00049
00050 /* Assets */
00051 extern ALLEGRO_BITMAP* gameOverBackground;
00052 extern ALLEGRO_BITMAP* pinguimBandido;
00053 extern ALLEGRO_BITMAP* backgroundImage;
00054 extern ALLEGRO_BITMAP* pendrive;
00055 extern ALLEGRO_BITMAP* ballShotSprite;
00056
00057 /* Sound FX */
00058 extern Sound* death_sound;
00059 extern Sound* gunshot_sound1;
00060 extern Sound* gunshot_sound2;
00061 extern Sound* gunshot_sound3;
00062 extern Sound* gunshot_sound4;
00063
00064 /* Game Music */
00065 extern Music* menu_music;
00066 extern Music* pause_game_music;
00067 extern Music* level_one_music;
00068 extern Music* level_two_music;
00069 extern Music* level_three_music;
00070 extern Music* defeat_music;
00071 extern Music* victory_music;
00072
00077
00078 class Bootstrap {
00079   private:
00080     static bool initialize_sys_sound();
00081     static void initialize_sounds();
00082   public:
00083     static bool initialize_allegro();
00084     static bool init_allegro_libs();
00085     static void register_allegro_events();
00086     static void cleanup_allegro();
00087     static bool file_exists(const char* path);
00088     static void start_sprite(ALLEGRO_BITMAP *&bitm, const char* path);
00089     static void start_font(ALLEGRO_FONT *&font, const char* path, int size);
00090 };
00091
00092 #endif
```

7.5 include/boss_states.hpp File Reference

Enumerations

- enum struct BossStates { descending , attacking , ascending }
- enum struct AttackType {
  ballShots1 , ballShots2 , ballShots3 , lineShotsRight ,
  lineShotsLeft , lineShotsDown }

7.5.1 Enumeration Type Documentation

7.5.1.1 AttackType

```
enum struct AttackType  [strong]
```

Enumerator

ballShots1	
ballShots2	
ballShots3	
lineShotsRight	
lineShotsLeft	
lineShotsDown	

7.5.1.2 BossStates

```
enum struct BossStates  [strong]
```

Enumerator

descending	
attacking	
ascending	

7.6 boss_states.hpp

Go to the documentation of this file.

```
00001 #ifndef BOSS_STATES
00002 #define BOSS_STATES
00003
00007 enum struct BossStates {
00008     descending,
00009     attacking,
00010     ascending
00011 };
00012
00016 enum struct AttackType {
00017     ballShots1,
00018     ballShots2,
00019     ballShots3,
00020     lineShotsRight,
00021     lineShotsLeft,
00022     lineShotsDown
00023 };
00024
00025 #endif
```

7.7 include/circle_obstacle.hpp File Reference

```
#include "movement.hpp"
#include "abstract_obstacle.hpp"
#include <vector>
#include <math.h>
```

Classes

- class CircleObstacle

  Representa um obstáculo com uma forma de colisão perfeitamente circular.

7.8 circle_obstacle.hpp

Go to the documentation of this file.

```
00001 #ifndef OBSTACLE_HPP
00002 #define OBSTACLE_HPP
00003
00004 #include "movement.hpp"
00005 #include "abstract_obstacle.hpp"
00006 #include <vector>
00007 #include <math.h>
00008
00015
00016 class CircleObstacle : public AbstractObstacle{
00017 private:
00018
00019   float _radius = 20;
00020
00021 public:
00030   CircleObstacle(const Vector &pos, const char* path);
00031
00036
00037   float get_radius() const;
00043
00044   void draw() override;
00051
00052   void update() override;
00053
00062
00063   bool checkCollisionWithPlayer(BrokenShip& player) override;
00064
00065 };
00066
00067 #endif
00068
00069
```

7.9 include/collision.hpp File Reference

```
#include "game_object.hpp"
#include "bootstrap.hpp"
#include "polygon_obstacle.hpp"
#include "movement.hpp"
```

Functions

- bool checkCircleCollision (GameObject &a, float radius_a, GameObject &b, float radius_b)
- bool isCollidingEdge (Vector &new_position, BrokenShip *player)

  Verifica se o jogador está colidindo com a borda direita da tela.
- void newPositionAfterCollisionEdge (Vector &new_position, BrokenShip *player)

  Corrige a posição do jogador após uma colisão com a borda direita da tela.
- bool checkCollisionWithPlayer (PolygonObstacle &polygon, BrokenShip &player)
- bool circleSquareCollision (Vector circlePoint, float radius, Vector squarePoint, float halfSide)

  Checks whether a circle and a square collide on the plane.
- bool circleCircleCollision (Vector circleA, float radiusA, Vector circleB, float radiusB)

  Check if two circles collided.
- float distanceBetweenPoints (Vector pointA, Vector pointB)

  Calculates the distance between two points on the plane.

7.9.1 Function Documentation

7.9.1.1 checkCircleCollision()

```
bool checkCircleCollision (
            GameObject & a,
            float radius_a,
            GameObject & b,
            float radius_b)
```

7.9.1.2 checkCollisionWithPlayer()

```
bool checkCollisionWithPlayer (
            PolygonObstacle & polygon,
            BrokenShip & player)
```

7.9.1.3 circleCircleCollision()

```
bool circleCircleCollision (
            Vector circleA,
            float radiusA,
            Vector circleB,
            float radiusB)
```

Check if two circles collided.

Parameters

circleA	Center point of circle A.
radiusA	Radius of circle A.
CircleB	Center point of circle B.
radiusB	Radius of circle B.

Returns

There was a collision.

7.9.1.4 circleSquareCollision()

```
bool circleSquareCollision (
            Vector circlePoint,
            float radius,
            Vector squarePoint,
            float halfSide)
```

Checks whether a circle and a square collide on the plane.

Parameters

circlePoint	Center point of the circle.
radius	Radius of circle.
squarePoint	Center point of the square.
halfSide	Half the side of the square.

Returns

There was a collision.

7.9.1.5 distanceBetweenPoints()

```
float distanceBetweenPoints (
            Vector pointA,
            Vector pointB)
```

Calculates the distance between two points on the plane.

Returns

The distance.

7.9.1.6 isCollidingEdge()

```
bool isCollidingEdge (
            Vector & new_position,
            BrokenShip * player)
```

Verifica se o jogador está colidindo com a borda direita da tela.

Testa se a coordenada X da posição futura do jogador, somada ao seu raio, ultrapassa a largura da tela (SCREEN↩ _W).

Parameters

new_position	A posição futura do jogador a ser testada.
player	Um ponteiro para o objeto do jogador, usado para obter seu raio.

Returns

true se estiver colidindo com a borda direita, false caso contrário.

7.9.1.7 newPositionAfterCollisionEdge()

```
void newPositionAfterCollisionEdge (
            Vector & new_position,
            BrokenShip * player)
```

Corrige a posição do jogador após uma colisão com a borda direita da tela.

Reposiciona o jogador de forma que sua borda direita fique exatamente alinhada com a borda direita da tela SCREEN_W, impedindo que ele saia da área visível.

Parameters

new_position	A posição do jogador, que será modificada por referência.
player	Um ponteiro para o objeto do jogador, usado para obter seu raio.

7.10 collision.hpp

Go to the documentation of this file.

```
00001 #ifndef COLLISION_HPP
00002 #define COLLISION_HPP
00003
00004 #include "game_object.hpp"
00005 #include "bootstrap.hpp"
00006 #include "polygon_obstacle.hpp"
00007 #include "movement.hpp"
00008
00009 bool checkCircleCollision(GameObject& a, float radius_a, GameObject& b, float radius_b);
00010 bool isCollidingEdge(Vector& new_position, BrokenShip* player);
00011 void newPositionAfterCollisionEdge(Vector& new_position, BrokenShip* player);
00012 bool checkCollisionWithPlayer(PolygonObstacle& polygon, BrokenShip& player);
00013
00014 bool circleSquareCollision(Vector circlePoint, float radius, Vector squarePoint, float halfSide);
00015 bool circleCircleCollision(Vector circleA, float radiusA, Vector circleB, float radiusB);
00016 float distanceBetweenPoints(Vector pointA, Vector pointB);
00017
00018 #endif
```

7.11 include/database_users.hpp File Reference

```
#include <string>
#include <vector>
#include "game_over.hpp"
#include <pqxx/pqxx>
```

Classes

- struct User

  Estrutura simples para armazenar os dados de um usuário.
- class DatabaseUsers

  Gerencia todas as operações de banco de dados relacionadas a usuários.

7.12 database_users.hpp

Go to the documentation of this file.

