Bee Game Namespace, Class, & File Documentation

Bee Game Version 0.1 - Minecraft Pre 0.0.9a Equivlent

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Namespace Documentation

0.0.1 BeeGame Namespace Reference

Namespaces

- namespace Blocks
- namespace Core
- namespace Inventory
- namespace Items
- namespace Player
- namespace Resources
- namespace Serialization
- namespace Terrain

Classes

- class LoadResources

  Loads all of the resources in the game
- class Test

0.0.2 BeeGame.Blocks Namespace Reference

Classes

- class Air

  Air Block is an empty block that does not render and has no collider
- class Apiary

  Apiary Block
- class Bedrock

  Bedrock Block
- class Block

  Base class for blocks
- class Dirt

  Dirt Block
- class Grass

  Grass Block

0.0.3 BeeGame.Core Namespace Reference

Namespaces

- namespace Enums

Classes

- class Extensions
- class PrefabDictionary

  The prefabs avaliable to the game
- class SpriteDictionary

  All of the sprites avaliable to the game
- class THInput

  My implementation of the unity input system. Acts as a buffer layer to the unity system so that the input keys can be changed at runtime
- struct THVector2

  Serilializable version of Vector2
- struct THVector3

  Serializable version of Vector3

0.0.4 BeeGame.Core.Enums Namespace Reference

Enumerations

- enum Direction {
  Direction.NORTH, Direction.EAST, Direction.SOUTH, Direction.WEST,
  Direction.UP, Direction.DOWN }

  Direction in the game

0.0.4.1 Enumeration Type Documentation

0.0.4.1.1 Direction

`enum BeeGame.Core.Enums.Direction [strong]`

Direction in the game

Enumerator

NORTH	
EAST	
SOUTH	
WEST	
UP	
DOWN	

Definition at line 6 of file Enums.cs.

```
00007     {
00008         NORTH, EAST, SOUTH, WEST, UP, DOWN
00009     };
```

0.0.5 BeeGame.Inventory Namespace Reference

Namespaces

- namespace Player_Inventory

Classes

- class Inventory

  Base class for all inventorys in the game
- class InventorySlot
- class ItemsInInventory

  Class that holds all of the items in the inventory. Can be serialized so inventory may be saved

0.0.6 BeeGame.Inventory.Player_Inventory Namespace Reference

Classes

- class PlayerInventory

  Controlls the player inventory

0.0.7 BeeGame.Items Namespace Reference

Classes

- class Item

  Base class for all Items and Blocks in the game
- class ItemGameObject

  Interface between item and inity gameobjects
- struct Tile

  Position of the items texture

0.0.8 BeeGame.Player Namespace Reference

Classes

- class PlayerLook

  The look for the player
- class PlayerMove

  Moves the player
- class Selector

  Moves the Block selector

0.0.9 BeeGame.Resources Namespace Reference

Classes

- class Resources

  A strongly-typed resource class, for looking up localized strings, etc.

0.0.10 BeeGame.Serialization Namespace Reference

Classes

- class Serialization

  Serializes and Deserialises things

0.0.11 BeeGame.Terrain Namespace Reference

Namespaces

- namespace Chunks
- namespace LandGeneration

Classes

- struct ChunkWorldPos

  Serializable int version of THVector3

0.0.12 BeeGame.Terrain.Chunks Namespace Reference

Classes

- class Chunk

  A section of land for the game, used so that land can be generated in parts and not all at once
- class LoadChunks

  Loads the Chunks around the player
- class MeshData

  The data for a Chunks's Mesh
- class SaveChunk

  Saves a Chunks modified Blocks for save optimisation

0.0.13 BeeGame.Terrain.LandGeneration Namespace Reference

Namespaces

- namespace Noise

Classes

- class Terrain

  Should use as an interface between the rest of the game and the terrain
- class TerrainGeneration

  Generates the terrain for the game
- class World

  Allows inter Chunk communication as it stores a list of active chunks

0.0.14 BeeGame.Terrain.LandGeneration.Noise Namespace Reference

Classes

- class SimplexNoise

  Implementation of the Perlin simplex noise, an improved Perlin noise algorithm. Based loosely on SimplexNoise1234 by Stefan Gustavson <http://∗staffwww.itn.liu.se/∼stegu/aqsis/aqsis-newnoise/>

Part II

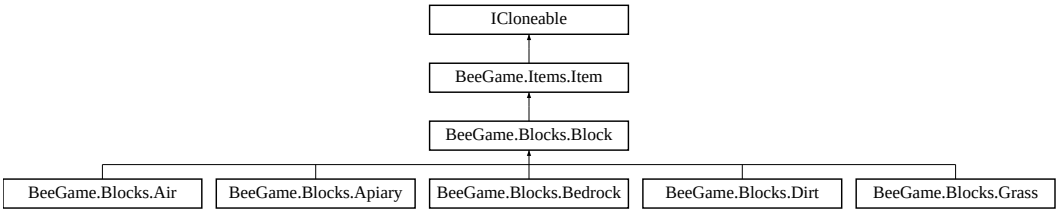
Class Documentation

0.1 Items

0.1.1 BeeGame.Items.Item Class Reference

Base class for all Items and Blocks in the game

Inheritance diagram for BeeGame.Items.Item:



Public Member Functions

- Item ()
- Item (string name)
- virtual GameObject GetGameObject ()

  Returns the GameObject for the item of it has one
- virtual string GetItemID ()

  Returns the id for the item as a string
- virtual Sprite GetItemSprite ()

  Returns the sprite for the item
- virtual string GetItemName ()
- virtual Tile TexturePosition (Direction direction)

  Texture postion of the items texture
- virtual MeshData ItemMesh (int x, int y, int z, MeshData meshData)

  Returns the mesh for the item
- virtual Vector2 [ ] FaceUVs (Direction direction)

  Sets the UVs for the given Direction
- object Clone ()

  Slow try no to use. Instead use Extensions.CloneObject<T>(T)
- override string ToString ()

  Returns the item name an id formatted nicely
- override int GetHashCode ()

  Returns the hashcode for the item
- override bool Equals (object obj)

  Checks if the item is equal to another

Static Public Member Functions

- static bool operator== (Item a, Item b)

  Overides the default == operator as different things need to be checked
- static bool operator!= (Item a, Item b)

  Inverse of ==

Public Attributes

- bool placeable = false

  Is this item placeable. Saves checking if the item is a block type
- bool usesGameObject = false

  Does the item use a gameobject
- int itemStackCount = 1

  Number of items in the stack
- int maxStackCount = 64

  Max number of items in a stack

Protected Member Functions

- virtual MeshData FaceDataUp (int x, int y, int z, MeshData meshData, bool addToRenderMesh=true, float blockSize=0.5f)

  Adds the Upwards face to the given MeshData
- virtual MeshData FaceDataDown (int x, int y, int z, MeshData meshData, bool addToRenderMesh=true, float blockSize=0.5f)

  Adds the Bottom face to the given MeshData
- virtual MeshData FaceDataNorth (int x, int y, int z, MeshData meshData, bool addToRenderMesh=true, float blockSize=0.5f)

  Adds the North face to the given MeshData
- virtual MeshData FaceDataEast (int x, int y, int z, MeshData meshData, bool addToRenderMesh=true, float blockSize=0.5f)

  Adds the East face to the given MeshData
- virtual MeshData FaceDataSouth (int x, int y, int z, MeshData meshData, bool addToRenderMesh=true, float blockSize=0.5f)

  Adds the South face to the given MeshData
- virtual MeshData FaceDataWest (int x, int y, int z, MeshData meshData, bool addToRenderMesh=true, float blockSize=0.5f)

  Adds the West face to the given MeshData

Package Attributes

- string itemName = "Test Item"

  Name of the item

Private Attributes

- const float tileSize = 0.1f

  How big are the texture tiles in the texture map (1/tile number x)

0.1.1.1 Detailed Description

Base class for all Items and Blocks in the game

Definition at line 15 of file Item.cs.

