

# Prog2\_NHF

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# Chapter 1

## Namespace Index

### 1.1 Namespace List

Here is a list of all namespaces with brief descriptions:

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## Chapter 2

# Hierarchical Index

### 2.1 Class Hierarchy

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

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## Chapter 3

# Class Index

### 3.1 Class List

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

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<a href="#">Coin</a>	16
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# Chapter 4

## File Index

### 4.1 File List

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## Chapter 5

# Namespace Documentation

### 5.1 AssetManager Namespace Reference

#### Functions

- Texture2D \* [GetTexture](#) ([TextureType](#) asset)

#### 5.1.1 Enumeration Type Documentation

##### 5.1.1.1 TextureType

```
enum class AssetManager::TextureType [strong]
```

Enum class for texture type.

#### Enumerator

SMALL_ENEMY	
LARGE_ENEMY	
ASSET_COUNT	

#### 5.1.2 Function Documentation

##### 5.1.2.1 GetTexture()

```
Texture2D * AssetManager::GetTexture (  
    TextureType asset )
```

Returns the texture of the asset.

#### Parameters

<i>asset</i>	The texture type
--------------	------------------

**Returns**

Texture2D\* The texture of the asset ("AssetManager keeps ownership")

**5.1.2.2 LoadAssets()**

```
void AssetManager::LoadAssets ( )
```

Loads all the necessary images.

**5.1.2.3 UnloadAssets()**

```
void AssetManager::UnloadAssets ( )
```

Unloads all the images loaded previously.

## 5.2 Utils Namespace Reference

**Classes**

- class [Vec2](#)

**Functions**

- template<typename T >  
std::ostream & [operator<<](#) (std::ostream &os, const [Vec2](#)< T > &vec)

### 5.2.1 Typedef Documentation

**5.2.1.1 Vec2d**

```
typedef Vec2<double> Utils::Vec2d
```

**5.2.1.2 Vec2i**

```
typedef Vec2<int> Utils::Vec2i
```

### 5.2.2 Function Documentation

**5.2.2.1 operator<<()**

```
template<typename T >  
std::ostream & Utils::operator<< (  
    std::ostream & os,  
    const Vec2< T > & vec )
```

Inserts a vector into an output stream.

## Parameters

<i>os</i>	The output stream
<i>vec</i>	The vector

## Returns

std::ostream& The modified output stream

**5.2.2.2 Vector2ToVec2()**

```
Vec2d Utils::Vector2ToVec2 (
    const Vector2 & vec )
```



# Chapter 6

## Class Documentation

### 6.1 Bullet Class Reference

```
#include <Bullet.h>
```

#### Public Member Functions

- [Bullet](#) ([World](#) \*worldPtr, const [Utils::Vec2d](#) &position, const [Utils::Vec2d](#) &velocity, [BulletTarget](#) target)
- virtual void [Update](#) (double dt) override
- [BulletTarget](#) [GetTarget](#) () const
- virtual double [GetSize](#) () const =0

#### Public Member Functions inherited from [GameObject](#)

- [GameObject](#) ([World](#) \*worldPtr, double health=0.0, double mass=0.0, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero](#)(), double friction=0.00)
- [Utils::Vec2d](#) [GetPosition](#) () const
- double [GetRotation](#) () const
- bool [IsAlive](#) () const
- void [TakeDamage](#) (double damage)
- void [AddForce](#) (const [Utils::Vec2d](#) &force)
- void [LookAt](#) (const [Utils::Vec2d](#) &target)

#### 6.1.1 Member Enumeration Documentation

##### 6.1.1.1 BulletTarget

```
enum class Bullet::BulletTarget [strong]
```

Enum class for bullet target type (the bullet only damages the target type)

#### Enumerator

PLAYER	
ENEMY	

## 6.1.2 Constructor & Destructor Documentation

### 6.1.2.1 Bullet()

```
Bullet::Bullet (
    World * worldPtr,
    const Utils::Vec2d & position,
    const Utils::Vec2d & velocity,
    BulletTarget target ) [inline]
```

Constructs a new [Bullet](#) object.

#### Parameters

<i>worldPtr</i>	The world that owns the object
<i>position</i>	The position of the object
<i>velocity</i>	The velocity of the object
<i>target</i>	The target type of the object

### 6.1.2.2 ~Bullet()

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

Destroy the [Bullet](#) object (virtual needed for inheritance)

## 6.1.3 Member Function Documentation

### 6.1.3.1 GetSize()

```
virtual double Bullet::GetSize ( ) const [pure virtual]
```

Returns the size of the bullet.

#### Returns

double The size of the bullet

Implemented in [CircleBullet](#).

### 6.1.3.2 GetTarget()

```
BulletTarget Bullet::GetTarget ( ) const [inline]
```

Returns the target type of the bullet.

#### Returns

BulletTarget The target type of the bullet

### 6.1.3.3 Update()

```
void Bullet::Update (
    double dt ) [override], [virtual]
```

Updates the bullet object.



## Parameters

<i>dt</i>	The delta time
-----------	----------------

Reimplemented from [GameObject](#).

## 6.1.4 Member Data Documentation

### 6.1.4.1 Target

[BulletTarget](#) `Bullet::Target` [protected]

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

- `src/Bullets/Bullet.h`
- `src/Bullets/Bullet.cpp`

## 6.2 CircleBullet Class Reference

```
#include <CircleBullet.h>
```

### Public Member Functions

- [CircleBullet](#) ([World](#) \*worldPtr, const [Utils::Vec2d](#) &position, const [Utils::Vec2d](#) &direction, [BulletTarget](#) target)
- double [GetSize](#) () const override

### Public Member Functions inherited from [Bullet](#)

- [Bullet](#) ([World](#) \*worldPtr, const [Utils::Vec2d](#) &position, const [Utils::Vec2d](#) &velocity, [BulletTarget](#) target)
- virtual void [Update](#) (double dt) override
- [BulletTarget](#) [GetTarget](#) () const

### Public Member Functions inherited from [GameObject](#)

- [GameObject](#) ([World](#) \*worldPtr, double health=0.0, double mass=0.0, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero](#)(), double friction=0.00)
- [Utils::Vec2d](#) [GetPosition](#) () const
- double [GetRotation](#) () const
- bool [IsAlive](#) () const
- void [TakeDamage](#) (double damage)
- void [AddForce](#) (const [Utils::Vec2d](#) &force)
- void [LookAt](#) (const [Utils::Vec2d](#) &target)

## 6.2.1 Constructor & Destructor Documentation

### 6.2.1.1 CircleBullet()

```
CircleBullet::CircleBullet (
    World * worldPtr,
    const Utils::Vec2d & position,
    const Utils::Vec2d & direction,
    BulletTarget target ) [inline]
```

Constructs a new [CircleBullet](#) object.

**Parameters**

<i>worldPtr</i>	The world that owns the object
<i>position</i>	The position of the object
<i>direction</i>	The direction of the object
<i>target</i>	The target type of the object

## 6.2.2 Member Function Documentation

### 6.2.2.1 Draw()

```
void CircleBullet::Draw ( ) const [override], [virtual]
```

Draws the circle bullet object.

Implements [GameObject](#).

### 6.2.2.2 GetSize()

```
double CircleBullet::GetSize ( ) const [inline], [override], [virtual]
```

Returns the size of the circle bullet.

**Returns**

double The size of the circle bullet

Implements [Bullet](#).

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

- [src/Bullets/CircleBullet.h](#)
- [src/Bullets/CircleBullet.cpp](#)

## 6.3 Coin Class Reference

```
#include <Coin.h>
```

**Public Member Functions**

- [Coin](#) ([World](#) \*worldPtr, const [Utils::Vec2d](#) &position)
- void [Update](#) (double dt) override
- double [GetSize](#) () const override

## Public Member Functions inherited from [Collectable](#)

- [Collectable](#) ([World](#) \*worldPtr, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero](#)())
- bool [IsCollected](#) () const
- void [SetCollected](#) (bool collected)

## Public Member Functions inherited from [GameObject](#)

- [GameObject](#) ([World](#) \*worldPtr, double health=0.0, double mass=0.0, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero](#)(), double friction=0.00)
- [Utils::Vec2d](#) [GetPosition](#) () const
- double [GetRotation](#) () const
- bool [IsAlive](#) () const
- void [TakeDamage](#) (double damage)
- void [AddForce](#) (const [Utils::Vec2d](#) &force)
- void [LookAt](#) (const [Utils::Vec2d](#) &target)

## 6.3.1 Constructor & Destructor Documentation

### 6.3.1.1 Coin()

```
Coin::Coin (
    World * worldPtr,
    const Utils::Vec2d & position ) [inline]
```

Constructs a new [Coin](#) object.