```
00001 #ifndef DATABASE_USER_H
00002 #define DATABASE_USER_H
00003
00004 #include <string>
00005 #include <vector>
00006 #include "game_over.hpp"
00007 #include <pqxx/pqxx>
00008
00013
00014 struct User {
00015     int id;
```

```
00016     std::string username;
00017     int score;
00018     std::string name;
00019     int games;
00020 };
00021
00028
00029 class DatabaseUsers{
00030 private:
00031     pqxx::connection* _connect;
00032 public:
00033
00042
00043     DatabaseUsers();
00044
00050     ~DatabaseUsers();
00061     bool registerUser(const std::string& name, const std::string& username, const std::string&
      password, int initialScore = 0, int initialGames = 0);
00067
00068     bool deleteUser(const std::string& username);
00075
00076     std::vector<User> listUsers();
00077
00084
00085     bool updateScore(const std::string& username, int new_score);
00092
00093     bool updateGamesNumber(const std::string& username, int new_games);
00100     std::unique_ptr<User> getUserByUsername(const std::string& username);
00107
00108     bool authenticateUser(const std::string& username, const std::string& password);
00109
00119     void addValuesGameOverScreen(std::string& username, gameOverScreen &game_over_screen);
00120 };
00121
00122 #endif
```

7.13 include/dotenv.h File Reference

```
#include <string>
#include <cstdlib>
#include <fstream>
#include <iostream>
#include <algorithm>
#include <functional>
#include <cctype>
```

Classes

- class dotenv

7.14 dotenv.h

Go to the documentation of this file.

```
00001 // Copyright (c) 2018 Heikki Johannes Hildén <hildenjohannes@gmail.com>
00002 //
00003 // All rights reserved.
00004 //
00005 // Redistribution and use in source and binary forms, with or without
00006 // modification, are permitted provided that the following conditions are met:
00007 //
00008 //     * Redistributions of source code must retain the above copyright
00009 //       notice, this list of conditions and the following disclaimer.
00010 //
00011 //     * Redistributions in binary form must reproduce the above
00012 //       copyright notice, this list of conditions and the following
00013 //       disclaimer in the documentation and/or other materials provided
```

```
00014 //       with the distribution.
00015 //
00016 //     * Neither the name of copyright holder nor the names of other
00017 //       contributors may be used to endorse or promote products derived
00018 //       from this software without specific prior written permission.
00019 //
00020 // THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS
00021 // "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT
00022 // LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR
00023 // A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT
00024 // OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
00025 // SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT
00026 // LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
00027 // DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
00028 // THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
00029 // (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE
00030 // OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
00031
00035 #pragma once
00036
00037 #include <string>
00038 #include <cstdlib>
00039 #include <fstream>
00040 #include <iostream>
00041 #include <algorithm>
00042 #include <functional>
00043 #include <cctype>
00044
00091 class dotenv
00092 {
00093 public:
00094     dotenv() = delete;
00095     ~dotenv() = delete;
00096
00097     static const unsigned char Preserve = 1 << 0;
00098
00099     static const int OptionsNone = 0;
00100
00101     static void init(const char* filename = ".env");
00102     static void init(int flags, const char* filename = ".env");
00103
00104     static std::string getenv(const char* name, const std::string& def = "");
00105
00106 private:
00107     static void do_init(int flags, const char* filename);
00108     static std::string strip_quotes(const std::string& str);
00109
00110     static std::pair<std::string,bool> resolve_vars(size_t iline, const std::string& str);
00111     static void  ltrim(std::string& s);
00112     static void  rtrim(std::string& s);
00113     static void  trim(std::string& s);
00114     static std::string trim_copy(std::string s);
00115     static size_t find_var_start(const std::string& str, size_t pos, std::string& start_tag);
00116     static size_t find_var_end(const std::string& str, size_t pos, const std::string& start_tag);
00117 };
00118
00125 inline void dotenv::init(const char* filename)
00126 {
00127     dotenv::do_init(OptionsNone, filename);
00128 }
00129
00145 inline void dotenv::init(int flags, const char* filename)
00146 {
00147     dotenv::do_init(flags, filename);
00148 }
00149
00160 inline std::string dotenv::getenv(const char* name, const std::string& def)
00161 {
00162     const char* str = std::getenv(name);
00163     return str ? std::string(str) : def;
00164 }
00165
00166 #if defined(_MSC_VER) || defined(__MINGW32__)
00167
00168 // https://stackoverflow.com/questions/17258029/c-setenv-undefined-identifier-in-visual-studio
00169 inline int setenv(const char *name, const char *value, int overwrite)
00170 {
00171     int errcode = 0;
00172
00173     if (!overwrite)
00174     {
00175         size_t envsize = 0;
00176         errcode = getenv_s(&envsize, NULL, 0, name);
00177         if (errcode || envsize) return errcode;
00178     }
00179     return _putenv_s(name, value);
00180 }
```

```
00181
00182 #endif // _MSC_VER
00183
00194 inline size_t dotenv::find_var_start(const std::string& str, size_t pos, std::string& start_tag)
00195 {
00196    size_t p1      = str.find('$',pos);
00197    size_t p2      = str.find("${",pos);
00198    size_t pos_var = (std::min)(p1,p2);
00199    if(pos_var != std::string::npos) start_tag = (pos_var == p2)? "${":"$";
00200    return pos_var;
00201 }
00202
00213 inline size_t dotenv::find_var_end(const std::string& str, size_t pos, const std::string& start_tag)
00214 {
00215    char end_tag    = (start_tag == "${")? '}':' ';
00216    size_t pos_end  = str.find(end_tag,pos);
00217    // special case when $VARIABLE is at end of str with no trailing whitespace
00218    if(pos_end == std::string::npos && end_tag==' ') pos_end = str.length();
00219    return pos_end;
00220 }
00221
00222 // trim whitespace from left (in place)
00223 inline void dotenv::ltrim(std::string& s) {
00224     s.erase(s.begin(), std::find_if(s.begin(), s.end(), [](int c) {return !std::isspace(c); }));
00225 }
00226
00227 // trim whitespace from right (in place)
00228 inline void dotenv::rtrim(std::string& s) {
00229     s.erase(std::find_if(s.rbegin(), s.rend(), [](int c) {return !std::isspace(c); }).base(),
      s.end());
00230 }
00231
00232 // trim both ends (in place)
00233 inline void dotenv::trim(std::string& s) {
00234     ltrim(s);
00235     rtrim(s);
00236 }
00237
00238 // trim from both ends (copying)
00239 inline std::string dotenv::trim_copy(std::string s) {
00240     trim(s);
00241     return s;
00242 }
00243
00253 inline std::pair<std::string, bool> dotenv::resolve_vars(size_t iline, const std::string& str)
00254 {
00255    std::string resolved;
00256
00257    size_t pos = 0;
00258    size_t pre_pos = pos;
00259    size_t nvar = 0;
00260
00261    bool finished=false;
00262    while(!finished)
00263    {
00264       // look for start of variable expression after pos
00265       std::string start_tag;
00266       pos = find_var_start(str,pos,start_tag);
00267       if(pos != std::string::npos)
00268       {
00269          // a variable definition detected
00270          nvar++;
00271
00272          // keep start of variable expression
00273          size_t pos_start = pos;
00274
00275          size_t lstart = start_tag.length();  // length of start tag
00276          size_t lend   = (lstart>1)? 1 : 0;   // length of end tag
00277
00278          // add substring since last variable
00279          resolved += str.substr(pre_pos,pos-pre_pos);
00280
00281          // look for end of variable expression
00282          pos = find_var_end(str,pos,start_tag);
00283          if(pos != std::string::npos)
00284          {
00285             // variable name with decoration
00286             std::string var = str.substr(pos_start,pos-pos_start+1);
00287
00288             // variable name without decoration
00289             std::string env_var = var.substr(lstart,var.length()-lstart-lend);
00290
00291             // remove possible whitespace at the end
00292             rtrim(env_var);
00293
00294             // evaluate environment variable
00295             if(const char* env_str = std::getenv(env_var.c_str()))
```

