

Lab Raid

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Chapter 1

Namespace Index

1.1 Namespace List

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Shapes	14
Views	14

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

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SelectionManager< SDL_Texture * >	67
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Vector2D	74
Views::View	78
Views::Camera	20
Views::HUD	34

Chapter 3

Class Index

3.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Objects::Bullet	15
Objects::Button	18
Views::Camera	
Camera for following object or stationary view	20
Shapes::Circle	25
Commands::Command	
Commands base abstract class	28
CommandManager	
Manages a map from key bindings to various functions. e.g. <code>player.move()</code> , <code>currentScene.set(mainMenu)</code> , or <code>renderer.drawCone()</code>	29
Commands::Command::ExecuteKey	30
GameManager	30
Shapes::HollowCircle	31
Views::HUD	34
InputHandler	
This is a global singleton class of handling user inputs. Wrapper class of <code>SDL_PollEvent</code> and events handling	37
Items::Item	41
KeyBind	
KeyBind structure for key bindings	41
Shapes::Line	43
Objects::Object	
Object type for all renderable objects in the world note: the texture won't be created until loaded into the renderer	46
Objects::Player	55
Shapes::Rect	57
Renderer	
Required key to call render() in	59
Renderer::RenderKey	63
RenderObjectBase	
Empty render object base class category	64
sdl_deleter	
Generic deleter functor for SDL resources. For use with std smart pointers	65
SelectionManager< T >	67
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TextureHandler	
This is a global singleton class for texture handling	72
Vector2D	74
Views::View	
View : defines a view area, translates the objects' virtual rects to real rendering rects	78

Chapter 4

File Index

4.1 File List

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Chapter 5

Namespace Documentation

5.1 Commands Namespace Reference

Classes

- class [Command](#)
[Commands](#) base abstract class.

5.2 Config Namespace Reference

Variables

- const std::string [gameTitle](#) = "Lab Raid"
- const int [screenWidth](#) = 1920*7/10
- const int [screenHeight](#) = 1080*7/10
- const int [volume](#) = 50
- const int [framerate](#) = 60
- const float [holdTimeThreshold](#) = 100
- const SDL_WindowFlags [screenType](#) = SDL_WINDOW_SHOWN
- const SDL_Color [backgroundColor](#) { 0x3F, 0x3F, 0x3F, 0xFF }

5.2.1 Variable Documentation

5.2.1.1 backgroundColor

```
const SDL_Color Config::backgroundColor { 0x3F, 0x3F, 0x3F, 0xFF }
```

5.2.1.2 framerate

```
const int Config::framerate = 60
```

5.2.1.3 gameTitle

```
const std::string Config::gameTitle = "Lab Raid"
```

5.2.1.4 holdTimeThreshold

```
const float Config::holdTimeThreshold = 100
```

5.2.1.5 screenHeight

```
const int Config::screenHeight = 1080*7/10
```

5.2.1.6 screenType

```
const SDL_WindowFlags Config::screenType = SDL_WINDOW_SHOWN
```

5.2.1.7 screenWidth

```
const int Config::screenWidth = 1920*7/10
```

5.2.1.8 volume

```
const int Config::volume = 50
```

5.3 Functions Namespace Reference

5.4 Global Namespace Reference

Functions

- void [init](#) ()

Variables

- `std::unique_ptr< FPSmanager > fpsManager`
- `std::unique_ptr< Views::Camera > playerCamera`
- `std::unique_ptr< Views::HUD > hudView`
- `std::unique_ptr< Views::HUD > menuView`
- `std::shared_ptr< Objects::Object > playerObject`
- `std::shared_ptr< Objects::Object > arrowObject1`
- `std::shared_ptr< Objects::Object > arrowObject2`
- `std::shared_ptr< Shapes::Circle > yellowCircle`
- `std::shared_ptr< Shapes::Circle > greenCircle`
- `std::shared_ptr< Shapes::Circle > blueCircle`
- `std::shared_ptr< Shapes::Circle > redCircle`
- `std::shared_ptr< Shapes::Circle > purpleCircle`
- `std::shared_ptr< Shapes::HollowCircle > hollowCircle1`
- `std::shared_ptr< Shapes::Line > line1`
- `std::shared_ptr< Shapes::Line > line2`
- `std::shared_ptr< Shapes::Line > line3`
- `std::shared_ptr< Shapes::Line > line4`
- `std::shared_ptr< Objects::Object > hudArrow`
- `std::shared_ptr< Shapes::Circle > hudCircle`
- `std::shared_ptr< Shapes::Line > crosshairLine1`
- `std::shared_ptr< Shapes::Line > crosshairLine2`
- `std::shared_ptr< Shapes::HollowCircle > crosshairCircle1`
- `std::shared_ptr< Objects::Object > cameraObject`

5.4.1 Function Documentation

5.4.1.1 `init()`

```
void Global::init ( )
```

5.4.2 Variable Documentation

5.4.2.1 `arrowObject1`

```
std::shared_ptr<Objects::Object> Global::arrowObject1 [extern]
```

5.4.2.2 `arrowObject2`

```
std::shared_ptr<Objects::Object> Global::arrowObject2 [extern]
```

5.4.2.3 `blueCircle`

```
std::shared_ptr<Shapes::Circle> Global::blueCircle [extern]
```

5.4.2.4 cameraObject

```
std::shared_ptr<Objects::Object> Global::cameraObject [extern]
```

5.4.2.5 crosshairCircle1

```
std::shared_ptr<Shapes::HollowCircle> Global::crosshairCircle1 [extern]
```

5.4.2.6 crosshairLine1

```
std::shared_ptr<Shapes::Line> Global::crosshairLine1 [extern]
```

5.4.2.7 crosshairLine2

```
std::shared_ptr<Shapes::Line> Global::crosshairLine2 [extern]
```

5.4.2.8 fpsManager

```
std::unique_ptr<FPSmanager> Global::fpsManager [extern]
```

5.4.2.9 greenCircle

```
std::shared_ptr<Shapes::Circle> Global::greenCircle [extern]
```

5.4.2.10 hollowCircle1

```
std::shared_ptr<Shapes::HollowCircle> Global::hollowCircle1 [extern]
```

5.4.2.11 hudArrow

```
std::shared_ptr<Objects::Object> Global::hudArrow [extern]
```

5.4.2.12 hudCircle

```
std::shared_ptr<Shapes::Circle> Global::hudCircle [extern]
```

5.4.2.13 hudView

```
std::unique_ptr<Views::HUD> Global::hudView [extern]
```


5.4.2.14 line1

```
std::shared_ptr<Shapes::Line> Global::line1 [extern]
```

5.4.2.15 line2

```
std::shared_ptr<Shapes::Line> Global::line2 [extern]
```

5.4.2.16 line3

```
std::shared_ptr<Shapes::Line> Global::line3 [extern]
```

5.4.2.17 line4

```
std::shared_ptr<Shapes::Line> Global::line4 [extern]
```

5.4.2.18 menuView

```
std::unique_ptr<Views::HUD> Global::menuView [extern]
```

5.4.2.19 playerCamera

```
std::unique_ptr<Views::Camera> Global::playerCamera [extern]
```

5.4.2.20 playerObject

```
std::shared_ptr<Objects::Object> Global::playerObject [extern]
```

5.4.2.21 purpleCircle

```
std::shared_ptr<Shapes::Circle> Global::purpleCircle [extern]
```

5.4.2.22 redCircle

```
std::shared_ptr<Shapes::Circle> Global::redCircle [extern]
```

5.4.2.23 yellowCircle

```
std::shared_ptr<Shapes::Circle> Global::yellowCircle [extern]
```

5.5 Items Namespace Reference

Classes

- class [Item](#)

5.6 Objects Namespace Reference

Classes

- class [Bullet](#)
- class [Button](#)
- class [Object](#)
[Object](#) type for all renderable objects in the world note: the texture won't be created until loaded into the renderer.
- class [Player](#)

5.7 Shapes Namespace Reference

Classes

- class [Circle](#)
- class [HollowCircle](#)
- class [Line](#)
- class [Rect](#)
- class [Shape](#)

5.8 Views Namespace Reference

Classes

- class [Camera](#)
[Camera](#) for following object or stationary view.
- class [HUD](#)
- class [View](#)
[View](#): defines a view area, translates the objects' virtual rects to real rendering rects.

Variables

- const int [INIT_VIEW_WIDTH](#) = 1600
- const int [INIT_VIEW_HEIGHT](#) = 900

5.8.1 Variable Documentation

5.8.1.1 INIT_VIEW_HEIGHT

```
const int Views::INIT_VIEW_HEIGHT = 900
```

5.8.1.2 INIT_VIEW_WIDTH

```
const int Views::INIT_VIEW_WIDTH = 1600
```

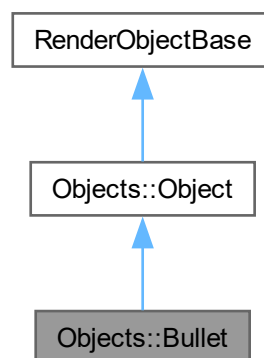
Chapter 6

Class Documentation

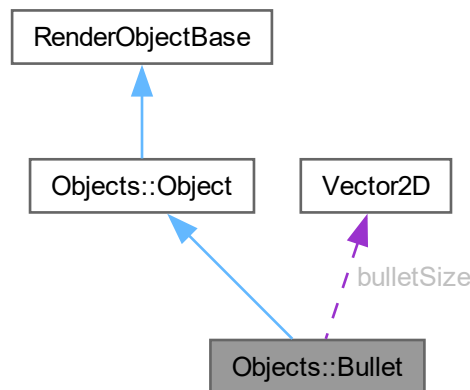
6.1 Objects::Bullet Class Reference

```
#include <bullet.h>
```

Inheritance diagram for Objects::Bullet:



Collaboration diagram for Objects::Bullet:



Public Member Functions

- [Bullet](#) (const [Views::View](#) *view, [Vector2D](#) position, float angle, float speed=20.0f)
- [Uint32 getAliveTime](#) (void) const noexcept
Gets the alive time of this bullet.
- void [update](#) (void) noexcept override
Updates the object state.

Public Member Functions inherited from [Objects::Object](#)

- [Object](#) (const std::vector< std::string > &textureNames, const [Views::View](#) *_view, const [Vector2D](#) &_↔ position, const [Vector2D](#) &_dimension)
Constructs a new object.
- virtual [~Object](#) ()=default
- float [getAngle](#) (void) const noexcept
Returns the angle of the object in radians. The returned angle will be in [0, 2pi), with 0 set at positive x direction, and going counter-clockwise.
- float [getRenderAngle](#) (void) const noexcept
Gets the render angle of the object.
- void [setAngle](#) (float newAngle) noexcept
Sets rotation angle to.
- void [rotate](#) (float diffAngle) noexcept
Rotates the object by.
- [SDL_RendererFlip getFlipFlag](#) (void) const noexcept
Returns the flip flag used by SDL.
- [Vector2D getPosition](#) (void) const noexcept
Gets the position of the object.
- void [setPosition](#) (const [Vector2D](#) &newPosition) noexcept
Sets the position of the object.
- [Vector2D getDimension](#) (void) const noexcept

- Gets the dimension of the object.*
- void [setDimension](#) (const [Vector2D](#) &newDimension)
 - Sets the dimension of the object. Throws 'std::invalid_argument' if one of the dimensions is negative.*
- void [move](#) (const [Vector2D](#) &translate) noexcept
 - Moves the object by the translate vector.*
- void [stretchX](#) (float ratio) noexcept
 - Stretches the object's width by.*
- void [stretchY](#) (float ratio) noexcept
 - Stretches the object's height by.*
- void [stretch](#) (float ratio) noexcept
 - Stretches both the object's width and height by.*
- void [flipHorizontal](#) (void) noexcept
 - Flips the object horizontally.*
- void [flipVertical](#) (void) noexcept
 - Flips the object vertically.*
- void [setVisibility](#) (bool visibility) noexcept
 - Sets the object's visibility.*
- bool [getVisibility](#) (void) const noexcept
 - Gets the object's visibility.*
- bool [collideWith](#) (const [Object](#) &other) const noexcept
 - Check if this object collides with 'other' object.*
- void [nextTexture](#) (void) noexcept
 - Set to next texture, texture ID wraps around.*
- void [previousTexture](#) (void) noexcept
 - Set to previous texture, texture ID wraps around.*
- void [setTexture](#) (int textureId) noexcept
 - Sets texture to.*
- size_t [getTextureCount](#) (void) const noexcept
 - Gets the number of textures this object has.*
- SDL_Texture * [getTexture](#) (void) const noexcept
 - Gets current texture.*
- virtual void [lookAt](#) (const [Vector2D](#) &position) noexcept
 - Make the object face.*
- SDL_FRect [getRenderRect](#) (void) const noexcept
 - Gets render rectangle for rendering.*
- void [debug](#) (void) const noexcept override

Static Public Attributes

- static const [Vector2D](#) [bulletSize](#)

6.1.1 Constructor & Destructor Documentation

6.1.1.1 Bullet()

```
Objects::Bullet::Bullet (
    const Views::View * view,
    Vector2D position,
    float angle,
    float speed = 20.0f ) [inline]
```

6.1.2 Member Function Documentation

6.1.2.1 getAliveTime()

```
UInt32 Objects::Bullet::getAliveTime (
    void ) const [noexcept]
```

Gets the alive time of this bullet.

Returns

The alive time of this bullet.

6.1.2.2 update()

```
void Objects::Bullet::update (
    void ) [override], [virtual], [noexcept]
```

Updates the object state.

Reimplemented from [Objects::Object](#).

6.1.3 Member Data Documentation

6.1.3.1 bulletSize

```
const Vector2D Objects::Bullet::bulletSize [static]
```

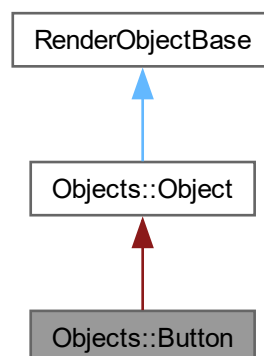
The documentation for this class was generated from the following file:

- [include/object/bullet.h](#)

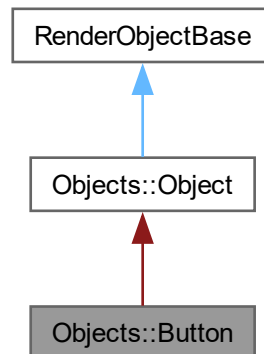
6.2 Objects::Button Class Reference

```
#include <button.h>
```

Inheritance diagram for Objects::Button:



Collaboration diagram for Objects::Button:



Public Member Functions

- `Button` (const `Views::View` *view, const `Vector2D` &position, const `Vector2D` &dimension, const `SDL_Color` &color, const `std::string` &text, `std::function`< void(void)> action)
- void `setHovered` (void) noexcept
- void `onClick` (void) noexcept
- void `update` (void) noexcept
Updates the object state.

6.2.1 Constructor & Destructor Documentation

6.2.1.1 Button()

```

Objects::Button::Button (
    const Views::View * view,
    const Vector2D & position,
    const Vector2D & dimension,
    const SDL_Color & color,
    const std::string & text,
    std::function< void(void)> action )

```

6.2.2 Member Function Documentation

6.2.2.1 onClick()

```

void Objects::Button::onClick (
    void ) [noexcept]

```

6.2.2.2 setHovered()

```
void Objects::Button::setHovered (
    void ) [noexcept]
```

6.2.2.3 update()

```
void Objects::Button::update (
    void ) [virtual], [noexcept]
```

Updates the object state.

Reimplemented from [Objects::Object](#).

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

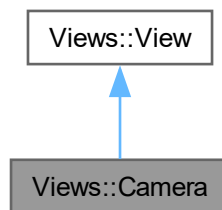
- include/object/[button.h](#)

6.3 Views::Camera Class Reference

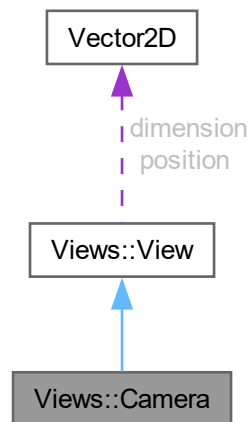
[Camera](#) for following object or stationary view.

```
#include <camera.h>
```

Inheritance diagram for Views::Camera:



Collaboration diagram for Views::Camera:



Public Member Functions

- [Camera](#) ()
- void [setPivotObject](#) (std::shared_ptr< [Objects::Object](#) > pivotObject) noexcept
Sets the pivot object of the camera.
- void [setPosition](#) (const [Vector2D](#) &newPosition) noexcept
Sets the position of the camera.
- void [setDimension](#) (const [Vector2D](#) &newDimension)
Sets the dimensions of the camera. The new dimension vector should be positive in both components. Throws std::invalid_argument if the new dimension vector is invalid.
- void [setZoom](#) (float zoom)
Sets the zoom level of the camera.
- float [getZoom](#) (void) const noexcept override
Gets the zoom level of the view.
- void [setAngle](#) (float angle) noexcept
Sets the rotation angle of the camera.
- void [rotate](#) (float diffAngle) noexcept
Rotates the view by @diffAngle.
- float [getAngle](#) (void) const noexcept override
Gets the rotation angle of the camera.
- SDL_FRect [getRect](#) (const [Objects::Object](#) &object) const noexcept override
Gets the render rect for.
- [Vector2D](#) [transform](#) (const [Vector2D](#) &position) const noexcept override
Gets the transformed render position of.
- [Vector2D](#) [transformFromRender](#) (const [Vector2D](#) &renderPosition) const noexcept override
Gets the virtual position of.

Public Member Functions inherited from [Views::View](#)

- virtual [~View](#) ()
- virtual [Vector2D](#) [getDimension](#) (void) const noexcept
Gets the virtual dimension of the view.

Additional Inherited Members

Protected Member Functions inherited from [Views::View](#)

- [View](#) (const [Vector2D](#) &_position, const [Vector2D](#) &_dimension)

Protected Attributes inherited from [Views::View](#)

- [Vector2D](#) position
- [Vector2D](#) dimension

6.3.1 Detailed Description

[Camera](#) for following object or stationary view.

6.3.2 Constructor & Destructor Documentation

6.3.2.1 Camera()

```
Views::Camera::Camera ( )
```

6.3.3 Member Function Documentation

6.3.3.1 getAngle()

```
float Views::Camera::getAngle (
    void ) const [override], [virtual], [noexcept]
```

Gets the rotation angle of the camera.

Returns

The rotation angle of the camera.

Reimplemented from [Views::View](#).

6.3.3.2 getRect()

```
SDL_FRect Views::Camera::getRect (
    const Objects::Object & object ) const [override], [virtual], [noexcept]
```

Gets the render rect for.

Parameters

<i>object.</i>	
<i>object</i>	The object to be rendered.

Returns

The render rect of
object.

Implements [Views::View](#).

6.3.3.3 getZoom()

```
float Views::Camera::getZoom (
    void ) const [override], [virtual], [noexcept]
```

Gets the zoom level of the view.

Returns

The zoom level of the view.

Reimplemented from [Views::View](#).

