ZBE

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Hierarchical Index

1.1 Class Hierarchy

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Class Index

2.1 Class List

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Chapter 4

Class Documentation

4.1 zbe::AABB< s > Struct Template Reference

Public Member Functions

- **AABB** (Point< s > pmin, Point< s > pmax)
- **AABB** (std::initializer_list< double > lmin, std::initializer_list< double > lmax)

Public Attributes

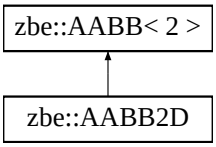
- Point< s > **minimun**
- Point< s > **maximun**

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/objects.h

4.2 zbe::AABB2D Struct Reference

Inheritance diagram for zbe::AABB2D:



Public Member Functions

- **AABB2D** (Point< 2 > pmin, Point< 2 > pmax)
- **AABB2D** (std::initializer_list< double > lmin, std::initializer_list< double > lmax)

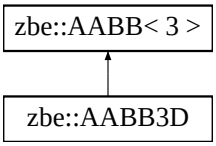
Additional Inherited Members

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/objects.h

4.3 zbe::AABB3D Struct Reference

Inheritance diagram for zbe::AABB3D:



Public Member Functions

- **AABB3D** (Point< 3 > pmin, Point< 3 > pmax)
- **AABB3D** (std::initializer_list< double > lmin, std::initializer_list< double > lmax)

Additional Inherited Members

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/objects.h

4.4 zbe::AABBCollisionable Class Reference

Public Member Functions

- **AABBCollisionable** (int x, int y, unsigned width, unsigned height, unsigned radius)
- void **setX** (int x)
- void **setY** (int y)
- void **setWidth** (unsigned width)
- void **setHeight** (unsigned height)
- void **setRadius** (unsigned radius)
- int **getX** () const
- int **getY** () const
- unsigned **getWidth** () const
- unsigned **getHeight** () const
- unsigned **getRadius** () const

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/AABBCollisionable.h

4.5 zbe::AABBSphereCollisionable Class Reference

Public Member Functions

- **AABBSphereCollisionable** (int x, int y, unsigned width, unsigned height, unsigned radius)
- void **setX** (int x)
- void **setY** (int y)
- void **setWidth** (unsigned width)
- void **setHeight** (unsigned height)

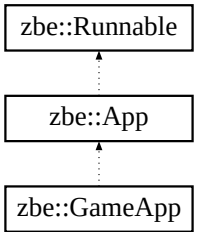
- void **setRadius** (unsigned radius)
- int **getX** () const
- int **getY** () const
- unsigned **getWidth** () const
- unsigned **getHeight** () const
- unsigned **getRadius** () const

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/AABBSphereCollisionable.h

4.6 zbe::App Class Reference

Inheritance diagram for zbe::App:



Public Member Functions

- virtual void **setup** ()
- virtual void **app** ()=0
- virtual void **shutdown** ()
- void **run** ()
- virtual void **pause** ()
- virtual void **resume** ()
- virtual void **restart** ()

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/system/App.h
- C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/system/App.cpp

4.7 zbe::ArrayList< Value > Class Template Reference

Public Member Functions

- **ArrayList** (unsigned capacity)
- **ArrayList** (const ArrayList< Value > &arraylist)
- unsigned **insert** (Value value)
- unsigned **getCapacity** ()
- unsigned **getSize** ()
- unsigned **getIndex** ()
- bool **isEmpty** ()
- ArrayListIter< Value > **begin** ()
- ArrayListIter< Value > **end** ()

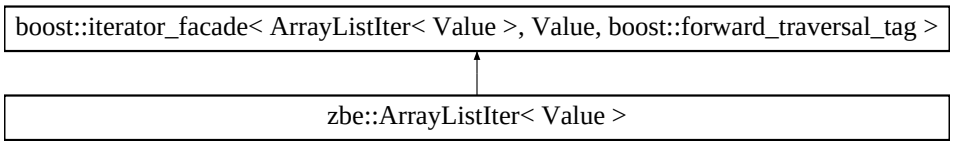
- ArrayListNode< Value > & **operator[ ]** (unsigned idx)
- const ArrayListNode< Value > & **operator[ ]** (unsigned idx) const

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/containers/ArrayList.h

4.8 zbe::ArrayListIter< Value > Class Template Reference

Inheritance diagram for zbe::ArrayListIter< Value >:



Public Member Functions

- **ArrayListIter** (ArrayList< Value > *list)
- **ArrayListIter** (ArrayList< Value > *list, unsigned i)
- **ArrayListIter** (const ArrayListIter< Value > &iter)

Friends

- class **boost::iterator_core_access**

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/containers/ArrayList.h
- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/containers/ArrayListIterator.h

4.9 zbe::ArrayListNode< Value > Struct Template Reference

Public Attributes

- Value **value**
- unsigned **next**

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/containers/ArrayList.h

4.10 zbe::ArrayListTicketed< Value > Class Template Reference

Public Member Functions

- **ArrayListTicketed** (unsigned capacity)
- Ticket & **insert** (Value value)

- unsigned **getCapacity** ()
- unsigned **getSize** ()
- bool **isEmpty** ()
- ArrayListTicketedIter< Value > **begin** ()
- ArrayListTicketedIter< Value > **end** ()
- ArrayListTicketedNode< Value > & **operator[ ]** (unsigned idx)
- const ArrayListTicketedNode< Value > & **operator[ ]** (unsigned idx) const

Friends

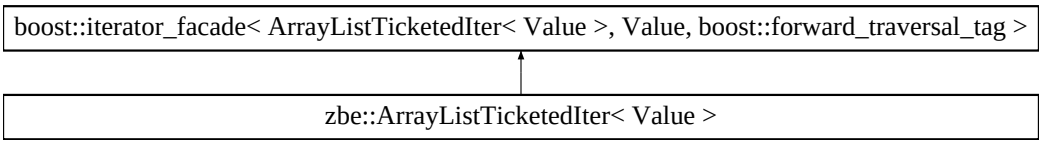
- class **ArrayListTicketedIter< Value >**