0.1.1.2 Constructor & Destructor Documentation

0.1.1.2.1 Item() [1/2]

```
BeeGame.Items.Item.Item ( )
```

Definition at line 46 of file Item.cs.

```
00047         {
00048             itemName = "TestItem";
00049         }
```

0.1.1.2.2 Item() [2/2]

```
BeeGame.Items.Item.Item (
              string name )
```

Definition at line 51 of file Item.cs.

```
00052         {
00053             itemName = name;
00054         }
```

0.1.1.3 Member Function Documentation

0.1.1.3.1 Clone()

```
object BeeGame.Items.Item.Clone ( )
```

Slow try no to use. Instead use Extensions.CloneObject<T>(T)

Returns

A deep copy of this

Definition at line 314 of file Item.cs.

```
00315         {
00316             //Saves this to a file then reads it back so that a copy and not a reference is passed
00317             BinaryFormatter bf = new BinaryFormatter();
00318             MemoryStream ms = new MemoryStream();
00319
00320             bf.Serialize(ms, this);
00321             ms.Seek(0, SeekOrigin.Begin);
00322
00323             return bf.Deserialize(ms);
00324         }
```

0.1.1.3.2 Equals()

```
override bool BeeGame.Items.Item.Equals (
              object obj )
```

Checks if the item is equal to another

Parameters

obj	object to check against

Returns

true if items are the same

Definition at line 351 of file Item.cs.

```
00352         {
00353             if (!(obj is Item))
00354                 return false;
00355 
00356             return this == (obj as Item);
00357         }
```

0.1.1.3.3 FaceDataDown()

```
virtual MeshData BeeGame.Items.Item.FaceDataDown (
            int x,
            int y,
            int z,
            MeshData meshData,
            bool addToRenderMesh = true,
            float blockSize = 0.5f )  [protected], [virtual]
```

Adds the Bottom face to the given MeshData

Parameters

x	X pos of the item
y	Y pos of the item
z	Z pos of the item
meshData	MeshData to add the face to
addToRenderMesh	Should the mesh be added to the render mesh (default true)
blockSize	how big is the item

Returns

Given MeshData with the face data added

Definition at line 178 of file Item.cs.

```
00179         {
00180             //Adds vertices in a anti-clockwise order
00181             meshData.AddVertices(new THVector3(x - blockSize, y - blockSize, z -
      blockSize), addToRenderMesh);
00182             meshData.AddVertices(new THVector3(x + blockSize, y - blockSize, z -
      blockSize), addToRenderMesh);
00183             meshData.AddVertices(new THVector3(x + blockSize, y - blockSize, z +
      blockSize), addToRenderMesh);
00184             meshData.AddVertices(new THVector3(x - blockSize, y - blockSize, z +
```

```
      blockSize), addToRenderMesh);
00185
00186             //adds teh tirs for the quad
00187             meshData.AddQuadTriangles(addToRenderMesh);
00188
00189             //if the data should be added to the render mesh also add the uvs to the mesh
00190             if (addToRenderMesh)
00191                 meshData.uv.AddRange(FaceUVs(Direction.DOWN));
00192
00193             return meshData;
00194         }
```

0.1.1.3.4 FaceDataEast()

```
virtual MeshData BeeGame.Items.Item.FaceDataEast (
              int x,
              int y,
              int z,
              MeshData meshData,
              bool addToRenderMesh = true,
              float blockSize = 0.5f )  [protected], [virtual]
```

Adds the East face to the given MeshData

Parameters

x	X pos of the item
y	Y pos of the item
z	Z pos of the item
meshData	MeshData to add the face to
addToRenderMesh	Should the mesh be added to the render mesh (default true)
blockSize	how big is the item

Returns

Given MeshData with the face data added

Definition at line 234 of file Item.cs.

```
00235         {
00236             //Adds vertices in a anti-clockwise order
00237             meshData.AddVertices(new THVector3(x + blockSize, y - blockSize, z -
      blockSize), addToRenderMesh);
00238             meshData.AddVertices(new THVector3(x + blockSize, y + blockSize, z -
      blockSize), addToRenderMesh);
00239             meshData.AddVertices(new THVector3(x + blockSize, y + blockSize, z +
      blockSize), addToRenderMesh);
00240             meshData.AddVertices(new THVector3(x + blockSize, y - blockSize, z +
      blockSize), addToRenderMesh);
00241
00242             //adds teh tirs for the quad
00243             meshData.AddQuadTriangles(addToRenderMesh);
00244
00245             //if the data should be added to the render mesh also add the uvs to the mesh
00246             if (addToRenderMesh)
00247                 meshData.uv.AddRange(FaceUVs(Direction.EAST));
00248
00249             return meshData;
00250         }
```

0.1.1.3.5 FaceDataNorth()

```
virtual MeshData BeeGame.Items.Item.FaceDataNorth (
            int x,
            int y,
            int z,
            MeshData meshData,
            bool addToRenderMesh = true,
            float blockSize = 0.5f )  [protected], [virtual]
```

Adds the North face to the given MeshData

Parameters

x	X pos of the item
y	Y pos of the item
z	Z pos of the item
meshData	MeshData to add the face to
addToRenderMesh	Should the mesh be added to the render mesh (default true)
blockSize	how big is the item

Returns

Given MeshData with the face data added

Definition at line 206 of file Item.cs.

```
00207         {
00208             //Adds vertices in a anti-clockwise order
00209             meshData.AddVertices(new THVector3(x + blockSize, y - blockSize, z +
      blockSize), addToRenderMesh);
00210             meshData.AddVertices(new THVector3(x + blockSize, y + blockSize, z +
      blockSize), addToRenderMesh);
00211             meshData.AddVertices(new THVector3(x - blockSize, y + blockSize, z +
      blockSize), addToRenderMesh);
00212             meshData.AddVertices(new THVector3(x - blockSize, y - blockSize, z +
      blockSize), addToRenderMesh);
00213
00214             //adds teh tirs for the quad
00215             meshData.AddQuadTriangles(addToRenderMesh);
00216
00217             //if the data should be added to the render mesh also add the uvs to the mesh
00218             if (addToRenderMesh)
00219                 meshData.uv.AddRange(FaceUVs(Direction.NORTH));
00220
00221             return meshData;
00222         }
```