6.3.3.4 rotate()

```
void Views::Camera::rotate (
    float diffAngle ) [noexcept]
```

Rotates the view by @diffAngle.

Parameters

<i>diffAngle</i>	The angle to rotate by.
------------------	-------------------------

6.3.3.5 setAngle()

```
void Views::Camera::setAngle (
    float angle ) [noexcept]
```

Sets the rotation angle of the camera.

Parameters

<i>angle</i>	The rotation angle to be set.
--------------	-------------------------------

6.3.3.6 setDimension()

```
void Views::Camera::setDimension (
    const Vector2D & newDimension )
```

Sets the dimensions of the camera. The new dimension vector should be positive in both components. Throws `std::invalid_argument` if the new dimension vector is invalid.

Parameters

<i>newDimension</i>	The new dimensions of the camera.
---------------------	-----------------------------------

6.3.3.7 setPivotObject()

```
void Views::Camera::setPivotObject (
    std::shared_ptr< Objects::Object > pivotObject ) [noexcept]
```

Sets the pivot object of the camera.

Parameters

<i>pivotObject</i>	The object to pivot on.
--------------------	-------------------------

6.3.3.8 setPosition()

```
void Views::Camera::setPosition (
    const Vector2D & newPosition ) [noexcept]
```

Sets the position of the camera.

Parameters

<i>newPosition</i>	The new positions of the camera.
--------------------	----------------------------------

6.3.3.9 setZoom()

```
void Views::Camera::setZoom (
    float zoom )
```

Sets the zoom level of the camera.

Parameters

<i>zoom</i>	should be positive. Throws <code>std::invalid_argument</code> if
<i>zoom</i>	is invalid.
<i>zoom</i>	The zoom level to be set.

6.3.3.10 transform()

```
Vector2D Views::Camera::transform (
    const Vector2D & position ) const [override], [virtual], [noexcept]
```

Gets the transformed render position of.

Parameters

<i>position.</i>	
<i>position</i>	The virtual position to be transformed.

Returns

The render position after transformation.

Implements [Views::View](#).

6.3.3.11 transformFromRender()

```
Vector2D Views::Camera::transformFromRender (
    const Vector2D & renderPosition ) const [override], [virtual], [noexcept]
```

Gets the virtual position of.

Parameters

<i>renderPosition.</i>	
<i>renderPosition</i>	The render position to be transformed

Returns

The virtual position after transformation.

Implements [Views::View](#).

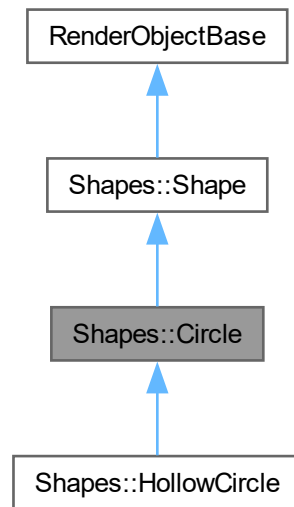
The documentation for this class was generated from the following file:

- [include/view/camera.h](#)

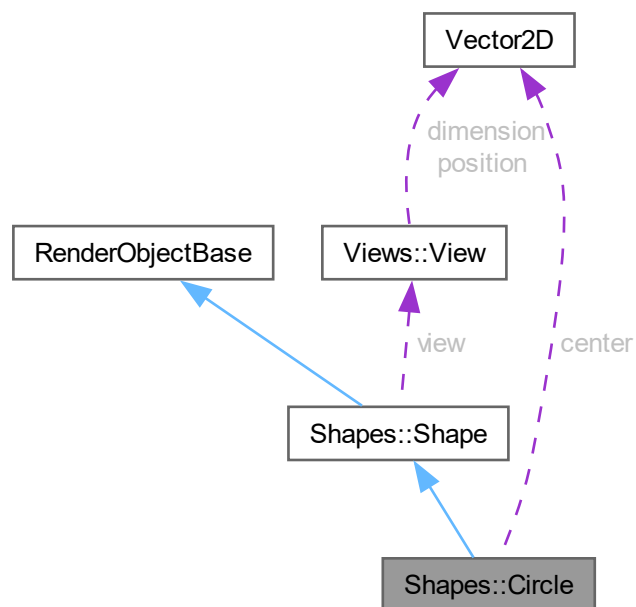
6.4 Shapes::Circle Class Reference

```
#include <circle.h>
```

Inheritance diagram for Shapes::Circle:



Collaboration diagram for Shapes::Circle:



Public Member Functions

- `Circle` (`Views::View` *`view`, const `Vector2D` &`center`, float `radius`, `SDL_Color` `color`={ 0, 0, 0, 255 }) noexcept

- void [setCenter](#) (const [Vector2D](#) &newCenter) noexcept
- void [setRadius](#) (float newRadius) noexcept
- void [draw](#) (SDL_Renderer *renderer) const noexcept override

Public Member Functions inherited from [Shapes::Shape](#)

- [Shape](#) ([Views::View](#) *view, const SDL_Color &color={ 0, 0, 0, 255 })
- virtual [~Shape](#) ()=default
- void [setColor](#) (const SDL_Color &newColor) noexcept
- SDL_Color [getColor](#) (void) const noexcept

Public Member Functions inherited from [RenderObjectBase](#)

- virtual void [debug](#) (void) const noexcept

Protected Attributes

- [Vector2D](#) center
- float [radius](#)

Protected Attributes inherited from [Shapes::Shape](#)

- const [Views::View](#) * view
- SDL_Color [color](#)

6.4.1 Constructor & Destructor Documentation

6.4.1.1 Circle()

```
Shapes::Circle::Circle (
    Views::View * view,
    const Vector2D & center,
    float radius,
    SDL_Color color = { 0, 0, 0, 255 } ) [noexcept]
```

6.4.2 Member Function Documentation

6.4.2.1 draw()

```
void Shapes::Circle::draw (
    SDL_Renderer * renderer ) const [override], [virtual], [noexcept]
```

Reimplemented from [Shapes::Shape](#).

Reimplemented in [Shapes::HollowCircle](#).

6.4.2.2 setCenter()

```
void Shapes::Circle::setCenter (
    const Vector2D & newCenter ) [noexcept]
```

6.4.2.3 setRadius()

```
void Shapes::Circle::setRadius (
    float newRadius ) [noexcept]
```

6.4.3 Member Data Documentation

6.4.3.1 center

```
Vector2D Shapes::Circle::center [protected]
```

6.4.3.2 radius

```
float Shapes::Circle::radius [protected]
```

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

- include/shape/[circle.h](#)

6.5 Commands::Command Class Reference

[Commands](#) base abstract class.

```
#include <command.h>
```

Classes

- class [ExecuteKey](#)

Public Member Functions

- virtual [~Command](#) ()
- virtual void [execute](#) (const [ExecuteKey](#) &)

6.5.1 Detailed Description

[Commands](#) base abstract class.

6.5.2 Constructor & Destructor Documentation

6.5.2.1 ~Command()

```
virtual Commands::Command::~~Command ( ) [inline], [virtual]
```

6.5.3 Member Function Documentation

6.5.3.1 execute()

```
virtual void Commands::Command::execute (
    const ExecuteKey & ) [inline], [virtual]
```

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

- include/command/[command.h](#)

6.6 CommandManager Class Reference

Manages a map from key bindings to various functions. e.g. `player.move()`, `currentScene.set(mainMenu)`, or `renderer.drawCone()`.

```
#include <command_manager.h>
```

Public Member Functions

- bool [registerCommand](#) ([KeyBind](#) keyBind, std::shared_ptr< [Commands::Command](#) > command)
Registers a command for the specified key bind.
- void [update](#) () noexcept
Executes corresponding command if a key bind was matched. Note: beware of thread safety.

6.6.1 Detailed Description

Manages a map from key bindings to various functions. e.g. `player.move()`, `currentScene.set(mainMenu)`, or `renderer.drawCone()`.

6.6.2 Member Function Documentation

6.6.2.1 registerCommand()

```
bool CommandManager::registerCommand (
    KeyBind keyBind,
    std::shared_ptr< Commands::Command > command )
```

Registers a command for the specified key bind.

Parameters

<i>keyBind</i>	The key bind of this command.
<i>command</i>	The command to execute if the key bind is pressed.

Returns

Whether the command was successfully registered, fails if keyBind is already registered.

6.6.2.2 update()

```
void CommandManager::update ( ) [noexcept]
```

Executes corresponding command if a key bind was matched. Note: beware of thread safety.

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

- include/[command_manager.h](#)

6.7 Commands::Command::ExecuteKey Class Reference

```
#include <command.h>
```

Friends

- class [CommandManager](#)

6.7.1 Friends And Related Symbol Documentation**6.7.1.1 CommandManager**

```
friend class CommandManager [friend]
```

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

- include/command/[command.h](#)

6.8 GameManager Class Reference

```
#include <game_manager.h>
```

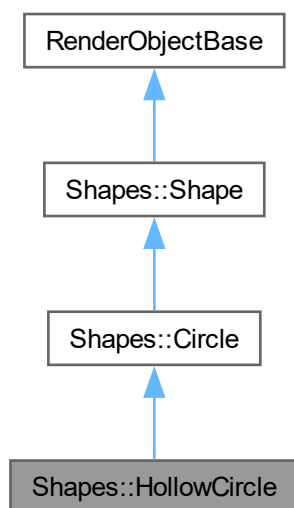
The documentation for this class was generated from the following file:

- include/[game_manager.h](#)

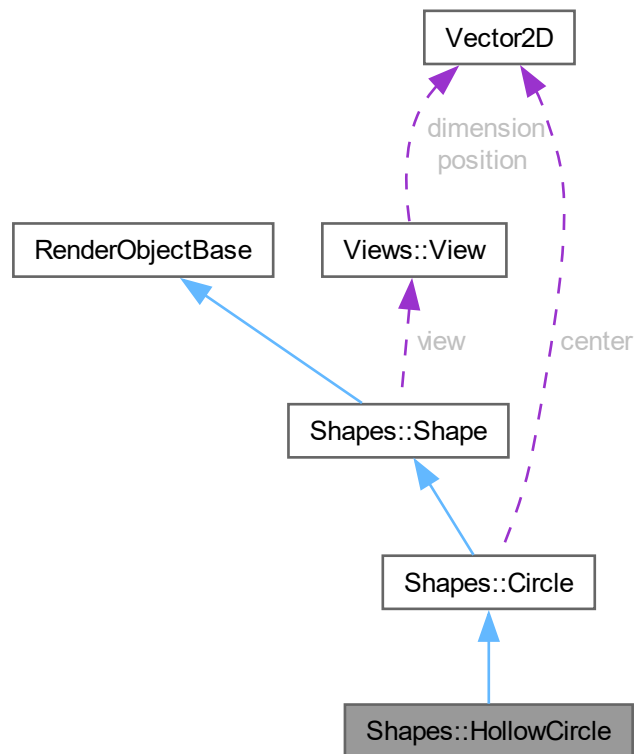
6.9 Shapes::HollowCircle Class Reference

```
#include <circle.h>
```

Inheritance diagram for Shapes::HollowCircle:



Collaboration diagram for Shapes::HollowCircle:



Public Member Functions

- [HollowCircle](#) ([Views::View](#) *[view](#), const [Vector2D](#) &[center](#), float [radius](#), uint8_t [thickness](#), [SDL_Color](#) [color](#)={ 0, 0, 0, 255 }) noexcept
- void [setThickness](#) (uint8_t newThickness) noexcept
- void [draw](#) ([SDL_Renderer](#) *[renderer](#)) const noexcept override

Public Member Functions inherited from [Shapes::Circle](#)

- [Circle](#) ([Views::View](#) *[view](#), const [Vector2D](#) &[center](#), float [radius](#), [SDL_Color](#) [color](#)={ 0, 0, 0, 255 }) noexcept
- void [setCenter](#) (const [Vector2D](#) &newCenter) noexcept
- void [setRadius](#) (float newRadius) noexcept

Public Member Functions inherited from [Shapes::Shape](#)

- [Shape](#) ([Views::View](#) *[view](#), const [SDL_Color](#) &[color](#)={ 0, 0, 0, 255 })
- virtual [~Shape](#) ()=default
- void [setColor](#) (const [SDL_Color](#) &newColor) noexcept
- [SDL_Color](#) [getColor](#) (void) const noexcept

Public Member Functions inherited from [RenderObjectBase](#)

- virtual void [debug](#) (void) const noexcept

Protected Attributes

- uint8_t [thickness](#)

Protected Attributes inherited from [Shapes::Circle](#)

- [Vector2D](#) [center](#)
- float [radius](#)

Protected Attributes inherited from [Shapes::Shape](#)

- const [Views::View](#) * [view](#)
- [SDL_Color](#) [color](#)

6.9.1 Constructor & Destructor Documentation

6.9.1.1 [HollowCircle\(\)](#)

```
Shapes::HollowCircle::HollowCircle (
    Views::View * view,
    const Vector2D & center,
    float radius,
    uint8_t thickness,
    SDL\_Color color = { 0, 0, 0, 255 } ) [noexcept]
```

6.9.2 Member Function Documentation

6.9.2.1 [draw\(\)](#)

```
void Shapes::HollowCircle::draw (
    SDL\_Renderer * renderer ) const [override], [virtual], [noexcept]
```

Reimplemented from [Shapes::Circle](#).

6.9.2.2 [setThickness\(\)](#)

```
void Shapes::HollowCircle::setThickness (
    uint8_t newThickness ) [noexcept]
```

6.9.3 Member Data Documentation

6.9.3.1 thickness

```
uint8_t Shapes::HollowCircle::thickness [protected]
```

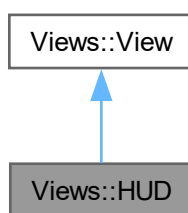
The documentation for this class was generated from the following file:

- [include/shape/circle.h](#)

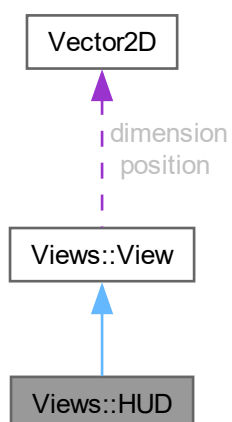
6.10 Views::HUD Class Reference

```
#include <hud.h>
```

Inheritance diagram for Views::HUD:



Collaboration diagram for Views::HUD:



Public Member Functions

- [HUD](#) ()
- `SDL_FRect` [getRect](#) (const [Objects::Object](#) &) const noexcept override
Gets the render rect for.
- [Vector2D](#) [transform](#) (const [Vector2D](#) &position) const noexcept override
Gets the transformed render position of.
- [Vector2D](#) [transformFromRender](#) (const [Vector2D](#) &renderPosition) const noexcept override
Gets the virtual position of.

Public Member Functions inherited from [Views::View](#)

- virtual [~View](#) ()
- virtual [Vector2D](#) [getPosition](#) (void) const noexcept
Gets the virtual position of the view.
- virtual [Vector2D](#) [getDimension](#) (void) const noexcept
Gets the virtual dimension of the view.
- virtual float [getAngle](#) (void) const noexcept
Gets the rotation angle of the view.
- virtual float [getZoom](#) (void) const noexcept
Gets the zoom level of the view.

Additional Inherited Members

Protected Member Functions inherited from [Views::View](#)

- [View](#) (const [Vector2D](#) &_position, const [Vector2D](#) &_dimension)

Protected Attributes inherited from [Views::View](#)

- [Vector2D](#) position
- [Vector2D](#) dimension

6.10.1 Constructor & Destructor Documentation

6.10.1.1 HUD()

```
Views::HUD::HUD ( )
```

6.10.2 Member Function Documentation

6.10.2.1 getRect()

```
SDL_FRect Views::HUD::getRect (
    const Objects::Object & object ) const [override], [virtual], [noexcept]
```

Gets the render rect for.

Parameters

<i>object.</i>	
<i>object</i>	The object to be rendered.

Returns

The render rect of
object.

Implements [Views::View](#).

6.10.2.2 transform()

```
Vector2D Views::HUD::transform (  
    const Vector2D & position ) const [override], [virtual], [noexcept]
```

Gets the transformed render position of.

Parameters

<i>position.</i>	
<i>position</i>	The virtual position to be transformed.

Returns

The render position after transformation.

Implements [Views::View](#).

6.10.2.3 transformFromRender()

```
Vector2D Views::HUD::transformFromRender (  
    const Vector2D & renderPosition ) const [override], [virtual], [noexcept]
```

Gets the virtual position of.

Parameters

<i>renderPosition.</i>	
<i>renderPosition</i>	The render position to be transformed

Returns

The virtual position after transformation.

Implements [Views::View](#).

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

- [include/view/hud.h](#)

6.11 InputHandler Class Reference

This is a global singleton class of handling user inputs. Wrapper class of `SDL_PollEvent` and events handling.

```
#include <input_handler.h>
```

Public Member Functions

- [InputHandler](#) (const [InputHandler](#) &)=delete
- void [operator=](#) (const [InputHandler](#) &)=delete
- bool [pollKeyPress](#) (SDL_Keycode key) noexcept
Polls if a key is pressed. (SDL_KeyDown) Is only true when the key was not held down in the previous tick.
- bool [pollKeyRelease](#) (SDL_Keycode key) noexcept
Checks if a key is released. (SDL_KeyUp) Is only true when the key was held down in the last tick.
- bool [isKeyDown](#) (SDL_Keycode key) const noexcept
Checks if a key is held down. (SDL_KeyDown)
- bool [isKeyUp](#) (SDL_Keycode key) const noexcept
Checks if a key is not held down.
- uint32_t [holdTime](#) (SDL_Keycode key) const noexcept
Gets the time a key was held down in SDL_Ticks.
- bool [pollButtonPress](#) (MouseButton button) noexcept
- bool [pollButtonRelease](#) (MouseButton button) noexcept
- bool [isButtonDown](#) (MouseButton button) const noexcept
- bool [isButtonUp](#) (MouseButton button) const noexcept
- uint32_t [holdTime](#) (MouseButton button) const noexcept
- [Vector2D](#) [getMousePosition](#) (void) const noexcept
- [Vector2D](#) [pollMouseScroll](#) (void) noexcept
- void [receiveEvent](#) (SDL_KeyboardEvent keyboardEvent) noexcept
- void [receiveEvent](#) (SDL_MouseButtonEvent mouseButtonEvent) noexcept
- void [receiveEvent](#) (SDL_MouseWheelEvent mouseWheelEvent) noexcept

Static Public Member Functions

- static [InputHandler](#) & [getInstance](#) (void) noexcept

6.11.1 Detailed Description

This is a global singleton class of handling user inputs. Wrapper class of `SDL_PollEvent` and events handling.

6.11.2 Constructor & Destructor Documentation

6.11.2.1 InputHandler()

```
InputHandler::InputHandler (
    const InputHandler & ) [delete]
```

6.11.3 Member Function Documentation

6.11.3.1 getInstance()

```
static InputHandler & InputHandler::getInstance (
    void ) [static], [noexcept]
```

6.11.3.2 getMousePosition()

```
Vector2D InputHandler::getMousePosition (
    void ) const [noexcept]
```

6.11.3.3 holdTime() [1/2]

```
uint32_t InputHandler::holdTime (
    MouseButton button ) const [noexcept]
```

6.11.3.4 holdTime() [2/2]

```
uint32_t InputHandler::holdTime (
    SDL_Keycode key ) const [noexcept]
```

Gets the time a key was held down in SDL_Ticks.