#### Parameters

<i>worldPtr</i>	The world that owns the object
<i>position</i>	The position of the object

## 6.3.2 Member Function Documentation

### 6.3.2.1 Draw()

```
void Coin::Draw ( ) const [override], [virtual]
```

Draws the coin object.

Implements [GameObject](#).

### 6.3.2.2 GetSize()

```
double Coin::GetSize ( ) const [inline], [override], [virtual]
```

Returns the size of the coin.

#### Returns

double The size of the coin

Implements [Collectable](#).

### 6.3.2.3 Update()

```
void Coin::Update (
    double dt ) [inline], [override], [virtual]
```

Updates the coin object.

#### Parameters

<i>dt</i>	The delta time
-----------	----------------

Reimplemented from [GameObject](#).

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

- [src/Collectables/Coin.h](#)
- [src/Collectables/Coin.cpp](#)

## 6.4 Col Struct Reference

```
#include <Color.h>
```

### Public Member Functions

- [Col](#) (int *r*, int *g*, int *b*, int *a*=255)
- [Col](#) (int gray)
- [Col Fade](#) (double *t*) const
- [Col Lerp](#) (const [Col](#) &other, double *t*) const
- [operator Color](#) () const

### 6.4.1 Constructor & Destructor Documentation

#### 6.4.1.1 Col() [1/2]

```
Col::Col (
    int r,
    int g,
    int b,
    int a = 255 )
```

Constructs a new [Col](#) object.

#### Parameters

<i>r</i>	The red value
<i>g</i>	The green value
<i>b</i>	The blue value
<i>a</i>	The alpha value

### 6.4.1.2 Col() [2/2]

```
Col::Col (
    int gray )
```

Constructs a new grayscale [Col](#) object (alpha is 255)

#### Parameters

<i>gray</i>	The grayscale value
-------------	---------------------

## 6.4.2 Member Function Documentation

### 6.4.2.1 Fade()

```
Col Col::Fade (
    double t ) const
```

Fades the color by a certain amount (changes the alpha value)

#### Parameters

<i>t</i>	The amount to fade by (0.0 - 1.0)
----------	-----------------------------------

#### Returns

[Col](#) The faded color

### 6.4.2.2 Lerp()

```
Col Col::Lerp (
    const Col & other,
    double t ) const
```

Linearly interpolates between two colors.

#### Parameters

<i>other</i>	The other color
<i>t</i>	The interpolation value

#### Returns

[Col](#) The interpolated color

### 6.4.2.3 operator Color()

```
Col::operator Color ( ) const
```

Converts the color to a Color object (Raylib color)

#### Returns

Color The Color object

### 6.4.3 Member Data Documentation

#### 6.4.3.1 A

```
int Col::A
```

#### 6.4.3.2 B

```
int Col::B
```

#### 6.4.3.3 G

```
int Col::G
```

#### 6.4.3.4 R

```
int Col::R
```

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

- [src/Color/Color.h](#)
- [src/Color/Color.cpp](#)

## 6.5 Collectable Class Reference

```
#include <Collectable.h>
```

#### Public Member Functions

- [Collectable](#) ([World](#) \*worldPtr, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero](#)())
- virtual double [GetSize](#) () const =0
- bool [IsCollected](#) () const
- void [SetCollected](#) (bool collected)

## Public Member Functions inherited from [GameObject](#)

- [GameObject](#) ([World](#) \*worldPtr, double health=0.0, double mass=0.0, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero\(\)](#), double friction=0.00)
- [Utils::Vec2d GetPosition](#) () const
- double [GetRotation](#) () const
- bool [IsAlive](#) () const
- void [TakeDamage](#) (double damage)
- void [AddForce](#) (const [Utils::Vec2d](#) &force)
- void [LookAt](#) (const [Utils::Vec2d](#) &target)
- virtual void [Update](#) (double dt)

## 6.5.1 Constructor & Destructor Documentation

### 6.5.1.1 Collectable()

```
Collectable::Collectable (
    World * worldPtr,
    const Utils::Vec2d & position = Utils::Vec2d::Zero\(\) ) [inline]
```

Constructs a new [Collectable](#) object.

#### Parameters

<i>worldPtr</i>	The world that owns the object
<i>position</i>	The position of the object

### 6.5.1.2 ~Collectable()

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

Destroys the [Collectable](#) object (virtual needed for inheritance)

## 6.5.2 Member Function Documentation

### 6.5.2.1 GetSize()

```
virtual double Collectable::GetSize ( ) const [pure virtual]
```

Returns the size of the object.

#### Returns

double The size of the object

Implemented in [Coin](#).

### 6.5.2.2 IsCollected()

```
bool Collectable::IsCollected ( ) const [inline]
```

Returns whether the object is collected.

#### Returns

bool True if the object is collected, false otherwise

### 6.5.2.3 SetCollected()

```
void Collectable::SetCollected (
    bool collected ) [inline]
```

Sets whether the object is collected.

#### Parameters

<i>collected</i>	True if the object is collected, false otherwise
------------------	--

## 6.5.3 Member Data Documentation

### 6.5.3.1 Collected

```
bool Collectable::Collected [protected]
```

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

- [src/Collectables/Collectable.h](#)

## 6.6 Enemy Class Reference

```
#include <Enemy.h>
```

### Public Member Functions

- [Enemy](#) ([World](#) \*worldPtr, double health=100.0, double mass=1.0, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero](#)())
- void [SetTarget](#) (const [Utils::Vec2d](#) &target)
- virtual double [GetMoveForce](#) () const =0
- virtual double [GetSize](#) () const =0
- virtual [Col](#) [GetColor](#) () const =0



## Public Member Functions inherited from [GameObject](#)

- [GameObject](#) ([World](#) \*worldPtr, double health=0.0, double mass=0.0, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero\(\)](#), double friction=0.00)
- [Utils::Vec2d GetPosition](#) () const
- double [GetRotation](#) () const
- bool [IsAlive](#) () const
- void [TakeDamage](#) (double damage)
- void [AddForce](#) (const [Utils::Vec2d](#) &force)
- void [LookAt](#) (const [Utils::Vec2d](#) &target)
- virtual void [Update](#) (double dt)

## 6.6.1 Constructor & Destructor Documentation

### 6.6.1.1 [Enemy\(\)](#)

```
Enemy::Enemy (
    World * worldPtr,
    double health = 100.0,
    double mass = 1.0,
    const Utils::Vec2d & position = Utils::Vec2d::Zero\(\) ) [inline]
```

Constructs a new [Enemy](#) object.

#### Parameters

<i>worldPtr</i>	The world that owns the object
<i>health</i>	Max health of the object
<i>mass</i>	Mass of the object
<i>position</i>	Position of the object

### 6.6.1.2 [~Enemy\(\)](#)

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

Destroys the [Enemy](#) object (virtual needed for inheritance)

## 6.6.2 Member Function Documentation

### 6.6.2.1 [GetColor\(\)](#)

```
virtual Col Enemy::GetColor ( ) const [pure virtual]
```

Returns the color of the object (needed because of inheritance)

#### Returns

[Col](#) The color of the object

Implemented in [LargeEnemy](#), and [SmallEnemy](#).

#### 6.6.2.2 GetMoveForce()

```
virtual double Enemy::GetMoveForce ( ) const [pure virtual]
```

Returns the move force of the object (needed because of inheritance)

##### Returns

double The move force of the object

Implemented in [LargeEnemy](#), and [SmallEnemy](#).

#### 6.6.2.3 GetSize()

```
virtual double Enemy::GetSize ( ) const [pure virtual]
```

Returns the size of the object (needed because of inheritance)

##### Returns

double The size of the object

Implemented in [LargeEnemy](#), and [SmallEnemy](#).

#### 6.6.2.4 SetTarget()

```
void Enemy::SetTarget (
    const Utils::Vec2d & target ) [inline]
```

Sets the target of the enemy (where it will move towards)

##### Parameters

<i>target</i>	The target to set
---------------	-------------------

### 6.6.3 Member Data Documentation

#### 6.6.3.1 Target

```
Utils::Vec2d Enemy::Target [protected]
```

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

- [src/Enemies/Enemy.h](#)

## 6.7 GameObject Class Reference

```
#include <GameObject.h>
```

### Public Member Functions

- [GameObject](#) ([World](#) \*worldPtr, double health=0.0, double mass=0.0, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero](#)(), double friction=0.00)
- [Utils::Vec2d](#) [GetPosition](#) () const
- double [GetRotation](#) () const
- bool [IsAlive](#) () const
- void [TakeDamage](#) (double damage)
- void [AddForce](#) (const [Utils::Vec2d](#) &force)
- void [LookAt](#) (const [Utils::Vec2d](#) &target)
- virtual void [Update](#) (double dt)

### 6.7.1 Constructor & Destructor Documentation

#### 6.7.1.1 GameObject()

```
GameObject::GameObject (
    World * worldPtr,
    double health = 0.0,
    double mass = 0.0,
    const Utils::Vec2d & position = Utils::Vec2d::Zero(),
    double friction = 0.00 ) [inline]
```

Construct a new [GameObject](#).