0.1.1.3.6 FaceDataSouth()

```
virtual MeshData BeeGame.Items.Item.FaceDataSouth (
            int x,
            int y,
            int z,
            MeshData meshData,
            bool addToRenderMesh = true,
            float blockSize = 0.5f )  [protected], [virtual]
```

Adds the South face to the given MeshData

Parameters

x	X pos of the item
y	Y pos of the item
z	Z pos of the item
meshData	MeshData to add the face to
addToRenderMesh	Should the mesh be added to the render mesh (default true)
blockSize	how big is the item

Returns

Given MeshData with the face data added

Definition at line 262 of file Item.cs.

```
00263         {
00264             //Adds vertices in a anti-clockwise order
00265             meshData.AddVertices(new THVector3(x - blockSize, y - blockSize, z -
      blockSize), addToRenderMesh);
00266             meshData.AddVertices(new THVector3(x - blockSize, y + blockSize, z -
      blockSize), addToRenderMesh);
00267             meshData.AddVertices(new THVector3(x + blockSize, y + blockSize, z -
      blockSize), addToRenderMesh);
00268             meshData.AddVertices(new THVector3(x + blockSize, y - blockSize, z -
      blockSize), addToRenderMesh);
00269
00270             //adds teh tirs for the quad
00271             meshData.AddQuadTriangles(addToRenderMesh);
00272
00273             //if the data should be added to the render mesh also add the uvs to the mesh
00274             if (addToRenderMesh)
00275                 meshData.uv.AddRange(FaceUVs(Direction.SOUTH));
00276
00277             return meshData;
00278         }
```

0.1.1.3.7 FaceDataUp()

```
virtual MeshData BeeGame.Items.Item.FaceDataUp (
              int x,
              int y,
              int z,
              MeshData meshData,
              bool addToRenderMesh = true,
              float blockSize = 0.5f )  [protected], [virtual]
```

Adds the Upwards face to the given MeshData

Parameters

x	X pos of the item
y	Y pos of the item
z	Z pos of the item
meshData	MeshData to add the face to
addToRenderMesh	Should the mesh be added to the render mesh (default true)
blockSize	how big is the item

Returns

Given MeshData with the face data added

Definition at line 150 of file Item.cs.

```
00151         {
00152             //Adds vertices in a anti-clockwise order
00153             meshData.AddVertices(new THVector3(x - blockSize, y + blockSize, z +
      blockSize), addToRenderMesh, Direction.UP);
00154             meshData.AddVertices(new THVector3(x + blockSize, y + blockSize, z +
      blockSize), addToRenderMesh, Direction.UP);
00155             meshData.AddVertices(new THVector3(x + blockSize, y + blockSize, z -
      blockSize), addToRenderMesh, Direction.UP);
00156             meshData.AddVertices(new THVector3(x - blockSize, y + blockSize, z -
      blockSize), addToRenderMesh, Direction.UP);
00157 
00158             //adds teh tirs for the quad
00159             meshData.AddQuadTriangles(addToRenderMesh);
00160 
00161             //if the data should be added to the render mesh also add the uvs to the mesh
00162             if (addToRenderMesh)
00163                 meshData.uv.AddRange(FaceUVs(Direction.UP));
00164 
00165             return meshData;
00166         }
```

0.1.1.3.8 FaceDataWest()

```
virtual MeshData BeeGame.Items.Item.FaceDataWest (
            int x,
            int y,
            int z,
            MeshData meshData,
            bool addToRenderMesh = true,
            float blockSize = 0.5f )  [protected], [virtual]
```

Adds the West face to the given MeshData

Parameters

x	X pos of the item
y	Y pos of the item
z	Z pos of the item
meshData	MeshData to add the face to
addToRenderMesh	Should the mesh be added to the render mesh (default true)
blockSize	how big is the item

Returns

Given MeshData with the face data added

Definition at line 290 of file Item.cs.

```
00291         {
00292             //Adds vertices in a anti-clockwise order
00293             meshData.AddVertices(new THVector3(x - blockSize, y - blockSize, z +
      blockSize), addToRenderMesh);
```

```
00294             meshData.AddVertices(new THVector3(x - blockSize, y + blockSize, z +
      blockSize), addToRenderMesh);
00295             meshData.AddVertices(new THVector3(x - blockSize, y + blockSize, z -
      blockSize), addToRenderMesh);
00296             meshData.AddVertices(new THVector3(x - blockSize, y - blockSize, z -
      blockSize), addToRenderMesh);
00297
00298             //adds teh tirs for the quad
00299             meshData.AddQuadTriangles(addToRenderMesh);
00300
00301             //if the data should be added to the render mesh also add the uvs to the mesh
00302             if (addToRenderMesh)
00303                 meshData.uv.AddRange(FaceUVs(Direction.WEST));
00304
00305             return meshData;
00306         }
```

0.1.1.3.9 FaceUVs()

```
virtual Vector2 [] BeeGame.Items.Item.FaceUVs (
            Direction direction )  [virtual]
```

Sets the UVs for the given Direction

Parameters

direction	Direction to add the texture

Returns

Array of Vector2 to add to the UVsreturns>

Definition at line 125 of file Item.cs.

```
00126         {
00127             //only 4 uvs per face
00128             Vector2[] UVs = new Vector2[4];
00129             Tile tilePos = TexturePosition(direction);
00130
00131             //sets the UVs for each vertex
00132             UVs[0] = new THVector2(tileSize * tilePos.x +
      tileSize - 0.01f, tileSize * tilePos.y + 0.01f);
00133             UVs[1] = new THVector2(tileSize * tilePos.x +
      tileSize - 0.01f, tileSize * tilePos.y + tileSize - 0.01f);
00134             UVs[2] = new THVector2(tileSize * tilePos.x + 0.01f,
      tileSize * tilePos.y + tileSize - 0.01f);
00135             UVs[3] = new THVector2(tileSize * tilePos.x + 0.01f,
      tileSize * tilePos.y + 0.01f);
00136
00137             return UVs;
00138         }
```

0.1.1.3.10 GetGameObject()

```
virtual GameObject BeeGame.Items.Item.GetGameObject ( )  [virtual]
```

Returns the GameObject for the item of it has one

Returns

GameObject for the item

Definition at line 62 of file Item.cs.

```
00062 { return null; }
```

0.1.1.3.11 GetHashCode()

```
override int BeeGame.Items.Item.GetHashCode ( )
```

Returns the hashcode for the item

Returns

1

Definition at line 341 of file Item.cs.

```
00342         {
00343             return 1;
00344         }
```

0.1.1.3.12 GetItemID()

```
virtual string BeeGame.Items.Item.GetItemID ( )  [virtual]
```

Returns the id for the item as a string

Returns

Definition at line 68 of file Item.cs.

```
00069         {
00070             return $"{GetHashCode()}";
00071         }
```

0.1.1.3.13 GetItemName()

```
virtual string BeeGame.Items.Item.GetItemName ( )  [virtual]
```

Reimplemented in BeeGame.Blocks.Grass.