Returns

How long the key was held down.

6.11.3.5 isButtonDown()

```
bool InputHandler::isButtonDown (
    MouseButton button ) const [noexcept]
```

6.11.3.6 isButtonUp()

```
bool InputHandler::isButtonUp (
    MouseButton button ) const [noexcept]
```

6.11.3.7 isKeyDown()

```
bool InputHandler::isKeyDown (
    SDL_Keycode key ) const [noexcept]
```

Checks if a key is held down. (SDL_KeyDown)

Parameters

<i>key</i>	SDL_Keycode key value.
------------	------------------------

Returns

Whether the key was held down.

6.11.3.8 isKeyUp()

```
bool InputHandler::isKeyUp (
    SDL_Keycode key ) const [noexcept]
```

Checks if a key is not held down.

Parameters

<i>key</i>	SDL_Keycode key value.
------------	------------------------

Returns

Whether the key was not held down.

6.11.3.9 operator=()

```
void InputHandler::operator= (
    const InputHandler & ) [delete]
```

6.11.3.10 pollButtonPress()

```
bool InputHandler::pollButtonPress (
    MouseButton button ) [noexcept]
```

6.11.3.11 pollButtonRelease()

```
bool InputHandler::pollButtonRelease (
    MouseButton button ) [noexcept]
```

6.11.3.12 pollKeyPress()

```
bool InputHandler::pollKeyPress (
    SDL_Keycode key ) [noexcept]
```

Polls if a key is pressed. (SDL_KeyDown) Is only true when the key was not held down in the previous tick.

Parameters

<i>key</i>	SDL_Keycode key value.
------------	------------------------

Returns

Whether the key was pressed.

6.11.3.13 pollKeyRelease()

```
bool InputHandler::pollKeyRelease (
    SDL_Keycode key ) [noexcept]
```

Checks if a key is released. (SDL_KeyUp) Is only true when the key was held down in the last tick.

Parameters

<i>key</i>	SDL_Keycode key value.
------------	------------------------

Returns

Whether the key was released.

6.11.3.14 pollMouseScroll()

```
Vector2D InputHandler::pollMouseScroll (
    void ) [noexcept]
```

6.11.3.15 receiveEvent() [1/3]

```
void InputHandler::receiveEvent (
    SDL_KeyboardEvent keyboardEvent ) [noexcept]
```

6.11.3.16 receiveEvent() [2/3]

```
void InputHandler::receiveEvent (
    SDL_MouseButtonEvent mouseButtonEvent ) [noexcept]
```

6.11.3.17 receiveEvent() [3/3]

```
void InputHandler::receiveEvent (
    SDL_MouseWheelEvent mouseWheelEvent ) [noexcept]
```

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

- [include/input_handler.h](#)

6.12 Items::Item Class Reference

```
#include <item.h>
```

Public Member Functions

- [Item](#) (const std::vector< std::string > &instanceTextureNames, const std::vector< std::string > &inventoryObject, const std::string &itemName, uint8_t cap, uint8_t count)

6.12.1 Constructor & Destructor Documentation

6.12.1.1 Item()

```
Items::Item::Item (
    const std::vector< std::string > & instanceTextureNames,
    const std::vector< std::string > & inventoryObject,
    const std::string & itemName,
    uint8_t cap,
    uint8_t count )
```

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

- include/object/item/[item.h](#)

6.13 KeyBind Struct Reference

[KeyBind](#) structure for key bindings.

```
#include <command_manager.h>
```

Public Types

- enum class [Trigger](#) { [TAP](#) , [HOLD](#) , [RELEASE](#) }

Public Member Functions

- [KeyBind](#) (const std::map< SDL_Keycode, [Trigger](#) > &keys, const std::map< [MouseButton](#), [Trigger](#) > buttons)

Public Attributes

- int [ID](#)
- std::map< SDL_Keycode, [Trigger](#) > [keys](#)
- std::map< [MouseButton](#), [Trigger](#) > [buttons](#)

Static Public Attributes

- static unsigned int [KeyBindCount](#)

Friends

- bool [operator<](#) (const [KeyBind](#) &a, const [KeyBind](#) &b)

6.13.1 Detailed Description

[KeyBind](#) structure for key bindings.

6.13.2 Member Enumeration Documentation

6.13.2.1 Trigger

```
enum class KeyBind::Trigger [strong]
```

Enumerator

TAP	
HOLD	
RELEASE	

6.13.3 Constructor & Destructor Documentation

6.13.3.1 KeyBind()

```
KeyBind::KeyBind (
    const std::map< SDL_Keycode, Trigger > & keys,
    const std::map< MouseButton, Trigger > buttons ) [inline]
```

6.13.4 Friends And Related Symbol Documentation

6.13.4.1 operator<

```
bool operator< (
    const KeyBind & a,
    const KeyBind & b ) [friend]
```

6.13.5 Member Data Documentation

6.13.5.1 buttons

```
std::map<MouseButton, Trigger> KeyBind::buttons
```

6.13.5.2 ID

```
int KeyBind::ID
```

6.13.5.3 KeyBindCount

```
unsigned int KeyBind::KeyBindCount [static]
```

6.13.5.4 keys

```
std::map<SDL_Keycode, Trigger> KeyBind::keys
```

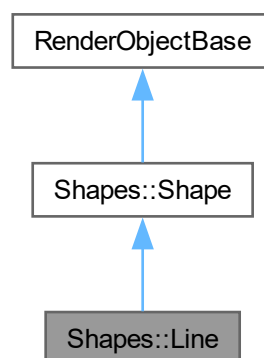
The documentation for this struct was generated from the following file:

- include/[command_manager.h](#)

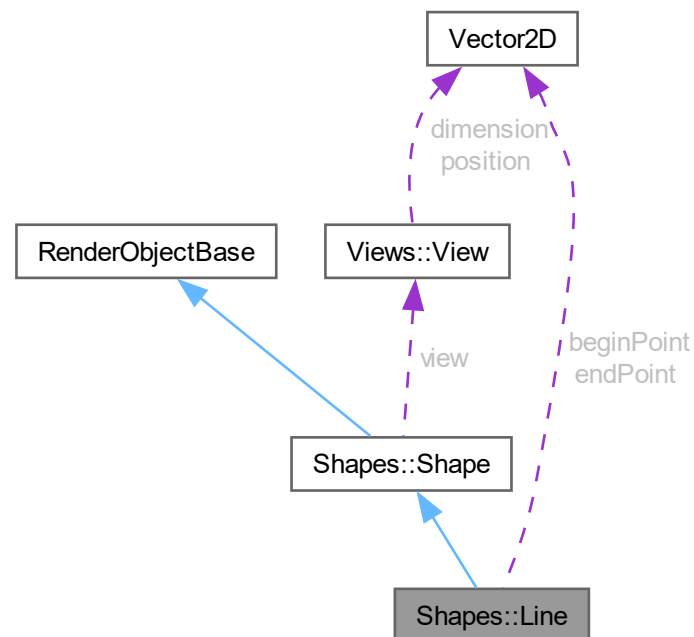
6.14 Shapes::Line Class Reference

```
#include <line.h>
```

Inheritance diagram for Shapes::Line:



Collaboration diagram for Shapes::Line:



Public Member Functions

- [Line](#) ([Views::View](#) *view, [Vector2D](#) _beginPoint, [Vector2D](#) _endPoint, uint8_t _thickness, [SDL_Color](#) color={0, 0, 0, 255}) noexcept
- void [setBeginPoint](#) ([Vector2D](#) newBeginPoint) noexcept
- void [setEndPoint](#) ([Vector2D](#) newEndPoint) noexcept
- void [setThickness](#) (uint8_t newThickness) noexcept
- void [draw](#) ([SDL_Renderer](#) *renderer) const noexcept override

Public Member Functions inherited from [Shapes::Shape](#)

- [Shape](#) ([Views::View](#) *view, const [SDL_Color](#) &color={ 0, 0, 0, 255 })
- virtual [~Shape](#) ()=default
- void [setColor](#) (const [SDL_Color](#) &newColor) noexcept
- [SDL_Color](#) [getColor](#) (void) const noexcept

Public Member Functions inherited from [RenderObjectBase](#)

- virtual void [debug](#) (void) const noexcept

Protected Attributes

- [Vector2D](#) [beginPoint](#)
- [Vector2D](#) [endPoint](#)
- uint8_t [thickness](#)

Protected Attributes inherited from [Shapes::Shape](#)

- const [Views::View](#) * [view](#)
- [SDL_Color](#) [color](#)

6.14.1 Constructor & Destructor Documentation

6.14.1.1 Line()

```
Shapes::Line::Line (
    Views::View * view,
    Vector2D \_beginPoint,
    Vector2D \_endPoint,
    uint8\_t \_thickness,
    SDL\_Color color = {0, 0, 0, 255} ) [noexcept]
```

6.14.2 Member Function Documentation

6.14.2.1 draw()

```
void Shapes::Line::draw (
    SDL\_Renderer * renderer ) const [override], [virtual], [noexcept]
```

Reimplemented from [Shapes::Shape](#).

6.14.2.2 setBeginPoint()

```
void Shapes::Line::setBeginPoint (
    Vector2D newBeginPoint ) [noexcept]
```

6.14.2.3 setEndPoint()

```
void Shapes::Line::setEndPoint (
    Vector2D newEndPoint ) [noexcept]
```

6.14.2.4 setThickness()

```
void Shapes::Line::setThickness (
    uint8\_t newThickness ) [noexcept]
```

6.14.3 Member Data Documentation

6.14.3.1 beginPoint

```
Vector2D Shapes::Line::beginPoint [protected]
```

6.14.3.2 endPoint

`Vector2D` Shapes::Line::endPoint [protected]

6.14.3.3 thickness

`uint8_t` Shapes::Line::thickness [protected]

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

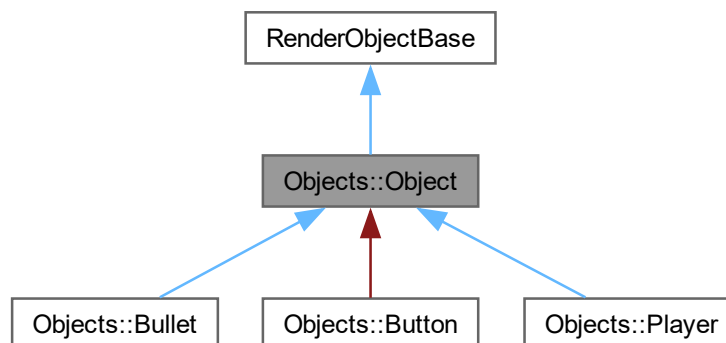
- `include/shape/line.h`

6.15 Objects::Object Class Reference

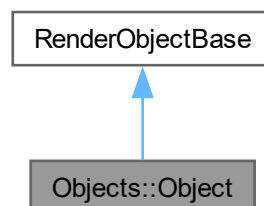
`Object` type for all renderable objects in the world note: the texture won't be created until loaded into the renderer.

```
#include <object.h>
```

Inheritance diagram for Objects::Object:



Collaboration diagram for Objects::Object:



Public Member Functions

- **Object** (const std::vector< std::string > &textureNames, const **Views::View** *_view, const **Vector2D** &_position, const **Vector2D** &_dimension)
Constructs a new object.
- virtual **~Object** ()=default
- float **getAngle** (void) const noexcept
Returns the angle of the object in radians. The returned angle will be in [0, 2pi), with 0 set at positive x direction, and going counter-clockwise.
- float **getRenderAngle** (void) const noexcept
Gets the render angle of the object.
- void **setAngle** (float newAngle) noexcept
Sets rotation angle to.
- void **rotate** (float diffAngle) noexcept
Rotates the object by.
- SDL_RendererFlip **getFlipFlag** (void) const noexcept
Returns the flip flag used by SDL.
- **Vector2D** **getPosition** (void) const noexcept
Gets the position of the object.
- void **setPosition** (const **Vector2D** &newPosition) noexcept
Sets the position of the object.
- **Vector2D** **getDimension** (void) const noexcept
Gets the dimension of the object.
- void **setDimension** (const **Vector2D** &newDimension)
Sets the dimension of the object. Throws 'std::invalid_argument' if one of the dimensions is negative.
- void **move** (const **Vector2D** &translate) noexcept
Moves the object by the translate vector.
- void **stretchX** (float ratio) noexcept
Stretches the object's width by.
- void **stretchY** (float ratio) noexcept
Stretches the object's height by.
- void **stretch** (float ratio) noexcept
Stretches both the object's width and height by.
- void **flipHorizontal** (void) noexcept
Flips the object horizontally.
- void **flipVertical** (void) noexcept
Flips the object vertically.
- void **setVisibility** (bool visibility) noexcept
Sets the object's visibility.
- bool **getVisibility** (void) const noexcept
Gets the object's visibility.
- bool **collideWith** (const **Object** &other) const noexcept
Check if this object collides with 'other' object.
- void **nextTexture** (void) noexcept
Set to next texture, texture ID wraps around.
- void **previousTexture** (void) noexcept
Set to previous texture, texture ID wraps around.
- void **setTexture** (int textureId) noexcept
Sets texture to.
- size_t **getTextureCount** (void) const noexcept
Gets the number of textures this object has.

- `SDL_Texture *` [getTexture](#) (void) const noexcept
Gets current texture.
- virtual void [lookAt](#) (const [Vector2D](#) &position) noexcept
Make the object face.
- `SDL_FRect` [getRenderRect](#) (void) const noexcept
Gets render rectangle for rendering.
- virtual void [update](#) (void) noexcept
Updates the object state.
- void [debug](#) (void) const noexcept override

Friends

- class [TextureHandler](#)

6.15.1 Detailed Description

[Object](#) type for all renderable objects in the world note: the texture won't be created until loaded into the renderer.

6.15.2 Constructor & Destructor Documentation

6.15.2.1 Object()

```
Objects::Object::Object (
    const std::vector< std::string > & textureNames,
    const Views::View * _view,
    const Vector2D & _position,
    const Vector2D & _dimension )
```

Constructs a new object.

Parameters

<i>textureNames</i>	The list of texture names.
<i>_view</i>	The viewport of the object.
<i>_position</i>	Initial position. (x, y)
<i>_dimension</i>	Initial Dimension. (width, height)

6.15.2.2 ~Object()

```
virtual Objects::Object::~~Object ( ) [virtual], [default]
```

6.15.3 Member Function Documentation

6.15.3.1 collideWith()

```
bool Objects::Object::collideWith (
    const Object & other ) const [noexcept]
```

Check if this object collides with 'other' object.

Parameters

<i>other</i>	The other object.
--------------	-------------------

Returns

If collided.

6.15.3.2 debug()

```
void Objects::Object::debug (  
    void ) const [override], [virtual], [noexcept]
```

Reimplemented from [RenderObjectBase](#).

6.15.3.3 flipHorizontal()

```
void Objects::Object::flipHorizontal (  
    void ) [noexcept]
```

Flips the object horizontally.

6.15.3.4 flipVertical()

```
void Objects::Object::flipVertical (  
    void ) [noexcept]
```

Flips the object vertically.

6.15.3.5 getAngle()

```
float Objects::Object::getAngle (  
    void ) const [noexcept]
```

Returns the angle of the object in radians. The returned angle will be in $[0, 2\pi)$, with 0 set at positive x direction, and going counter-clockwise.

Returns

The angle which the object is facing.

6.15.3.6 `getDimension()`

```
Vector2D Objects::Object::getDimension (
    void ) const [noexcept]
```

Gets the dimension of the object.

Returns

The object's dimension.

6.15.3.7 `getFlipFlag()`

```
SDL_RendererFlip Objects::Object::getFlipFlag (
    void ) const [noexcept]
```

Returns the flip flag used by SDL.

Returns

A `SDL_RendererFlip` flag.

6.15.3.8 `getPosition()`

```
Vector2D Objects::Object::getPosition (
    void ) const [noexcept]
```

Gets the position of the object.

Returns

The object's location.

6.15.3.9 `getRenderAngle()`

```
float Objects::Object::getRenderAngle (
    void ) const [noexcept]
```

Gets the render angle of the object.

Returns

The render angle of the object

6.15.3.10 getRenderRect()

```
SDL_FRect Objects::Object::getRenderRect (
    void ) const [noexcept]
```

Gets render rectangle for rendering.

Returns

The SDL_FRect for rendering.

6.15.3.11 getTexture()

```
SDL_Texture * Objects::Object::getTexture (
    void ) const [noexcept]
```

Gets current texture.

Returns

The current texture the object is using.

6.15.3.12 getTextureCount()

```
size_t Objects::Object::getTextureCount (
    void ) const [noexcept]
```

Gets the number of textures this object has.

Returns

Number of textures.

6.15.3.13 getVisibility()

```
bool Objects::Object::getVisibility (
    void ) const [noexcept]
```

Gets the object's visibility.

Returns

The object's visibility.

6.15.3.14 lookAt()

```
virtual void Objects::Object::lookAt (
    const Vector2D & position ) [virtual], [noexcept]
```

Make the object face.

Parameters

<i>position</i>	coordinates.
<i>position</i>	The coordinate of where the object should look at.

6.15.3.15 move()

```
void Objects::Object::move (
    const Vector2D & translate ) [noexcept]
```

Moves the object by the translate vector.

Parameters

<i>translate</i>	The offset vector to move by.
------------------	-------------------------------

6.15.3.16 nextTexture()

```
void Objects::Object::nextTexture (
    void ) [noexcept]
```

Set to next texture, texture ID wraps around.

6.15.3.17 previousTexture()

```
void Objects::Object::previousTexture (
    void ) [noexcept]
```

Set to previous texture, texture ID wraps around.

6.15.3.18 rotate()

```
void Objects::Object::rotate (
    float diffAngle ) [noexcept]
```

Rotates the object by.

Parameters

<i>diffAngle</i>	radians in the counter-clockwise direction.
<i>diffAngle</i>	Rotation angle.

6.15.3.19 setAngle()

```
void Objects::Object::setAngle (
```



```
float newAngle ) [noexcept]
```

Sets rotation angle to.

Parameters

<i>newAngle</i>	radians.
<i>newAngle</i>	The new angle to set to. (in radians)

6.15.3.20 setDimension()

```
void Objects::Object::setDimension (
    const Vector2D & newDimension )
```

Sets the dimension of the object. Throws 'std::invalid_argument' if one of the dimensions is negative.

6.15.3.21 setPosition()

```
void Objects::Object::setPosition (
    const Vector2D & newPosition ) [noexcept]
```

Sets the position of the object.

6.15.3.22 setTexture()

```
void Objects::Object::setTexture (
    int textureId ) [noexcept]
```

Sets texture to.

Parameters

<i>textureId.</i>	
<i>textureId</i>	The ID of the texture to be set. Should be in [0, textureCount).