#### Parameters

<i>worldPtr</i>	The world that owns the object
<i>health</i>	Max health of the object
<i>mass</i>	Mass of the object
<i>position</i>	Position of the object
<i>friction</i>	Friction of the object

#### 6.7.1.2 ~GameObject()

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

Destroy the Game Object object (virtual needed for inheritance)

### 6.7.2 Member Function Documentation

#### 6.7.2.1 AddForce()

```
void GameObject::AddForce (
    const Utils::Vec2d & force ) [inline]
```

Adds force to the object.

## Parameters

<i>force</i>	The force to add
--------------	------------------

### 6.7.2.2 Destroy()

```
void GameObject::Destroy ( ) [inline]
```

Destroys the object.

### 6.7.2.3 Draw()

```
virtual void GameObject::Draw ( ) const [pure virtual]
```

Draws the object.

Implemented in [CircleBullet](#), [Coin](#), [LargeEnemy](#), [SmallEnemy](#), and [Player](#).

### 6.7.2.4 DrawHealthBar()

```
void GameObject::DrawHealthBar (
    const Utils::Vec2d & position,
    const Utils::Vec2d & size ) const [protected]
```

### 6.7.2.5 GetPosition()

```
Utils::Vec2d GameObject::GetPosition ( ) const [inline]
```

Returns the position of the object.

## Returns

[Utils::Vec2d](#) The position of the object

### 6.7.2.6 GetRotation()

```
double GameObject::GetRotation ( ) const [inline]
```

Returns the rotation of the object.

## Returns

double The rotation of the object

#### 6.7.2.7 IsAlive()

```
bool GameObject::IsAlive ( ) const [inline]
```

Returns whether the object is alive.

##### Returns

bool Whether the object is alive

#### 6.7.2.8 LookAt()

```
void GameObject::LookAt (
    const Utils::Vec2d & target )
```

Rotates the object to look at a target.

## Parameters

<i>target</i>	The target to look at
---------------	-----------------------

### 6.7.2.9 TakeDamage()

```
void GameObject::TakeDamage (
    double damage ) [inline]
```

Deals damage to the object (decreases health, destroys if health is  $\leq 0$ )

## Parameters

<i>damage</i>	The amount of damage to deal
---------------	------------------------------

### 6.7.2.10 Update()

```
void GameObject::Update (
    double dt ) [virtual]
```

Updates the object (using euler integration)

## Parameters

<i>dt</i>	The delta time
-----------	----------------

Reimplemented in [Bullet](#), [Coin](#), [LargeEnemy](#), [SmallEnemy](#), and [Player](#).

## 6.7.3 Member Data Documentation

### 6.7.3.1 Acceleration

```
Utils::Vec2d GameObject::Acceleration [protected]
```

### 6.7.3.2 Alive

```
bool GameObject::Alive [protected]
```

### 6.7.3.3 Force

```
Utils::Vec2d GameObject::Force [protected]
```

#### 6.7.3.4 Friction

```
double GameObject::Friction [protected]
```

#### 6.7.3.5 Health

```
double GameObject::Health [protected]
```

#### 6.7.3.6 Mass

```
double GameObject::Mass [protected]
```

#### 6.7.3.7 MaxHealth

```
double GameObject::MaxHealth [protected]
```

#### 6.7.3.8 Position

```
Utils::Vec2d GameObject::Position [protected]
```

#### 6.7.3.9 Rotation

```
double GameObject::Rotation [protected]
```

#### 6.7.3.10 Velocity

```
Utils::Vec2d GameObject::Velocity [protected]
```

#### 6.7.3.11 WorldPtr

```
World* GameObject::WorldPtr [protected]
```

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

- [src/GameObjects/GameObject.h](#)
- [src/GameObjects/GameObject.cpp](#)

## 6.8 LargeEnemy Class Reference

```
#include <LargeEnemy.h>
```



## Public Member Functions

- [LargeEnemy](#) ([World](#) \*worldPtr, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero](#)())
- void [Update](#) (double dt) override
- double [GetSize](#) () const override
- double [GetMoveForce](#) () const override
- [Col](#) [GetColor](#) () const override

## Public Member Functions inherited from [Enemy](#)

- [Enemy](#) ([World](#) \*worldPtr, double health=100.0, double mass=1.0, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero](#)())
- void [SetTarget](#) (const [Utils::Vec2d](#) &target)

## Public Member Functions inherited from [GameObject](#)

- [GameObject](#) ([World](#) \*worldPtr, double health=0.0, double mass=0.0, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero](#)(), double friction=0.00)
- [Utils::Vec2d](#) [GetPosition](#) () const
- double [GetRotation](#) () const
- bool [IsAlive](#) () const
- void [TakeDamage](#) (double damage)
- void [AddForce](#) (const [Utils::Vec2d](#) &force)
- void [LookAt](#) (const [Utils::Vec2d](#) &target)

## 6.8.1 Constructor & Destructor Documentation

### 6.8.1.1 [LargeEnemy](#)()

```
LargeEnemy::LargeEnemy (
    World * worldPtr,
    const Utils::Vec2d & position = Utils::Vec2d::Zero() ) [inline]
```

Constructs a new [SmallEnemy](#) object.

#### Parameters

<i>worldPtr</i>	The world that owns the object
<i>position</i>	The position of the object

## 6.8.2 Member Function Documentation

### 6.8.2.1 [Draw](#)()

```
void LargeEnemy::Draw ( ) const [override], [virtual]
```

Draws the small enemy object.

Implements [GameObject](#).

### 6.8.2.2 GetColor()

```
Col LargeEnemy::GetColor ( ) const [inline], [override], [virtual]
```

Returns the color of the object.

#### Returns

[Col](#) The color of the object

Implements [Enemy](#).

### 6.8.2.3 GetMoveForce()

```
double LargeEnemy::GetMoveForce ( ) const [inline], [override], [virtual]
```

Returns the move force of the object.

#### Returns

double The move force of the object

Implements [Enemy](#).

### 6.8.2.4 GetSize()

```
double LargeEnemy::GetSize ( ) const [inline], [override], [virtual]
```

Returns the size of the object.

#### Returns

double The size of the object

Implements [Enemy](#).

### 6.8.2.5 Update()

```
void LargeEnemy::Update (
    double dt ) [override], [virtual]
```

Updates the small enemy object.

#### Parameters

<i>dt</i>	The delta time
-----------	----------------

Reimplemented from [GameObject](#).

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

- src/Enemies/[LargeEnemy.h](#)
- src/Enemies/[LargeEnemy.cpp](#)

## 6.9 ParticleSystem Class Reference

```
#include <ParticleSystem.h>
```

### Public Member Functions

- `size_t` [GetParticleCount](#) () const
- void [Emit](#) (const [Utils::Vec2d](#) &position, const [Utils::Vec2d](#) &direction, double randomAngle, double lifetime, const [Col](#) &startColor, const [Col](#) &endColor, double startSize, double endSize, size\_t count)
- void [Update](#) (double dt)

### 6.9.1 Constructor & Destructor Documentation

#### 6.9.1.1 ParticleSystem()

```
ParticleSystem::ParticleSystem ( )
```

Constructs a new Particle System object.

#### 6.9.1.2 ~ParticleSystem()

```
ParticleSystem::~~ParticleSystem ( ) [default]
```

Destroys the Particle System object.

### 6.9.2 Member Function Documentation

#### 6.9.2.1 Draw()

```
void ParticleSystem::Draw ( ) const
```

Draws the particles in the system.

#### 6.9.2.2 Emit()

```
void ParticleSystem::Emit (
    const Utils::Vec2d & position,
    const Utils::Vec2d & direction,
    double randomAngle,
    double lifetime,
    const Col & startColor,
    const Col & endColor,
    double startSize,
    double endSize,
    size_t count )
```

Emits particles with given parameters.