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/containers/ArrayList.h

4.11 zbe::ArrayListTicketedIter< Value > Class Template Reference

Inheritance diagram for zbe::ArrayListTicketedIter< Value >:



Public Member Functions

- **ArrayListTicketedIter** (ArrayListTicketed< Value > *list)
- **ArrayListTicketedIter** (ArrayListTicketed< Value > *list, unsigned i)
- **ArrayListTicketedIter** (const ArrayListTicketedIter< Value > &iter)
- void **reset** ()

Friends

- class **boost::iterator_core_access**

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/containers/ArrayList.h
- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/containers/ArrayListIterator.h

4.12 zbe::ArrayListTicketedNode< Value > Struct Template Reference

Public Attributes

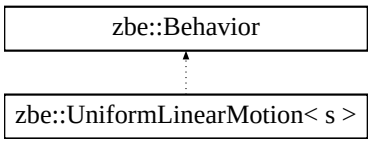
- Value **v**
- int **next**
- Ticket **t**

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/containers/ArrayList.h

4.13 zbe::Behavior Class Reference

Inheritance diagram for zbe::Behavior:



Public Member Functions

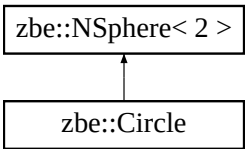
- virtual void **behaveUntil** (double time)=0

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/behaviors/Behavior.h

4.14 zbe::Circle Struct Reference

Inheritance diagram for zbe::Circle:



Public Member Functions

- **Circle** (Point< 2 > center, double radius)
- **Circle** (std::initializer_list< double > lc, double r)

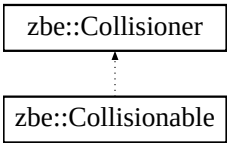
Additional Inherited Members

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/objects.h

4.15 zbe::Collisionable Class Reference

Inheritance diagram for zbe::Collisionable:

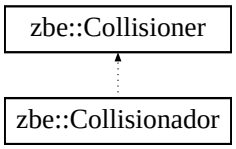


The documentation for this class was generated from the following file:

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/Collisionable.h

4.16 zbe::Collisionador Class Reference

Inheritance diagram for zbe::Collisionador:



Public Member Functions

- double **collisionDetection** (std::forward_list< CollisionData > *cdata, double timeRemain)

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/Collisionador.h

4.17 zbe::CollisionData Class Reference

Public Member Functions

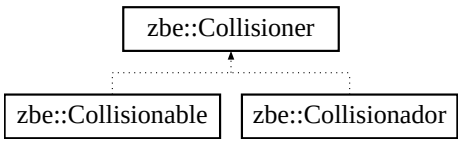
- **CollisionData** (Collisioner *collisionador, Collisioner *collisionable, const Vector2D &normal, const Vector2D &point)
- Collisioner * **getCollisionador** () const
- Collisioner * **getCollisionable** () const
- const Vector2D & **getNormal** () const
- const Vector2D & **getPoint** () const
- void **react** (double time)

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/collisions/CollisionData.h
- C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/tools/math/collisions/CollisionData.cpp

4.18 zbe::Collisioner Class Reference

Inheritance diagram for zbe::Collisioner:



Public Types

- enum **CollysionType** { **SPHERE** = 0, **AABB** = 1 }

Public Member Functions

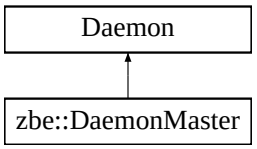
- virtual void **react** (Collisioner ∗c, const Vector2D &normal, const Vector2D &point, double time)=0
- virtual CollysionType **getType** ()=0
- virtual unsigned **collisionLevel** ()=0

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/Collisioner.h

4.19 Daemon Class Reference

Inheritance diagram for Daemon:



Public Member Functions

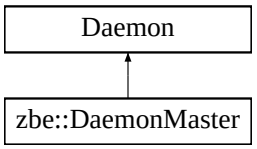
- virtual void **run** ()=0

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/daemons/Daemon.h

4.20 zbe::DaemonMaster Class Reference

Inheritance diagram for zbe::DaemonMaster:



Public Member Functions

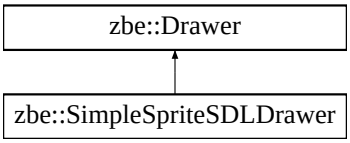
- void **run** ()
- void **addDaemon** (const Daemon &daemon)

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/daemons/DaemonMaster.h
- C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/daemons/DaemonMaster.cpp

4.21 zbe::Drawer Class Reference

Inheritance diagram for zbe::Drawer:



Public Member Functions

- virtual void **draw** ()=0

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/drawers/Drawer.h

4.22 zbe::FileHandler Class Reference

Public Member Functions

- **FileHandler** (const char ∗filename, const char ∗mode, bool createPath=false)
- size_t **read** (void ∗buffer, size_t size, size_t count)
- char ∗ **readln** (char ∗buffer, size_t size)
- size_t **write** (const char ∗text)
- size_t **write** (const void ∗buffer, size_t size, size_t count)
- size_t **writeflush** (const char ∗text)
- size_t **writeflush** (const void ∗buffer, size_t size, size_t count)
- size_t **writeln** (const char ∗text)
- size_t **writeln** (const void ∗buffer, size_t size, size_t count)
- size_t **writelnflush** (const char ∗text)
- size_t **writelnflush** (const void ∗buffer, size_t size, size_t count)
- void **flush** ()