Definition at line 82 of file Item.cs.

```
00083         {
00084             return $"{itemName}";
00085         }
```

0.1.1.3.14 GetItemSprite()

```
virtual Sprite BeeGame.Items.Item.GetItemSprite ( )  [virtual]
```

Returns the sprite for the item

Returns

Sprite for this item

Definition at line 77 of file Item.cs.

```
00078         {
00079             return SpriteDictionary.GetSprite("TestSprite");
00080         }
```

0.1.1.3.15 ItemMesh()

```
virtual MeshData BeeGame.Items.Item.ItemMesh (
              int x,
              int y,
              int z,
              MeshData meshData )  [virtual]
```

Returns the mesh for the item

Parameters

x	X pos if the item
y	Y pos if the item
z	Z pos if the item
meshData	data to add the mesh to

Returns

given MeshData with the items mesh added

Definition at line 107 of file Item.cs.

```
00108         {
00109             //adds all faces of the item to the mesh as all faces could be seen at any time
00110             meshData = FaceDataUp(x, y, z, meshData, true, 0.25f);
00111             meshData = FaceDataDown(x, y, z, meshData, true, 0.25f);
00112             meshData = FaceDataNorth(x, y, z, meshData, true, 0.25f);
00113             meshData = FaceDataEast(x, y, z, meshData, true, 0.25f);
00114             meshData = FaceDataSouth(x, y, z, meshData, true, 0.25f);
00115             meshData = FaceDataWest(x, y, z, meshData, true, 0.25f);
00116 
00117             return meshData;
00118         }
```

0.1.1.3.16 operator"!=()

```
static bool BeeGame.Items.Item.operator!= (
            Item a,
            Item b )  [static]
```

Inverse of ==

Parameters

a	Item
b	Item

Returns

True if *a* != *b*

Definition at line 384 of file Item.cs.

```
00385         {
00386             return !(a == b);
00387         }
```

0.1.1.3.17 operator==()

```
static bool BeeGame.Items.Item.operator== (
            Item a,
            Item b )  [static]
```

Overides the default == operator as different things need to be checked

Parameters

a	Item
b	Item

Returns

true if *a* == *b*

Definition at line 365 of file Item.cs.

```
00366         {
00367             if (ReferenceEquals(a, null) && ReferenceEquals(b, null))
00368                 return true;
00369             if (ReferenceEquals(a, null) || ReferenceEquals(b, null))
00370                 return false;
00371 
00372             if(a.GetItemID() == b.GetItemID())
00373                 return true;
00374 
00375             return false;
00376         }
```

0.1.1.3.18 TexturePosition()

```
virtual Tile BeeGame.Items.Item.TexturePosition (
            Direction direction )  [virtual]
```

Texture postion of the items texture

Parameters

direction	Direction for the texture

Returns

Position of the texture

Reimplemented in BeeGame.Blocks.Bedrock, BeeGame.Blocks.Grass, and BeeGame.Blocks.Dirt.

Definition at line 94 of file Item.cs.

```
00095         {
00096             return new Tile() { x = 1, y = 9 };
00097         }
```

0.1.1.3.19 ToString()

```
override string BeeGame.Items.Item.ToString ( )
```

Returns the item name an id formatted nicely

Returns

Definition at line 332 of file Item.cs.

```
00333         {
00334             return $"{itemName} \nID: {GetItemID()}";
00335         }
```

0.1.1.4 Member Data Documentation

0.1.1.4.1 itemName

```
string BeeGame.Items.Item.itemName = "Test Item"  [package]
```

Name of the item

Definition at line 21 of file Item.cs.

0.1.1.4.2 itemStackCount

```
int BeeGame.Items.Item.itemStackCount = 1
```

Number of items in the stack

Definition at line 38 of file Item.cs.

0.1.1.4.3 maxStackCount

```
int BeeGame.Items.Item.maxStackCount = 64
```

Max number of items in a stack

Definition at line 42 of file Item.cs.

0.1.1.4.4 placeable

```
bool BeeGame.Items.Item.placeable = false
```

Is this item placeable. Saves checking if the item is a block type

Definition at line 25 of file Item.cs.

0.1.1.4.5 tileSize

```
const float BeeGame.Items.Item.tileSize = 0.1f  [private]
```

How big are the texture tiles in the texture map (1/tile number x)

Definition at line 33 of file Item.cs.

0.1.1.4.6 usesGameObject

```
bool BeeGame.Items.Item.usesGameObject = false
```

Does the item use a gameobject

Definition at line 29 of file Item.cs.

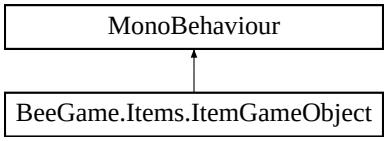
The documentation for this class was generated from the following file:

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Items/Item.cs

0.1.2 BeeGame.Items.ItemGameObject Class Reference

Interface between item and inity gameobjects

Inheritance diagram for BeeGame.Items.ItemGameObject:



Public Attributes

- Item item

  Item that this gameobject repersents
- GameObject go

  GameObject to make

Private Member Functions

- void Start ()

  Makes the mesh or instantiates the items gameobject
- void MakeMesh ()

  Makes the items mesh

0.1.2.1 Detailed Description

Interface between item and inity gameobjects

Definition at line 18 of file ItemGameObject.cs.

0.1.2.2 Member Function Documentation

0.1.2.2.1 MakeMesh()

```
void BeeGame.Items.ItemGameObject.MakeMesh ( )  [private]
```

Makes the items mesh

Definition at line 47 of file ItemGameObject.cs.

```
00048         {
00049             MeshData meshData = new MeshData();
00050             if(item != null)
00051                 meshData = item.ItemMesh(0, 0, 0, meshData);
00052 
00053             Mesh mesh = new Mesh()
00054             {
00055                 vertices = meshData.verts.ToArray(),
00056                 triangles = meshData.tris.ToArray(),
00057                 uv = meshData.uv.ToArray()
00058             };
00059 
00060             mesh.RecalculateNormals();
00061 
00062             GetComponent<MeshFilter>().mesh = mesh;
00063         }
```

0.1.2.2.2 Start()

```
void BeeGame.Items.ItemGameObject.Start ( )  [private]
```

Makes the mesh or instantiates the items gameobject

Definition at line 32 of file ItemGameObject.cs.

```
00033         {
00034             if (!item.usesGameObject)
00035                 MakeMesh();
00036 
00037             if (item.usesGameObject)
00038             {
00039                 GetComponent<BoxCollider>().enabled = false;
00040                 Instantiate(item.GetGameObject(), transform, false);
00041             }
00042         }
```

0.1.2.3 Member Data Documentation

0.1.2.3.1 go

```
GameObject BeeGame.Items.ItemGameObject.go
```

GameObject to make

Definition at line 27 of file ItemGameObject.cs.