**Parameters**

<i>position</i>	The position to emit the particles from
<i>direction</i>	The direction the particles will move
<i>randomAngle</i>	The max angle the direction will be randomized by
<i>lifetime</i>	The lifetime of the particles in seconds
<i>startColor</i>	The starting color of the particles
<i>endColor</i>	The ending color of the particles
<i>startSize</i>	The starting size of the particles
<i>endSize</i>	The ending size of the particles
<i>count</i>	The number of particles to emit

**6.9.2.3 GetParticleCount()**

```
size_t ParticleSystem::GetParticleCount ( ) const [inline]
```

Returns the number of particles in the system.

**Returns**

size\_t The number of particles in the system

**6.9.2.4 Update()**

```
void ParticleSystem::Update (
    double dt )
```

Updates the particles in the system.

**Parameters**

<i>dt</i>	The delta time
-----------	----------------

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

- src/ParticleSystem/[ParticleSystem.h](#)
- src/ParticleSystem/[ParticleSystem.cpp](#)

**6.10 Player Class Reference**

```
#include <Player.h>
```

**Public Member Functions**

- [Player](#) ([World](#) \*worldPtr, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero\(\)](#))
- void [Update](#) (double dt) override
- void [AddCoin](#) (size\_t count=1)
- size\_t [GetCoinCount](#) () const

## Public Member Functions inherited from [GameObject](#)

- [GameObject](#) ([World](#) \*worldPtr, double health=0.0, double mass=0.0, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero\(\)](#), double friction=0.00)
- [Utils::Vec2d GetPosition](#) () const
- double [GetRotation](#) () const
- bool [IsAlive](#) () const
- void [TakeDamage](#) (double damage)
- void [AddForce](#) (const [Utils::Vec2d](#) &force)
- void [LookAt](#) (const [Utils::Vec2d](#) &target)

## 6.10.1 Constructor & Destructor Documentation

### 6.10.1.1 [Player\(\)](#)

```
Player::Player (
    World * worldPtr,
    const Utils::Vec2d & position = Utils::Vec2d::Zero\(\) ) [inline]
```

Constructs a new [Player](#) object.

#### Parameters

<i>worldPtr</i>	The world that owns the object
<i>position</i>	The position of the object

### 6.10.1.2 [~Player\(\)](#)

```
Player::~~Player ( ) [default]
```

Destroys the [Player](#) object.

## 6.10.2 Member Function Documentation

### 6.10.2.1 [AddCoin\(\)](#)

```
void Player::AddCoin (
    size_t count = 1 ) [inline]
```

Adds coins to the player.

#### Parameters

<i>count</i>	The number of coins to add
--------------	----------------------------

### 6.10.2.2 Draw()

```
void Player::Draw ( ) const [override], [virtual]
```

Draws the player object.

Implements [GameObject](#).

### 6.10.2.3 GetCoinCount()

```
size_t Player::GetCoinCount ( ) const [inline]
```

Returns the coin count of the player.

#### Returns

size\_t The coin count of the player

### 6.10.2.4 Update()

```
void Player::Update (
    double dt ) [override], [virtual]
```

Updates the player object.

#### Parameters

<i>dt</i>	The delta time
-----------	----------------

Reimplemented from [GameObject](#).

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

- src/GameObjects/[Player.h](#)
- src/GameObjects/[Player.cpp](#)

## 6.11 SmallEnemy Class Reference

```
#include <SmallEnemy.h>
```

#### Public Member Functions

- [SmallEnemy](#) ([World](#) \*worldPtr, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero](#)())
- void [Update](#) (double dt) override
- double [GetSize](#) () const override
- double [GetMoveForce](#) () const override
- [Col](#) [GetColor](#) () const override

## Public Member Functions inherited from [Enemy](#)

- [Enemy](#) ([World](#) \*worldPtr, double health=100.0, double mass=1.0, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero\(\)](#))
- void [SetTarget](#) (const [Utils::Vec2d](#) &target)

## Public Member Functions inherited from [GameObject](#)

- [GameObject](#) ([World](#) \*worldPtr, double health=0.0, double mass=0.0, const [Utils::Vec2d](#) &position=[Utils::Vec2d::Zero\(\)](#), double friction=0.00)
- [Utils::Vec2d](#) [GetPosition](#) () const
- double [GetRotation](#) () const
- bool [IsAlive](#) () const
- void [TakeDamage](#) (double damage)
- void [AddForce](#) (const [Utils::Vec2d](#) &force)
- void [LookAt](#) (const [Utils::Vec2d](#) &target)

## 6.11.1 Constructor & Destructor Documentation

### 6.11.1.1 [SmallEnemy\(\)](#)

```
SmallEnemy::SmallEnemy (
    World * worldPtr,
    const Utils::Vec2d & position = Utils::Vec2d::Zero\(\) ) [inline]
```

Constructs a new [SmallEnemy](#) object.

#### Parameters

<i>worldPtr</i>	The world that owns the object
<i>position</i>	The position of the object

## 6.11.2 Member Function Documentation

### 6.11.2.1 [Draw\(\)](#)

```
void SmallEnemy::Draw ( ) const [override], [virtual]
```

Draws the small enemy object.

Implements [GameObject](#).

### 6.11.2.2 [GetColor\(\)](#)

```
Col SmallEnemy::GetColor ( ) const [inline], [override], [virtual]
```

Returns the color of the object.

#### Returns

[Col](#) The color of the object

Implements [Enemy](#).

### 6.11.2.3 GetMoveForce()

```
double SmallEnemy::GetMoveForce ( ) const [inline], [override], [virtual]
```

Returns the move force of the object.

#### Returns

double The move force of the object

Implements [Enemy](#).

### 6.11.2.4 GetSize()

```
double SmallEnemy::GetSize ( ) const [inline], [override], [virtual]
```

Returns the size of the object.

#### Returns

double The size of the object

Implements [Enemy](#).

### 6.11.2.5 Update()

```
void SmallEnemy::Update (
    double dt ) [override], [virtual]
```

Updates the small enemy object.

#### Parameters

<i>dt</i>	The delta time
-----------	----------------

Reimplemented from [GameObject](#).

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

- src/Enemies/[SmallEnemy.h](#)
- src/Enemies/[SmallEnemy.cpp](#)

## 6.12 Utils::Vec2< T > Class Template Reference

```
#include <Vec2.h>
```



**Public Member Functions**

- [Vec2](#) (T x, T y)
- T [GetX](#) () const
- T [GetY](#) () const
- double [GetAngle](#) () const
- double [GetLengthSquared](#) () const
- double [GetLength](#) () const
- [Vec2](#) [GetNormalized](#) () const
- void [SetX](#) (T x)
- void [SetY](#) (T y)
- [Vec2](#) [Rotate](#) (double angle) const
- [Vec2](#) [operator+](#) (const [Vec2](#) &other) const
- [Vec2](#) [operator-](#) (const [Vec2](#) &other) const
- T [operator\\*](#) (const [Vec2](#) &other) const
- T [operator^](#) (const [Vec2](#) &other) const
- [Vec2](#) [operator\\*](#) (const T &other) const
- [Vec2](#) [operator/](#) (const T &other) const
- [Vec2](#) [operator-](#) () const
- [Vec2](#) & [operator+=](#) (const [Vec2](#) &other)
- [Vec2](#) & [operator-=](#) (const [Vec2](#) &other)
- [Vec2](#) & [operator\\*=](#) (const [Vec2](#) &other)
- [Vec2](#) & [operator/=](#) (const [Vec2](#) &other)
- [Vec2](#) & [operator\\*=](#) (const T &other)
- [Vec2](#) & [operator/=](#) (const T &other)

**Static Public Member Functions**

- static [Vec2](#) [FromAngle](#) (double angle)
- static [Vec2](#) [Zero](#) ()
- static [Vec2](#) [One](#) ()
- static [Vec2](#) [Up](#) ()
- static [Vec2](#) [Down](#) ()
- static [Vec2](#) [Left](#) ()
- static [Vec2](#) [Right](#) ()

**6.12.1 Constructor & Destructor Documentation****6.12.1.1 Vec2() [1/2]**

```
template<typename T >
Utils::Vec2< T >::Vec2 ( ) [inline]
```

Constructs a new [Vec2](#) object with a given type (default values are 0)

**6.12.1.2 Vec2() [2/2]**

```
template<typename T >
Utils::Vec2< T >::Vec2 (
    T x,
    T y ) [inline]
```

Constructs a new [Vec2](#) object with a given type and given values.