6.15.3.23 setVisibility()

```
void Objects::Object::setVisibility (
    bool visibility ) [noexcept]
```

Sets the object's visibility.

Parameters

<i>visibility</i>	The object's visibility.
-------------------	--------------------------

6.15.3.24 stretch()

```
void Objects::Object::stretch (
    float ratio ) [noexcept]
```

Stretches both the object's width and height by.

Parameters

<i>ratio</i> .	
<i>ratio</i>	Stretch ratio.

6.15.3.25 stretchX()

```
void Objects::Object::stretchX (
    float ratio ) [noexcept]
```

Stretches the object's width by.

Parameters

<i>ratio</i> .	
<i>ratio</i>	Stretch ratio.

6.15.3.26 stretchY()

```
void Objects::Object::stretchY (
    float ratio ) [noexcept]
```

Stretches the object's height by.

Parameters

<i>ratio</i> .	
<i>ratio</i>	Stretch ratio.

6.15.3.27 update()

```
virtual void Objects::Object::update (
    void ) [virtual], [noexcept]
```

Updates the object state.

Reimplemented in [Objects::Button](#), and [Objects::Bullet](#).

6.15.4 Friends And Related Symbol Documentation

6.15.4.1 TextureHandler

```
friend class TextureHandler [friend]
```

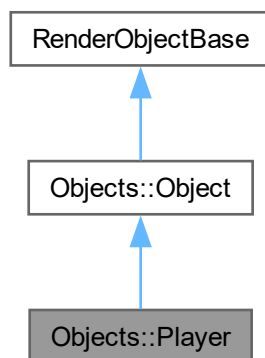
The documentation for this class was generated from the following file:

- include/object/object.h

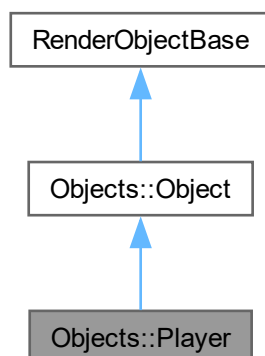
6.16 Objects::Player Class Reference

```
#include <player.h>
```

Inheritance diagram for Objects::Player:



Collaboration diagram for Objects::Player:



Additional Inherited Members

Public Member Functions inherited from **Objects::Object**

- **Object** (const std::vector< std::string > &textureNames, const **Views::View** * _view, const **Vector2D** &_position, const **Vector2D** &_dimension)
Constructs a new object.
- virtual **~Object** ()=default
- float **getAngle** (void) const noexcept
Returns the angle of the object in radians. The returned angle will be in $[0, 2\pi)$, with 0 set at positive x direction, and going counter-clockwise.
- float **getRenderAngle** (void) const noexcept
Gets the render angle of the object.
- void **setAngle** (float newAngle) noexcept
Sets rotation angle to.
- void **rotate** (float diffAngle) noexcept
Rotates the object by.
- SDL_RendererFlip **getFlipFlag** (void) const noexcept
Returns the flip flag used by SDL.
- **Vector2D** **getPosition** (void) const noexcept
Gets the position of the object.
- void **setPosition** (const **Vector2D** &newPosition) noexcept
Sets the position of the object.
- **Vector2D** **getDimension** (void) const noexcept
Gets the dimension of the object.
- void **setDimension** (const **Vector2D** &newDimension)
Sets the dimension of the object. Throws 'std::invalid_argument' if one of the dimensions is negative.
- void **move** (const **Vector2D** &translate) noexcept
Moves the object by the translate vector.
- void **stretchX** (float ratio) noexcept
Stretches the object's width by.
- void **stretchY** (float ratio) noexcept
Stretches the object's height by.
- void **stretch** (float ratio) noexcept
Stretches both the object's width and height by.
- void **flipHorizontal** (void) noexcept
Flips the object horizontally.
- void **flipVertical** (void) noexcept
Flips the object vertically.
- void **setVisibility** (bool visibility) noexcept
Sets the object's visibility.
- bool **getVisibility** (void) const noexcept
Gets the object's visibility.
- bool **collideWith** (const **Object** &other) const noexcept
Check if this object collides with 'other' object.
- void **nextTexture** (void) noexcept
Set to next texture, texture ID wraps around.
- void **previousTexture** (void) noexcept
Set to previous texture, texture ID wraps around.
- void **setTexture** (int textureId) noexcept
Sets texture to.

- `size_t` [getTextureCount](#) (void) const noexcept
Gets the number of textures this object has.
- `SDL_Texture *` [getTexture](#) (void) const noexcept
Gets current texture.
- virtual void [lookAt](#) (const [Vector2D](#) &position) noexcept
Make the object face.
- `SDL_FRect` [getRenderRect](#) (void) const noexcept
Gets render rectangle for rendering.
- virtual void [update](#) (void) noexcept
Updates the object state.
- void [debug](#) (void) const noexcept override

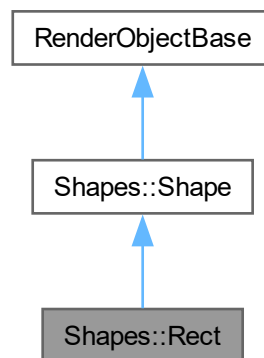
The documentation for this class was generated from the following file:

- `include/object/player.h`

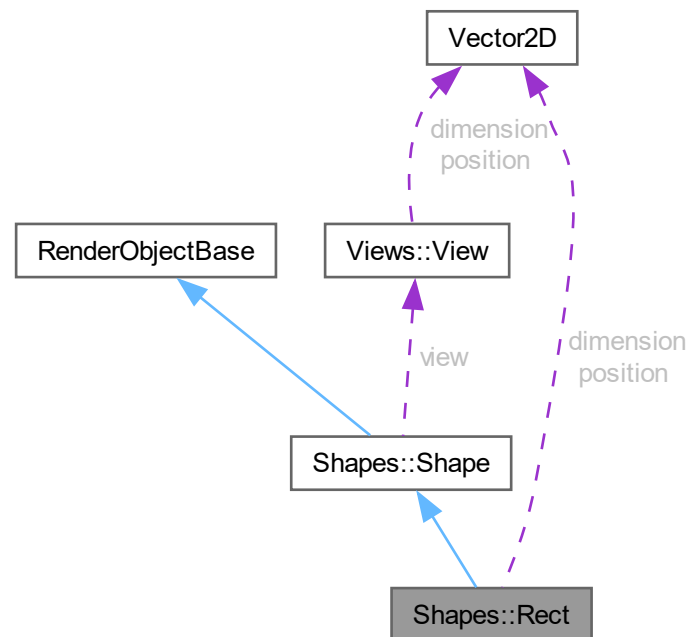
6.17 Shapes::Rect Class Reference

```
#include <rect.h>
```

Inheritance diagram for Shapes::Rect:



Collaboration diagram for Shapes::Rect:



Protected Attributes

- [Vector2D](#) position
- [Vector2D](#) dimension

Protected Attributes inherited from [Shapes::Shape](#)

- const [Views::View](#) * [view](#)
- [SDL_Color](#) [color](#)

Additional Inherited Members

Public Member Functions inherited from [Shapes::Shape](#)

- virtual void [draw](#) ([SDL_Renderer](#) *renderer) const noexcept
- [Shape](#) ([Views::View](#) *view, const [SDL_Color](#) &color={ 0, 0, 0, 255 })
- virtual [~Shape](#) ()=default
- void [setColor](#) (const [SDL_Color](#) &newColor) noexcept
- [SDL_Color](#) [getColor](#) (void) const noexcept

Public Member Functions inherited from [RenderObjectBase](#)

- virtual void [debug](#) (void) const noexcept

6.17.1 Member Data Documentation

6.17.1.1 dimension

`Vector2D` Shapes::Rect::dimension [protected]

6.17.1.2 position

`Vector2D` Shapes::Rect::position [protected]

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

- include/shape/rect.h

6.18 Renderer Class Reference

Required key to call `render()` in.

```
#include <renderer.h>
```

Classes

- class `RenderKey`

Public Member Functions

- `Renderer` (const `Renderer` &)=delete
- void `operator=` (const `Renderer` &)=delete
- `SDL_Window` * `getWindow` (void) noexcept
Gets game window.
- `SDL_Texture` * `createTexture` (CreateTextureKey key, `SDL_Surface` *surface) const
Creates a texture from a SDL_Surface.
- `Vector2D` `getWindowSize` (void) const noexcept
Get underlying SDL_Renderer renderer.
- bool `registerObject` (std::shared_ptr< `RenderObjectBase` > objectPtr) noexcept
Registers the object for rendering.
- bool `removeObject` (std::weak_ptr< `RenderObjectBase` > objectPtr) noexcept
Unregisters the object for rendering.
- void `render` (const `RenderKey` &key)
Renders every registered object. Note: SDL has built-in out of boundaries check.
- void `moveLayerUp` (std::shared_ptr< `RenderObjectBase` > objectPtr)
Moves the object up one layer. Throws std::invalid_argument if @objectPtr is not registered.
- void `moveLayerDown` (std::shared_ptr< `RenderObjectBase` > objectPtr)
Moves the object down one layer. Throws std::invalid_argument if @objectPtr is not registered.
- void `moveLayerTop` (std::shared_ptr< `RenderObjectBase` > objectPtr)
Moves the object to the top layer. Throws std::invalid_argument if @objectPtr is not registered.
- void `moveLayerBottom` (std::shared_ptr< `RenderObjectBase` > objectPtr)
Moves the object to the bottom layer. Throws std::invalid_argument if @objectPtr is not registered.
- void `clear` () noexcept
Clears object set and unloads all textures.
- void `debug` (void) const noexcept
Prints renderer debug info.

Static Public Member Functions

- static [Renderer](#) & [getInstance](#) (void) noexcept

6.18.1 Detailed Description

Required key to call [render\(\)](#) in.

This is a global singleton class for rendering. Keeps track of current objects, shapes and renders everything onto a set window.

6.18.2 Constructor & Destructor Documentation

6.18.2.1 [Renderer\(\)](#)

```
Renderer::Renderer (
    const Renderer & ) [delete]
```

6.18.3 Member Function Documentation

6.18.3.1 [clear\(\)](#)

```
void Renderer::clear ( ) [noexcept]
```

Clears object set and unloads all textures.

6.18.3.2 [createTexture\(\)](#)

```
SDL_Texture * Renderer::createTexture (
    CreateTextureKey key,
    SDL_Surface * surface ) const
```

Creates a texture from a `SDL_Surface`.

Parameters

<i>key</i>	Required key to use this function.
<i>surface</i>	The source surface.

Returns

A pointer to the allocated `SDL_Texture` object.

6.18.3.3 [debug\(\)](#)

```
void Renderer::debug (
    void ) const [noexcept]
```


Prints renderer debug info.

6.18.3.4 getInstance()

```
static Renderer & Renderer::getInstance (
    void ) [static], [noexcept]
```

6.18.3.5 getWindow()

```
SDL_Window * Renderer::getWindow (
    void ) [noexcept]
```

Gets game window.

Returns

The game window.

6.18.3.6 getWindowSize()

```
Vector2D Renderer::getWindowSize (
    void ) const [noexcept]
```

Get underlying SDL_Renderer renderer.

Returns

The underlying renderer.

Gets current window size.

Returns

Current window size.

6.18.3.7 moveLayerBottom()

```
void Renderer::moveLayerBottom (
    std::shared_ptr< RenderObjectBase > objectPtr )
```

Moves the object to the bottom layer. Throws std::invalid_argument if @objectPtr is not registered.

Parameters

<i>objectPtr</i>	The object to be moved.
------------------	-------------------------

6.18.3.8 moveLayerDown()

```
void Renderer::moveLayerDown (
    std::shared_ptr< RenderObjectBase > objectPtr )
```

Moves the object down one layer. Throws `std::invalid_argument` if `@objectPtr` is not registered.

Parameters

<i>objectPtr</i>	The object to be moved.
------------------	-------------------------

6.18.3.9 moveLayerTop()

```
void Renderer::moveLayerTop (
    std::shared_ptr< RenderObjectBase > objectPtr )
```

Moves the object to the top layer. Throws `std::invalid_argument` if `@objectPtr` is not registered.

Parameters

<i>objectPtr</i>	The object to be moved.
------------------	-------------------------

6.18.3.10 moveLayerUp()

```
void Renderer::moveLayerUp (
    std::shared_ptr< RenderObjectBase > objectPtr )
```

Moves the object up one layer. Throws `std::invalid_argument` if `@objectPtr` is not registered.

Parameters

<i>objectPtr</i>	The object to be moved.
------------------	-------------------------

6.18.3.11 operator=()

```
void Renderer::operator= (
    const Renderer & ) [delete]
```

6.18.3.12 registerObject()

```
bool Renderer::registerObject (
    std::shared_ptr< RenderObjectBase > objectPtr ) [noexcept]
```

Registers the object for rendering.

Parameters

<i>objectPtr</i>	<code>std::shared_ptr</code> of the object
------------------	--

Returns

Whether the object was successfully registered

6.18.3.13 `removeObject()`

```
bool Renderer::removeObject (
    std::weak_ptr< RenderObjectBase > objectPtr ) [noexcept]
```

Unregisters the object for rendering.

Parameters

<i>objectPtr</i>	<code>std::shared_ptr</code> of the object
------------------	--

Returns

Whether the object was successfully unregistered.

6.18.3.14 `render()`

```
void Renderer::render (
    const RenderKey & key )
```

Renders every registered object. Note: SDL has built-in out of boundaries check.

Parameters

<i>key</i>	Access Control Key
------------	--------------------

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

- `include/renderer.h`

6.19 `Renderer::RenderKey` Class Reference

```
#include <renderer.h>
```

Public Member Functions

- [RenderKey](#) ()=default
- [RenderKey](#) (const [RenderKey](#) &)=default

6.19.1 Constructor & Destructor Documentation

6.19.1.1 RenderKey() [1/2]

```
Renderer::RenderKey::RenderKey ( ) [default]
```

6.19.1.2 RenderKey() [2/2]

```
Renderer::RenderKey::RenderKey (
    const RenderKey & ) [default]
```

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

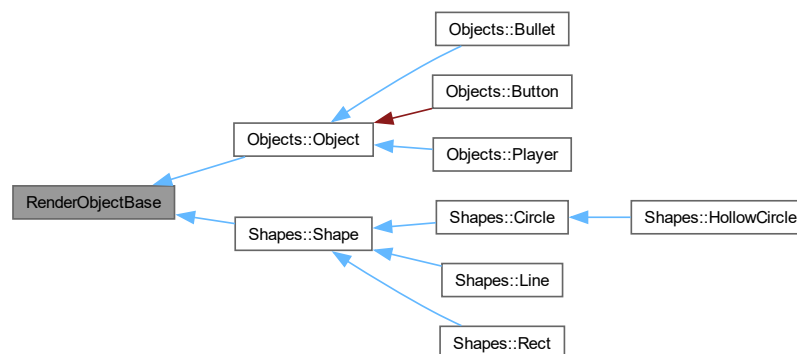
- include/[render.h](#)

6.20 RenderObjectBase Class Reference

Empty render object base class category.

```
#include <render_object_base.h>
```

Inheritance diagram for RenderObjectBase:



Public Member Functions

- virtual void [debug](#) (void) const noexcept

6.20.1 Detailed Description

Empty render object base class category.

6.20.2 Member Function Documentation

6.20.2.1 debug()

```
virtual void RenderObjectBase::debug (
    void ) const [virtual], [noexcept]
```

Reimplemented in [Objects::Object](#).

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

- [include/render_object_base.h](#)

6.21 sdl_deleter Struct Reference

Generic deleter functor for SDL resources. For use with std smart pointers.

```
#include <pointer_wrappers.h>
```

Public Member Functions

- void [operator\(\)](#) (SDL_RWops *thing) const noexcept
- void [operator\(\)](#) (SDL_cond *thing) const noexcept
- void [operator\(\)](#) (SDL_Cursor *thing) const noexcept
- void [operator\(\)](#) (SDL_PixelFormat *thing) const noexcept
- void [operator\(\)](#) (SDL_mutex *thing) const noexcept
- void [operator\(\)](#) (SDL_Palette *thing) const noexcept
- void [operator\(\)](#) (SDL_Renderer *thing) const noexcept
- void [operator\(\)](#) (SDL_sem *thing) const noexcept
- void [operator\(\)](#) (SDL_Surface *thing) const noexcept
- void [operator\(\)](#) (SDL_Texture *thing) const noexcept
- void [operator\(\)](#) (Uint8 *thing) const noexcept
- void [operator\(\)](#) (SDL_Window *thing) const noexcept

6.21.1 Detailed Description

Generic deleter functor for SDL resources. For use with std smart pointers.

6.21.2 Member Function Documentation

6.21.2.1 operator>() [1/12]

```
void sdl_deleter::operator() (
    SDL_cond * thing ) const [inline], [noexcept]
```

6.21.2.2 operator>() [2/12]

```
void sdl_deleter::operator() (
    SDL_Cursor * thing ) const    [inline], [noexcept]
```

6.21.2.3 operator>() [3/12]

```
void sdl_deleter::operator() (
    SDL_mutex * thing ) const    [inline], [noexcept]
```

6.21.2.4 operator>() [4/12]

```
void sdl_deleter::operator() (
    SDL_Palette * thing ) const    [inline], [noexcept]
```

6.21.2.5 operator>() [5/12]

```
void sdl_deleter::operator() (
    SDL_PixelFormat * thing ) const    [inline], [noexcept]
```

6.21.2.6 operator>() [6/12]

```
void sdl_deleter::operator() (
    SDL_Renderer * thing ) const    [inline], [noexcept]
```

6.21.2.7 operator>() [7/12]

```
void sdl_deleter::operator() (
    SDL_RWops * thing ) const    [inline], [noexcept]
```

6.21.2.8 operator>() [8/12]

```
void sdl_deleter::operator() (
    SDL_sem * thing ) const    [inline], [noexcept]
```

6.21.2.9 operator>() [9/12]

```
void sdl_deleter::operator() (
    SDL_Surface * thing ) const    [inline], [noexcept]
```

6.21.2.10 operator>() [10/12]

```
void sdl_deleter::operator() (
    SDL_Texture * thing ) const    [inline], [noexcept]
```

6.21.2.11 operator>() [11/12]

```
void sdl_deleter::operator() (
    SDL_Window * thing ) const [inline], [noexcept]
```

6.21.2.12 operator>() [12/12]

```
void sdl_deleter::operator() (
    Uint8 * thing ) const [inline], [noexcept]
```

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

- [include/utility/pointer_wrappers.h](#)

6.22 SelectionManager< T > Class Template Reference

```
#include <selection_manager.h>
```

Public Member Functions

- [SelectionManager](#) ()
- [SelectionManager](#) (const std::vector< T > &selections)
- void [next](#) (void) const noexcept
Set to next selection.
- void [prev](#) (void) const noexcept
Set to previous selection.
- void [set](#) (int newSelection) const
Set current selection ID to.
- size_t [size](#) (void) const noexcept
Gets the count of available selections.
- void [add](#) (T newSelection) noexcept
Adds.
- void [remove](#) (size_t selectionId)
Removes the selection at.
- T [get](#) (void) const
Gets the current selection. Throws std::logic_error is current selection is SELECTION_NOT_SET.
- int [getSelectionId](#) (void) const noexcept
Gets the current selection ID.