Static Public Member Functions

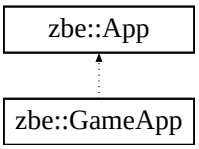
- static bool **exist** (const char ∗filename)
- static bool **existDir** (const char ∗filename)
- static int **rm** (const char ∗filename)
- static bool **rmdir** (const char ∗filename)

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/io/FileHandler.h
- C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/io/FileHandler.cpp

4.23 zbe::GameApp Class Reference

Inheritance diagram for zbe::GameApp:



Public Member Functions

- void **behaveviorAndPhysics** ()
- void **behaveUntil** (double time)
- void **draw** ()

Protected Member Functions

- double **collisionDetection** (std::forward_list< CollisionData > *cdata, double timeRemain)
- void **reportCollision** (const std::forward_list< CollisionData > &cdata, double collisionTime)

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/system/GameApp.h

4.24 zbe::Logger Class Reference

Public Types

- using **WriterCallback** = void(*)(const char *type, const char *msg)

Public Member Functions

- void **setDefaultWriters** ()
- void **setDefaultCommandLineWriter** ()
- void **setDefaultFileWriters** ()
- void **addWriter** (WriterCallback callback)
- void **log** (const char *type, LoggerMsg msg)

Static Public Member Functions

- static Logger * **createInstance** ()
- static void **deleteInstance** ()
- static Logger * **getInstance** ()

Static Public Attributes

- static const char **TINFO** [ ] = "[INFO]"
- static const char **TDEBUG** [ ] = "[DEBUG]"
- static const char **TWARNING** [ ] = "[WARNING]"
- static const char **TERROR** [ ] = "[ERROR]"

Static Protected Member Functions

- static void **defaultCommandLineWriter** (const char *type, const char *msg)
- static void **defaultFileWriter** (const char *type, const char *msg)

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/system/Logger.h
- C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/system/Logger.cpp

4.25 zbe::LoggerMsg Class Reference

Public Member Functions

- **LoggerMsg** (const LoggerMsg &l)
- LoggerMsg & **operator<<** (bool b)
- template<typename T >
  LoggerMsg & **operator<<** (T t)

Public Attributes

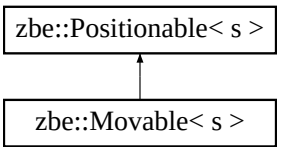
- std::stringstream **msg**

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/system/Logger.h
- C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/system/Logger.cpp

4.26 zbe::Movable< s > Class Template Reference

Inheritance diagram for zbe::Movable< s >:



Public Member Functions

- **Movable** (Point< s > position, Vector< s > velocity)
- void **setVelocity** (Vector< s > velocity)
- Vector< s > **getVelocity** () const
- void **travel** (double time)

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/Movable.h

4.27 zbe::NSphere< s > Struct Template Reference

Public Member Functions

- **NSphere** (Point< s > center, double radius)
- **NSphere** (std::initializer_list< double > lc, double r)

Public Attributes

- Point< s > **c**
- double **r**

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/objects.h

4.28 zbe::Point< s > Class Template Reference

Public Member Functions

- **Point** (const std::initializer_list< double > l)
- double & **operator[ ]** (std::size_t idx)
- const double & **operator[ ]** (std::size_t idx) const
- Point & **operator+=** (Vector< s > rhs)
- Point & **operator*=** (double rhs)

Protected Attributes

- double **data** [s]

Friends

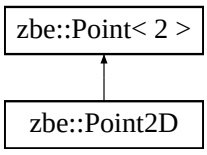
- Point **operator+** (Point lhs, const Vector< s > &rhs)
- Vector< s > **operator-** (const Point &lhs, const Point &rhs)
- Point **operator*** (Point lhs, double rhs)

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/Point.h

4.29 zbe::Point2D Class Reference

Inheritance diagram for zbe::Point2D:



Public Member Functions

- **Point2D** (std::initializer_list< double > l)
- Point2D & **operator=** (Point< 2 > rhs)

Public Attributes

- double & **x** = data[0]
- double & **y** = data[1]

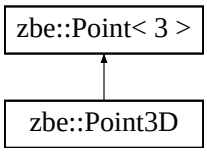
Additional Inherited Members

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/Point.h

4.30 zbe::Point3D Class Reference

Inheritance diagram for zbe::Point3D:



Public Member Functions

- **Point3D** (std::initializer_list< double > l)
- Point3D & **operator=** (Point< 3 > rhs)

Public Attributes

- double & **x** = data[0]
- double & **y** = data[1]
- double & **z** = data[2]

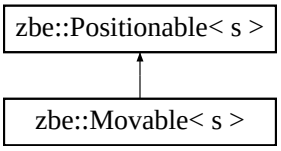
Additional Inherited Members

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/Point.h

4.31 zbe::Positionable< s > Class Template Reference

Inheritance diagram for zbe::Positionable< s >:



Public Member Functions

- **Positionable** (Point< s > position)
- Point< s > **getPosition** () const
- void **setPosition** (Point< s > position)
- void **increase** (Vector< s > offset)

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/Positionable.h

4.32 zbe::Ray< s > Struct Template Reference

Public Member Functions

- **Ray** (Point< s > p, Vector< s > v)
- **Ray** (std::initializer_list< double > lo, std::initializer_list< double > lv)

Public Attributes

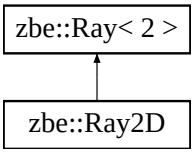
- Point< s > **o**
- Vector< s > **d**

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/objects.h

4.33 zbe::Ray2D Struct Reference

Inheritance diagram for zbe::Ray2D:



Public Member Functions

- **Ray2D** (Point< 2 > p, Vector< 2 > v)
- **Ray2D** (std::initializer_list< double > lo, std::initializer_list< double > lv)