**Parameters**

<i>x</i>	The x value
<i>y</i>	The y value

**6.12.1.3 ~Vec2()**

```
template<typename T >
Vec2 Utils::Vec2< T >::~Vec2 ( ) [default]
```

**6.12.2 Member Function Documentation****6.12.2.1 Down()**

```
template<typename T >
static Vec2 Utils::Vec2< T >::Down ( ) [inline], [static]
```

Returns a unit vector pointing down.

**Returns**

Vec2 The down vector

**6.12.2.2 FromAngle()**

```
template<typename T >
static Vec2 Utils::Vec2< T >::FromAngle (
    double angle ) [inline], [static]
```

Creates a vector from an angle.

**Parameters**

<i>angle</i>	The angle
--------------	-----------

**Returns**

Vec2 The vector from the angle

**6.12.2.3 GetAngle()**

```
template<typename T >
double Utils::Vec2< T >::GetAngle ( ) const [inline]
```

Returns the angle of the vector.

**Returns**

double The angle of the vector

**6.12.2.4 GetLength()**

```
template<typename T >
double Utils::Vec2< T >::GetLength ( ) const [inline]
```

Returns the length of the vector.

**Returns**

double The length of the vector

**6.12.2.5 GetLengthSquared()**

```
template<typename T >
double Utils::Vec2< T >::GetLengthSquared ( ) const [inline]
```

Returns the squared length of the vector.

**Returns**

double The squared length of the vector

**6.12.2.6 GetNormalized()**

```
template<typename T >
Vec2 Utils::Vec2< T >::GetNormalized ( ) const [inline]
```

Returns the normalized vector.

**Returns**

Vec2 The normalized vector

**6.12.2.7 GetX()**

```
template<typename T >
T Utils::Vec2< T >::GetX ( ) const [inline]
```

Returns the x value.

**Returns**

T The x value

#### 6.12.2.8 GetY()

```
template<typename T >
T Utils::Vec2< T >::GetY ( ) const [inline]
```

Returns the y value.

##### Returns

T The y value

#### 6.12.2.9 Left()

```
template<typename T >
static Vec2 Utils::Vec2< T >::Left ( ) [inline], [static]
```

Returns a unit vector pointing left.

##### Returns

Vec2 The left vector

#### 6.12.2.10 One()

```
template<typename T >
static Vec2 Utils::Vec2< T >::One ( ) [inline], [static]
```

Returns a one vector.

##### Returns

Vec2 The one vector

#### 6.12.2.11 operator Vector2()

```
template<typename T >
Utils::Vec2< T >::operator Vector2 ( ) const [inline]
```

#### 6.12.2.12 operator\*() [1/2]

```
template<typename T >
Vec2 Utils::Vec2< T >::operator* (
    const T & other ) const [inline]
```

Returns the element-wise product of two vectors.

## Parameters

<i>other</i>	The other vector
--------------	------------------

## Returns

[Vec2](#) The product of the two vectors

**6.12.2.13 operator\*() [2/2]**

```
template<typename T >
T Utils::Vec2< T >::operator* (
    const Vec2< T > & other ) const [inline]
```

Returns the dot product of two vectors.

## Parameters

<i>other</i>	The other vector
--------------	------------------

## Returns

T The dot product of the two vectors

**6.12.2.14 operator\*=( ) [1/2]**

```
template<typename T >
Vec2 & Utils::Vec2< T >::operator*= (
    const T & other ) [inline]
```

Multiplies the vector with a scalar.

## Parameters

<i>other</i>	The scalar
--------------	------------

## Returns

[Vec2&](#) The current vector

**6.12.2.15 operator\*=( ) [2/2]**

```
template<typename T >
Vec2 & Utils::Vec2< T >::operator*= (
    const Vec2< T > & other ) [inline]
```

Multiplies another vector with the current vector.

## Parameters

<i>other</i>	The other vector
--------------	------------------

## Returns

[Vec2](#)& The current vector

**6.12.2.16 operator+()**

```
template<typename T >
Vec2 Utils::Vec2< T >::operator+ (
    const Vec2< T > & other ) const [inline]
```

Returns the sum of two vectors.

## Parameters

<i>other</i>	The other vector
--------------	------------------

## Returns

[Vec2](#) The sum of the two vectors

**6.12.2.17 operator+=()**

```
template<typename T >
Vec2 & Utils::Vec2< T >::operator+= (
    const Vec2< T > & other ) [inline]
```

Adds another vector to the current vector.

## Parameters

<i>other</i>	The other vector
--------------	------------------

## Returns

[Vec2](#)& The current vector

**6.12.2.18 operator-() [1/2]**

```
template<typename T >
Vec2 Utils::Vec2< T >::operator- ( ) const [inline]
```

Returns the negation of the vector.

## Returns

[Vec2](#) The negation of the vector

### 6.12.2.19 operator-() [2/2]

```
template<typename T >
Vec2 Utils::Vec2< T >::operator- (
    const Vec2< T > & other ) const [inline]
```

Returns the difference of two vectors.

#### Parameters

<i>other</i>	The other vector
--------------	------------------

#### Returns

[Vec2](#) The difference of the two vectors

### 6.12.2.20 operator-=( )

```
template<typename T >
Vec2 & Utils::Vec2< T >::operator-= (
    const Vec2< T > & other ) [inline]
```

Subtracts another vector from the current vector.

#### Parameters

<i>other</i>	The other vector
--------------	------------------

#### Returns

[Vec2&](#) The current vector

### 6.12.2.21 operator/( )

```
template<typename T >
Vec2 Utils::Vec2< T >::operator/ (
    const T & other ) const [inline]
```

Returns the element-wise division of two vectors.

#### Parameters

<i>other</i>	The other vector
--------------	------------------

#### Returns

[Vec2](#) The division of the two vectors

**6.12.2.22 operator/=( ) [1/2]**

```
template<typename T >
Vec2 & Utils::Vec2< T >::operator/= (
    const T & other ) [inline]
```

Divides the vector with a scalar.

**Parameters**

<i>other</i>	The scalar
--------------	------------

**Returns**

[Vec2](#)& The current vector

**6.12.2.23 operator/=( ) [2/2]**

```
template<typename T >
Vec2 & Utils::Vec2< T >::operator/= (
    const Vec2< T > & other ) [inline]
```

Divides another vector with the current vector.

**Parameters**

<i>other</i>	The other vector
--------------	------------------

**Returns**

[Vec2](#)& The current vector

**6.12.2.24 operator^()**

```
template<typename T >
T Utils::Vec2< T >::operator^ (
    const Vec2< T > & other ) const [inline]
```

Returns the cross product of two vectors.

**Parameters**

<i>other</i>	The other vector
--------------	------------------

**Returns**

T The cross product of the two vectors



#### 6.12.2.25 Right()

```
template<typename T >
static Vec2 Utils::Vec2< T >::Right ( ) [inline], [static]
```

Returns a unit vector pointing right.

##### Returns

[Vec2](#) The right vector

#### 6.12.2.26 Rotate()

```
template<typename T >
Vec2 Utils::Vec2< T >::Rotate (
    double angle ) const [inline]
```

Rotates the vector by a given angle.

##### Parameters

<i>angle</i>	The angle to rotate the vector by
--------------	-----------------------------------

##### Returns

[Vec2](#) The rotated vector

#### 6.12.2.27 SetX()

```
template<typename T >
void Utils::Vec2< T >::SetX (
    T x ) [inline]
```

Sets the x value.

##### Parameters

<i>x</i>	The new x value
----------	-----------------

#### 6.12.2.28 SetY()

```
template<typename T >
void Utils::Vec2< T >::SetY (
    T y ) [inline]
```

Sets the y value.

## Parameters

<code>y</code>	The new y value
----------------	-----------------

**6.12.2.29 Up()**

```
template<typename T >
static Vec2 Utils::Vec2< T >::Up ( ) [inline], [static]
```

Returns a unit vector pointing up.

## Returns

[Vec2](#) The up vector

**6.12.2.30 Zero()**

```
template<typename T >
static Vec2 Utils::Vec2< T >::Zero ( ) [inline], [static]
```

Returns a zero vector.

## Returns

[Vec2](#) The zero vector

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

- `src/Utils/Vec2.h`

**6.13 World Class Reference**

```
#include <World.h>
```

**Public Member Functions**

- void [AddCollectable](#) (std::unique\_ptr< [Collectable](#) > collectable)
- void [AddEnemy](#) (std::unique\_ptr< [Enemy](#) > enemy)
- void [AddBullet](#) (std::unique\_ptr< [Bullet](#) > bullet)
- void [Update](#) (double dt)
- [Player](#) \* [GetMainPlayer](#) ()

**6.13.1 Constructor & Destructor Documentation****6.13.1.1 World()**

```
World::World ( )
```

Constructs a new [World](#) object.