Static Public Attributes

- static const int [SELECTION_NOT_SET](#) = -1

6.22.1 Constructor & Destructor Documentation

6.22.1.1 SelectionManager() [1/2]

```
template<class T >
SelectionManager< T >::SelectionManager ( )
```

6.22.1.2 SelectionManager() [2/2]

```
template<class T >
SelectionManager< T >::SelectionManager (
    const std::vector< T > & selections )
```

6.22.2 Member Function Documentation

6.22.2.1 add()

```
template<class T >
void SelectionManager< T >::add (
    T newSelection ) [noexcept]
```

Adds.

Parameters

<i>newSelection</i>	to the manager.
<i>newSelection</i>	The new selection.

6.22.2.2 get()

```
template<class T >
T SelectionManager< T >::get (
    void ) const
```

Gets the current selection. Throws `std::logic_error` if current selection is `SELECTION_NOT_SET`.

Returns

The current selection.

6.22.2.3 getSelectionId()

```
template<class T >
int SelectionManager< T >::getSelectionId (
    void ) const [noexcept]
```

Gets the current selection ID.

Returns

The current selection ID.

6.22.2.4 next()

```
template<class T >
void SelectionManager< T >::next (
    void ) const [noexcept]
```

Set to next selection.

6.22.2.5 prev()

```
template<class T >
void SelectionManager< T >::prev (
    void ) const [noexcept]
```

Set to previous selection.

6.22.2.6 remove()

```
template<class T >
void SelectionManager< T >::remove (
    size_t selectionId )
```

Removes the selection at.

Parameters

<i>selectionId.</i>	Throws std::out_of_range if selectionId is invalid.
<i>selectionId</i>	The position of where the selection is at.

6.22.2.7 set()

```
template<class T >
void SelectionManager< T >::set (
    int newSelection ) const
```

Set current selection ID to.

Parameters

<i>newSelection.</i>	Throws std::out_of_range if ID is not in range of [0, size) or SELECTION_NOT_SET.
<i>newSelection</i>	The new selection ID.

6.22.2.8 size()

```
template<class T >
size_t SelectionManager< T >::size (
    void ) const [noexcept]
```

Gets the count of available selections.

Returns

The count of available selections.

6.22.3 Member Data Documentation

6.22.3.1 SELECTION_NOT_SET

```
template<class T >
const int SelectionManager< T >::SELECTION_NOT_SET = -1 [static]
```

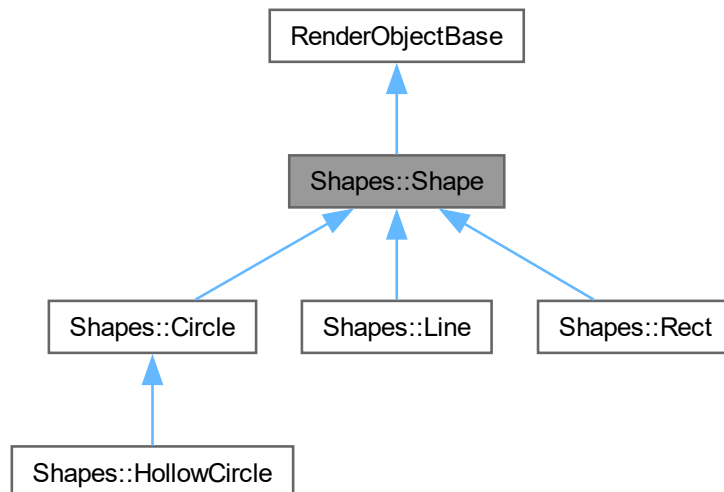
The documentation for this class was generated from the following file:

- include/utility/[selection_manager.h](#)

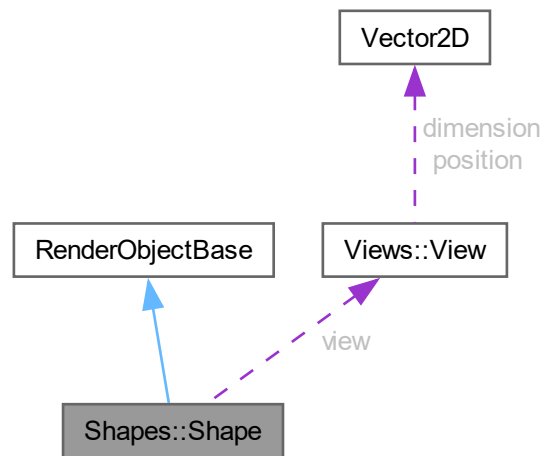
6.23 Shapes::Shape Class Reference

```
#include <shape.h>
```

Inheritance diagram for Shapes::Shape:



Collaboration diagram for Shapes::Shape:



Public Member Functions

- virtual void `draw` (SDL_Renderer *renderer) const noexcept
- `Shape` (Views::View *view, const SDL_Color &color={ 0, 0, 0, 255 })
- virtual `~Shape` ()=default
- void `setColor` (const SDL_Color &newColor) noexcept
- SDL_Color `getColor` (void) const noexcept

Public Member Functions inherited from RenderObjectBase

- virtual void `debug` (void) const noexcept

Protected Attributes

- const Views::View * `view`
- SDL_Color `color`

6.23.1 Constructor & Destructor Documentation

6.23.1.1 Shape()

```

Shapes::Shape::Shape (
    Views::View * view,
    const SDL_Color & color = { 0, 0, 0, 255 } )

```

6.23.1.2 ~Shape()

```
virtual Shapes::Shape::~~Shape ( ) [virtual], [default]
```

6.23.2 Member Function Documentation

6.23.2.1 draw()

```
virtual void Shapes::Shape::draw (
    SDL_Renderer * renderer ) const [inline], [virtual], [noexcept]
```

Reimplemented in [Shapes::Circle](#), [Shapes::HollowCircle](#), and [Shapes::Line](#).

6.23.2.2 getColor()

```
SDL_Color Shapes::Shape::getColor (
    void ) const [noexcept]
```

6.23.2.3 setColor()

```
void Shapes::Shape::setColor (
    const SDL_Color & newColor ) [noexcept]
```

6.23.3 Member Data Documentation

6.23.3.1 color

```
SDL_Color Shapes::Shape::color [protected]
```

6.23.3.2 view

```
const Views::View* Shapes::Shape::view [protected]
```

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

- [include/shape/shape.h](#)

6.24 TextureHandler Class Reference

This is a global singleton class for texture handling.

```
#include <texture_handler.h>
```

Public Member Functions

- `SDL_Texture *` [getTexture](#) (TextureRequestKey key, const std::string &textureName)
Gets a weak pointer pointing to the requested texture.
- [TextureHandler](#) (const [TextureHandler](#) &)=delete
- void [operator=](#) (const [TextureHandler](#) &)=delete

Static Public Member Functions

- static [TextureHandler](#) & [getInstance](#) (void)

6.24.1 Detailed Description

This is a global singleton class for texture handling.

Required key to request texture from.

6.24.2 Constructor & Destructor Documentation

6.24.2.1 TextureHandler()

```
TextureHandler::TextureHandler (
    const TextureHandler & ) [delete]
```

6.24.3 Member Function Documentation

6.24.3.1 getInstance()

```
static TextureHandler & TextureHandler::getInstance (
    void ) [static]
```

6.24.3.2 getTexture()

```
SDL_Texture * TextureHandler::getTexture (
    TextureRequestKey key,
    const std::string & textureName )
```

Gets a weak pointer pointing to the requested texture.

Parameters

<i>key</i>	Access Control Key
<i>textureName</i>	The name of the texture.

Returns

The raw pointer of the requested texture.

6.24.3.3 operator=()

```
void TextureHandler::operator= (
    const TextureHandler & ) [delete]
```

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

- include/texture/[texture_handler.h](#)

6.25 Vector2D Class Reference

```
#include <vector2d.h>
```

Public Member Functions

- [Vector2D](#) (void) noexcept
- [Vector2D](#) (float _x, float _y) noexcept
- float [getX](#) (void) const noexcept
- float [getY](#) (void) const noexcept
- [Vector2D norm](#) (void) const noexcept
- float [len](#) (void) const noexcept
- float [len2](#) (void) const noexcept
- [Vector2D rotate](#) (float theta) const noexcept

Static Public Member Functions

- static [Vector2D zero](#) (void) noexcept
- static float [dot](#) (const [Vector2D](#) &, const [Vector2D](#) &) noexcept
- static float [cross](#) (const [Vector2D](#) &, const [Vector2D](#) &) noexcept
- static [Vector2D rotate](#) ([Vector2D](#), float) noexcept

Friends

- [Vector2D operator+](#) (const [Vector2D](#) &, const [Vector2D](#) &) noexcept
- [Vector2D operator-](#) (const [Vector2D](#) &) noexcept
- [Vector2D operator-](#) (const [Vector2D](#) &, const [Vector2D](#) &) noexcept
- [Vector2D operator*](#) (const [Vector2D](#) &, float) noexcept
- [Vector2D operator*](#) (float, const [Vector2D](#) &) noexcept
- [Vector2D operator/](#) (const [Vector2D](#) &, float) noexcept
- [Vector2D & operator+=](#) ([Vector2D](#) &, const [Vector2D](#) &) noexcept
- [Vector2D & operator-=](#) ([Vector2D](#) &, const [Vector2D](#) &) noexcept
- [Vector2D & operator*=](#) ([Vector2D](#) &, float) noexcept
- [Vector2D & operator/=](#) ([Vector2D](#) &, float) noexcept

6.25.1 Constructor & Destructor Documentation

6.25.1.1 Vector2D() [1/2]

```
Vector2D::Vector2D (  
    void ) [noexcept]
```

6.25.1.2 Vector2D() [2/2]

```
Vector2D::Vector2D (  
    float _x,  
    float _y ) [noexcept]
```

6.25.2 Member Function Documentation

6.25.2.1 cross()

```
static float Vector2D::cross (  
    const Vector2D & ,  
    const Vector2D & ) [static], [noexcept]
```

6.25.2.2 dot()

```
static float Vector2D::dot (  
    const Vector2D & ,  
    const Vector2D & ) [static], [noexcept]
```

6.25.2.3 getX()

```
float Vector2D::getX (  
    void ) const [noexcept]
```

6.25.2.4 getY()

```
float Vector2D::getY (  
    void ) const [noexcept]
```

6.25.2.5 len()

```
float Vector2D::len (  
    void ) const [noexcept]
```

6.25.2.6 len2()

```
float Vector2D::len2 (  
    void ) const [noexcept]
```

6.25.2.7 norm()

```
Vector2D Vector2D::norm (  
    void ) const [noexcept]
```

6.25.2.8 rotate() [1/2]

```
Vector2D Vector2D::rotate (  
    float theta ) const [noexcept]
```

6.25.2.9 rotate() [2/2]

```
static Vector2D Vector2D::rotate (  
    Vector2D ,  
    float ) [static], [noexcept]
```

6.25.2.10 zero()

```
static Vector2D Vector2D::zero (  
    void ) [static], [noexcept]
```

6.25.3 Friends And Related Symbol Documentation

6.25.3.1 operator* [1/2]

```
Vector2D operator* (  
    const Vector2D & ,  
    float ) [friend]
```

6.25.3.2 operator* [2/2]

```
Vector2D operator* (  
    float ,  
    const Vector2D & ) [friend]
```

6.25.3.3 operator*=

```
Vector2D & operator*= (  
    Vector2D & ,  
    float ) [friend]
```

6.25.3.4 operator+

```
Vector2D operator+ (  
    const Vector2D & ,  
    const Vector2D & ) [friend]
```


6.25.3.5 operator+=

```
Vector2D & operator+= (
    Vector2D & ,
    const Vector2D & ) [friend]
```

6.25.3.6 operator- [1/2]

```
Vector2D operator- (
    const Vector2D & ) [friend]
```

6.25.3.7 operator- [2/2]

```
Vector2D operator- (
    const Vector2D & ,
    const Vector2D & ) [friend]
```

6.25.3.8 operator-=

```
Vector2D & operator-= (
    Vector2D & ,
    const Vector2D & ) [friend]
```

6.25.3.9 operator/

```
Vector2D operator/ (
    const Vector2D & ,
    float ) [friend]
```

6.25.3.10 operator/=

```
Vector2D & operator/= (
    Vector2D & ,
    float ) [friend]
```

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

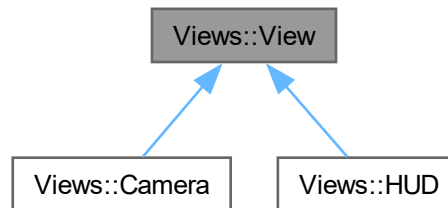
- include/utility/[vector2d.h](#)

6.26 Views::View Class Reference

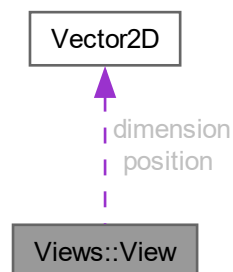
View: defines a view area, translates the objects' virtual rects to real rendering rects.

```
#include <view.h>
```

Inheritance diagram for Views::View:



Collaboration diagram for Views::View:



Public Member Functions

- virtual **~View** ()
- virtual **SDL_FRect getRect** (const **Objects::Object** &object) const noexcept=0
Gets the render rect for.
- virtual **Vector2D transform** (const **Vector2D** &position) const noexcept=0
Gets the transformed render position of.
- virtual **Vector2D transformFromRender** (const **Vector2D** &renderPosition) const noexcept=0
Gets the virtual position of.
- virtual **Vector2D getPosition** (void) const noexcept
Gets the virtual position of the view.
- virtual **Vector2D getDimension** (void) const noexcept

Gets the virtual dimension of the view.

- virtual float [getAngle](#) (void) const noexcept

Gets the rotation angle of the view.

- virtual float [getZoom](#) (void) const noexcept

Gets the zoom level of the view.

Protected Member Functions

- [View](#) (const [Vector2D](#) &_position, const [Vector2D](#) &_dimension)

Protected Attributes

- [Vector2D](#) position
- [Vector2D](#) dimension

6.26.1 Detailed Description

[View](#): defines a view area, translates the objects' virtual rects to real rendering rects.

6.26.2 Constructor & Destructor Documentation

6.26.2.1 View()

```
Views::View::View (
    const Vector2D & _position,
    const Vector2D & _dimension ) [inline], [protected]
```

6.26.2.2 ~View()

```
virtual Views::View::~View ( ) [inline], [virtual]
```

6.26.3 Member Function Documentation

6.26.3.1 getAngle()

```
virtual float Views::View::getAngle (
    void ) const [inline], [virtual], [noexcept]
```

Gets the rotation angle of the view.

Returns

The virtual angle of the view.

Reimplemented in [Views::Camera](#).

6.26.3.2 `getDimension()`

```
virtual Vector2D Views::View::getDimension (
    void ) const [inline], [virtual], [noexcept]
```

Gets the virtual dimension of the view.

Returns

The virtual dimension of the view.

6.26.3.3 `getPosition()`

```
virtual Vector2D Views::View::getPosition (
    void ) const [inline], [virtual], [noexcept]
```

Gets the virtual position of the view.

Returns

The virtual position of the view.

6.26.3.4 `getRect()`

```
virtual SDL_FRect Views::View::getRect (
    const Objects::Object & object ) const [pure virtual], [noexcept]
```

Gets the render rect for.

Parameters

<i>object.</i>	
<i>object</i>	The object to be rendered.

Returns

The render rect of
object.

Implemented in [Views::HUD](#), and [Views::Camera](#).

6.26.3.5 `getZoom()`

```
virtual float Views::View::getZoom (
    void ) const [inline], [virtual], [noexcept]
```

Gets the zoom level of the view.

Returns

The zoom level of the view.

Reimplemented in [Views::Camera](#).

6.26.3.6 transform()

```
virtual Vector2D Views::View::transform (
    const Vector2D & position ) const [pure virtual], [noexcept]
```

Gets the transformed render position of.

Parameters

<i>position.</i>	
<i>position</i>	The virtual position to be transformed.

Returns

The render position after transformation.

Implemented in [Views::Camera](#), and [Views::HUD](#).

6.26.3.7 transformFromRender()

```
virtual Vector2D Views::View::transformFromRender (
    const Vector2D & renderPosition ) const [pure virtual], [noexcept]
```

Gets the virtual position of.

Parameters

<i>renderPosition.</i>	
<i>renderPosition</i>	The render position to be transformed

Returns

The virtual position after transformation.

Implemented in [Views::Camera](#), and [Views::HUD](#).

6.26.4 Member Data Documentation

6.26.4.1 dimension

```
Vector2D Views::View::dimension [protected]
```

6.26.4.2 position

```
Vector2D Views::View::position [protected]
```

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

- [include/view/view.h](#)

Chapter 7

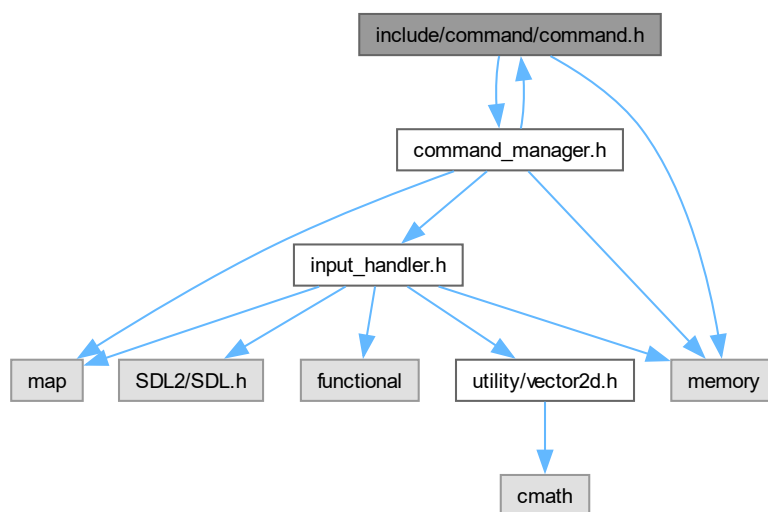
File Documentation

7.1 include/command/command.h File Reference

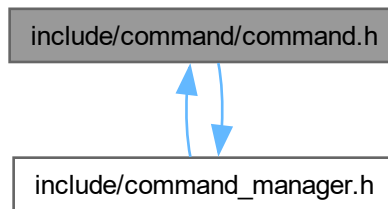
```
#include <command_manager.h>
```

```
#include <memory>
```

Include dependency graph for command.h:



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



Classes

- class [Commands::Command](#)
Commands base abstract class.
- class [Commands::Command::ExecuteKey](#)

Namespaces

- namespace [Commands](#)

7.2 command.h

[Go to the documentation of this file.](#)

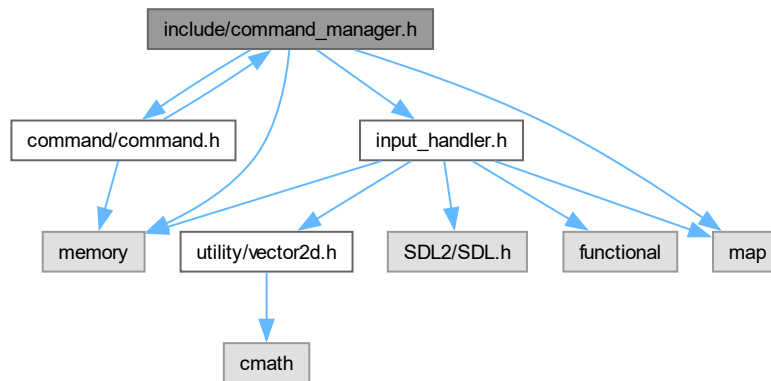
```

00001 #pragma once
00002
00003 #include <command_manager.h>
00004 #include <memory>
00005
00006 class CommandManager;
00007
00008 namespace Commands {
00009
00013     class Command {
00014     protected:
00015         class ExecuteKey {
00016             friend class CommandManager;
00017         private:
00018             ExecuteKey() = default;
00019             ExecuteKey(const ExecuteKey&) = default;
00020         };
00021     public:
00022         virtual ~Command() {};
00023         virtual void execute(const ExecuteKey&) {};
00024     };
00025 }
  
```

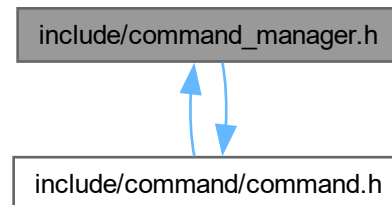

7.3 include/command_manager.h File Reference

```
#include <command/command.h>
#include <input_handler.h>
#include <map>
#include <memory>
```

Include dependency graph for command_manager.h:



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



Classes

- struct [KeyBind](#)
KeyBind structure for key bindings.
- class [CommandManager](#)
Manages a map from key bindings to various functions. e.g. `player.move()`, `currentScene.set(mainMenu)`, or `renderer.drawCone()`.