```
00296             {
00297                resolved += env_str;
00298                nvar--; // decrement to indicate variable resolved
00299             }
00300             else
00301             {
00302                // could not resolve the variable, so don't decrement
00303                std::cout « "dotenv: Variable " « var « " is not defined on line " « iline « std::endl;
00304             }
00305
00306             // skip end tag
00307             pre_pos = pos+lend;
00308          }
00309       }
00310       else {
00311          // no more variables
00312          finished = true;
00313       }
00314    }
00315
00316    // add possible trailing non-whitespace after last variable
00317    if(pre_pos < str.length())
00318    {
00319       resolved += str.substr(pre_pos);
00320    }
00321
00322    // nvar must be 0, or else we have an error
00323    return std::make_pair(resolved,(nvar==0));
00324 }
00325
00326 inline void dotenv::do_init(int flags, const char* filename)
00327 {
00328     std::ifstream file;
00329     std::string line;
00330
00331     file.open(filename);
00332
00333     if (file)
00334     {
00335         unsigned int i = 1;
00336
00337         while (getline(file, line))
00338         {
00339             const auto len = line.length();
00340             if (len == 0 || line[0] == '#') {
00341                 continue;
00342             }
00343
00344             const auto pos = line.find("=");
00345
00346             if (pos == std::string::npos) {
00347                 std::cout « "dotenv: Ignoring ill-formed assignment on line "
00348                          « i « ": '" « line « "'" « std::endl;
00349             } else {
00350                 auto name = trim_copy(line.substr(0, pos));
00351                 auto line_stripped = strip_quotes(trim_copy(line.substr(pos + 1)));
00352
00353                 // resolve any contained variable expressions in 'line_stripped'
00354                 auto p = resolve_vars(i,line_stripped);
00355                 bool ok = p.second;
00356                 if(!ok) {
00357                    std::cout « "dotenv: Ignoring ill-formed assignment on line "
00358                    « i « ": '" « line « "'" « std::endl;
00359                 }
00360                 else {
00361
00362                    // variable resolved ok, set as environment variable
00363                    const auto& val = p.first;
00364                    setenv(name.c_str(), val.c_str(), ~flags & dotenv::Preserve);
00365                 }
00366             }
00367             ++i;
00368         }
00369     }
00370 }
00371
00372 inline std::string dotenv::strip_quotes(const std::string& str)
00373 {
00374     const std::size_t len = str.length();
00375
00376     if (len < 2)
00377         return str;
00378
00379     const char first = str[0];
00380     const char last = str[len - 1];
00381
00382     if (first == last && ('"' == first || '\'' == first))
```

```
00383         return str.substr(1, len - 2);
00384
00385     return str;
00386 }
```

7.15 include/game_object.hpp File Reference

```
#include "movement.hpp"
#include "boss_states.hpp"
#include "bootstrap.hpp"
#include <allegro5/allegro.h>
#include <allegro5/allegro_primitives.h>
#include <allegro5/bitmap.h>
#include <allegro5/bitmap_draw.h>
#include <allegro5/bitmap_io.h>
```

Classes

- class GameObject

  Base class to objects of the game.
- class FlappyMovement

  Base class that implements Flappy-Bird-like movement.
- class FixedShip

  Player of phase 3, implements 2D movement.
- class BrokenShip

  Player of phases 1 and 2, implements Flappy Movement.

7.16 game_object.hpp

Go to the documentation of this file.

```
00001 #ifndef GAME_OBJECT_HPP
00002 #define GAME_OBJECT_HPP
00003
00004 #include "movement.hpp"
00005 #include "boss_states.hpp"
00006 #include "bootstrap.hpp"
00007 #include <allegro5/allegro.h>
00008 #include <allegro5/allegro_primitives.h>
00009 #include <allegro5/bitmap.h>
00010 #include <allegro5/bitmap_draw.h>
00011 #include <allegro5/bitmap_io.h>
00012 #include "movement.hpp"
00013
00019
00020 class GameObject {
00021   protected:
00022     Vector _position;
00023   public:
00024     GameObject();
00025     GameObject(Vector position);
00026     ALLEGRO_BITMAP *objectSprite = NULL;
00027     Vector get_position();
00028     void set_position(const Vector &position);
00029     virtual ~GameObject() = 0;
00030     void set_bitmap(const char* path);
00031 };
00032
00039
00040 class FlappyMovement : public GameObject {
00041   private:
00042     static Vector gravity;
```

```
00043     static Vector move_force;
00044   public:
00045     void apply_gravity();
00046     void move_flappy();
00047     Vector getMoveForce();
00048 };
00049
00056 class FixedShip : public GameObject{
00057   private:
00058     static float move_force;
00059     static float _radius;
00060     bool _applyDamage = false; // Indicates whether or not the player can take damage
00061     int _life = 3;
00062
00063   public:
00064     FixedShip();
00065     FixedShip(const Vector &pos);
00066     float get_radius() const;
00067     void set_radius(float r);
00068     void moveShip(char direction);
00069     void draw();
00070
00071     void setCanTakeDamage(bool canTakeDamage);
00072     void takeDamage(bool &playing, int damage=1);
00073 };
00079 class BrokenShip : public FlappyMovement {
00080   private:
00081     float _radius = 12;
00082   public:
00083     BrokenShip();
00084     BrokenShip(const Vector &pos);
00085     float get_radius() const;
00086     void set_radius(float r);
00087     void update();
00088     void draw();
00089     void restart();
00090 };
00091
00092 #endif
```

7.17 include/game_over.hpp File Reference

```
#include "interface.hpp"
#include <string>
#include <allegro5/allegro.h>
#include <allegro5/allegro_font.h>
#include <allegro5/allegro_color.h>
#include <allegro5/allegro_primitives.h>
```

Classes

- class gameOverOption

  Classe base abstrata para as opções de ação na tela de Game Over.
- class playAgain

  Ação para reiniciar o jogo.
- class returnMenu

  Ação para retornar ao menu principal do jogo.
- class exitGame

  Ação para sair do jogo.
- class gameOverScreen

  Gerencia a exibição da mensagem de Game Over, scores, botões de ação e a interação do jogador. _currentScore: pontuação na partida _highScore: maior pontuação (recorde pessoal) _bestScore: Melhor pontuação (recorde geral) ALLEGRO_FONT _font: fonte dos textos da tela _playAgainButton: botão jogar novamente _returnToMenuButton: botão para retornar para a tela inicial _exitGameButton: botão para sair do jogo.*

7.18 game_over.hpp

Go to the documentation of this file.

```
00001 #ifndef GAME_OVER_HPP
00002 #define GAME_OVER_HPP
00003
00004 #include "interface.hpp"
00005 #include <string>
00006
00007 #include <allegro5/allegro.h>
00008 #include <allegro5/allegro_font.h>
00009 #include <allegro5/allegro_color.h>
00010 #include <allegro5/allegro_primitives.h>
00011
00012
00017   class gameOverOption {
00018 public:
00022     virtual ~gameOverOption() = default;
00026     virtual void execute () = 0;
00027 };
00028
00033
00034 class playAgain : public gameOverOption {
00035 public:
00036     ~playAgain() override = default;
00037     void execute() override;
00038 };
00039
00044 class returnMenu : public gameOverOption {
00045 public:
00046     ~returnMenu() override = default;
00047     void execute() override;
00048 };
00049
00054 class exitGame : public gameOverOption {
00055 public:
00056     ~exitGame() override = default;
00057     void execute() override;
00058 };
00059
00060
00072 class gameOverScreen {
00073 private:
00074
00075     ALLEGRO_FONT* _font;
00076
00077     int _currentScore;
00078     int _highScore;
00079     int _bestScore;
00080     int _numGames;
00081
00082     Button _playAgainButton;
00083     Button _returnToMenuButton;
00084     Button _exitGameButton;
00085
00086
00087 public:
00091     gameOverScreen (ALLEGRO_FONT* font);
00092
00096     void setCurrentScore(int score);
00097     void setHighScore(int score);
00098     void setbestScore(int score);
00099     void setnumGames(int games);
00100     void draw();
00101
00102
00110     gameOverOption* run(ALLEGRO_EVENT_QUEUE* event_queue, ALLEGRO_TIMER* timer);
00111
00112 };
00113 #endif
```

7.19 include/interface.hpp File Reference

```
#include <allegro5/allegro.h>
#include <allegro5/allegro_font.h>
#include <allegro5/allegro_ttf.h>
#include <allegro5/allegro_primitives.h>
```

```
#include <allegro5/color.h>
#include <allegro5/transformations.h>
#include <string>
```

Classes

- struct Coordinates

  Extremely basic coordinates struct. Takes x and y coordinates, width and height as paramenters. Mostly used to keep better logic in buttons.
- class Button

  simple button logic with draw, click checking and setText functions
- class Interface

  Base game start interface using button class.
- class victoryInterface

  interface to the "victory screen" after defeating the final boss (windows)

7.20 interface.hpp

Go to the documentation of this file.