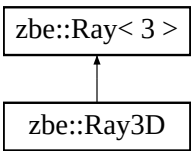
Additional Inherited Members

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/objects.h

4.34 zbe::Ray3D Struct Reference

Inheritance diagram for zbe::Ray3D:



Public Member Functions

- **Ray3D** (Point< 3 > p, Vector< 3 > v)
- **Ray3D** (std::initializer_list< double > lo, std::initializer_list< double > lv)

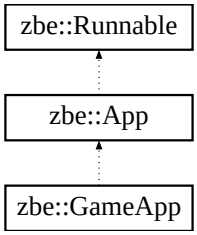
Additional Inherited Members

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/objects.h

4.35 zbe::Runnable Class Reference

Inheritance diagram for zbe::Runnable:



Public Member Functions

- virtual void **run** ()=0

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/Runnable.h

4.36 zbe::SDL_Starter Class Reference

Used to init SDL subsystems only once (alonelton).

`#include <SDL_Starter.h>`

Public Member Functions

- bool addSubsystem (Uint32 flags)

  Initiates the SDL subsystem if it's not already initiated.

Static Public Member Functions

- static SDL_Starter * **createInstance** (Uint32 flags=0)
- static void **deleteInstance** ()
- static SDL_Starter * **getInstance** ()

4.36.1 Detailed Description

Used to init SDL subsystems only once (alonelton).

4.36.2 Member Function Documentation

4.36.2.1 bool zbe::SDL_Starter::addSubsystem (Uint32 *flags*)

Initiates the SDL subsystem if it's not already initiated.

Parameters

flags	Uint32. A integer with the necessary flags to initiate SDL.

Returns

if any errors occur, it returns true, else, false.

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/starters/SDL_Starter.h
- C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/starters/SDL_Starter.cpp

4.37 zbe::SDLFontLoader Class Reference

Public Member Functions

- void **loadFont** (const char *url, int size, int id)
- void **reloadFont** (const char *url, int size, int id)
- void **removeFont** (int id)
- TTF_Font * **getFont** (int id)

Static Public Member Functions

- static SDLFontLoader * **createInstance** ()
- static void **deleteInstance** ()
- static SDLFontLoader * **getInstance** ()

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/loaders/SDLFontLoader.h
- C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/loaders/SDLFontLoader.cpp

4.38 zbe::SimpleSprite Class Reference

Public Member Functions

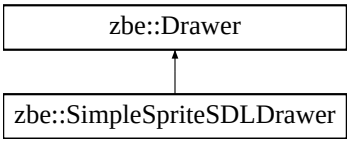
- **SimpleSprite** (unsigned width, unsigned height, unsigned img)
- **SimpleSprite** (int x, int y, unsigned width, unsigned height, unsigned img)
- void **setLeftX** (int x)
- void **setTopY** (int y)
- void **setWidth** (unsigned width)
- void **setHeight** (unsigned height)
- void **setImage** (unsigned img)
- int **getLeftX** () const
- int **getTopY** () const
- unsigned **getWidth** () const
- unsigned **getHeight** () const
- unsigned **getImage** () const

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/SimpleSprite.h

4.39 zbe::SimpleSpriteSDLDrawer Class Reference

Inheritance diagram for zbe::SimpleSpriteSDLDrawer:



Public Member Functions

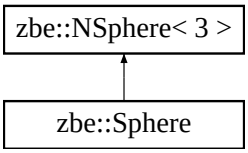
- **SimpleSpriteSDLDrawer** (Window *window, SimpleSpriteIterator first, SimpleSpriteIterator end)
- void **draw** ()

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/drawers/SDL/SimpleSpriteSDLDrawer.h
- C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/drawers/SDL/SimpleSpriteSDLDrawer.cpp

4.40 zbe::Sphere Struct Reference

Inheritance diagram for zbe::Sphere:



Public Member Functions

- **Sphere** (Point< 3 > center, double radius)
- **Sphere** (std::initializer_list< double > lc, double r)

Additional Inherited Members

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/objects.h

4.41 zbe::SphereCollisionable Class Reference

Public Member Functions

- **SphereCollisionable** (int x, int y, unsigned radius)
- void **setX** (int x)
- void **setY** (int y)
- void **setRadius** (unsigned radius)
- int **getX** () const
- int **getY** () const
- unsigned **getRadius** () const

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/SphereCollisionable.h

4.42 zbe::SysError Class Reference

Static Public Member Functions

- static void **setError** (std::string errorString)
- static int **getNErrors** ()
- static std::string **getLastErrorString** ()
- static void **clear** ()

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/system/SysError.h
- C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/system/SysError.cpp

4.43 zbe::Ticket Class Reference

Public Types

- enum **State** { **ACTIVE**, **INACTIVE**, **ERASED** }

Public Member Functions

- **Ticket** (State state=ACTIVE)
- void **setState** (State state)
- State **getState** () const
- void **setACTIVE** ()
- void **setINACTIVE** ()
- void **setERASED** ()
- bool **isACTIVE** ()
- bool **isNotACTIVE** ()
- bool **isINACTIVE** ()
- bool **isERASED** ()

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/containers/Ticket.h

4.44 zbe::Timer Class Reference

Public Member Functions

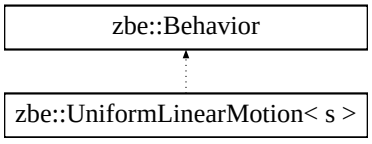
- virtual void **restart** ()=0
- virtual void **pause** ()=0
- virtual void **resume** ()=0
- virtual unsigned int **getMilliseconds** ()=0

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/Timer.h

4.45 zbe::UniformLinearMotion< s > Class Template Reference

Inheritance diagram for zbe::UniformLinearMotion< s >:



Public Member Functions

- void **behaveUntil** (double time)