Namespaces

- namespace [Commands](#)

7.4 command_manager.h

[Go to the documentation of this file.](#)

```

00001 #pragma once
00002
00003 #include <command/command.h>
00004 #include <input_handler.h>
00005 #include <map>
00006 #include <memory>
00007
00008 namespace Commands { class Command; }
00009
00010 enum class MouseButton : uint8_t;
00014 struct KeyBind {
00015     static unsigned int KeyBindCount;
00016     int ID; // only used for sorting
00017     enum class Trigger { TAP, HOLD, RELEASE };
00018     std::map<SDL_Keycode, Trigger> keys;
00019     std::map<MouseButton, Trigger> buttons;
00020     KeyBind(const std::map<SDL_Keycode, Trigger>& keys, const std::map<MouseButton, Trigger> buttons):
00021         keys(keys), buttons(buttons) {
00022         ID = KeyBind::KeyBindCount++;
00023     }
00024     friend bool operator < (const KeyBind& a, const KeyBind& b) {
00025         return a.ID < b.ID;
00026     }
00027 };
00028
00033 class CommandManager {
00034 private:
00035     std::map<KeyBind, std::shared_ptr<Commands::Command> commandDB;
00036 public:
00037
00044     bool registerCommand(KeyBind keyBind, std::shared_ptr<Commands::Command> command);
00045
00050     void update() noexcept;
00051 };

```

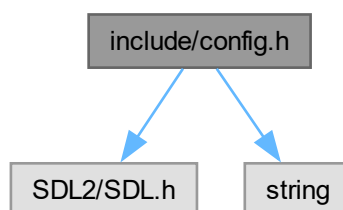
7.5 include/config.h File Reference

```

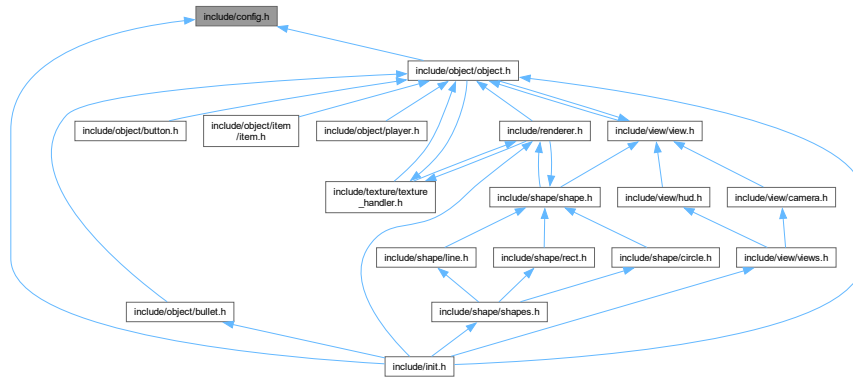
#include <SDL2/SDL.h>
#include <string>

```

Include dependency graph for config.h:



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



Namespaces

- namespace **Config**

Variables

- const std::string Config::gameTitle = "Lab Raid"
- const int Config::screenWidth = 1920*7/10
- const int Config::screenHeight = 1080*7/10
- const int Config::volume = 50
- const int Config::framerate = 60
- const float Config::holdTimeThreshold = 100
- const SDL_WindowFlags Config::screenType = SDL_WINDOW_SHOWN
- const SDL_Color Config::backgroundColor { 0x3F, 0x3F, 0x3F, 0xFF }

7.6 config.h

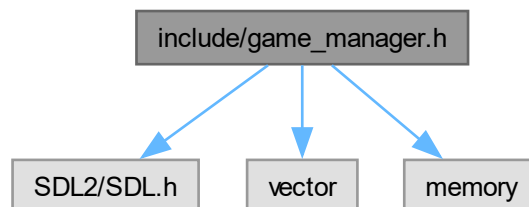
[Go to the documentation of this file.](#)

```
00001 #pragma once
00002
00003 #include <SDL2/SDL.h>
00004 #include <string>
00005
00006 namespace Config {
00007     const std::string gameTitle = "Lab Raid";
00008     const int screenWidth = 1920*7/10;
00009     const int screenHeight = 1080*7/10;
00010     const int volume = 50;
00011     const int framerate = 60;
00012     const float holdTimeThreshold = 100;
00013     const SDL_WindowFlags screenHeight = SDL_WINDOW_SHOWN;
00014     //const SDL_Color backgroundColor{ 0x1F, 0x1E, 0x33, 0x7F };
00015     const SDL_Color backgroundColor{ 0x3F, 0x3F, 0x3F, 0xFF };
00016 }
```

7.7 include/game_manager.h File Reference

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

Include dependency graph for game_manager.h:



Classes

- class [GameManager](#)

7.8 game_manager.h

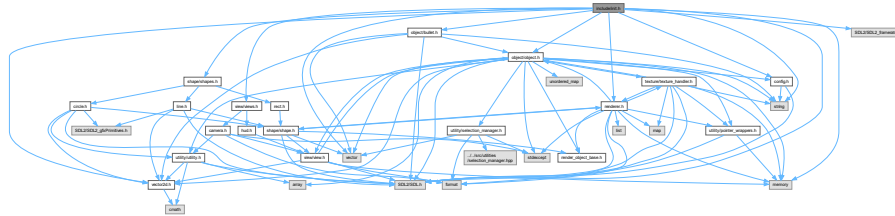
[Go to the documentation of this file.](#)

```
00001 #pragma once
00002
00003 #include <SDL2/SDL.h>
00004 #include <vector>
00005 #include <memory>
00006
00007 class GameManager {
00008 private:
00009     bool paused;
00010     enum {
00011         GAME_TITLE = 1,
00012         GAME_LEVEL = 2,
00013         GAME_END = 3
00014     } state;
00015
00016 };
```

7.9 include/init.h File Reference

```
#include <object/object.h>
#include <object/bullet.h>
#include <view/views.h>
#include <renderer.h>
#include <config.h>
#include <utility/vector2d.h>
#include <shape/shapes.h>
#include <SDL2/SDL.h>
```

Include dependency graph for init.h:



- namespace **Global**

- void Global::init ()

- std::unique_ptr< FPSManager > Global::fpsManager
- std::unique_ptr< Views::Camera > Global::playerCamera
- std::unique_ptr< Views::HUD > Global::hudView
- std::unique_ptr< Views::HUD > Global::menuView
- std::shared_ptr< Objects::Object > Global::playerObject
- std::shared_ptr< Objects::Object > Global::arrowObject1
- std::shared_ptr< Objects::Object > Global::arrowObject2
- std::shared_ptr< Shapes::Circle > Global::yellowCircle
- std::shared_ptr< Shapes::Circle > Global::greenCircle
- std::shared_ptr< Shapes::Circle > Global::blueCircle
- std::shared_ptr< Shapes::Circle > Global::redCircle
- std::shared_ptr< Shapes::Circle > Global::purpleCircle
- std::shared_ptr< Shapes::HollowCircle > Global::hollowCircle1
- std::shared_ptr< Shapes::Line > Global::line1
- std::shared_ptr< Shapes::Line > Global::line2
- std::shared_ptr< Shapes::Line > Global::line3
- std::shared_ptr< Shapes::Line > Global::line4
- std::shared_ptr< Objects::Object > Global::hudArrow
- std::shared_ptr< Shapes::Circle > Global::hudCircle
- std::shared_ptr< Shapes::Line > Global::crosshairLine1
- std::shared_ptr< Shapes::Line > Global::crosshairLine2
- std::shared_ptr< Shapes::HollowCircle > Global::crosshairCircle1
- std::shared_ptr< Objects::Object > Global::cameraObject

7.10 init.h

[Go to the documentation of this file.](#)

```

00001 #pragma once
00002
00003 #include <object/object.h>
00004 #include <object/bullet.h>
00005 #include <view/views.h>
00006 #include <renderer.h>
00007 #include <config.h>
00008 #include <utility/vector2d.h>
00009 #include <shape/shapes.h>
00010 #include <SDL2/SDL.h>
00011 #include <SDL2/SDL2_framerate.h>
00012 #include <memory>
00013 #include <string>
00014 #include <vector>
00015
00016 namespace Global {
00017     extern std::unique_ptr<FPSmanager> fpsManager;
00018     extern std::unique_ptr<Views::Camera> playerCamera;
00019     extern std::unique_ptr<Views::HUD> hudView;
00020     extern std::unique_ptr<Views::HUD> menuView;
00021
00022     extern std::shared_ptr<Objects::Object> playerObject;
00023     extern std::shared_ptr<Objects::Object> arrowObject1;
00024     extern std::shared_ptr<Objects::Object> arrowObject2;
00025     extern std::shared_ptr<Shapes::Circle> yellowCircle;
00026     extern std::shared_ptr<Shapes::Circle> greenCircle;
00027     extern std::shared_ptr<Shapes::Circle> blueCircle;
00028     extern std::shared_ptr<Shapes::Circle> redCircle;
00029     extern std::shared_ptr<Shapes::Circle> purpleCircle;
00030
00031     extern std::shared_ptr<Shapes::HollowCircle> hollowCircle1;
00032     extern std::shared_ptr<Shapes::Line> line1;
00033     extern std::shared_ptr<Shapes::Line> line2;
00034     extern std::shared_ptr<Shapes::Line> line3;
00035     extern std::shared_ptr<Shapes::Line> line4;
00036
00037     extern std::shared_ptr<Objects::Object> hudArrow;
00038     extern std::shared_ptr<Shapes::Circle> hudCircle;
00039
00040     extern std::shared_ptr<Shapes::Line> crosshairLine1;
00041     extern std::shared_ptr<Shapes::Line> crosshairLine2;
00042     extern std::shared_ptr<Shapes::HollowCircle> crosshairCircle1;
00043
00044     extern std::shared_ptr<Objects::Object> cameraObject;
00045
00046     void init();
00047 }

```

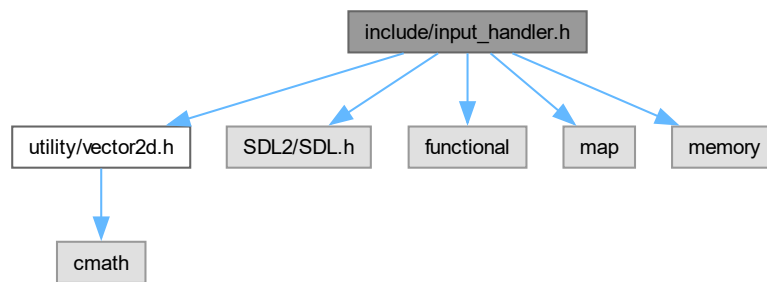
7.11 include/input_handler.h File Reference

```

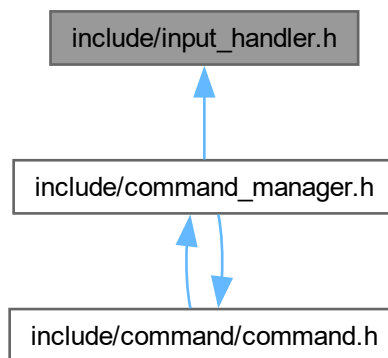
#include <utility/vector2d.h>
#include <SDL2/SDL.h>
#include <functional>
#include <map>
#include <memory>

```

Include dependency graph for input_handler.h:



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



Classes

- class [InputHandler](#)

This is a global singleton class of handling user inputs. Wrapper class of `SDL_PollEvent` and events handling.

Enumerations

- enum class [MouseButton](#) : `uint8_t` {
`LEFT` = `SDL_BUTTON_LEFT` , `MIDDLE` = `SDL_BUTTON_MIDDLE` , `RIGHT` = `SDL_BUTTON_RIGHT` , `X1` = `SDL_BUTTON_X1` ,
`X2` = `SDL_BUTTON_X2` }

7.11.1 Enumeration Type Documentation

7.11.1.1 MouseButton

```
enum class MouseButton : uint8_t [strong]
```

Enumerator

LEFT	
MIDDLE	
RIGHT	
X1	
X2	

7.12 input_handler.h

[Go to the documentation of this file.](#)

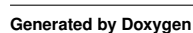
```

00001 #pragma once
00002
00003 #include <utility/vector2d.h>
00004 #include <SDL2/SDL.h>
00005 #include <functional>
00006 #include <map>
00007 #include <memory>
00008
00009 enum class MouseButton : uint8_t {
00010     LEFT    = SDL_BUTTON_LEFT,
00011     MIDDLE  = SDL_BUTTON_MIDDLE,
00012     RIGHT   = SDL_BUTTON_RIGHT,
00013     X1      = SDL_BUTTON_X1,
00014     X2      = SDL_BUTTON_X2
00015 };
00016
00021 class InputHandler {
00022 private:
00023     struct KeyState {
00024         enum { PRESSED, RELEASED, NONE } toggle;
00025         enum { UP, DOWN } hold;
00026         uint32_t holdStart; // The tick this key was first held down.
00027         KeyState() :
00028             toggle(NONE),
00029             hold(UP),
00030             holdStart(0) {}
00031         void toggleDown(void) noexcept {
00032             if (hold == UP) {
00033                 toggle = PRESSED;
00034                 holdStart = SDL_GetTicks();
00035             }
00036             hold = DOWN;
00037         }
00038         void toggleUp(void) noexcept {
00039             if (hold == DOWN) {
00040                 toggle = RELEASED;
00041             }
00042             hold = UP;
00043         }
00044         uint32_t getHoldTime(void) const noexcept {
00045             if (hold == DOWN)
00046                 return SDL_GetTicks() - holdStart;
00047             return 0;
00048         }
00049     };
00050     std::map<SDL_Keycode, KeyState> keyStateDB;
00051     std::map<MouseButton, KeyState> mouseButtonStateDB;
00052     Vector2D mouseScroll;
00053
00054     InputHandler();
00055 public:
00056     InputHandler(const InputHandler&) = delete;
00057     void operator = (const InputHandler&) = delete;
00058
00059     static InputHandler& getInstance(void) noexcept;
00060
00061
00062     // Keyboard functions
00063
00070     bool pollKeyPress(SDL_Keycode key) noexcept;
00071
00078     bool pollKeyRelease(SDL_Keycode key) noexcept;
00079
00085     bool isKeyDown(SDL_Keycode key) const noexcept;
00086

```


7.13 include/object/bullet.h File Reference

Include dependency graph for bullet.h:



Classes

- class [Objects::Button](#)

Namespaces

- namespace [Objects](#)

7.16 button.h

[Go to the documentation of this file.](#)

```

00001 #pragma once
00002
00003 #include "object.h"
00004 #include <string>
00005 #include <functional>
00006
00007 namespace Objects {
00008     class Button : private Object {
00009     private:
00010         std::string text;
00011         bool hover;
00012         std::function<void(void)> actionFunc;
00013
00014         bool pollHover(void) noexcept;
00015
00016     public:
00017         Button(
00018             const Views::View* view,
00019             const Vector2D& position,
00020             const Vector2D& dimension,
00021             const SDL_Color& color,
00022             const std::string& text,
00023             std::function<void(void)> action
00024         );
00025
00026         void setHovered(void) noexcept;
00027
00028         void onClick(void) noexcept;
00029
00030         void update(void) noexcept;
00031     };
00032 }

```

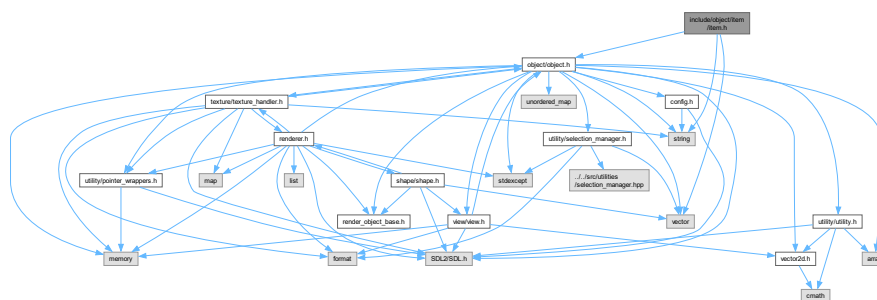
7.17 include/object/item/item.h File Reference

```

#include <object/object.h>
#include <vector>
#include <string>

```

Include dependency graph for item.h:



Classes

- class [Items::Item](#)

Namespaces

- namespace [Items](#)

7.18 item.h

[Go to the documentation of this file.](#)

```

00001 #pragma once
00002
00003 #include <object/object.h>
00004 #include <vector>
00005 #include <string>
00006
00007 namespace Items {
00008     class Item {
00009     private:
00010         std::string itemName;
00011         const uint8_t cap;
00012         uint8_t count;
00013         std::unique_ptr<Objects::Object> instanceObject;
00014         std::unique_ptr<Objects::Object> inventoryObject;
00015     public:
00016         Item(
00017             const std::vector<std::string>& instanceTextureNames,
00018             const std::vector<std::string>& inventoryObject,
00019             const std::string& itemName,
00020             uint8_t cap,
00021             uint8_t count
00022         );
00023     };
00024 }
```

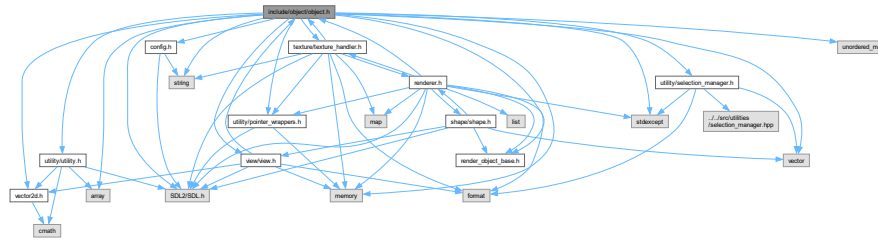
7.19 include/object/object.h File Reference

```

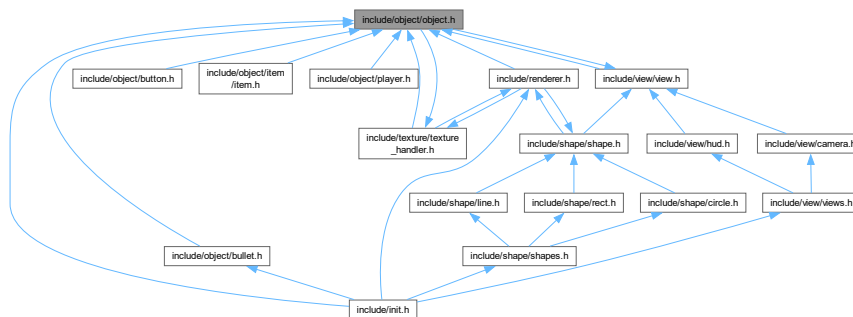
#include <render_object_base.h>
#include <utility/utility.h>
#include <utility/pointer_wrappers.h>
#include <utility/vector2d.h>
#include <utility/selection_manager.h>
#include <texture/texture_handler.h>
#include <view/view.h>
#include <config.h>
#include <SDL2/SDL.h>
#include <memory>
#include <string>
#include <vector>
#include <array>
#include <unordered_map>
```

```
#include <stdexcept>
```

Include dependency graph for object.h:



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



Classes

- class **Objects::Object**

Object type for all renderable objects in the world note: the texture won't be created until loaded into the renderer.