0.1.2.3.2 item

```
Item BeeGame.Items.ItemGameObject.item
```

Item that this gameobject repersents

Definition at line 23 of file ItemGameObject.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Items/ItemGameObject.cs

0.2 Blocks

0.2.1 BeeGame.Items.Tile Struct Reference

Position of the items texture

Public Attributes

- int x
  X pos of the texture
- int y
  Y pos of the texture

0.2.1.1 Detailed Description

Position of the items texture

Definition at line 395 of file Item.cs.

0.2.1.2 Member Data Documentation

0.2.1.2.1 x

```
int BeeGame.Items.Tile.x
```

X pos of the texture

Definition at line 400 of file Item.cs.

0.2.1.2.2 y

```
int BeeGame.Items.Tile.y
```

Y pos of the texture

Definition at line 404 of file Item.cs.

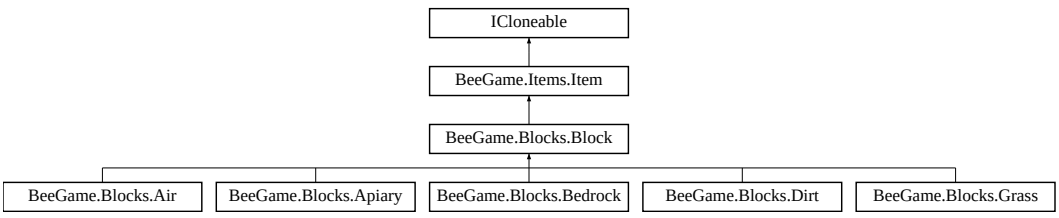
The documentation for this struct was generated from the following file:

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Items/Item.cs

0.2.2 BeeGame.Blocks.Block Class Reference

Base class for blocks

Inheritance diagram for BeeGame.Blocks.Block:



Public Member Functions

- Block ()

  Constructor sets the Item.placeable to true
- Block (string name)
- virtual void BreakBlock (THVector3 pos)

  Spawns an item with the same texture as the broken block
- virtual void UpdateBlock (int x, int y, int z, Chunk chunk)

  Should this Block be updated when the mesh is made
- virtual MeshData BlockData (Chunk chunk, int x, int y, int z, MeshData meshData, bool addToRender↩ Mesh=true)

  The data that this block adds to the mesh
- virtual bool IsSolid (Direction direction)

  What Directions is this Block solid in
- override int GetHashCode ()

  Hascode for the Block
- override string ToString ()

  Returns the Block name and Id formatted nicely

Public Attributes

- bool breakable = true

  Can this Block be broken
- bool changed = true

  Has this block been placed by the player

Additional Inherited Members

0.2.2.1 Detailed Description

Base class for blocks

Definition at line 13 of file Block.cs.

0.2.2.2 Constructor & Destructor Documentation

0.2.2.2.1 Block() [1/2]

```
BeeGame.Blocks.Block.Block ( )
```

Constructor sets the Item.placeable to true

Definition at line 30 of file Block.cs.

```
00030                         : base()
00031         {
00032             itemName = "Stone";
00033             placeable = true;
00034         }
```

0.2.2.2.2 Block() [2/2]

```
BeeGame.Blocks.Block.Block (
            string name )
```

Definition at line 36 of file Block.cs.

```
00036                                   : base(name)
00037         {
00038             placeable = true;
00039         }
```

0.2.2.3 Member Function Documentation

0.2.2.3.1 BlockData()

```
virtual MeshData BeeGame.Blocks.Block.BlockData (
            Chunk chunk,
            int x,
            int y,
            int z,
            MeshData meshData,
            bool addToRenderMesh = true )  [virtual]
```

The data that this block adds to the mesh

Parameters

chunk	Chunk the block is in
x	X pos of the block
y	Y pos of the block
z	Z pos of the block
meshData	meshdata to add to
addToRenderMesh	should the block also be added to the render mesh not just the collsion mesh

Returns

Given *meshData* with this blocks data added to it

If no data of either collider or render should be added override to return the givn mesh.
If only collsion data should be added override to say render mesh false.

Reimplemented in BeeGame.Blocks.Air.

Definition at line 78 of file Block.cs.

```
00079         {
00080             //Adds the Top face of the block
00081             if (!chunk.GetBlock(x, y + 1, z, false).IsSolid(Direction.DOWN))
00082             {
00083                 meshData = FaceDataUp(x, y, z, meshData, addToRenderMesh);
00084             }
```

```
00085
00086             //Adds the Bottom face of the block
00087             if (!chunk.GetBlock(x, y - 1, z, false).IsSolid(Direction.UP))
00088             {
00089                 meshData = FaceDataDown(x, y, z, meshData, addToRenderMesh);
00090             }
00091
00092             //Adds the North face of the block
00093             if (!chunk.GetBlock(x, y, z + 1, false).IsSolid(Direction.SOUTH))
00094             {
00095                 meshData = FaceDataNorth(x, y, z, meshData, addToRenderMesh);
00096             }
00097
00098             //Adds the South face of the block
00099             if (!chunk.GetBlock(x, y, z - 1, false).IsSolid(Direction.NORTH))
00100             {
00101                 meshData = FaceDataSouth(x, y, z, meshData, addToRenderMesh);
00102             }
00103
00104             //Adds the East face of the block
00105             if (!chunk.GetBlock(x + 1, y, z, false).IsSolid(Direction.WEST))
00106             {
00107                 meshData = FaceDataEast(x, y, z, meshData, addToRenderMesh);
00108             }
00109
00110             //Adds the West face of the block
00111             if (!chunk.GetBlock(x - 1, y, z, false).IsSolid(Direction.EAST))
00112             {
00113                 meshData = FaceDataWest(x, y, z, meshData, addToRenderMesh);
00114             }
00115
00116             return meshData;
00117
00118         }
```

0.2.2.3.2 BreakBlock()

```
virtual void BeeGame.Blocks.Block.BreakBlock (
            THVector3 pos )  [virtual]
```

Spawns an item with the same texture as the broken block

Parameters

pos	position to spawn the Item

Reimplemented in BeeGame.Blocks.Bedrock, and BeeGame.Blocks.Air.

Definition at line 47 of file Block.cs.

```
00048         {
00049             GameObject go = Object.Instantiate(UnityEngine.Resources.Load("
      Prefabs/ItemGameObject") as GameObject, pos, Quaternion.identity) as GameObject;
00050             go.GetComponent<ItemGameObject>().item = this;
00051         }
```

0.2.2.3.3 GetHashCode()

```
override int BeeGame.Blocks.Block.GetHashCode ( )
```

Hascode for the Block

Returns

1

Definition at line 136 of file Block.cs.

```
00137         {
00138             return 1;
00139         }
```

0.2.2.3.4 IsSolid()

```
virtual bool BeeGame.Blocks.Block.IsSolid (
            Direction direction )  [virtual]
```

What Directions is this Block solid in

Parameters

direction	Direction to check

Returns

Default returns true for all sides

Reimplemented in BeeGame.Blocks.Air.