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/behaviors/UniformLinearMotion.h
- C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/behaviors/UniformLinearMotion.cpp

4.46 zbe::Vector< s > Class Template Reference

Public Member Functions

- **Vector** (std::initializer_list< double > l)
- double & **operator[ ]** (std::size_t idx)
- const double & **operator[ ]** (std::size_t idx) const
- Vector< s > & **operator+=** (Vector< s > rhs)
- Vector< s > & **operator-=** (Vector< s > rhs)
- Vector< s > & **operator-** ()
- Vector< s > & **operator*=** (double rhs)
- double **getModule** ()
- double **getSqrModule** ()

Protected Attributes

- double **data** [s]

Friends

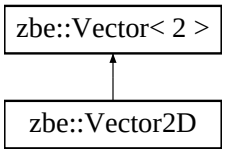
- Vector **operator+** (Vector lhs, const Vector &rhs)
- Vector **operator+** (Vector &lhs, Vector &&rhs)
- Vector **operator-** (Vector lhs, const Vector &rhs)
- Vector **operator-** (const Vector &lhs, Vector &&rhs)
- Vector **operator*** (Vector lhs, double rhs)
- double **operator*** (const Vector &lhs, const Vector &rhs)

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/Point.h
- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/Vector.h

4.47 zbe::Vector2D Class Reference

Inheritance diagram for zbe::Vector2D:



Public Member Functions

- **Vector2D** (const Vector< 2 > &v)
- **Vector2D** (std::initializer_list< double > l)
- Vector2D & **operator=** (Vector< 2 > rhs)
- void **setCartesian** (double x, double y)
- void **setPolars** (double r, double rads)
- void **setPolarsDegrees** (double r, double degree)
- double **getRads** ()
- double **getDegrees** ()

Public Attributes

- double & **x** = data[0]
- double & **y** = data[1]

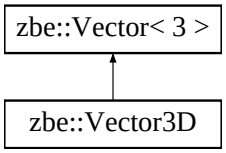
Additional Inherited Members

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/Vector.h

4.48 zbe::Vector3D Class Reference

Inheritance diagram for zbe::Vector3D:



Public Member Functions

- **Vector3D** (const Vector< 3 > &v)
- **Vector3D** (std::initializer_list< double > l)
- Vector & **operator=** (Vector< 3 > rhs)

Public Attributes

- double & **x** = data[0]
- double & **y** = data[1]
- double & **z** = data[2]

Additional Inherited Members

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/Vector.h

4.49 zbe::Window Class Reference

Used to create windows using SDL 2.0.

`#include <Window.h>`

Public Member Functions

- **Window** (int width, int height, Uint32 window_flags=0)
- **Window** (const char ∗title, int width, int height, Uint32 window_flags=0, Uint32 rederer_flags=0)
- **Window** (const char ∗title, int x, int y, int width, int height, Uint32 window_flags=0, Uint32 rederer_flags=0)
- void **clear** ()
- void **render** (SDL_Texture ∗texture, const SDL_Rect ∗srcrect, const SDL_Rect ∗dstrect)
- void **render** (SDL_Texture ∗texture, const SDL_Rect ∗srcrect, const SDL_Rect ∗dstrect, const double angle, const SDL_Point ∗center, const SDL_RendererFlip flip)
- void **render** (unsigned texID, const SDL_Rect ∗srcrect, const SDL_Rect ∗dstrect)
- void **render** (unsigned texID, const SDL_Rect ∗srcrect, const SDL_Rect ∗dstrect, const double angle, const SDL_Point ∗center, const SDL_RendererFlip flip)
- void **present** ()
- unsigned **loadImg** (const char ∗url)
- unsigned **reloadImg** (const char ∗url, unsigned id)

4.49.1 Detailed Description

Used to create windows using SDL 2.0.

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

- C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/SDL2.0/Window.h
- C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/SDL2.0/Window.cpp

Chapter 5

File Documentation

5.1 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/AABBCollisionable.h File Reference

Define a class that collides as a Axis Aligned Bounding Box (AABB).

Classes

- class zbe::AABBCollisionable

5.1.1 Detailed Description

Define a class that collides as a Axis Aligned Bounding Box (AABB).

Copyright 2012 Batis Degryll Ludo

Since

2014-05-94

Date

2015-05-04

Author

Degryll

5.2 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/AABBSphere↩ Collisionable.h File Reference

Define a class that Collides hierarchically as a sphere and in more detail as an AABB.

Classes

- class zbe::AABBSphereCollisionable

5.2.1 Detailed Description

Define a class that Collides hierarchically as a sphere and in more detail as an AABB.

Copyright 2012 Batis Degryll Ludo

Since

2014-05-94

Date

2015-05-04

Author

Degryll

5.3 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/Collisionable.h File Reference

Define a class that participate in collision system.

```
#include "ZBE/core/tools/math/Vector2D.h"
```

Classes

- class zbe::Collisionable

5.3.1 Detailed Description

Define a class that participate in collision system.

Copyright 2012 Batis Degryll Ludo

Since

2014-09-22

Date

2014-09-22

Author

Ludo and Degryll

5.4 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/Collisionador.h File Reference

Define a class that participate in collision system.

```
#include "ZBE/core/tools/math/collisions/CollisionData.h"
```

Classes

- class zbe::Collisionador

5.4.1 Detailed Description

Define a class that participate in collision system.

Copyright 2012 Batis Degryll Ludo

Since

2014-09-22

Date

2014-09-22

Author

Ludo and Degryll

5.5 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/Collisioner.h File Reference

Define a class that participate in collision system.

```
#include "ZBE/core/tools/math/Vector.h"
```

Classes

- class zbe::Collisioner

5.5.1 Detailed Description

Define a class that participate in collision system.