**6.13.2 Member Function Documentation****6.13.2.1 AddBullet()**

```
void World::AddBullet (
    std::unique_ptr< Bullet > bullet ) [inline]
```

Adds a bullet to the world (takes ownership)

## Parameters

<i>bullet</i>	The bullet to add
---------------	-------------------

**6.13.2.2 AddCollectable()**

```
void World::AddCollectable (
    std::unique_ptr< Collectable > collectable ) [inline]
```

Adds a collectable to the world (takes ownership)

## Parameters

<i>collectable</i>	The collectable to add
--------------------	------------------------

**6.13.2.3 AddEnemy()**

```
void World::AddEnemy (
    std::unique_ptr< Enemy > enemy ) [inline]
```

Adds an enemy to the world (takes ownership)

## Parameters

<i>enemy</i>	The enemy to add
--------------	------------------

**6.13.2.4 Draw()**

```
void World::Draw ( ) const
```

Calls the Draw function of all objects in the world and shows FPS.

**6.13.2.5 GetMainPlayer()**

```
Player * World::GetMainPlayer ( ) [inline]
```

Returns the main player.

## Returns

Player\* The main player (the world keeps ownership of the player object)

**6.13.2.6 Update()**

```
void World::Update (
    double dt )
```

Generates objects, calls the Update function of all objects in the world.

**Parameters**

<i>dt</i>	The delta time
-----------	----------------

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

- src/World/[World.h](#)
- src/World/[World.cpp](#)

# Chapter 7

## File Documentation

### 7.1 src/AssetManager/AssetManager.cpp File Reference

#### Namespaces

- namespace [AssetManager](#)

#### Functions

- Texture2D \* [AssetManager::GetTexture](#) ([TextureType](#) asset)

### 7.2 src/AssetManager/AssetManager.h File Reference

#### Namespaces

- namespace [AssetManager](#)

#### Functions

- Texture2D \* [AssetManager::GetTexture](#) ([TextureType](#) asset)

### 7.3 AssetManager.h

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

```
00001 #ifndef CPORTA
00002
00003 #ifndef ASSET_MANAGER_H
00004 #define ASSET_MANAGER_H
00005
00006 #include <raylib.h>
00007
00008 namespace AssetManager {
00009
00014     enum class TextureType
00015     {
00016         SMALL_ENEMY = 0, LARGE_ENEMY, ASSET_COUNT
00017     };
00018
00022     void LoadAssets();
00026     void UnloadAssets();
00027
00034     Texture2D* GetTexture(TextureType asset);
00035 }
00036
00037
00038 #endif
00039
00040 #endif
```

## 7.4 src/Bullets/Bullet.cpp File Reference

## 7.5 src/Bullets/Bullet.h File Reference

### Classes

- class [Bullet](#)

## 7.6 Bullet.h

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

```
00001 #ifndef BULLET_H
00002 #define BULLET_H
00003
00004 #include "GameObjects/GameObject.h"
00005 #include "Utils/Vec2.h"
00006
00007 class Bullet : public GameObject
00008 {
00009 public:
00013     enum class BulletTarget { PLAYER = 0, ENEMY };
00014
00015 public:
00024     Bullet(World* worldPtr, const Utils::Vec2d& position, const Utils::Vec2d& velocity, BulletTarget
target)
00025         : GameObject(worldPtr, 0.0, 0.5, position, 0.0), Target(target) { Velocity = velocity; }
00029     virtual ~Bullet() = default;
00030
00036     virtual void Update(double dt) override;
00037     //virtual void Draw() const override; // this is a pure virtual function in GameObject
00038
00044     BulletTarget GetTarget() const { return Target; }
00050     virtual double GetSize() const = 0;
00051
00052 protected:
00053     BulletTarget Target;
00054 };
00055
00056 #endif
```

## 7.7 src/Bullets/CircleBullet.cpp File Reference

## 7.8 src/Bullets/CircleBullet.h File Reference

### Classes

- class [CircleBullet](#)

## 7.9 CircleBullet.h

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

```
00001 #ifndef CIRCLEBULLET_H
00002 #define CIRCLEBULLET_H
00003
00004 #include "Bullet.h"
00005 #include "Color/Color.h"
00006
00007 class CircleBullet : public Bullet
00008 {
```

```

00009 public:
00018     CircleBullet(World* worldPtr, const Utils::Vec2d& position, const Utils::Vec2d& direction,
        BulletTarget target)
00019         : Bullet(worldPtr, position, direction.GetNormalized() * Speed, target) { }
00020
00021     // void Update(double dt) override; // no need to override
00025     void Draw() const override;
00026
00032     double GetSize() const override { return Radius; }
00033
00034 private:
00035     static const double Radius;
00036     static const double Speed;
00037     static const Col Color;
00038 };
00039
00040 #endif

```

## 7.10 src/Collectables/Coin.cpp File Reference

## 7.11 src/Collectables/Coin.h File Reference

### Classes

- class [Coin](#)

## 7.12 Coin.h

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

```

00001 #ifndef COIN_H
00002 #define COIN_H
00003
00004 #include "Collectable.h"
00005
00006 class Coin : public Collectable
00007 {
00008 public:
00015     Coin(World* worldPtr, const Utils::Vec2d& position) : Collectable(worldPtr, position), Time(0.0) {
    }
00016
00022     void Update(double dt) override { Time += dt; }
00026     void Draw() const override;
00027
00033     double GetSize() const override { return Radius * 2.0f; }
00034
00035 private:
00036     static const double Radius;
00037     static const double SwingSpeed;
00038     static const double SwingAmount;
00039
00040 private:
00041     double Time; // keep track of time for the swing animation
00042 };
00043
00044 #endif

```

## 7.13 src/Collectables/Collectable.h File Reference

### Classes

- class [Collectable](#)

## 7.14 Collectable.h

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

```

00001 #ifndef COLLECTABLE_H
00002 #define COLLECTABLE_H
00003
00004 #include "GameObjects/GameObject.h"
00005
00006 class Collectable : public GameObject
00007 {
00008 public:
00015     Collectable(World* worldPtr, const Utils::Vec2d& position = Utils::Vec2d::Zero())
00016         : GameObject(worldPtr, 0.0, 0.0, position, 0.0), Collected(false) { }
00020     virtual ~Collectable() = default;
00021
00027     virtual double GetSize() const = 0;
00033     bool IsCollected() const { return Collected; }
00039     void SetCollected(bool collected) { Collected = collected; }
00040
00041 protected:
00042     bool Collected;
00043 };
00044
00045
00046 #endif

```

## 7.15 src/Collisions/Collisions.cpp File Reference

### Functions

- bool [CheckCollision](#) (const [Player](#) &player, const [Collectable](#) &collectable)
- bool [CheckCollision](#) (const [Player](#) &player, const [Bullet](#) &bullet)
- bool [CheckCollision](#) (const [Player](#) &player, const [Enemy](#) &enemy)
- bool [CheckCollision](#) (const [Enemy](#) &enemy, const [Bullet](#) &bullet)

### 7.15.1 Function Documentation

#### 7.15.1.1 CheckCollision() [1/4]

```

bool CheckCollision (
    const Enemy & enemy,
    const Bullet & bullet )

```

Checks if the enemy collides with the bullet (AABB collision detection)

#### Parameters

<i>enemy</i>	The enemy object
<i>bullet</i>	The enemy object

#### Returns

bool True if the enemy collides with the bullet, false otherwise

#### 7.15.1.2 CheckCollision() [2/4]

```

bool CheckCollision (

```



```
const Player & player,  
const Bullet & bullet )
```

Checks if the player collides with the bullet (AABB collision detection)

#### Parameters

<i>player</i>	The player object
<i>bullet</i>	The bullet object

#### Returns

bool True if the player collides with the bullet, false otherwise

### 7.15.1.3 CheckCollision() [3/4]

```
bool CheckCollision (  
    const Player & player,  
    const Collectable & collectable )
```

Checks if the player collides with the collectable (AABB collision detection)

#### Parameters

<i>player</i>	The player object
<i>collectable</i>	The collectable object

#### Returns

bool True if the player collides with the collectable, false otherwise

### 7.15.1.4 CheckCollision() [4/4]

```
bool CheckCollision (  
    const Player & player,  
    const Enemy & enemy )
```

Checks if the player collides with the enemy (AABB collision detection)