Definition at line 125 of file Block.cs.

```
00126         {
00127             return true;
00128         }
```

0.2.2.3.5 ToString()

```
override string BeeGame.Blocks.Block.ToString ( )
```

Returns the Block name and Id formatted nicely

Returns

Definition at line 145 of file Block.cs.

```
00146         {
00147             return $"{itemName} \nID: {GetHashCode()}";
00148         }
```

0.2.2.3.6 UpdateBlock()

```
virtual void BeeGame.Blocks.Block.UpdateBlock (
            int x,
            int y,
            int z,
            Chunk chunk )  [virtual]
```

Should this Block be updated when the mesh is made

Parameters

x	X pos if the block
y	Y pos of the block
z	Z pos of the block
chunk	Chunk that the block is in

Reimplemented in BeeGame.Blocks.Grass.

Definition at line 60 of file Block.cs.

```
00060 { }
```

0.2.2.4 Member Data Documentation

0.2.2.4.1 breakable

```
bool BeeGame.Blocks.Block.breakable = true
```

Can this Block be broken

Definition at line 19 of file Block.cs.

0.2.2.4.2 changed

```
bool BeeGame.Blocks.Block.changed = true
```

Has this block been placed by the player

Definition at line 23 of file Block.cs.

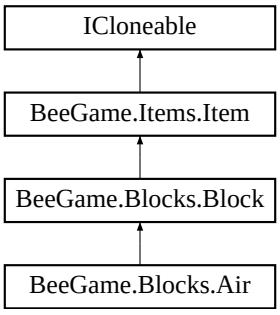
The documentation for this class was generated from the following file:

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Blocks/Block.cs

0.2.3 BeeGame.Blocks.Air Class Reference

Air Block is an empty block that does not render and has no collider

Inheritance diagram for BeeGame.Blocks.Air:



Public Member Functions

- Air ()
- override void BreakBlock (THVector3 pos)

  No item should be made when air is broken
- override MeshData BlockData (Chunk chunk, int x, int y, int z, MeshData meshData, bool addRoRender↩ Mesh=true)

  Returns the given MeshData as Air does not add anything to the mesh
- override bool IsSolid (Direction direction)
- override int GetHashCode ()

  Hashcode acts as the base ID for an item
- override string ToString ()

  Gets the item name and ID in a nice format

Additional Inherited Members

0.2.3.1 Detailed Description

Air Block is an empty block that does not render and has no collider

Definition at line 12 of file Air.cs.

0.2.3.2 Constructor & Destructor Documentation

0.2.3.2.1 Air()

```
BeeGame.Blocks.Air.Air ( )
```

Definition at line 14 of file Air.cs.

```
00014                     : base("Air")
00015         {
00016         }
```

0.2.3.3 Member Function Documentation

0.2.3.3.1 BlockData()

```
override MeshData BeeGame.Blocks.Air.BlockData (
            Chunk chunk,
            int x,
            int y,
            int z,
            MeshData meshData,
            bool addRoRenderMesh = true )  [virtual]
```

Returns the given MeshData as Air does not add anything to the mesh

Returns

Given MeshData

Reimplemented from BeeGame.Blocks.Block.

Definition at line 31 of file Air.cs.

```
00032         {
00033             return meshData;
00034         }
```

0.2.3.3.2 BreakBlock()

```
override void BeeGame.Blocks.Air.BreakBlock (
            THVector3 pos )  [virtual]
```

No item should be made when air is broken

Parameters

pos	position to spawn the Item

Reimplemented from BeeGame.Blocks.Block.

Definition at line 22 of file Air.cs.

```
00023         {
00024             return;
00025         }
```

0.2.3.3.3 GetHashCode()

```
override int BeeGame.Blocks.Air.GetHashCode ( )
```

Hashcode acts as the base ID for an item

Returns

2

Definition at line 50 of file Air.cs.

```
00051         {
00052             return 2;
00053         }
```

0.2.3.3.4 IsSolid()

```
override bool BeeGame.Blocks.Air.IsSolid (
            Direction direction )  [virtual]
```

Parameters

direction	Direction wanted to chesk solid

Returns

false

Reimplemented from BeeGame.Blocks.Block.

Definition at line 41 of file Air.cs.

```
00042         {
00043             return false;
00044         }
```

0.2.3.3.5 ToString()

```
override string BeeGame.Blocks.Air.ToString ( )
```

Gets the item name and ID in a nice format

Returns

Definition at line 59 of file Air.cs.

```
00060         {
00061             return $"{itemName} \nID: {GetItemID()}";
00062         }
```

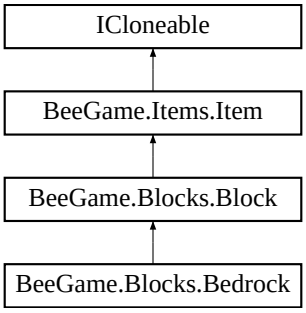
The documentation for this class was generated from the following file:

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Blocks/Air.cs

0.2.4 BeeGame.Blocks.Bedrock Class Reference

Bedrock Block

Inheritance diagram for BeeGame.Blocks.Bedrock:



Public Member Functions

- Bedrock ()
  Constructor
- override void BreakBlock (THVector3 pos)
  The block cannot be broken so nothing is done
- override Tile TexturePosition (Direction direction)
  Position if te bedrock texture in the atlas
- override int GetHashCode ()
  Returns the ID of the item
- override string ToString ()
  The item name and ID as a string

Additional Inherited Members

0.2.4.1 Detailed Description

Bedrock Block

Definition at line 12 of file Bedrock.cs.

0.2.4.2 Constructor & Destructor Documentation

0.2.4.2.1 Bedrock()

```
BeeGame.Blocks.Bedrock.Bedrock ( )
```

Constructor

Definition at line 18 of file Bedrock.cs.

```
00018                           : base("Bedrock")
00019         {
00020             breakable = false;
00021         }
```

0.2.4.3 Member Function Documentation

0.2.4.3.1 BreakBlock()

```
override void BeeGame.Blocks.Bedrock.BreakBlock (
            THVector3 pos )  [virtual]
```

The block cannot be broken so nothing is done

Parameters

pos	positon of the block

Reimplemented from BeeGame.Blocks.Block.

Definition at line 29 of file Bedrock.cs.

```
00030         {
00031             return;
00032         }
```

0.2.4.3.2 GetHashCode()

```
override int BeeGame.Blocks.Bedrock.GetHashCode ( )
```

Returns the ID of the item

Returns

-1

Definition at line 52 of file Bedrock.cs.

```
00053         {
00054             return -1;
00055         }
```

0.2.4.3.3 TexturePosition()

```
override Tile BeeGame.Blocks.Bedrock.TexturePosition (
            Direction direction )  [virtual]
```

Position if te bedrock texture in the atlas

Parameters

direction	Direction

Returns

Position in the texture atlas

Reimplemented from BeeGame.Items.Item.