Copyright 2012 Batis Degryll Ludo

Since

2014-09-12

Date

2014-09-12

Author

Ludo and Degryll

5.6 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/Positionable.h File Reference

Define a class that has a position in the world.

```
#include "ZBE/core/tools/math/Vector.h"
#include "ZBE/core/tools/math/Point.h"
```

Classes

- class zbe::Positionable< s >

5.6.1 Detailed Description

Define a class that has a position in the world.

Copyright 2012 Batis Degryll Ludo

Since

2015-05-04

Date

2015-05-04

Author

Degryll

5.7 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/Runnable.h File Reference

Define a class with a void run(void) function.

Classes

- class zbe::Runnable

5.7.1 Detailed Description

Define a class with a void run(void) function.

Copyright 2012 Batis Degryll Ludo

Since

2014-09-08

Date

2014-09-08

Author

Ludo and Degryll

5.8 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/SimpleSprite.h File Reference

Define a class that can be draw as a simple sprite.

```
#include <SDL2/SDL.h>
```

Classes

- class zbe::SimpleSprite

5.8.1 Detailed Description

Define a class that can be draw as a simple sprite.

Copyright 2012 Batis Degryll Ludo

Since

2014-09-27

Date

2015-05-04

Author

Ludo and Degryll

5.9 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/archetypes/SphereCollisionable.h File Reference

Define a class that collides as a sphere.

Classes

- class zbe::SphereCollisionable

5.9.1 Detailed Description

Define a class that collides as a sphere.

Copyright 2012 Batis Degryll Ludo

Since

2014-05-04

Date

2015-05-04

Author

Degryll

5.10 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/behaviors/Behavior.h File Reference

Define the minimal functions of every behavior.

Classes

- class zbe::Behavior

5.10.1 Detailed Description

Define the minimal functions of every behavior.

Define the minimal functions of demons.

Copyright 2012 Batis Degryll Ludo

Since

2014-09-12

Date

2015-05-04

Author

Ludo and Degryll

Copyright 2015 Batis Degryll Ludo

Since

2014-09-12

Date

2015-05-04

Author

Ludo

5.11 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/behaviors/UniformLinearMotion.h File Reference

Updates the position of an object based on its speed. Requires Movible.

```
#include "any_iterator.hpp"
#include "ZBE/core/behaviors/Behavior.h"
#include "ZBE/core/archetypes/Movable.h"
```

Classes

- class zbe::UniformLinearMotion< s >

Typedefs

- template<unsigned s>
  using **zbe::MovableIterator** = IteratorTypeErasure::any_iterator< Movable< s >, boost::forward_traversal_tag, Movable< s > &, ptrdiff_t >

5.11.1 Detailed Description

Updates the position of an object based on its speed. Requires Movible.

Copyright 2012 Batis Degryll Ludo

Since

2015-05-04

Date

2015-05-04

Author

Degryll

5.12 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/drawers/Drawer.h File Reference

Define the minimal functions of every Drawer.

Classes

- class zbe::Drawer

5.12.1 Detailed Description

Define the minimal functions of every Drawer.

Copyright 2012 Batis Degryll Ludo

Since

2014-09-22

Date

2014-09-27

Author

Ludo and Degryll

5.13 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/drawers/SDL/SimpleSpriteSDLDrawer.h File Reference

Class that know how to draw ball Entities for the game ZombieBall.

```
#include "ZBE/core/drawers/Drawer.h"
#include "ZBE/core/archetypes/SimpleSprite.h"
#include "ZBE/core/SDL2.0/Window.h"
#include "any_iterator.hpp"
#include <SDL2/SDL.h>
```

Classes

- class zbe::SimpleSpriteSDLDrawer

Typedefs

- typedef IteratorTypeErasure::any_iterator< SimpleSprite, boost::forward_traversal_tag, SimpleSprite &, ptrdiff_t > **zbe::SimpleSpriteIterator**

5.13.1 Detailed Description

Class that know how to draw ball Entities for the game ZombieBall.

Class that know how to draw SimpleSprite entities with SDL.

Copyright 2012 Batis Degryll Ludo

Since

2012-02-01

Date

2014-09-27

Author

degryll

5.14 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/io/FileHandler.h File Reference

To handle files.

```
#include <string>
```

Classes

- class zbe::FileHandler

5.14.1 Detailed Description

To handle files.

Copyright 2012 Batis Degryll Ludo

Since

2014-05-25

Date

2014-08-23

Author

Degryll

5.15 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/system/App.h File Reference

Main application.

```
#include "ZBE/core/archetypes/Runnable.h"
```

Classes

- class zbe::App

5.15.1 Detailed Description

Main application.

Copyright 2012 Batis Degryll Ludo

Since

2014-09-08

Date

2014-09-09

Author

Ludo and Degryll

5.16 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/system/GameApp.h File Reference

Main game application.

```
#include <forward_list>
#include <algorithm>
#include "any_iterator.hpp"
#include "ZBE/core/system/App.h"
#include "ZBE/core/Timer.h"
#include "ZBE/core/CollisionData.h"
#include "ZBE/core/Behavior.h"
#include "ZBE/core/Drawer.h"
```

Classes

- class zbe::GameApp

Typedefs

- typedef IteratorTypeErasure::any_iterator< Behavior, boost::forward_traversal_tag, Behavior &, ptrdiff_t > **zbe::BehaviorIterator**
- typedef IteratorTypeErasure::any_iterator< Collisioner, boost::forward_traversal_tag, Collisioner &, ptrdiff_t > **zbe::CollisionerIterator**
- typedef IteratorTypeErasure::any_iterator< Drawer, boost::forward_traversal_tag, Drawer &, ptrdiff_t > **zbe::DrawerIterator**

5.16.1 Detailed Description

Main game application.

Data of a collision.