#### Parameters

<i>player</i>	The player object
<i>enemy</i>	The enemy object

#### Returns

bool True if the player collides with the enemy, false otherwise

## 7.16 src/Collisions/Collisions.h File Reference

### Functions

- bool [CheckCollision](#) (const [Player](#) &player, const [Collectable](#) &collectable)
- bool [CheckCollision](#) (const [Player](#) &player, const [Bullet](#) &bullet)
- bool [CheckCollision](#) (const [Player](#) &player, const [Enemy](#) &enemy)
- bool [CheckCollision](#) (const [Enemy](#) &enemy, const [Bullet](#) &bullet)

### 7.16.1 Function Documentation

#### 7.16.1.1 CheckCollision() [1/4]

```
bool CheckCollision (
    const Enemy & enemy,
    const Bullet & bullet )
```

Checks if the enemy collides with the bullet (AABB collision detection)

#### Parameters

<i>enemy</i>	The enemy object
<i>bullet</i>	The enemy object

#### Returns

bool True if the enemy collides with the bullet, false otherwise

#### 7.16.1.2 CheckCollision() [2/4]

```
bool CheckCollision (
    const Player & player,
    const Bullet & bullet )
```

Checks if the player collides with the bullet (AABB collision detection)

#### Parameters

<i>player</i>	The player object
<i>bullet</i>	The bullet object

#### Returns

bool True if the player collides with the bullet, false otherwise

#### 7.16.1.3 CheckCollision() [3/4]

```
bool CheckCollision (
```

```
const Player & player,
const Collectable & collectable )
```

Checks if the player collides with the collectable (AABB collision detection)

#### Parameters

<i>player</i>	The player object
<i>collectable</i>	The collectable object

#### Returns

bool True if the player collides with the collectable, false otherwise

#### 7.16.1.4 CheckCollision() [4/4]

```
bool CheckCollision (
    const Player & player,
    const Enemy & enemy )
```

Checks if the player collides with the enemy (AABB collision detection)

#### Parameters

<i>player</i>	The player object
<i>enemy</i>	The enemy object

#### Returns

bool True if the player collides with the enemy, false otherwise

## 7.17 Collisions.h

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

```
00001 #ifndef COLLISIONS_H
00002 #define COLLISIONS_H
00003
00004 #include "GameObjects/Player.h"
00005 #include "Collectables/Collectable.h"
00006 #include "Bullets/Bullet.h"
00007 #include "Enemies/Enemy.h"
00008
00016 bool CheckCollision(const Player& player, const Collectable& collectable);
00024 bool CheckCollision(const Player& player, const Bullet& bullet);
00032 bool CheckCollision(const Player& player, const Enemy& enemy);
00040 bool CheckCollision(const Enemy& enemy, const Bullet& bullet);
00041
00042 #endif
```

## 7.18 src/Color/Color.cpp File Reference

## 7.19 src/Color/Color.h File Reference

### Classes

- struct [Col](#)

## 7.20 Color.h

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

```
00001 #ifndef COLOR_H
00002 #define COLOR_H
00003
00004 struct Color;
00005
00006 struct Col
00007 {
00016     Col(int r, int g, int b, int a = 255);
00022     Col(int gray);
00023
00030     Col Fade(double t) const;
00038     Col Lerp(const Col& other, double t) const;
00039
00045     operator Color() const;
00046
00047 public:
00048     int R, G, B, A;
00049 };
00050
00051 #endif
```

## 7.21 src/Enemies/Enemy.h File Reference

### Classes

- class [Enemy](#)

## 7.22 Enemy.h

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

```
00001 #ifndef ENEMY_H
00002 #define ENEMY_H
00003
00004 #include "GameObjects/GameObject.h"
00005 #include "Color/Color.h"
00006
00007 class Enemy : public GameObject
00008 {
00009 public:
00018     Enemy(World* worldPtr, double health = 100.0, double mass = 1.0, const Utils::Vec2d& position =
        Utils::Vec2d::Zero())
00019         : GameObject(worldPtr, health, mass, position, 0.05), Target(position) { }
00023     virtual ~Enemy() = default;
00024
00030     void SetTarget(const Utils::Vec2d& target) { Target = target; }
00031
00037     virtual double GetMoveForce() const = 0;
00043     virtual double GetSize() const = 0;
00049     virtual Col GetColor() const = 0;
00050
00051 protected:
00052     Utils::Vec2d Target;
00053 };
00054
00055 #endif
```

## 7.23 src/Enemies/LargeEnemy.cpp File Reference

## 7.24 src/Enemies/LargeEnemy.h File Reference

### Classes

- class [LargeEnemy](#)

## 7.25 LargeEnemy.h

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

```

00001 #ifndef LARGE_ENEMY_H
00002 #define LARGE_ENEMY_H
00003
00004 #include "Enemy.h"
00005
00006 class LargeEnemy : public Enemy
00007 {
00008 public:
00015     LargeEnemy(World* worldPtr, const Utils::Vec2d& position = Utils::Vec2d::Zero()) : Enemy(worldPtr,
00016     50.0, 1.0, position) { }
00016
00022     void Update(double dt) override;
00026     void Draw() const override;
00027
00033     double GetSize() const override { return Size; }
00039     double GetMoveForce() const override { return MoveForce; }
00045     Col GetColor() const override { return Color; }
00046
00047 private:
00048     static const double MoveForce;
00049     static const double Size;
00050     static const Col Color;
00051 };
00052
00053 #endif

```

## 7.26 src/Enemies/SmallEnemy.cpp File Reference

## 7.27 src/Enemies/SmallEnemy.h File Reference

### Classes

- class [SmallEnemy](#)

## 7.28 SmallEnemy.h

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

```

00001 #ifndef SMALL_ENEMY_H
00002 #define SMALL_ENEMY_H
00003
00004 #include "Enemy.h"
00005
00006 class SmallEnemy : public Enemy
00007 {
00008 public:
00015     SmallEnemy(World* worldPtr, const Utils::Vec2d& position = Utils::Vec2d::Zero()) : Enemy(worldPtr,
00016     20.0, 1.0, position) { }
00016

```

```

00022     void Update(double dt) override;
00026     void Draw() const override;
00027
00033     double GetSize() const override { return Size; }
00039     double GetMoveForce() const override { return MoveForce; }
00045     Col GetColor() const override { return Color; }
00046
00047 private:
00048     static const double MoveForce;
00049     static const double Size;
00050     static const Col Color;
00051 };
00052
00053 #endif

```

## 7.29 src/GameObjects/GameObject.cpp File Reference

## 7.30 src/GameObjects/GameObject.h File Reference

### Classes

- class [GameObject](#)

## 7.31 GameObject.h

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

```

00001 #ifndef GAMEOBJECT_H
00002 #define GAMEOBJECT_H
00003
00004 #include "Utils/Vec2.h"
00005
00006 class World; // forward declaration
00007 class GameObject
00008 {
00009 public:
00019     GameObject(World* worldPtr, double health = 0.0, double mass = 0.0, const Utils::Vec2d& position =
Utils::Vec2d::Zero(), double friction = 0.00)
00020         : WorldPtr(worldPtr), MaxHealth(health), Health(health), Alive(true), Mass(mass),
Position(position), Rotation(0.0), Force(Utils::Vec2d::Zero()), Acceleration(Utils::Vec2d::Zero()),
Velocity(Utils::Vec2d::Zero()), Friction(friction) { }
00024     virtual ~GameObject() = default;
00025
00031     Utils::Vec2d GetPosition() const { return Position; }
00037     double GetRotation() const { return Rotation; }
00038
00044     bool IsAlive() const { return Alive; }
00050     void TakeDamage(double damage) { Health -= damage; if (Health <= 0.0) Destroy(); }
00054     void Destroy() { Alive = false; }
00055
00061     void AddForce(const Utils::Vec2d& force) { Force += force; }
00067     void LookAt(const Utils::Vec2d& target);
00068
00074     virtual void Update(double dt);
00078     virtual void Draw() const = 0;
00079
00080 protected:
00081     void DrawHealthBar(const Utils::Vec2d& position, const Utils::Vec2d& size) const;
00082
00083 protected:
00084     World* WorldPtr;
00085     double MaxHealth;
00086     double Health;
00087     bool Alive;
00088
00089     double Mass;
00090     Utils::Vec2d Position;
00091     double Rotation;
00092
00093     Utils::Vec2d Force;
00094     Utils::Vec2d Acceleration;
00095     Utils::Vec2d Velocity;
00096
00097     double Friction; // slows down the object (0.0 - 1.0)
00098 };
00099
00100 #endif

```

## 7.32 src/GameObjects/Player.cpp File Reference

## 7.33 src/GameObjects/Player.h File Reference

### Classes

- class [Player](#)