```
00001 #pragma once
00002
00003 #include <allegro5/allegro.h>
00004 #include <allegro5/allegro_font.h>
00005 #include <allegro5/allegro_ttf.h>
00006 #include <allegro5/allegro_primitives.h>
00007 #include <allegro5/color.h>
00008 #include <allegro5/transformations.h>
00009 #include <string>
00010
00011
00020
00021 struct Coordinates {
00022     double _x, _y, _width, _heigth;
00023
00024     Coordinates(double x, double y, double width, double heigth);
00025     Coordinates() : _x(0), _y(0), _width(0), _heigth(0) {}
00026 };
00027
00039
00040 class Button {
00041     private:
00042     Coordinates _coords;
00043     ALLEGRO_COLOR _color;
00044     std::string _text;
00045     ALLEGRO_FONT* _font;
00046
00047     bool _drawBackground;
00048
00049     public:
00050         Button(Coordinates coords, ALLEGRO_COLOR color, std::string text,
00051                 ALLEGRO_FONT* font, bool drawBackground = true);
00052         void drawButton();
00053         bool gotClicked(int mx, int my);
00054         void setText(const char* txt);
00055
00056 };
00057
00064 class Interface {
00065
00066     ALLEGRO_FONT* _font;
00067     public:
00068     Button playButton;
00069     Button stopSongButton;
00070     Button returnToMenuButton;
00071     Button exitGameButton;
00072
00073     Interface(ALLEGRO_FONT* font);
00074
00075     void drawOffGameInterface();
```

```
00076
00077 };
00078
00079
00086 class victoryInterface {
00087     ALLEGRO_FONT* _font;
00088     public:
00089
00090     victoryInterface(ALLEGRO_FONT* font);
00091     void drawVictoryScreen();
00092
00093
00094 };
00095
```

7.21 include/levels.hpp File Reference

```
#include <allegro5/allegro_font.h>
#include <allegro5/bitmap.h>
#include <allegro5/bitmap_draw.h>
#include <allegro5/bitmap_io.h>
#include <allegro5/color.h>
#include <allegro5/display.h>
#include <allegro5/drawing.h>
#include <allegro5/keycodes.h>
#include <allegro5/timer.h>
#include <unistd.h>
#include "abstract_obstacle.hpp"
#include "obstacles_list.hpp"
```

Classes

- class Background

  moving background logic
- class Level

  Base class for the game levels, encapsulates the bare minimum logic to maintain a level.
- class LevelOne

  First phase of the game, basic vertically-oriented flappy bird with satellites as pipes.
- class LevelTwo

  Second phase of the game, vertically-oriented flappy bird with moving obstacles (asteroids)
- class LevelThree

  Third phase of the game, a free-movement, shooter boss fight against Windows (The biggest piece of bloatware in earth)

Macros

- #define LEVEL_DURATION 15

  Duração padrão das fases 1 e 2 (em segundos)

Functions

- void interLevelHandling (std::vector< AbstractObstacle * > &obstacles, ALLEGRO_BITMAP *sprite, const char *message, float bitmapScale)

  Clears the obstacles, draw a selected sprite with a user controlled scale and a message.

7.21.1 Macro Definition Documentation

7.21.1.1 LEVEL_DURATION

```
#define LEVEL_DURATION 15
```

Duração padrão das fases 1 e 2 (em segundos)

7.21.2 Function Documentation

7.21.2.1 interLevelHandling()

```
void interLevelHandling (
            std::vector< AbstractObstacle * > & obstacles,
            ALLEGRO_BITMAP * sprite,
            const char * message,
            float bitmapScale)
```

Clears the obstacles, draw a selected sprite with a user controlled scale and a message.

Parameters

obstacles	vector of abstract obstacles to be cleared
sprite	allegro-typed bitmap of sprite
message	message in the screen
bitmapScale	new width and heigth scale

7.22 levels.hpp

Go to the documentation of this file.

```
00001 #ifndef LEVEL_HPP
00002 #define LEVEL_HPP
00003
00004 #include <allegro5/allegro_font.h>
00005 #include <allegro5/bitmap.h>
00006 #include <allegro5/bitmap_draw.h>
00007 #include <allegro5/bitmap_io.h>
00008 #include <allegro5/color.h>
00009 #include <allegro5/display.h>
00010 #include <allegro5/drawing.h>
00011 #include <allegro5/keycodes.h>
00012 #include <allegro5/timer.h>
00013 #include <unistd.h>
00014 #include <allegro5/bitmap.h>
00015 #include "abstract_obstacle.hpp"
00016 #include "obstacles_list.hpp"
00017
00021 #define LEVEL_DURATION 15
00022
00023
00033
00034 void interLevelHandling(std::vector<AbstractObstacle*>& obstacles, ALLEGRO_BITMAP* sprite, const char*
      message, float bitmapScale);
00035
00042
00043 class Background {
00044     float scrollSpeed;
00045     float bgY;
00046
00047     public:
```

```
00048
00049     Background();
00050
00051     void renderBackground();
00052
00053 };
00054
00064
00065 class Level{
00066   protected:
00067     static GameObject* _player;
00068     static Background _bg;
00069     static ALLEGRO_EVENT _event;
00070
00071   public:
00072     friend void interLevelHandling(std::vector<AbstractObstacle*>& obstacles, ALLEGRO_BITMAP* sprite,
      const char* message, float bitmapScale);
00073 };
00074
00075 void interLevelHandling(std::vector<AbstractObstacle*>& obstacles, ALLEGRO_BITMAP* sprite, const char*
      message, float bitmapScale);
00076
00081
00082 class LevelOne : public Level{
00083   private:
00084     static PipeList _pipesList;
00085
00086   public:
00087     static BrokenShip* setLevelOne();
00088     static void cleanLevel();
00089     static void mainLoop(bool &playing, bool &isAlive);
00090     static void handleTimerEvents(bool &playing, BrokenShip* player, std::vector<AbstractObstacle*>&
      obstacles, bool &isAlive);
00091     static void handleKeyPressEvents(bool &playing, BrokenShip* player, bool &isAlive);
00092     static void handleKeyReleaseEvents();
00093 };
00094
00100 class LevelTwo : public Level{
00101   private:
00102     static ObstaclesList _obstaclesList;
00103
00104   public:
00105     static BrokenShip* setLevelTwo();
00106     static void cleanLevel();
00107     static void mainLoop(bool &playing, bool &isAlive);
00108     static void handleTimerEvents(bool &playing, BrokenShip* player, std::vector<AbstractObstacle*>&
      obstacles, bool &isAlive);
00109     static void handleKeyPressEvents(bool &playing, BrokenShip* player, bool &isAlive);
00110     static void handleKeyReleaseEvents();
00111 };
00112
00118
00119 class LevelThree : public Level{
00120   private:
00121     static bool key_pressed[ALLEGRO_KEY_MAX];
00122   public:
00123     static FixedShip* setLevelThree();
00124     static void cleanLevel();
00125     static void mainLoop(bool &playing, bool &isAlive);
00126     static void updatePlayerPosition(FixedShip* player);
00127
00128     static void handleTimerEvents(bool &playing, FixedShip* player,
00129       WindowsBoss &windows, bool &isAlive);
00130
00131     static void handleKeyPressEvents(bool &playing, FixedShip* player, WindowsBoss &boss, bool
      &isAlive);
00132     static void handleKeyReleaseEvents(bool &playing);
00133     static void handleKeyPressEvents(bool &playing, FixedShip* player);
00134     static void handleKeyReleaseEvents();
00135 };
00136
00137
00138 #endif
```

7.23 include/menu.hpp File Reference

```
#include "interface.hpp"
#include "music.hpp"
```

Classes

- class Menu

  base menu class
- class StartMenu

  main menu that inherits from the base menu class

7.24 menu.hpp

Go to the documentation of this file.