Copyright 2012 Batis Degryll Ludo

Since

2014-09-09

Date

2014-09-22

Author

Degryll

Copyright 2012 Batis Degryll Ludo

Since

2014-09-12

Date

2014-09-12

Author

Degryll

5.17 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/system/Logger.h File Reference

To create Logs.

```
#include <vector>
#include <forward_list>
#include <string>
#include <sstream>
#include <mutex>
```

Classes

- class zbe::LoggerMsg
- class zbe::Logger

Macros

- #define **ZBE_LOG_INFO**(MSG)
- #define **ZBE_LOG_DEBUG**(MSG)
- #define **ZBE_LOG_WARNING**(MSG)
- #define **ZBE_LOG_ERROR**(MSG)
- #define **ZBE_LOG**(TYPE, MSG)

5.17.1 Detailed Description

To create Logs.

Copyright 2012 Batis Degryll Ludo

Since

2014-05-16

Date

2014-05-16

Author

Degryll

5.17.2 Macro Definition Documentation

5.17.2.1 #define ZBE_LOG(*TYPE*, *MSG*)

Value:

```
do{ zbe::LoggerMsg lm; \
    zbe::Logger::getInstance()->log(TYPE, lm << "> " << MSG); } while(0)
```

5.17.2.2 #define ZBE_LOG_DEBUG(*MSG*)

Value:

```
do{ zbe::LoggerMsg lm; \
    zbe::Logger::getInstance()->log(zbe::Logger::TDEBUG, lm << __FILE__ << ":" << __LINE__ << "> " << MSG);
       } while(0)
```

5.17.2.3 #define ZBE_LOG_ERROR(*MSG*)

Value:

```
do{ zbe::LoggerMsg lm; \
    zbe::Logger::getInstance()->log(zbe::Logger::TERROR, lm << "> " << MSG); } while(0)
```

5.17.2.4 #define ZBE_LOG_INFO(*MSG*)

Value:

```
do{ zbe::LoggerMsg lm; \
    zbe::Logger::getInstance()->log(zbe::Logger::TINFO, lm << "> " << MSG); } while(0)
```

5.17.2.5 #define ZBE_LOG_WARNING(*MSG*)

Value:

```
do{ zbe::LoggerMsg lm; \
    zbe::Logger::getInstance()->log(zbe::Logger::TWARNING, lm << "> " << MSG); } while(0)
```

5.18 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/system/SysError.h File Reference

System to inform about errors.

```
#include <string>
```

Classes

- class zbe::SysError

5.18.1 Detailed Description

System to inform about errors.

Copyright 2012 Batis Degryll Ludo

Since

2013-11-23

Date

2014-03-16

Author

Degryll

5.19 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/containers/ArrayList.h File Reference

A list in an static array.

```
#include "ZBE/core/system/SysError.h"
#include "ZBE/core/tools/containers/Ticket.h"
#include "ZBE/core/tools/containers/ArrayListIterator.h"
```

Classes

- class zbe::ArrayListIter< Value >
- struct zbe::ArrayListNode< Value >
- class zbe::ArrayList< Value >
- class zbe::ArrayListTicketedIter< Value >
- struct zbe::ArrayListTicketedNode< Value >
- class zbe::ArrayListTicketed< Value >

5.19.1 Detailed Description

A list in an static array.

Copyright 2011 Batis Degryll Ludo

Since

2015/02/08

Date

2015/04/03

Author

Degryll

5.20 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/containers/ArrayListIterator.h File Reference

An iterator for the arrayList.

```
#include <cstdio>
#include <boost/iterator/iterator_facade.hpp>
#include "arrayList.h"
#include "Ticket.h"
```

Classes

- struct zbe::ArrayListNode< Value >
- class zbe::ArrayList< Value >
- class zbe::ArrayListIter< Value >
- struct zbe::ArrayListTicketedNode< Value >
- class zbe::ArrayListTicketed< Value >
- class zbe::ArrayListTicketedIter< Value >

Typedefs

- template<typename T >
  using **zbe::ArrayListIterator** = ArrayListIter< T >
- template<typename T >
  using **zbe::ArrayListConstIterator** = ArrayListIter< T const >
- template<typename T >
  using **zbe::ArrayListTicketedIterator** = ArrayListTicketedIter< T >
- template<typename T >
  using **zbe::ArrayListTicketedConstIterator** = ArrayListTicketedIter< T const >

5.20.1 Detailed Description

An iterator for the arrayList.

Copyright 2011 Batis Degryll Ludo

Since

2015/02/08

Date

2015/04/10

Author

Degryll

5.21 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/containers/Ticket.h File Reference

To be used in containers in witch each element can be marked as active, inactive, erase.

Classes

- class zbe::Ticket

5.21.1 Detailed Description

To be used in containers in witch each element can be marked as active, inactive, erase.

Copyright 2011 Batis Degryll Ludo

Since

2015/02/15

Date

2015/04/10

Author

Degryll

5.22 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/math.h File Reference

Math constant.

```
#include <utility>
#include <initializer_list>
#include <cstdio>
```

5.22.1 Detailed Description

Math constant.

Copyright 2011 Batis Degryll Ludo

Since

2015/05/16

Date

2015/05/19

Author

Degryll

5.23 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/objects.h File Reference

Math objects definitions.

```
#include <initializer_list>
#include "ZBE/core/tools/math/Point.h"
#include "ZBE/core/tools/math/Vector.h"
```

Classes

- struct zbe::Ray< s >
- struct zbe::Ray2D
- struct zbe::Ray3D
- struct zbe::NSphere< s >
- struct zbe::Circle
- struct zbe::Sphere
- struct zbe::AABB< s >
- struct zbe::AABB2D
- struct zbe::AABB3D

5.23.1 Detailed Description

Math objects definitions.