## 7.34 Player.h

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

```

00001 #ifndef PLAYER_H
00002 #define PLAYER_H
00003
00004 #include "GameObject.h"
00005 #include "ParticleSystem/ParticleSystem.h"
00006
00007 class Player : public GameObject
00008 {
00009 public:
00016     Player(World* worldPtr, const Utils::Vec2d& position = Utils::Vec2d::Zero())
00017         : GameObject(worldPtr, 100.0, 1.0, position, 0.05), CoinCount(0), Fume() { }
00021     ~Player() = default;
00022
00028     void Update(double dt) override;
00032     void Draw() const override;
00033
00039     void AddCoin(size_t count = 1) { CoinCount += count; }
00045     size_t GetCoinCount() const { return CoinCount; }
00046
00047 private:
00048     void Shoot() const;
00049
00050 private:
00051     static const double MoveForce;
00052     static const Col Color;
00053     static const double BulletSpeed;
00054
00055 private:
00056     size_t CoinCount;
00057     ParticleSystem Fume;
00058 };
00059
00060
00061
00062 #endif

```

## 7.35 src/main.cpp File Reference

### 7.35.1 Function Documentation

#### 7.35.1.1 main()

```
int main ( )
```

## 7.36 src/ParticleSystem/ParticleSystem.cpp File Reference

## 7.37 src/ParticleSystem/ParticleSystem.h File Reference

### Classes

- class [ParticleSystem](#)

## 7.38 ParticleSystem.h

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

```
00001 #ifndef PARTICLESYSTEM_H
00002 #define PARTICLESYSTEM_H
00003
00004 #include "Utils/Vec2.h"
00005 #include "Color/Color.h"
00006
00007 #include <vector>
00008
00009 class ParticleSystem
00010 {
00011 public:
00012     ParticleSystem();
00013     ~ParticleSystem() = default;
00014
00015     size_t GetParticleCount() const { return Particles.size(); }
00016     void Emit(const Utils::Vec2d& position, const Utils::Vec2d& direction, double randomAngle, double
lifetime, const Col& startColor, const Col& endColor, double startSize, double endSize, size_t count);
00017
00018     void Update(double dt);
00019     void Draw() const;
00020
00021 private:
00022     struct Particle
00023     {
00024         Particle(const Utils::Vec2d& position, const Utils::Vec2d& velocity, double lifetime, const
Col& startColor, const Col& endColor, double startSize, double endSize);
00025
00026         void Update(double dt);
00027         void Draw() const;
00028
00029     public:
00030         Utils::Vec2d Position;
00031         Utils::Vec2d Velocity;
00032         double Age;
00033
00034         double Lifetime;
00035         Col StartColor, EndColor;
00036         double StartSize, EndSize;
00037     };
00038
00039     private:
00040     std::vector<Particle> Particles;
00041 };
00042
00043 #endif
```

## 7.39 src/Utils/Vec2.cpp File Reference

### Namespaces

- namespace [Utils](#)

## 7.40 src/Utils/Vec2.h File Reference

### Classes

- class [Utils::Vec2< T >](#)

### Namespaces

- namespace [Utils](#)



## Functions

- `template<typename T>`  
`std::ostream & Utils::operator<< (std::ostream &os, const Vec2< T > &vec)`

## 7.41 Vec2.h

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

```

00001 #ifndef VEC2_H
00002 #define VEC2_H
00003
00004 #include <raylib.h>
00005 #include <iostream>
00006 #include <math.h>
00007
00008 namespace Utils
00009 {
00010     template<typename T>
00011     class Vec2
00012     {
00013     public:
00017         Vec2() : X(0), Y(0) {}
00024         Vec2(T x, T y) : X(x), Y(y) {}
00025         ~Vec2() = default;
00026
00032         T GetX() const { return X; }
00038         T GetY() const { return Y; }
00044         double GetAngle() const { return atan2(Y, X) * RAD2DEG; }
00050         double GetLengthSquared() const { return X * X + Y * Y; }
00056         double GetLength() const { return sqrt(GetLengthSquared()); }
00062         Vec2 GetNormalized() const { return *this / GetLength(); }
00063
00069         void SetX(T x) { X = x; }
00075         void SetY(T y) { Y = y; }
00076
00083         Vec2 Rotate(double angle) const
00084         {
00085             double a = GetAngle() + angle;
00086             double l = GetLength();
00087             return Vec2(cos(a * DEG2RAD) * l, sin(a * DEG2RAD) * l);
00088         }
00089
00096         Vec2 operator+(const Vec2& other) const { return Vec2(X + other.X, Y + other.Y); }
00103         Vec2 operator-(const Vec2& other) const { return Vec2(X - other.X, Y - other.Y); }
00110         T operator*(const Vec2& other) const { return X * other.X + Y * other.Y; }
00117         T operator^(const Vec2& other) const { return X * other.Y - Y * other.X; }
00124         Vec2 operator*(const T& other) const { return Vec2(X * other, Y * other); }
00131         Vec2 operator/(const T& other) const { return Vec2(X / other, Y / other); }
00137         Vec2 operator-() const { return Vec2(-X, -Y); }
00138
00145         Vec2& operator+=(const Vec2& other)
00146         {
00147             X += other.X;
00148             Y += other.Y;
00149             return *this;
00150         }
00157         Vec2& operator-=(const Vec2& other)
00158         {
00159             X -= other.X;
00160             Y -= other.Y;
00161             return *this;
00162         }
00169         Vec2& operator*=(const Vec2& other)
00170         {
00171             X *= other.X;
00172             Y *= other.Y;
00173             return *this;
00174         }
00181         Vec2& operator/=(const Vec2& other)
00182         {
00183             X /= other.X;
00184             Y /= other.Y;
00185             return *this;
00186         }
00193         Vec2& operator*=(const T& other)
00194         {
00195             X *= other;
00196             Y *= other;
00197             return *this;
00198         }
00198     }

```

```

00205         Vec2& operator/=(const T& other)
00206     {
00207         X /= other;
00208         Y /= other;
00209         return *this;
00210     }
00211     operator Vector2() const { return Vector2{ (float)X, (float)Y }; }
00212
00213     public:
00220     static Vec2 FromAngle(double angle) { return Vec2(cos(angle * DEG2RAD), sin(angle * DEG2RAD)); }
00226 }
00226     static Vec2 Zero() { return Vec2(0, 0); }
00232     static Vec2 One() { return Vec2(1, 1); }
00238     static Vec2 Up() { return Vec2(0, -1); }
00244     static Vec2 Down() { return Vec2(0, 1); }
00250     static Vec2 Left() { return Vec2(-1, 0); }
00256     static Vec2 Right() { return Vec2(1, 0); }
00257
00258     private:
00259         T X;
00260         T Y;
00261     };
00262
00270     template<typename T>
00271     std::ostream& operator<<(std::ostream& os, const Vec2<T>& vec)
00272     {
00273         os << "(" << vec.GetX() << ", " << vec.GetY() << ")";
00274         return os;
00275     }
00276
00277     typedef Vec2<int> Vec2i;
00278     typedef Vec2<double> Vec2d;
00279
00280     Vec2d Vector2ToVec2(const Vector2& vec);
00281 }
00282
00283 #endif

```

## 7.42 src/World/World.cpp File Reference

## 7.43 src/World/World.h File Reference

### Classes

- class [World](#)

## 7.44 World.h

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

```

00001 #ifndef WORLD_H
00002 #define WORLD_H
00003
00004 #include <vector>
00005 #include <memory>
00006
00007 #include "GameObjects/Player.h"
00008 #include "Collectables/Collectable.h"
00009 #include "Enemies/Enemy.h"
00010 #include "Bullets/Bullet.h"
00011
00012 class World
00013 {
00014     public:
00018         World();
00019
00025         void AddCollectable(std::unique_ptr<Collectable> collectable) {
Collectables.push_back(std::move(collectable)); }
00031         void AddEnemy(std::unique_ptr<Enemy> enemy) { Enemies.push_back(std::move(enemy)); }
00037         void AddBullet(std::unique_ptr<Bullet> bullet) { Bullets.push_back(std::move(bullet)); }
00038
00044         void Update(double dt);

```

```
00048     void Draw() const;
00049
00055     Player* GetMainPlayer() { return MainPlayer.get(); }
00056
00057 private:
00058     std::unique_ptr<Player> MainPlayer;
00059     std::vector<std::unique_ptr<Collectable>> Collectables;
00060     std::vector<std::unique_ptr<Enemy>> Enemies;
00061     std::vector<std::unique_ptr<Bullet>> Bullets;
00062 };
00063
00064 #endif
```



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