Namespaces

- namespace Views
- namespace Objects

7.20 object.h

[Go to the documentation of this file.](#)

```
00001 #pragma once
00002
00003 #include <render_object_base.h>
00004 #include <utility/utility.h>
00005 #include <utility/pointer_wrappers.h>
00006 #include <utility/vector2d.h>
00007 #include <utility/selection_manager.h>
00008 #include <texture/texture_handler.h>
00009 #include <view/view.h>
00010 #include <config.h>
00011 #include <SDL2/SDL.h>
00012 #include <memory>
00013 #include <string>
00014 #include <vector>
```

```

00015 #include <array>
00016 #include <unordered_map>
00017 #include <stdexcept>
00018
00019 namespace Views { class View; }
00020 class TextureHandler;
00021
00022 namespace Objects {
00023
00024     // TODO: add 'shapes' field to `Objects::Object`
00025
00026     class Object : public RenderObjectBase {
00027     friend class TextureHandler;
00028     private:
00029         SelectionManager<SDL_Texture*> textures;
00030         bool visible;
00031
00032         float angle; // stored as radians
00033         SDL_RendererFlip flipFlag;
00034         // SDL_Color colorMask; // color mod mask
00035         Vector2D position; // actual position in the world
00036         Vector2D dimension; // height and width
00037         const Views::View* view;
00038     public:
00039
00040         Object(
00041             const std::vector<std::string>& textureNames,
00042             const Views::View* _view,
00043             const Vector2D& _position,
00044             const Vector2D& _dimension
00045         );
00046
00047         virtual ~Object() = default;
00048
00049         float getAngle(void) const noexcept;
00050
00051         float getRenderAngle(void) const noexcept;
00052
00053         void setAngle(float newAngle) noexcept;
00054
00055         void rotate(float diffAngle) noexcept;
00056
00057         SDL_RendererFlip getFlipFlag(void) const noexcept;
00058
00059         Vector2D getPosition(void) const noexcept;
00060
00061         void setPosition(const Vector2D& newPosition) noexcept;
00062
00063         Vector2D getDimension(void) const noexcept;
00064
00065         void setDimension(const Vector2D& newDimension);
00066
00067         void move(const Vector2D& translate) noexcept;
00068
00069         void stretchX(float ratio) noexcept;
00070
00071         void stretchY(float ratio) noexcept;
00072
00073         void stretch(float ratio) noexcept;
00074
00075         void flipHorizontal(void) noexcept;
00076
00077         void flipVertical(void) noexcept;
00078
00079         void setVisibility(bool visibility) noexcept;
00080
00081         bool getVisibility(void) const noexcept;
00082
00083         bool collideWith(const Object& other) const noexcept;
00084
00085         /* TEXTURES */
00086
00087         void nextTexture(void) noexcept;
00088
00089         void previousTexture(void) noexcept;
00090
00091         void setTexture(int textureId) noexcept;
00092
00093         size_t getTextureCount(void) const noexcept;
00094
00095         SDL_Texture* getTexture(void) const noexcept;
00096
00097         /* TEXTURES */
00098
00099         virtual void lookAt(const Vector2D& position) noexcept;
00100
00101     };

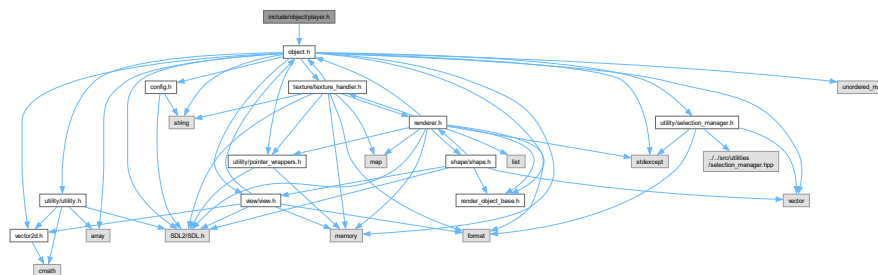
```

```
00209         SDL_FRect getRenderRect(void) const noexcept;
00210         //Vector2D getRenderRelativePosition(Vector2D renderPosition) const noexcept;
00211
00212         virtual void update(void) noexcept;
00213
00214         // debug
00215         void debug(void) const noexcept override;
00216     };
00217 }
00218 }
```

7.21 include/object/player.h File Reference

```
#include "object.h"
```

Include dependency graph for player.h:



Classes

- class **Objects::Player**

Namespaces

- namespace **Objects**

7.22 player.h

[Go to the documentation of this file.](#)

```
00001 #pragma once
00002
00003 #include "object.h"
00004
00005 namespace Objects {
00006     class Player : public Object {
00007
00008     };
00009 }
```



```

00008 #include <SDL2/SDL.h>
00009 #include <memory>
00010 #include <list>
00011 #include <map>
00012 #include <stdexcept>
00013 #include <format>
00014
00015 namespace Objects {
00016     class Object;
00017 }
00018
00019 // TODO: Consider wrapping object layer management into a LayerManager class.
00020
00021 // Singleton is needed as the renderer can only be initialized at runtime.
00022 class Renderer {
00023     class CreateTextureKey {
00024         friend class TextureHandler;
00025     private:
00026         CreateTextureKey() = default;
00027         CreateTextureKey(const CreateTextureKey&) = default;
00028     };
00029
00030 public: // TODO: change this to private, this is for testing purposes.
00031     class RenderKey {
00032     public: // TODO: change this to private, this is for testing purposes.
00033         RenderKey() = default;
00034         RenderKey(const RenderKey&) = default;
00035     };
00036
00037 private:
00038     using ObjectWeakPtr = std::weak_ptr<RenderObjectBase>;
00039     using ObjectList = std::list<ObjectWeakPtr>;
00040
00041 private:
00042     sdl_unique_ptr<SDL_Window> window;
00043     sdl_unique_ptr<SDL_Renderer> renderer;
00044     std::map<ObjectWeakPtr, ObjectList::iterator, std::owner_less<ObjectWeakPtr> objectListMap;
00045     ObjectList objectList;
00046
00047     Renderer();
00048 public:
00049     /* SINGLETON PATTERN */
00050     Renderer(const Renderer&) = delete;
00051     void operator = (const Renderer&) = delete;
00052     static Renderer& getInstance(void) noexcept;
00053     /* SINGLETON PATTERN */
00054
00055     SDL_Window* getWindow(void) noexcept;
00056
00057     SDL_Texture* createTexture(CreateTextureKey key, SDL_Surface* surface) const;
00058
00059     //SDL_Renderer* getRenderer(void) noexcept;
00060
00061     Vector2D getWindowSize(void) const noexcept;
00062
00063     bool registerObject(std::shared_ptr<RenderObjectBase> objectPtr) noexcept;
00064
00065     bool removeObject(std::weak_ptr<RenderObjectBase> objectPtr) noexcept;
00066
00067     void render(const RenderKey& key);
00068
00069     void moveLayerUp(std::shared_ptr<RenderObjectBase> objectPtr);
00070
00071     void moveLayerDown(std::shared_ptr<RenderObjectBase> objectPtr);
00072
00073     void moveLayerTop(std::shared_ptr<RenderObjectBase> objectPtr);
00074
00075     void moveLayerBottom(std::shared_ptr<RenderObjectBase> objectPtr);
00076
00077     void clear() noexcept;
00078
00079     void debug(void) const noexcept;
00080 };

```

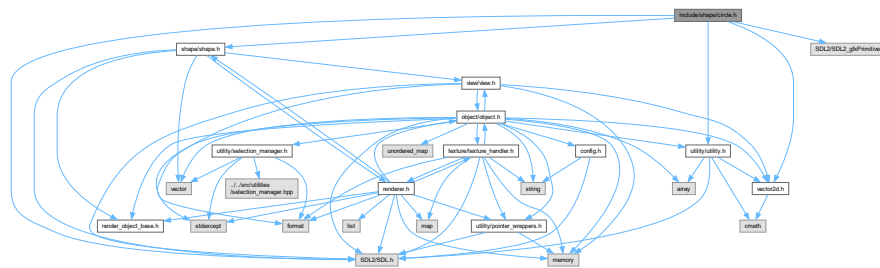
7.27 include/shape/circle.h File Reference

```

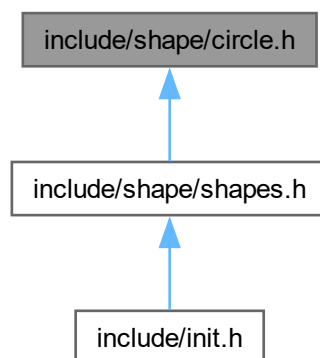
#include <shape/shape.h>
#include <utility/vector2d.h>
#include <utility/utility.h>
#include <SDL2/SDL.h>

```

```
#include <SDL2/SDL2_gfxPrimitives.h>
Include dependency graph for circle.h:
```



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



Classes

- class Shapes::Circle
- class Shapes::HollowCircle

Namespaces

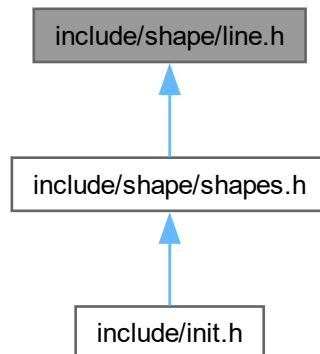
- namespace Views
- namespace Shapes

7.28 circle.h

[Go to the documentation of this file.](#)

```
00001 #pragma once
00002
00003 #include <shape/shape.h>
00004 #include <utility/vector2d.h>
```


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



Classes

- class [Shapes::Line](#)

Namespaces

- namespace [Shapes](#)

7.30 line.h

[Go to the documentation of this file.](#)

```

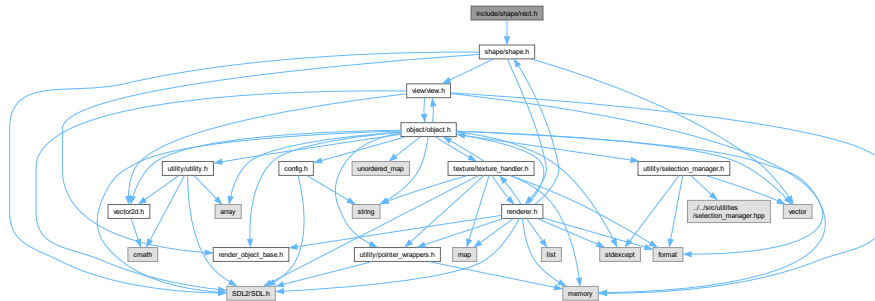
00001 #pragma once
00002
00003 #include <shape/shape.h>
00004 #include <utility/vector2d.h>
00005 #include <SDL2/SDL.h>
00006 #include <SDL2/SDL2_gfxPrimitives.h>
00007
00008 namespace Shapes {
00009     class Line : public Shape {
00010     protected:
00011         Vector2D beginPoint;
00012         Vector2D endPoint;
00013         uint8_t thickness;
00014     public:
00015         Line(
00016             Views::View* view,
00017             Vector2D _beginPoint,
00018             Vector2D _endPoint,
00019             uint8_t _thickness,
00020             SDL_Color color = {0, 0, 0, 255}
00021         ) noexcept;
00022         void setBeginPoint(Vector2D newBeginPoint) noexcept;
00023         void setEndPoint(Vector2D newEndPoint) noexcept;
00024         void setThickness(uint8_t newThickness) noexcept;
00025         void draw(SDL_Renderer* renderer) const noexcept override;
00026     };
00027 }

```

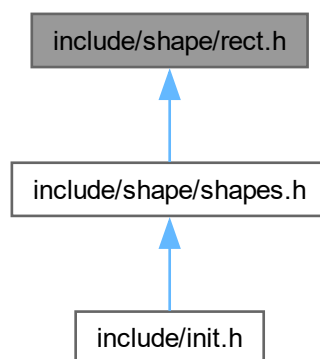
7.31 include/shape/rect.h File Reference

```
#include <shape/shape.h>
```

Include dependency graph for rect.h:



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



Classes

- class [Shapes::Rect](#)

Namespaces

- namespace [Shapes](#)

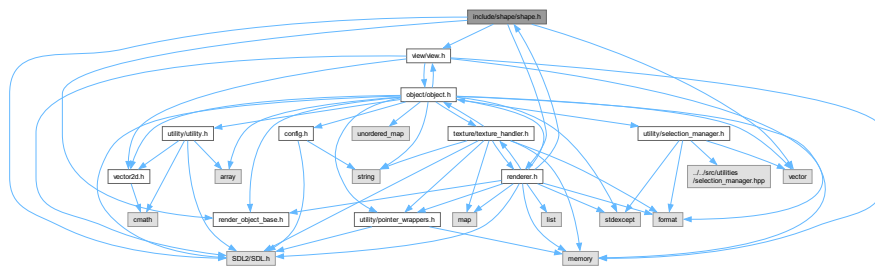
7.32 rect.h

[Go to the documentation of this file.](#)

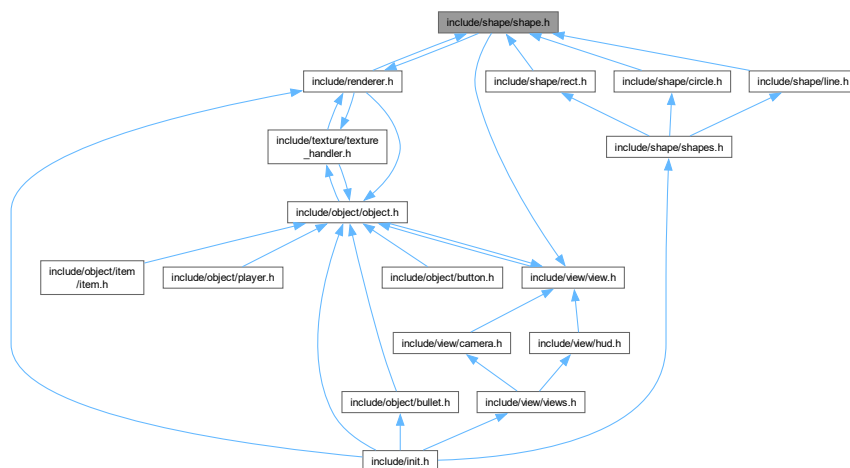
```
00001 #pragma once
00002
00003 #include <shape/shape.h>
00004
00005 namespace Shapes {
00006     class Rect : public Shape {
00007     private:
00008         //void draw()
00009     protected:
00010         Vector2D position;
00011         Vector2D dimension;
00012     };
00013 }
```

7.33 include/shape/shape.h File Reference

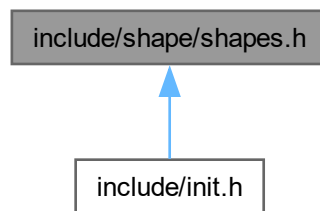
```
#include <render_object_base.h>
#include <view/view.h>
#include <renderer.h>
#include <SDL2/SDL.h>
#include <vector>
Include dependency graph for shape.h:
```



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



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



7.36 shapes.h

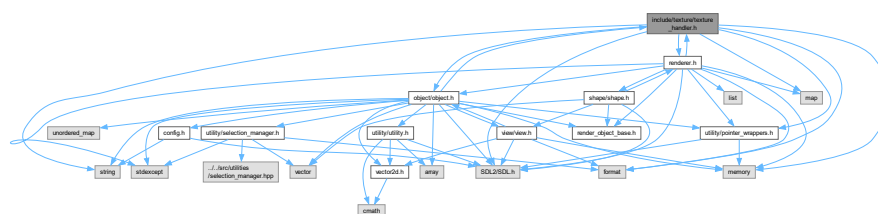
[Go to the documentation of this file.](#)

```
00001 #pragma once
00002
00003 #include "line.h"
00004 #include "circle.h"
00005 #include "rect.h"
00006
00007 // TODO: add more shapes: pie, triangle
```

7.37 include/texture/texture_handler.h File Reference

```
#include <renderer.h>
#include <utility/pointer_wrappers.h>
#include <object/object.h>
#include <SDL2/SDL.h>
#include <string>
#include <map>
#include <memory>
#include <format>
```

Include dependency graph for texture_handler.h:




```
00042
00043 public:
00050     SDL_Texture* getTexture(TextureRequestKey key, const std::string& textureName);
00051
00052 public:
00053     TextureHandler(const TextureHandler&) = delete;
00054     void operator = (const TextureHandler&) = delete;
00055     static TextureHandler& getInstance(void);
00056 };
```

7.39 include/utility/functions.h File Reference

Namespaces

- namespace [Functions](#)

7.40 functions.h

[Go to the documentation of this file.](#)

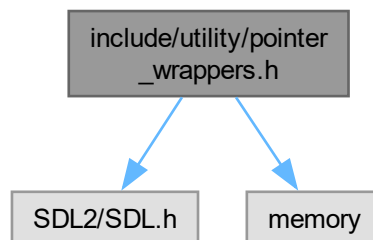
```
00001 #pragma once
00002
00003 namespace Functions {
00004
00005 }
```

7.41 include/utility/pointer_wrappers.h File Reference

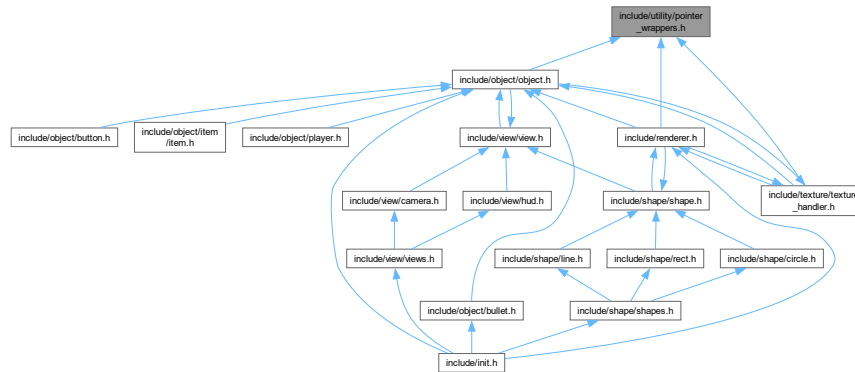
```
#include <SDL2/SDL.h>
```

```
#include <memory>
```

Include dependency graph for pointer_wrappers.h:



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



Classes

- struct [sdl_deleter](#)

Generic deleter functor for SDL resources. For use with std smart pointers.