Copyright 2011 Batis Degryll Ludo

Since

2015/05/19

Date

2015/05/19

Author

Degryll

5.24 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/math/Point.h File Reference

Math Point definitions.

```
#include <initializer_list>
#include "ZBE/core/system/SysError.h"
```

Classes

- class zbe::Vector< s >
- class zbe::Point< s >
- class zbe::Point2D
- class zbe::Point3D

5.24.1 Detailed Description

Math Point definitions.

Copyright 2011 Batis Degryll Ludo

Since

2015/05/16

Date

2015/05/21

Author

Degryll

5.25 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/text/utf8.h File Reference

To work with UTF-8.

```
#include <string>
```

Functions

- int **zbe::next** (const char *&it, unsigned int &code_point)
- int **zbe::utf8to16** (unsigned short *dst, const char *src)
- template<typename u16bit_iterator >
  int **zbe::utf8to16** (u16bit_iterator result, const char *src)

Variables

- const uint16_t **zbe::LEAD_SURROGATE_MIN** = 0xd800u
- const uint16_t **zbe::LEAD_SURROGATE_MAX** = 0xdbffu
- const uint16_t **zbe::TRAIL_SURROGATE_MIN** = 0xdc00u
- const uint16_t **zbe::TRAIL_SURROGATE_MAX** = 0xdfffu
- const uint16_t **zbe::LEAD_OFFSET** = LEAD_SURROGATE_MIN - (0x10000 >> 10)
- const uint32_t **zbe::SURROGATE_OFFSET** = 0x10000u - (LEAD_SURROGATE_MIN << 10) - TRAIL_↩ SURROGATE_MIN
- const uint32_t **zbe::CODE_POINT_MAX** = 0x0010ffffu

5.25.1 Detailed Description

To work with UTF-8.

Copyright 2012 Batis Degryll Ludo

Since

2014-08-23

Date

2014-08-23

Author

Degryll

5.26 C:/Users/Degryll/Documents/GitHub/ZBE/include/ZBE/core/tools/Timer.h File Reference

Abstract timer class.

Classes

- class zbe::Timer

5.26.1 Detailed Description

Abstract timer class.

Copyright 2012 Batis Degryll Ludo

Since

2014-09-09

Date

2014-09-09

Author

Ludo and Degryll

5.27 C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/behaviors/UniformLinear↩ Motion.cpp File Reference

Updates the position of an object based on its speed. Requires Movible.

```
#include "ZBE/core/behaviors/UniformLinearMotion.h"
```

5.27.1 Detailed Description

Updates the position of an object based on its speed. Requires Movible.

Copyright 2012 Batis Degryll Ludo

Since

2015-05-04

Date

2015-05-04

Author

Degryll

5.28 C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/io/FileHandler.cpp File Reference

To handle files and directories.

```
#include "ZBE/core/io/FileHandler.h"
#include "ZBE/core/system/SysError.h"
#include "ZBE/core/tools/text/utf8.h"
#include "sys/stat.h"
#include <stdio.h>
```

5.28.1 Detailed Description

To handle files and directories.

Copyright 2012 Batis Degryll Ludo

Since

2014-05-25

Date

2014-05-25

Author

Degryll

5.29 C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/system/App.cpp File Reference

Main application.

```
#include "ZBE/core/system/App.h"
```

5.29.1 Detailed Description

Main application.

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Since

2014-09-08

Date

2014-09-08

Author

Ludo and Degryll

5.30 C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/system/Logger.cpp File Reference

To create Logs.

```
#include "ZBE/core/system/Logger.h"
#include "ZBE/core/io/FileHandler.h"
#include <iostream>
```

5.30.1 Detailed Description

To create Logs.

Copyright 2012 Batis Degryll Ludo

Since

2014-05-16

Date

2014-05-16

Author

Degryll

5.31 C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/system/SysError.cpp File Reference

System to inform about errors.

```
#include <string>
#include "ZBE/core/system/SysError.h"
```

5.31.1 Detailed Description

System to inform about errors.

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Since

2013-11-23

Date

2014-03-16

Author

Degryll

5.32 C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE/core/tools/text/utf8.cpp File Reference

To work with UTF-8.

```
#include <string>
#include "ZBE/core/tools/text/utf8.h"
#include "ZBE/core/system/SysError.h"
```

Functions

- size_t **zbe::sequence_length** (unsigned char lead)
- unsigned char **zbe::mask8** (char oc)
- int **zbe::increase_safely** (const char ∗&it)
- int **zbe::get_sequence_2** (const char ∗&it, unsigned int &code_point)
- int **zbe::get_sequence_3** (const char ∗&it, unsigned int &code_point)
- int **zbe::get_sequence_4** (const char ∗&it, unsigned int &code_point)
- bool **zbe::is_surrogate** (unsigned short cp)
- bool **zbe::is_code_point_valid** (unsigned int cp)
- bool **zbe::is_overlong_sequence** (unsigned int cp, size_t length)
- int **zbe::next** (const char ∗&it, unsigned int &code_point)
- int **zbe::utf8to16** (unsigned short ∗dst, const char ∗src)

5.32.1 Detailed Description

To work with UTF-8.

Copyright 2012 Batis Degryll Ludo

Since

2014-08-23

Date

2014-08-23

Author

Degryll

5.33 C:/Users/Degryll/Documents/GitHub/ZBE/src/ZBE_main/include/degryllmain.h File Reference

Mi main, nome nome quete quete.

```
#include <iostream>
#include <cstdio>
```

Functions

- int **degryllmain** (int argc, char ∗argv[ ])

5.33.1 Detailed Description

Mi main, nome nome quete quete.

Copyright 2012 Batis Degryll Ludo

Since

26/01/2012

Date

09/03/2012

Author

degryll

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