Definition at line 41 of file Bedrock.cs.

```
00042         {
00043             return new Tile() { x = 0, y = 0};
00044         }
```

0.2.4.3.4 ToString()

```
override string BeeGame.Blocks.Bedrock.ToString ( )
```

The item name and ID as a string

Returns

A nicely formatted string

Definition at line 61 of file Bedrock.cs.

```
00062         {
00063             return $"{itemName} \nID: {GetItemID()}";
00064         }
```

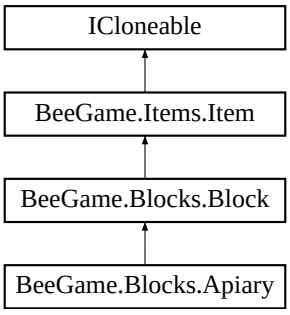
The documentation for this class was generated from the following file:

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Blocks/Bedrock.cs

0.2.5 BeeGame.Blocks.Apiary Class Reference

Apiary Block

Inheritance diagram for BeeGame.Blocks.Apiary:



Public Member Functions

- Apiary ()

  Constructor
- Apiary (SerializationInfo info, StreamingContext context)
- override int GetHashCode ()

  ID of the item
- override string ToString ()

  The item name and ID as a string

Additional Inherited Members

0.2.5.1 Detailed Description

Apiary Block

Definition at line 8 of file Apiary.cs.

0.2.5.2 Constructor & Destructor Documentation

0.2.5.2.1 Apiary() [1/2]

```
BeeGame.Blocks.Apiary.Apiary ( )
```

Constructor

Definition at line 14 of file Apiary.cs.

```
00014                         : base("Apiary")
00015         {
00016         }
```

0.2.5.2.2 Apiary() [2/2]

```
BeeGame.Blocks.Apiary.Apiary (
             SerializationInfo info,
             StreamingContext context )
```

Definition at line 19 of file Apiary.cs.

```
00020         {
00021             //*use info.getvalue("valuename", typeof(valueType))
00022             UnityEngine.MonoBehaviour.print("hi");
00023         }
```

0.2.5.3 Member Function Documentation

0.2.5.3.1 GetHashCode()

```
override int BeeGame.Blocks.Apiary.GetHashCode ( )
```

ID of the item

Returns

3

Definition at line 30 of file Apiary.cs.

```
00031         {
00032             return 3;
00033         }
```

0.2.5.3.2 ToString()

```
override string BeeGame.Blocks.Apiary.ToString ( )
```

The item name and ID as a string

Returns

A nicely formatted string

Definition at line 39 of file Apiary.cs.

```
00040         {
00041             return $"{itemName} \nID: {GetItemID()}";
00042         }
```

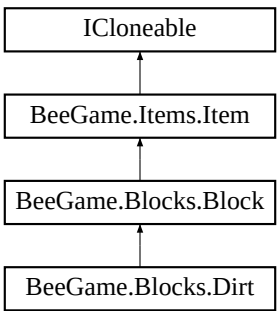
The documentation for this class was generated from the following file:

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Blocks/Apiary.cs

0.2.6 BeeGame.Blocks.Dirt Class Reference

Dirt Block

Inheritance diagram for BeeGame.Blocks.Dirt:



Public Member Functions

- Dirt ()

  Constructor
- override Tile TexturePosition (Direction direction)

  Position of the dirt texture in the atlas
- override int GetHashCode ()

  Base ID of the block
- override string ToString ()

  Returns the name and ID of the block as a string

Additional Inherited Members

0.2.6.1 Detailed Description

Dirt Block

Definition at line 11 of file Dirt.cs.

0.2.6.2 Constructor & Destructor Documentation

0.2.6.2.1 Dirt()

```
BeeGame.Blocks.Dirt.Dirt ( )
```

Constructor

Definition at line 17 of file Dirt.cs.

```
00017 : base("Dirt"){}
```

0.2.6.3 Member Function Documentation

0.2.6.3.1 GetHashCode()

```
override int BeeGame.Blocks.Dirt.GetHashCode ( )
```

Base ID of the block

Returns

5

Definition at line 37 of file Dirt.cs.

```
00038         {
00039             return 5;
00040         }
```

0.2.6.3.2 TexturePosition()

```
override Tile BeeGame.Blocks.Dirt.TexturePosition (
            Direction direction )  [virtual]
```

Position of the dirt texture in the atlas

Parameters

direction	

Returns

Reimplemented from BeeGame.Items.Item.

Definition at line 26 of file Dirt.cs.

```
00027         {
00028             return new Tile { x = 2, y = 9 };
00029         }
```

0.2.6.3.3 ToString()

```
override string BeeGame.Blocks.Dirt.ToString ( )
```

Returns the name and ID of the block as a string

Returns

A nicely formatted string

Definition at line 46 of file Dirt.cs.

```
00047         {
00048             return $"{itemName} \nID: {GetItemID()}";
00049         }
```

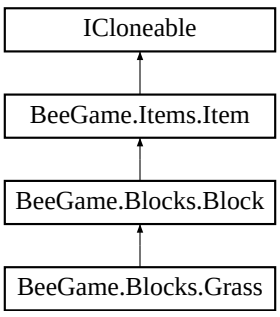
The documentation for this class was generated from the following file:

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Blocks/Dirt.cs

0.2.7 BeeGame.Blocks.Grass Class Reference

Grass Block

Inheritance diagram for BeeGame.Blocks.Grass:



Public Member Functions

- Grass ()

  Constructor also sets teh items name
- override void UpdateBlock (int x, int y, int z, Chunk chunk)

  Will turn this Block into a Dirt block if another block is above it
- override Tile TexturePosition (Direction direction)

  Texture position of the Block face
- override string GetItemName ()
- override int GetHashCode ()

  The Base id for the block
- override string ToString ()

  REturns the name and value for the block as a string

Additional Inherited Members

0.2.7.1 Detailed Description

Grass Block

Definition at line 12 of file Grass.cs.

0.2.7.2 Constructor & Destructor Documentation

0.2.7.2.1 Grass()

```
BeeGame.Blocks.Grass.Grass ( )
```

Constructor also sets teh items name

Definition at line 18 of file Grass.cs.

```
00018 : base("Grass"){}
```

0.2.7.3 Member Function Documentation

0.2.7.3.1 GetHashCode()

```
override int BeeGame.Blocks.Grass.GetHashCode ( )
```

The Base id for the block

Returns

4

Definition at line 76 of file Grass.cs.

```
00077         {
00078             return 4;
00079         }
```

0.2.7.3.2 GetItemName()

```
override string BeeGame.Blocks.Grass.GetItemName ( )  [virtual]
```

Reimplemented from BeeGame.Items.Item.

Definition at line 67 of file Grass.cs.

```
00068         {
00069             return "Grass";
00070         }
```

0.2.7.3.3 TexturePosition()

```
override Tile BeeGame.Blocks.Grass.TexturePosition (
            Direction direction )  [virtual]
```

Texture position of the Block face

Parameters

direction	Direction of the block face

Returns

Texture positon as a Tile

Reimplemented from BeeGame.Items.Item.