```
00001 #ifndef MENU_HPP
00002 #define MENU_HPP
00003 #include "interface.hpp"
00004 #include "music.hpp"
00005
00011 class Menu {
00012 protected:
00013     static ALLEGRO_EVENT event;
00014     static ALLEGRO_FONT* font;
00015     static Interface* interface;
00016 };
00017
00023 class StartMenu : public Menu {
00024 private:
00025     static void handleTimerEvents();
00026     static void handleMouseEvents(bool &playing, bool &displayInterface);
00027     static void cleanMenu();
00028     static void drawBackground();
00029
00030 public:
00031     static void mainLoopMenu(bool &playing);
00032 };
00033
00034
00035 #endif
```

7.25 include/movement.hpp File Reference

Classes

- class Vector

  Implements 2D vectors that represent cartesian coordinates.

7.26 movement.hpp

Go to the documentation of this file.

```
00001 #ifndef MOVEMENT_HPP
00002 #define MOVEMENT_HPP
00003
00008 struct Vector{
00009   public:
00010     float _x, _y;
00011
00015
00016     Vector();
00020     Vector(float _xy);
00024     Vector(float _x, float _y);
00028     Vector operator+(const Vector& other) const;
00029
00033     Vector operator-(const Vector& other) const;
00037     Vector operator*(float value) const;
00044     static float dot(const Vector& a, const Vector& b);
00054
00055     static float distance(const Vector& a, const Vector& b);
00066     static float shortestDistancePointToSegment(const Vector& p, const Vector& a, const Vector& b);
00067 };
00068 #endif
```

7.27 include/music.hpp File Reference

```
#include <list>
#include <string>
#include "sound.hpp"
#include <allegro5/allegro.h>
#include <allegro5/allegro_audio.h>
#include <allegro5/allegro_acodec.h>
```

Classes

- class Music

  represents a sound in a more complex way, with pause and playback methods with fade-in and fade-out systems.

7.28 music.hpp

Go to the documentation of this file.

```
00001 #ifndef MUSIC_HPP
00002 #define MUSIC_HPP
00003
00004 #include <list>
00005 #include <string>
00006 #include "sound.hpp"
00007 #include <allegro5/allegro.h>
00008 #include <allegro5/allegro_audio.h>
00009 #include <allegro5/allegro_acodec.h>
00010
00017
00018 class Music : public Sound {
00019 private:
00020     ALLEGRO_SAMPLE_INSTANCE* music_sample = nullptr;      // Music object (more complex than the
      sample)
00021
00022     float ballast_volume;                         // Save the default volume
00023     float volume = 0;                                 // Reference volume at which the system follows
00024     float current_volume = 0;                         // Real-time volume
00025
00026     unsigned int current_music_position = 0;          // Position at which the music was paused
00027
00028     float fade_speed;                             // Fade-in and fade-out speed
00029
00030     static std::list <Music*> music_address;      // Music addresses to have their volumes updated, with
      fade-in and fade-out
00031
00032     static Music* lastMusicPlayed;
00033
00034 public:
00035     Music(const char* sound_address, float volume_parameter=0.6f, float fade_speed_parameter=2.0f);

00036     ~Music() override;                            // If the destroyer of music is called, the destroyer
      of sound will not be called
00037
00038     void play();                                  // Method of playing music
00039     void pause();                                 // Method to pause music
00040
00041     static void update_fade_in_fade_out();        // Method to do fade-in and fade-out
00042     static void muteMusic();
00043     static void unMuteMusic();
00044 };
00045
00046 #endif
```

7.29 include/obstacles_list.hpp File Reference

```
#include <vector>
#include "abstract_obstacle.hpp"
#include "bootstrap.hpp"
#include "polygon_obstacle.hpp"
#include "circle_obstacle.hpp"
#include "pipe.hpp"
#include <memory>
```

Classes

- class ObstaclesList

  Gerencia uma coleção polimórfica de múltiplos obstáculos.
- class PipeList

7.30 obstacles_list.hpp

Go to the documentation of this file.

```
00001 #pragma once
00002 #include <vector>
00003 #include "abstract_obstacle.hpp"
00004 #include "bootstrap.hpp"
00005 #include "polygon_obstacle.hpp"
00006 #include "circle_obstacle.hpp"
00007 #include "pipe.hpp"
00008 #include <memory>
00009
00019
00020 class ObstaclesList{
00021
00022 private:
00023   std::vector<AbstractObstacle*> _obstaclesList;
00024
00025 public:
00033     void setPolygonsObstaclesList(const std::vector<Vector>& verts, const char* path);
00040     void setCircleObstaclesList(const char* path);
00045
00046     std::vector<AbstractObstacle*>& getList();
00051     void updateAll(std::vector<AbstractObstacle*> obstaclesList);
00056     void drawAll(std::vector<AbstractObstacle*> obstaclesList);
00062     void clear();
00068     ~ObstaclesList();
00069 };
00070
00071 class PipeList {
00072 private:
00073     std::vector<AbstractObstacle*> pipes;
00074
00075 public:
00076
00077     PipeList() = default;
00082
00083     ~PipeList();
00093     void generatePipes(const std::vector<Vector>& shapeLeft,
00094         const std::vector<Vector>& shapeRight, const char* imagePathLeft, const char* imagePathRight);
00100     std::vector<AbstractObstacle*>& getList();
00104     void clear();
00105 };
```

7.31 include/pipe.hpp File Reference

```
#include "polygon_obstacle.hpp"
```

Classes

- class Pipe

  Representa um par de obstáculos (canos) que se movem em conjunto.

7.32 pipe.hpp

Go to the documentation of this file.

```
00001 #pragma once
00002 #include "polygon_obstacle.hpp"
00003
00012
00013 class Pipe : public AbstractObstacle{
00014
00015     private:
00016     PolygonObstacle leftPipe;
00017     PolygonObstacle rightPipe;
00018     float gap = 150;
00019
00020     public:
00032     Pipe(const Vector& startPosition, const std::vector<Vector>& shapeLeft,
00033         const std::vector<Vector>& shapeRight, const char* imagePathLeft, const char* imagePathRight);
00041     void update() override;
00045     void draw() override;
00051     bool checkCollisionWithPlayer(BrokenShip& player) override;
00052
00053 };
```

7.33 include/polygon_obstacle.hpp File Reference

```
#include "abstract_obstacle.hpp"
#include "game_object.hpp"
#include "windows_boss.hpp"
#include "boss_states.hpp"
#include <vector>
```

Classes

- class PolygonObstacle

  Representa um obstáculo com uma forma de colisão poligonal customizável.

7.34 polygon_obstacle.hpp

Go to the documentation of this file.

```
00001 #pragma once
00002
00003 #include "abstract_obstacle.hpp"
00004 #include "game_object.hpp"
00005 #include "windows_boss.hpp"
00006 #include "boss_states.hpp"
00007 #include <vector>
00008
00016
00017 class PolygonObstacle : public AbstractObstacle{
00018
00019 private:
00020   std::vector<Vector> vertices;
00021   float _scale = 1.00f;
```

```
00022
00023 public:
00033     PolygonObstacle(const Vector &pos, const std::vector<Vector>& verts, float scale, const char*
      imagePath)
00034         : vertices(verts), _scale(scale) {
00035
00036         this->set_position(pos);
00037
00038         // aplica a escala em todo o vetor
00039         for (auto& v : vertices) {
00040             v = v * _scale;
00041         }
00042
00043         this->set_bitmap(imagePath);
00044    }
00051    void draw() override;
00056    std::vector<Vector> getVertices();
00063
00064    void update() override;
00074    bool checkCollisionWithPlayer(BrokenShip& player) override;
00075 };
```

7.35 include/register_interface.hpp File Reference

```
#include "interface.hpp"
#include "database_users.hpp"
```

Classes

- class RegisterInterface

  Gerencia a interface gráfica e a lógica para registro e login de usuários.

7.36 register_interface.hpp

Go to the documentation of this file.