Typedefs

- `template<typename Resource >`
`using sdl_unique_ptr = std::unique_ptr<Resource, sdl_deleter>`

Functions

- `template<typename Resource >`
`std::shared_ptr< Resource > sdl_make_shared (Resource *resource)`

7.41.1 Typedef Documentation

7.41.1.1 [sdl_unique_ptr](#)

```
template<typename Resource >
using sdl\_unique\_ptr = std::unique_ptr<Resource, sdl\_deleter>
```

7.41.2 Function Documentation

7.41.2.1 [sdl_make_shared\(\)](#)

```
template<typename Resource >
std::shared_ptr< Resource > sdl\_make\_shared (
    Resource * resource )
```

7.42 pointer_wrappers.h

[Go to the documentation of this file.](#)

```

00001 #pragma once
00002
00003 #include <SDL2/SDL.h>
00004 #include <memory>
00005
00009 struct sdl_deleter {
00010     inline void operator () (SDL_RWops* thing) const noexcept { if (thing) SDL_FreeRW(thing); }
00011     inline void operator () (SDL_cond* thing) const noexcept { if (thing)
SDL_DestroyCond(thing); }
00012     inline void operator () (SDL_Cursor* thing) const noexcept { if (thing)
SDL_FreeCursor(thing); }
00013     inline void operator () (SDL_PixelFormat* thing) const noexcept { if (thing)
SDL_FreeFormat(thing); }
00014     inline void operator () (SDL_mutex* thing) const noexcept { if (thing)
SDL_DestroyMutex(thing); }
00015     inline void operator () (SDL_Palette* thing) const noexcept { if (thing)
SDL_FreePalette(thing); }
00016     inline void operator () (SDL_Renderer* thing) const noexcept { if (thing)
SDL_DestroyRenderer(thing); }
00017     inline void operator () (SDL_sem* thing) const noexcept { if (thing)
SDL_DestroySemaphore(thing); }
00018     inline void operator () (SDL_Surface* thing) const noexcept { if (thing)
SDL_FreeSurface(thing); }
00019     inline void operator () (SDL_Texture* thing) const noexcept { if (thing)
SDL_DestroyTexture(thing); }
00020     inline void operator () (Uint8* thing) const noexcept { if (thing) SDL_FreeWAV(thing); }
00021     inline void operator () (SDL_Window* thing) const noexcept { if (thing)
SDL_DestroyWindow(thing); }
00022 };
00023
00024 template <typename Resource>
00025 using sdl_unique_ptr = std::unique_ptr<Resource, sdl_deleter>;
00026
00027 template <typename Resource>
00028 std::shared_ptr<Resource> sdl_make_shared(Resource* resource) {
00029     return std::shared_ptr<Resource>(resource, sdl_deleter());
00030 }

```

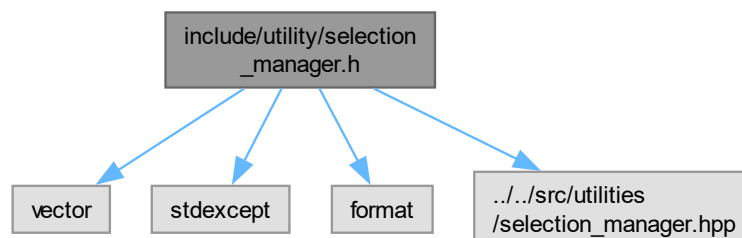
7.43 include/utility/selection_manager.h File Reference

```

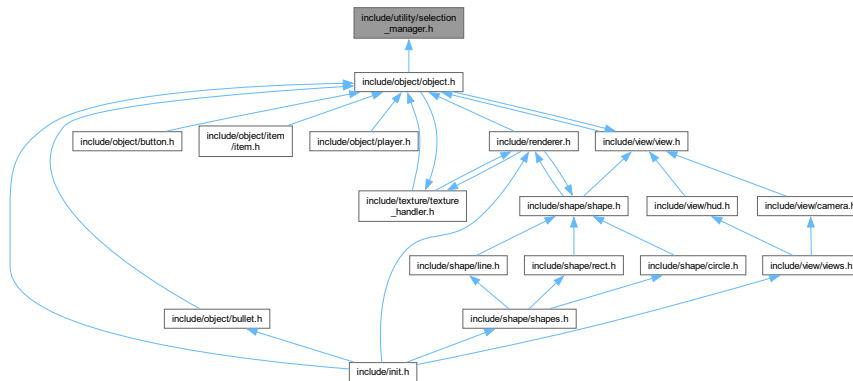
#include <vector>
#include <stdexcept>
#include <format>
#include "../src/utilities/selection_manager.hpp"

```

Include dependency graph for selection_manager.h:



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



Classes

- class [SelectionManager< T >](#)

7.44 selection_manager.h

[Go to the documentation of this file.](#)

```

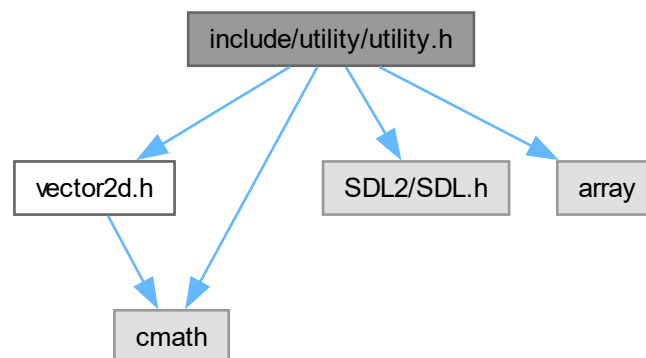
00001 #pragma once
00002
00003 #include <vector>
00004 #include <stdexcept>
00005 #include <format>
00006
00007 // TODO: Complete SelectionManager.
00008
00009 template<class T>
00010 class SelectionManager {
00011 private:
00012     std::vector<T> selections;
00013     mutable int currentSelection; // mutable: this field should ALWAYS be modifiable.
00014 public:
00015     static const int SELECTION_NOT_SET = -1;
00016
00017     SelectionManager();
00018     SelectionManager(const std::vector<T>& selections);
00019
00023     void next(void) const noexcept;
00024
00028     void prev(void) const noexcept;
00029
00035     void set(int newSelection) const;
00036
00041     size_t size(void) const noexcept;
00042
00047     void add(T newSelection) noexcept;
00048
00054     void remove(size_t selectionId);
00055
00061     T get(void) const;
00062
00067     int getSelectionId(void) const noexcept;
00068 };
00069
00070 #include "../src/utilities/selection_manager.hpp"

```

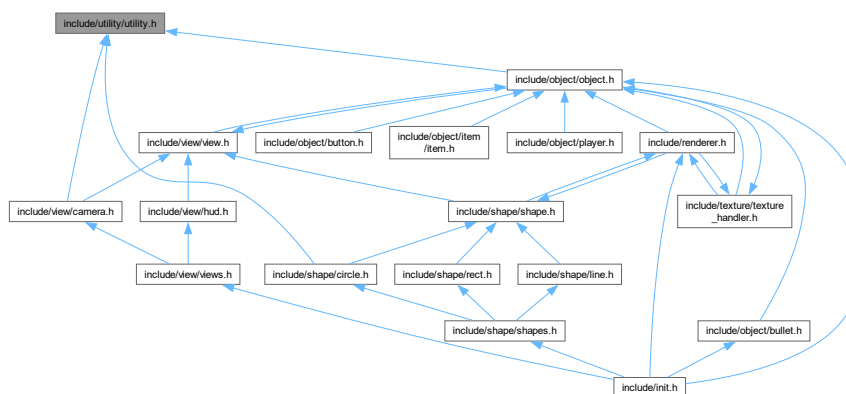
7.45 include/utility/utility.h File Reference

```
#include "vector2d.h"
#include <SDL2/SDL.h>
#include <cmath>
#include <array>
```

Include dependency graph for utility.h:



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



Macros

- `#define` [_USE_MATH_DEFINES](#)

Functions

- float [normalizeAngle](#) (float angle) noexcept
Helper function to normalize angle to $[0, 2\pi)$

- [Vector2D polarToCartesian](#) (float radius, float theta)
Helper function to transform polar coordinates to cartesian coordinates.
- bool [rectCollide](#) (const SDL_FRect &rect1, float angle1, const SDL_FRect &rect2, float angle2)
Checks if two rectangles collides.

7.45.1 Macro Definition Documentation

7.45.1.1 _USE_MATH_DEFINES

```
#define _USE_MATH_DEFINES
```

7.45.2 Function Documentation

7.45.2.1 normalizeAngle()

```
float normalizeAngle (
    float angle ) [noexcept]
```

Helper function to normalize angle to [0, 2pi)

Parameters

<i>angle</i>	input angle
--------------	-------------

Returns

normalized angle

7.45.2.2 polarToCartesian()

```
Vector2D polarToCartesian (
    float radius,
    float theta )
```

Helper function to transform polar coordinates to cartesian coordinates.

Parameters

<i>radius</i>	input radius
<i>theta</i>	input angle (radians)

Returns

the transformed cartesian coordinates

7.45.2.3 rectCollide()

```
bool rectCollide (
    const SDL_FRect & rect1,
    float angle1,
    const SDL_FRect & rect2,
    float angle2 )
```

Checks if two rectangles collides.

Parameters

<i>rect1</i>	First rect.
<i>angle1</i>	The rotation of the first rect.
<i>rect2</i>	Second rect.
<i>angle2</i>	The rotation of the second rect.

Returns

If the rectangles collides.

7.46 utility.h

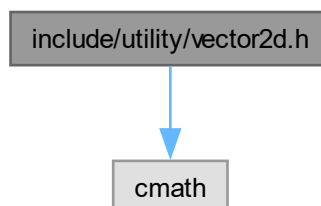
[Go to the documentation of this file.](#)

```
00001 #pragma once
00002
00003 #include "vector2d.h"
00004 #include <SDL2/SDL.h>
00005 #define _USE_MATH_DEFINES
00006 #include <cmath>
00007 #include <array>
00008
00014 float normalizeAngle(float angle) noexcept;
00015
00022 Vector2D polarToCartesian(float radius, float theta);
00023
00032 bool rectCollide(const SDL_FRect& rect1, float angle1, const SDL_FRect& rect2, float angle2);
```

7.47 include/utility/vector2d.h File Reference

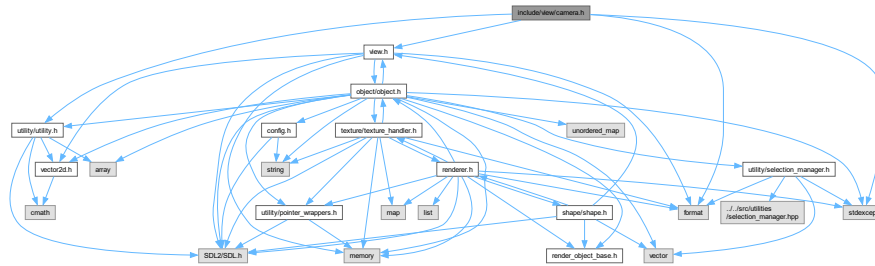
```
#include <cmath>
```

Include dependency graph for vector2d.h:

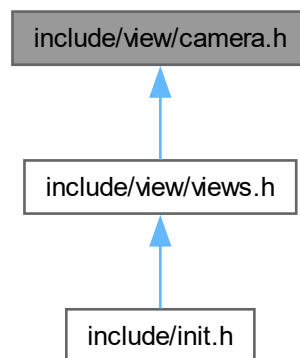


7.49 include/view/camera.h File Reference

```
#include <utility/utility.h>
#include "view.h"
#include <stdexcept>
#include <format>
Include dependency graph for camera.h:
```



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



Classes

- class [Views::Camera](#)
Camera for following object or stationary view.

Namespaces

- namespace [Views](#)

7.50 camera.h

[Go to the documentation of this file.](#)

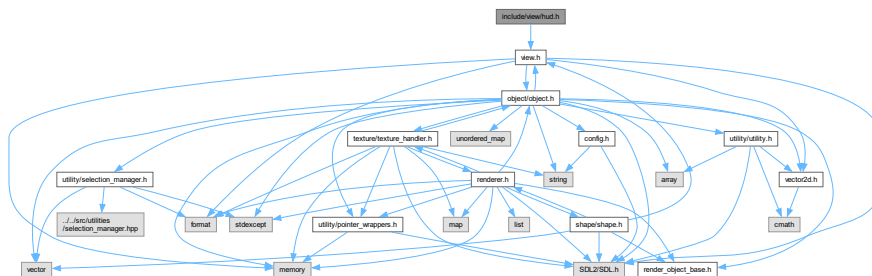
```

00001 #pragma once
00002
00003 #include <utility/utility.h>
00004 #include "view.h"
00005 #include <stdexcept>
00006 #include <format>
00007
00008 namespace Views {
00009
00010     class Camera : public View {
00011     private:
00012         std::weak_ptr<Objects::Object> pivotObject;
00013
00014         float zoom;
00015         float angle;
00016
00017         Vector2D getPosition(void) const noexcept;
00018     public:
00019         Camera();
00020
00021         void setPivotObject(std::shared_ptr<Objects::Object> pivotObject) noexcept;
00022         // const std::weak_ptr<Objects::Object> getPivotObject(void) const noexcept;
00023
00024         void setPosition(const Vector2D& newPosition) noexcept;
00025
00026         void setDimension(const Vector2D& newDimension);
00027
00028         void setZoom(float zoom);
00029
00030         float getZoom(void) const noexcept override;
00031
00032         void setAngle(float angle) noexcept;
00033
00034         void rotate(float diffAngle) noexcept;
00035
00036         float getAngle(void) const noexcept override;
00037
00038         SDL_FRect getRect(const Objects::Object& object) const noexcept override;
00039         Vector2D transform(const Vector2D& position) const noexcept override;
00040         Vector2D transformFromRender(const Vector2D& renderPosition) const noexcept override;
00041     };
00042 }
00043
00044 }
```

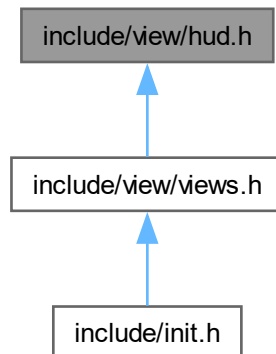
7.51 include/view/hud.h File Reference

#include "view.h"

Include dependency graph for hud.h:



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



Classes

- class [Views::HUD](#)

Namespaces

- namespace [Views](#)

7.52 hud.h

[Go to the documentation of this file.](#)

```
00001 #pragma once
00002
00003 #include "view.h"
00004
00005 namespace Views {
00006     class HUD : public View {
00007     public:
00008         HUD();
00009         SDL_FRect getRect(const Objects::Object&) const noexcept override;
00010         Vector2D transform(const Vector2D& position) const noexcept override;
00011         Vector2D transformFromRender(const Vector2D& renderPosition) const noexcept override;
00012     };
00013 }
```

7.53 include/view/view.h File Reference

```
#include <object/object.h>
#include <utility/vector2d.h>
#include <SDL2/SDL.h>
#include <memory>
```


7.54 view.h

[Go to the documentation of this file.](#)

```

00001 #pragma once
00002
00003 #include <object/object.h>
00004 #include <utility/vector2d.h>
00005 #include <SDL2/SDL.h>
00006 #include <memory>
00007 #include <format>
00008
00009 namespace Objects {
00010     class Object;
00011 }
00012 namespace Views {
00013
00014     class View {
00015     protected:
00016         Vector2D position;
00017         Vector2D dimension;
00018
00019     public:
00020         View(const Vector2D& _position, const Vector2D& _dimension) :
00021             position(_position), dimension(_dimension) {}
00022
00023         virtual ~View() {};
00024
00025         virtual SDL_FRect getRect(const Objects::Object& object) const noexcept = 0;
00026
00027         virtual Vector2D transform(const Vector2D& position) const noexcept = 0;
00028
00029         virtual Vector2D transformFromRender(const Vector2D& renderPosition) const noexcept = 0;
00030
00031         virtual Vector2D getPosition(void) const noexcept { return position; }
00032
00033         virtual Vector2D getDimension(void) const noexcept { return dimension; }
00034
00035         virtual float getAngle(void) const noexcept { return 0.0f; }
00036
00037         virtual float getZoom(void) const noexcept { return 1.0f; }
00038     };
00039
00040     const int INIT_VIEW_WIDTH = 1600;
00041     const int INIT_VIEW_HEIGHT = 900;
00042 }

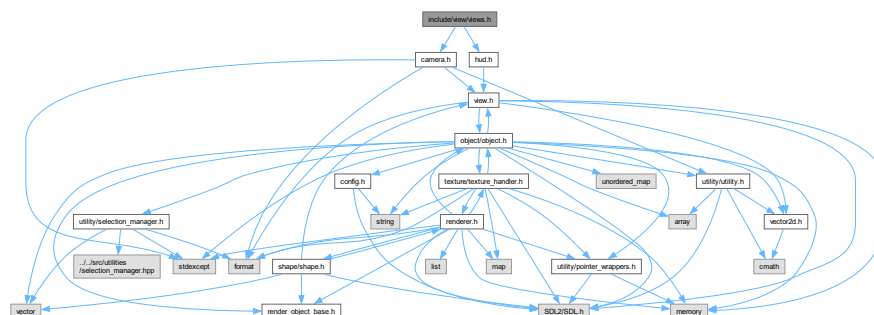
```

7.55 include/view/views.h File Reference

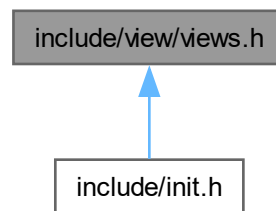
```
#include "hud.h"
```

```
#include "camera.h"
```

Include dependency graph for views.h:



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



7.56 views.h

[Go to the documentation of this file.](#)

```
00001 #pragma once
00002
00003 #include "hud.h"
00004 #include "camera.h"
```


Index

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