```
00001 #pragma once
00002 #include "interface.hpp"
00003 #include "database_users.hpp"
00004
00012
00013 class RegisterInterface {
00014
00015     private:
00016
00017     ALLEGRO_FONT* _font;
00018     ALLEGRO_BITMAP* _titleImage;
00019     bool typingUsername;
00020     bool typingName;
00021     bool typingPassword;
00022     std::string username;
00023     std::string name;
00024     std::string password;
00025     Coordinates nameBox;
00026     Coordinates usernameBox;
00027     Coordinates passwordBox;
00028     Button loginButton;
00029     Button registerButton;
00030     Button exitButton;
00031
00032     public:
00033
00040
00041     RegisterInterface(ALLEGRO_FONT* font);
00042
00047     ~RegisterInterface();
00048
00054
00055     void draw();
```

```
00063     void handleKeyInput(int keycode, unsigned char unicode);
00069     void handleMouseClick(int mx, int my);
00074     std::string getUsername() const;
00079     std::string getName() const;
00084     std::string getPassword() const;
00088     void resetFields();
00099     int  mainLoop(bool &inRegister,  bool &playing, DatabaseUsers &db);
00100 };
```

7.37 include/shapes_repository.hpp File Reference

```
#include <map>
#include <vector>
#include <string>
#include "movement.hpp"
```

Variables

- std::map< std::string, const std::vector< Vector > > shape_repository

7.37.1 Variable Documentation

7.37.1.1 shape_repository

```
std::map<std::string, const std::vector<Vector> > shape_repository
```

Initial value:

```
= {
    {"asteroid2", {
        {33.071f, -151}, {72.071f, -160}, {78.071f, -154}, {100.071f, -153},
        {107.071f, -156}, {111.071f, -128}, {141.071f, -102}, {165.071f, -71},
        {160.071f, -50}, {149.071f, -32}, {149.071f, -20}, {140.071f, -10},
        {137.071f, 3}, {142.071f, 19}, {143.071f, 42}, {130.071f, 64},
        {130.071f, 70}, {117.071f, 85}, {94.071f, 95}, {80.071f, 112},
        {68.071f, 118}, {59.071f, 129}, {51.071f, 148}, {22.071f, 149},
        {7.071f, 160}, {-8.929f, 162}, {-23.929f, 158}, {-32.929f, 164},
        {-45.929f, 166}, {-71.929f, 158}, {-80.929f, 140}, {-96.929f, 134},
        {-129.929f, 109}, {-136.929f, 85}, {-154.929f, 65}, {-165.929f, 26},
        {-171.929f, 14}, {-178.929f, 9}, {-181.929f, -1}, {-179.929f, -35},
        {-162.929f, -59}, {-136.929f, -76}, {-125.929f, -105}, {-99.929f, -129},
        {-67.929f, -139}, {-47.929f, -137}, {-37.929f, -144}, {-20.929f, -148},
        {-0.929f, -145}, {7.071f, -151}
    }},
    {"pipe", {
        {-559, 217}, {55, 216}, {-555, 214}, {-555, 187}, {-557, 214}, {-556, 187},
    {-619, 185}, {-766, 199}, {-768, -196}, {-754, -188}, {-762, -191}, {-558, -188},
    {-558, -215}, {-557, -187}, {-555, -214}, {336, -214}, {349, -244}, {365, -245},
    {352, -246}, {364, -247}, {364, -259}, {528, -261}, {530, -247}, {558, -232},
    {560, -207}, {574, -201}, {575, -159}, {586, -159}, {590, 145}, {588, 159},
    {574, 158}, {574, 198}, {560, 229}, {527, 258}, {365, 260}, {364, 246},
    {354, 246}, {351, 231}, {350, 244}, {335, 217}
    }},
}
```

7.38 shapes_repository.hpp

Go to the documentation of this file.

```
00001 #pragma once
00002 #include <map>
00003 #include <vector>
00004 #include <string>
00005 #include "movement.hpp"
00006
00007 std::map<std::string, const std::vector<Vector» shape_repository = {
00008     {"asteroid2", {
00009         {33.071f, -151}, {72.071f, -160}, {78.071f, -154}, {100.071f, -153},
00010         {107.071f, -156}, {111.071f, -128}, {141.071f, -102}, {165.071f, -71},
00011         {160.071f, -50}, {149.071f, -32}, {149.071f, -20}, {140.071f, -10},
00012         {137.071f, 3}, {142.071f, 19}, {143.071f, 42}, {130.071f, 64},
00013         {130.071f, 70}, {117.071f, 85}, {94.071f, 95}, {80.071f, 112},
00014         {68.071f, 118}, {59.071f, 129}, {51.071f, 148}, {22.071f, 149},
00015         {7.071f, 160}, {-8.929f, 162}, {-23.929f, 158}, {-32.929f, 164},
00016         {-45.929f, 166}, {-71.929f, 158}, {-80.929f, 140}, {-96.929f, 134},
00017         {-129.929f, 109}, {-136.929f, 85}, {-154.929f, 65}, {-165.929f, 26},
00018         {-171.929f, 14}, {-178.929f, 9}, {-181.929f, -1}, {-179.929f, -35},
00019         {-162.929f, -59}, {-136.929f, -76}, {-125.929f, -105}, {-99.929f, -129},
00020         {-67.929f, -139}, {-47.929f, -137}, {-37.929f, -144}, {-20.929f, -148},
00021         {-0.929f, -145}, {7.071f, -151}
00022     }},
00023     {"pipe", {
00024         {-559, 217}, {55, 216}, {-555, 214}, {-555, 187}, {-557, 214}, {-556, 187},
00025     {-619, 185}, {-766, 199}, {-768, -196}, {-754, -188}, {-762, -191}, {-558, -188},
00026     {-558, -215}, {-557, -187}, {-555, -214}, {336, -214}, {349, -244}, {365, -245},
00027     {352, -246}, {364, -247}, {364, -259}, {528, -261}, {530, -247}, {558, -232},
00028     {560, -207}, {574, -201}, {575, -159}, {586, -159}, {590, 145}, {588, 159},
00029     {574, 158}, {574, 198}, {560, 229}, {527, 258}, {365, 260}, {364, 246},
00030     {354, 246}, {351, 231}, {350, 244}, {335, 217}
00031     }},
00032 };
```

7.39 include/shots.hpp File Reference

```
#include "bootstrap.hpp"
#include "movement.hpp"
#include "game_object.hpp"
#include "levels.hpp"
#include "abstract_obstacle.hpp"
#include "windows_boss.hpp"
#include <string>
#include <list>
#include <iostream>
#include <vector>
#include <allegro5/allegro.h>
#include <allegro5/allegro_primitives.h>
#include <allegro5/bitmap.h>
#include <allegro5/bitmap_draw.h>
#include <allegro5/bitmap_io.h>
```

Classes

- class Shot

  represents a shot in a more abstract way, abstract class.
- class BallShot
- class LineShot

7.40 shots.hpp

Go to the documentation of this file.

```
00001 #ifndef SHOTS_HPP
00002 #define SHOTS_HPP
00003
00004 #include "bootstrap.hpp"
00005 #include "movement.hpp"
00006 #include "game_object.hpp"
00007 #include "levels.hpp"
00008 #include "bootstrap.hpp"
00009 #include "abstract_obstacle.hpp"
00010 #include "windows_boss.hpp"
00011
00012 #include <string>
00013 #include <list>
00014 #include <iostream>
00015 #include <vector>
00016
00017 #include <allegro5/allegro.h>
00018 #include <allegro5/allegro_primitives.h>
00019 #include <allegro5/allegro_primitives.h>
00020 #include <allegro5/bitmap.h>
00021 #include <allegro5/bitmap_draw.h>
00022 #include <allegro5/bitmap_io.h>
00023
00024
00030 class Shot : public GameObject {
00031 private:
00032   static void removeInactiveShots(); // Clears the list of inactive shots
00033   static std::vector<Shot*> inactiveShotsList; // List of inactive shots
00034
00035 protected:
00036   Vector _direction;
00037   ALLEGRO_COLOR _shotColor;
00038   static std::list<Shot*> ShotsList; // List of active shots
00039
00040
00041 public:
00042   Shot(Vector position, Vector direction, ALLEGRO_COLOR shotColor);
00043   virtual ~Shot() = default;
00044
00045   bool virtual isItActive() = 0;
00046   bool virtual shotCollidedWithPlayer(FixedShip& player) = 0;
00047   bool virtual shotCollidedWithBoss(WindowsBoss& boss) = 0;
00048   void virtual draw() = 0;
00049   void virtual update() = 0;
00050
00051   static void updateShots(FixedShip* player, WindowsBoss& boss, bool &playing); // Updates all shots
00052   static void drawShots();   // Draws all the shots
00053   static void cleanShots();
00054 };
00055
00061 class BallShot : public Shot {
00062 private:
00063   float _speed;
00064   float _radius;
00065
00066 public:
00067   BallShot(Vector initialPosi, Vector direction, float radius, float speed=40);
00068
00069   void draw() override;
00070   void update() override;
00071   bool isItActive() override;
00072   bool shotCollidedWithBoss(WindowsBoss& boss) override;
00073   bool shotCollidedWithPlayer(FixedShip& player) override;
00074 };
00075
00081 class LineShot : public Shot {
00082 private:
00083   float _thickness;
00084   float _length;
00085   double _activationTime; // Time for the line shot to cause damage
00086   bool _activated=false;
00087
00088 public:
00089   LineShot(Vector initialPosi, Vector direction, float espessura, float comprimento, double
      tempoAtivacao);
00090
00091   void draw() override;
00092   void update() override;
00093   bool isItActive() override;
00094   bool shotCollidedWithBoss(WindowsBoss& boss) override;
00095   bool shotCollidedWithPlayer(FixedShip& player) override;
00096
```

```
00097 };
00098
00099 #endif
```

7.41 include/sound.hpp File Reference

```
#include <allegro5/allegro.h>
#include <allegro5/allegro_audio.h>
#include <allegro5/allegro_acodec.h>
```

Classes

- class Sound

  class that represents a simple sound, with a musical object, ALLEGRO_SAMPLE, and a play method.

7.42 sound.hpp

Go to the documentation of this file.

```
00001 #ifndef SOUND_HPP
00002 #define SOUND_HPP
00003
00004 #include <allegro5/allegro.h>
00005 #include <allegro5/allegro_audio.h>
00006 #include <allegro5/allegro_acodec.h>
00007
00014
00015 class Sound {
00016 protected:
00017     ALLEGRO_SAMPLE* sound_sample = nullptr;      // Simple music object
00018     static bool isSoundMuted;
00019
00020 public:
00021     Sound(const char* sound_address);            // Build the sound
00022     virtual ~Sound();                            // Destroy the sound
00023     void play(float volume=1.0);                 // Play the sound
00024
00025     static void muteSounds();
00026     static void unmuteSounds();
00027
00028     static float volumeMester;
00029 };
00030
00031
00032 #endif
```

7.43 include/windows_boss.hpp File Reference

```
#include "game_object.hpp"
```

Classes

- class WindowsBoss

7.44 windows_boss.hpp

Go to the documentation of this file.

```
00001 #ifndef WINDOWS_BOSS_HPP
00002 #define WINDOWS_BOSS_HPP
00003
00004 #include "game_object.hpp"
00005
00011 class WindowsBoss : public GameObject {
00012 private:
00013   ALLEGRO_COLOR _color = al_map_rgb(255, 255, 255);
00014
00015   BossStates _bossState = BossStates::descending; // Initial
00016   AttackType _attacktype = AttackType::ballShots1; // Initial
00017
00018   bool _applyDamage = false; // Indicates whether or not the boss can take damage
00019   int timeBetweenAttacks;
00020
00021   float _halfSide;
00022   float _life;
00023
00024   bool upBoss(float yStop, float speed);
00025   bool downBoss(float yStop, float speed);
00026
00027   void bossAttack();
00028   static void makeBallShots1();
00029   static void makeBallShots2();
00030   static void makeBallShots3();
00031   static void makeLineShotsRight();
00032   static void makeLineShotsLeft();
00033   static void makeLineShotsDown();
00034
00035   Vector _relativeDistanceToCenterSquare[4];
00036   float _sideOfTheMiniSquare;
00037   ALLEGRO_COLOR miniSquaresColor;
00038   void calculateMiniSquarePositions(); // Calculates the 2 variables above for draw() to work
00039
00040 public:
00041   WindowsBoss(float halfSide, float life);
00042
00043   void draw();
00044   void update(FixedShip* player, bool &playing);
00045   float getHalfSide();
00046   bool isDead();
00047   void takeDamage(FixedShip* player);
00048
00049
00050 };
00051 #endif
```

7.45 src/abstract_obstacle.cpp File Reference

```
#include "abstract_obstacle.hpp"
```

7.46 src/bootstrap.cpp File Reference

```
#include <allegro5/allegro_font.h>
#include <allegro5/bitmap_io.h>
#include <allegro5/display.h>
#include <allegro5/events.h>
#include <exception>
#include <iostream>
#include <stdexcept>
#include "bootstrap.hpp"
#include "sound.hpp"
#include "music.hpp"
#include "shots.hpp"
```

Namespaces

- namespace globalVars

Variables

- const ALLEGRO_COLOR BACKGROUND_COLOR = al_map_rgb(0, 0, 0)
- ALLEGRO_DISPLAY * display = nullptr
- ALLEGRO_EVENT_QUEUE * event_queue = nullptr
- ALLEGRO_TIMER * timer = nullptr
- ALLEGRO_FONT * gameFont = nullptr
- ALLEGRO_FONT * levelFont = nullptr
- ALLEGRO_BITMAP * gameOverBackground = nullptr
- ALLEGRO_BITMAP * pinguimBandido = nullptr
- ALLEGRO_BITMAP * pendrive = nullptr
- ALLEGRO_BITMAP * backgroundImage = nullptr
- ALLEGRO_BITMAP * ballShotSprite = nullptr
- Sound * death_sound = nullptr
- Sound * gunshot_sound1 = nullptr
- Sound * gunshot_sound2 = nullptr
- Sound * gunshot_sound3 = nullptr
- Sound * gunshot_sound4 = nullptr
- bool globalVars::inInterLevel = false
- int globalVars::points = 0
- std::string globalVars::usernameGlobal = ""
- Music * menu_music = nullptr
- Music * pause_game_music = nullptr
- Music * level_one_music = nullptr
- Music * level_two_music = nullptr
- Music * level_three_music = nullptr
- Music * defeat_music = nullptr
- Music * victory_music = nullptr

7.46.1 Variable Documentation

7.46.1.1 BACKGROUND_COLOR

```
const ALLEGRO_COLOR BACKGROUND_COLOR = al_map_rgb(0, 0, 0)
```

7.46.1.2 backgroundImage

```
ALLEGRO_BITMAP* backgroundImage = nullptr
```

7.46.1.3 ballShotSprite

```
ALLEGRO_BITMAP* ballShotSprite = nullptr
```

7.46.1.4 death_sound

```
Sound* death_sound = nullptr
```

7.46.1.5 defeat_music

```
Music* defeat_music = nullptr
```

7.46.1.6 display

```
ALLEGRO_DISPLAY* display = nullptr
```

7.46.1.7 event_queue

```
ALLEGRO_EVENT_QUEUE* event_queue = nullptr
```

7.46.1.8 gameFont

```
ALLEGRO_FONT* gameFont = nullptr
```

7.46.1.9 gameOverBackground

```
ALLEGRO_BITMAP* gameOverBackground = nullptr
```

7.46.1.10 gunshot_sound1

```
Sound* gunshot_sound1 = nullptr
```

7.46.1.11 gunshot_sound2

```
Sound* gunshot_sound2 = nullptr
```

7.46.1.12 gunshot_sound3

```
Sound* gunshot_sound3 = nullptr
```

7.46.1.13 gunshot_sound4

```
Sound* gunshot_sound4 = nullptr
```

7.46.1.14 level_one_music

```
Music* level_one_music = nullptr
```

7.46.1.15 level_three_music

```
Music* level_three_music = nullptr
```

7.46.1.16 level_two_music

```
Music* level_two_music = nullptr
```

7.46.1.17 levelFont

```
ALLEGRO_FONT* levelFont = nullptr
```

7.46.1.18 menu_music

```
Music* menu_music = nullptr
```

7.46.1.19 pause_game_music

```
Music* pause_game_music = nullptr
```

7.46.1.20 pendrive

```
ALLEGRO_BITMAP* pendrive = nullptr
```

7.46.1.21 pinguimBandido

```
ALLEGRO_BITMAP* pinguimBandido = nullptr
```

7.46.1.22 timer

```
ALLEGRO_TIMER* timer = nullptr
```

7.46.1.23 victory_music

```
Music* victory_music = nullptr
```

7.47 src/circle_obstacle.cpp File Reference

```
#include "circle_obstacle.hpp"
#include "bootstrap.hpp"
```

7.48 src/collision.cpp File Reference

```
#include "collision.hpp"
#include <cmath>
```

Functions

- bool isCollidingEdge (Vector &new_position, BrokenShip *player)

  Verifica se o jogador está colidindo com a borda direita da tela.
- void newPositionAfterCollisionEdge (Vector &new_position, BrokenShip *player)

  Corrige a posição do jogador após uma colisão com a borda direita da tela.
- bool circleSquareCollision (Vector circlePoint, float radius, Vector squarePoint, float halfSide)

  Checks whether a circle and a square collide on the plane.
- bool circleCircleCollision (Vector circleA, float radiusA, Vector circleB, float radiusB)

  Check if two circles collided.
- float distanceBetweenPoints (Vector pointA, Vector pointB)

  Calculates the distance between two points on the plane.

7.48.1 Function Documentation

7.48.1.1 circleCircleCollision()

```
bool circleCircleCollision (
            Vector circleA,
            float radiusA,
            Vector circleB,
            float radiusB)
```

Check if two circles collided.

Parameters

circleA	Center point of circle A.
radiusA	Radius of circle A.
CircleB	Center point of circle B.
radiusB	Radius of circle B.

Returns

There was a collision.

7.48.1.2 circleSquareCollision()

```
bool circleSquareCollision (
            Vector circlePoint,
            float radius,
            Vector squarePoint,
            float halfSide)
```

Checks whether a circle and a square collide on the plane.

Parameters

circlePoint	Center point of the circle.
radius	Radius of circle.
squarePoint	Center point of the square.
halfSide	Half the side of the square.

Returns

There was a collision.

7.48.1.3 distanceBetweenPoints()

```
float distanceBetweenPoints (
            Vector pointA,
            Vector pointB)
```

Calculates the distance between two points on the plane.

Returns

The distance.

7.48.1.4 isCollidingEdge()

```
bool isCollidingEdge (
            Vector & new_position,
            BrokenShip * player)
```

Verifica se o jogador está colidindo com a borda direita da tela.

Testa se a coordenada X da posição futura do jogador, somada ao seu raio, ultrapassa a largura da tela (SCREEN↩ _W).

Parameters

new_position	A posição futura do jogador a ser testada.
player	Um ponteiro para o objeto do jogador, usado para obter seu raio.

Returns

true se estiver colidindo com a borda direita, false caso contrário.

7.48.1.5 newPositionAfterCollisionEdge()

```
void newPositionAfterCollisionEdge (
            Vector & new_position,
            BrokenShip * player)
```

Corrige a posição do jogador após uma colisão com a borda direita da tela.

Reposiciona o jogador de forma que sua borda direita fique exatamente alinhada com a borda direita da tela SCREEN_W, impedindo que ele saia da área visível.

Parameters

new_position	A posição do jogador, que será modificada por referência.
player	Um ponteiro para o objeto do jogador, usado para obter seu raio.

7.49 src/database_users.cpp File Reference

```
#include "database_users.hpp"
#include "bootstrap.hpp"
#include "dotenv.h"
#include <iostream>
#include <memory>
```

7.50 src/game_object.cpp File Reference

```
#include <iostream>
#include "game_object.hpp"
#include "shots.hpp"
#include "bootstrap.hpp"
```

Variables

- const int PLAYER_RADIUS = 50

7.50.1 Variable Documentation

7.50.1.1 PLAYER_RADIUS

```
const int PLAYER_RADIUS = 50
```

7.51 src/gameover.cpp File Reference

```
#include "game_over.hpp"
#include <iostream>
#include <string>
#include <allegro5/allegro_primitives.h>
#include <allegro5/allegro_font.h>
#include "music.hpp"
#include "bootstrap.hpp"
```

Variables

- ALLEGRO_BITMAP * gameOverBackground
- ALLEGRO_EVENT_QUEUE * event_queue
- ALLEGRO_TIMER * timer

7.51.1 Variable Documentation

7.51.1.1 event_queue

```
ALLEGRO_EVENT_QUEUE* event_queue  [extern]
```

7.51.1.2 gameOverBackground

```
ALLEGRO_BITMAP* gameOverBackground  [extern]
```

7.51.1.3 timer

```
ALLEGRO_TIMER* timer  [extern]
```

7.52 src/interface.cpp File Reference

```
#include "interface.hpp"
#include "bootstrap.hpp"
#include <allegro5/allegro_font.h>
#include <allegro5/allegro_primitives.h>
#include <allegro5/color.h>
```

7.53 src/levels.cpp File Reference

```
#include "levels.hpp"
#include "interface.hpp"
#include "shots.hpp"
#include "shapes_repository.hpp"
#include "bootstrap.hpp"
#include "game_object.hpp"
#include "allegro5/events.h"
#include "music.hpp"
#include "abstract_obstacle.hpp"
#include "obstacles_list.hpp"
#include "collision.hpp"
#include "sound.hpp"
#include <allegro5/timer.h>
```

Functions

- void interLevelHandling (vector< AbstractObstacle * > &obstacles, ALLEGRO_BITMAP *sprite, const char *message, float bitmapScale)

7.53.1 Function Documentation

7.53.1.1 interLevelHandling()

```
void interLevelHandling (
            vector< AbstractObstacle * > & obstacles,
            ALLEGRO_BITMAP * sprite,
            const char * message,
            float bitmapScale)
```

7.54 src/main.cpp File Reference

```
#include <memory>
#include <iostream>
#include <allegro5/allegro.h>
#include "game_over.hpp"
#include "menu.hpp"
#include "levels.hpp"
#include "bootstrap.hpp"
#include "music.hpp"
#include "database_users.hpp"
#include "register_interface.hpp"
```

Functions

- int main (int argc, char **argv)

Variables

- ALLEGRO_EVENT_QUEUE * event_queue
- ALLEGRO_TIMER * timer
- ALLEGRO_FONT * gameFont

7.54.1 Function Documentation

7.54.1.1 main()

```
int main (
            int argc,
            char ** argv)
```

7.54.2 Variable Documentation

7.54.2.1 event_queue

```
ALLEGRO_EVENT_QUEUE* event_queue  [extern]
```

7.54.2.2 gameFont

```
ALLEGRO_FONT* gameFont  [extern]
```

7.54.2.3 timer

```
ALLEGRO_TIMER* timer  [extern]
```

7.55 src/menu.cpp File Reference

```
#include <allegro5/bitmap.h>
#include <allegro5/bitmap_draw.h>
#include <allegro5/color.h>
#include <allegro5/events.h>
#include <iostream>
#include <allegro5/allegro.h>
#include <allegro5/allegro_font.h>
#include <allegro5/allegro_primitives.h>
#include <allegro5/allegro_ttf.h>
#include "menu.hpp"
#include "bootstrap.hpp"
#include "music.hpp"
```

7.56 src/movement.cpp File Reference

```
#include "movement.hpp"
#include <cmath>
```

7.57 src/music.cpp File Reference

```
#include "music.hpp"
#include <iostream>
```

7.58 src/obstacles_list.cpp File Reference

```
#include "obstacles_list.hpp"
```

7.59 src/pipe.cpp File Reference

```
#include "pipe.hpp"
#include "iostream"
#include "bootstrap.hpp"
```

7.60 src/polygon_obstacle.cpp File Reference

```
#include "polygon_obstacle.hpp"
```

7.61 src/register_interface.cpp File Reference

```
#include "register_interface.hpp"
#include "bootstrap.hpp"
#include <allegro5/allegro_primitives.h>
#include <allegro5/allegro_font.h>
#include <allegro5/allegro_ttf.h>
#include <allegro5/allegro.h>
#include <iostream>
```

7.62 src/shots.cpp File Reference

```
#include "shots.hpp"
#include "windows_boss.hpp"
#include "bootstrap.hpp"
#include "collision.hpp"
```

7.63 src/sound.cpp File Reference

```
#include "sound.hpp"
#include "bootstrap.hpp"
#include <iostream>
```

7.64 src/windows_boss.cpp File Reference

```
#include "windows_boss.hpp"
#include "collision.hpp"
#include "interface.hpp"
#include "shots.hpp"
#include "levels.hpp"
#include "bootstrap.hpp"
#include <iostream>
```

Variables

- int cont =0

7.64.1 Variable Documentation

7.64.1.1 cont

```
int cont =0
```

Index