Definition at line 40 of file Grass.cs.

```
00041         {
00042             //All textures are on the dame Y value for the texture atlas so Y can be set
00043             Tile tile = new Tile()
00044             {
00045                 y = 9
00046             };
00047 
00048             switch (direction)
00049             {
00050                 //if we want the top face return the full grass texture
00051                 case Direction.UP:
00052                     tile.x = 3;
00053                     return tile;
00054                 //if we want the bottom face return the dirt texture
00055                 case Direction.DOWN:
00056                     tile.x = 2;
00057                     return tile;
00058                 //return the 1/2 grass testure if a side face is wanted
00059                 default:
00060                     tile.x = 4;
00061                     return tile;
00062             }
00063         }
```

0.2.7.3.4 ToString()

```
override string BeeGame.Blocks.Grass.ToString ( )
```

REturns the name and value for the block as a string

Returns

A nicely formatted string

Definition at line 85 of file Grass.cs.

```
00086         {
00087             return $"{itemName} \nID: {GetItemID()}";
00088         }
```

0.2.7.3.5 UpdateBlock()

```
override void BeeGame.Blocks.Grass.UpdateBlock (
              int x,
              int y,
              int z,
              Chunk chunk )  [virtual]
```

Will turn this Block into a Dirt block if another block is above it

Parameters

x	X pos if the block
y	Y pos if the block
z	Z pos if the block
chunk	Chunk that this block is in

Reimplemented from BeeGame.Blocks.Block.

Definition at line 29 of file Grass.cs.

```
00030         {
00031             if (chunk.GetBlock(x, y + 1, z, false).IsSolid(Direction.DOWN))
00032                 chunk.blocks[x, y, z] = new Dirt() { changed =
      changed };
00033         }
```

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

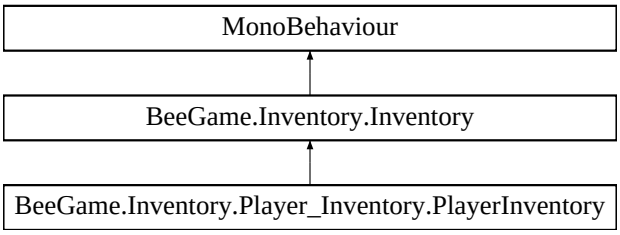
- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Blocks/Grass.cs

0.3 Inventory

0.3.1 BeeGame.Inventory.Inventory Class Reference

Base class for all inventorys in the game

Inheritance diagram for BeeGame.Inventory.Inventory:



Public Member Functions

- bool InventorySet ()

  Is the inventory set?
- void SetInventorySize (int inventorySize)

  Sets the inventory soze to the number of slots in the invnetory
- void SetAllItems (ItemsInInventory items)

  Sets the items to the given ItemsInInventory
- void UpdateBase ()

  Things in the inventory that should be updated
- ItemsInInventory GetAllItems ()

  Gets all of the items in the invntory
- void AddItemToSlots (int slotIndex, Item item)

  Adds the given item to the inventory in the given slotIndex
- bool AddItemToInventory (Item item)

  Add an item to the inventory

Public Attributes

- InventorySlot [ ] slots

  Slots in the inventory
- string inventoryName = ""

  Name of this inventory

Package Attributes

- Item floatingItem

  Item that is currenty being moved

Private Member Functions

- void PutItemsInSlots ()

  Sets an Item in the ItemsInInventory.itemsInInventory array to a InventorySlot.item

Private Attributes

- ItemsInInventory items
  Items in the invemtory

0.3.1.1 Detailed Description

Base class for all inventorys in the game

Definition at line 9 of file Inventory.cs.

0.3.1.2 Member Function Documentation

0.3.1.2.1 AddItemToInventory()

```
bool BeeGame.Inventory.Inventory.AddItemToInventory (
            Item item )
```

Add an item to the inventory

Parameters

item	Item to add

Returns

true if item wasa added

Definition at line 116 of file Inventory.cs.

```
00117         {
00118             return items.AddItem(item);
00119         }
```

0.3.1.2.2 AddItemToSlots()

```
void BeeGame.Inventory.Inventory.AddItemToSlots (
            int slotIndex,
            Item item )
```

Adds the given *item* to the inventory in the given *slotIndex*

Parameters

slotIndex	Slot to add item to
item	Item to add

Definition at line 104 of file Inventory.cs.

```
00105         {
00106             items.AddItem(slotIndex, item);
00107             //* saves the inventory changes
00108             Serialization.Serialization.SerializeInventory(this, inventoryName);
00109         }
```

0.3.1.2.3 GetAllItems()

```
ItemsInInventory BeeGame.Inventory.Inventory.GetAllItems ( )
```

Gets all of the items in the invntory

Returns

All of the items in the inventory as ItemsInInventory

Definition at line 94 of file Inventory.cs.

```
00095         {
00096             return items;
00097         }
```

0.3.1.2.4 InventorySet()

```
bool BeeGame.Inventory.Inventory.InventorySet ( )
```

Is the inventory set?

Returns

true if items == null

Definition at line 35 of file Inventory.cs.

```
00036         {
00037             if (items == null)
00038                 return true;
00039 
00040             return false;
00041         }
```

0.3.1.2.5 PutItemsInSlots()

```
void BeeGame.Inventory.Inventory.PutItemsInSlots ( )  [private]
```

Sets an Item in the ItemsInInventory.itemsInInventory array to a InventorySlot.item

Definition at line 79 of file Inventory.cs.

```
00080         {
00081             //* goes through all of the items in the array setting then all to a slot
00082             for (int i = 0; i < slots.Length; i++)
00083             {
00084                 slots[i].slotIndex = i;
00085                 slots[i].myInventory = this;
00086                 slots[i].item = items.itemsInInventory[i];
00087             }
00088         }
```

0.3.1.2.6 SetAllItems()

```
void BeeGame.Inventory.Inventory.SetAllItems (
             ItemsInInventory items )
```

Sets the items to the given ItemsInInventory

Parameters

items	Items to set this inventory to

remarks> Used during deserialization to restor the inventory /remarks>

Definition at line 59 of file Inventory.cs.

```
00060         {
00061             this.items = items;
00062         }
```

0.3.1.2.7 SetInventorySize()

```
void BeeGame.Inventory.Inventory.SetInventorySize (
             int inventorySize )
```

Sets the inventory soze to the number of slots in the invnetory

Parameters

inventorySize	

Definition at line 47 of file Inventory.cs.

```
00048         {
00049             items = new ItemsInInventory(slots.Length);
00050         }
```

0.3.1.2.8 UpdateBase()

```
void BeeGame.Inventory.Inventory.UpdateBase ( )
```

Things in the inventory that should be updated

Definition at line 69 of file Inventory.cs.

```
00070         {
00071             PutItemsInSlots();
00072         }
```

0.3.1.3 Member Data Documentation

0.3.1.3.1 floatingItem

```
Item BeeGame.Inventory.Inventory.floatingItem  [package]
```

Item that is currenty being moved

Definition at line 23 of file Inventory.cs.

0.3.1.3.2 inventoryName

```
string BeeGame.Inventory.Inventory.inventoryName = ""
```

Name of this inventory

Definition at line 27 of file Inventory.cs.

0.3.1.3.3 items

```
ItemsInInventory BeeGame.Inventory.Inventory.items  [private]
```

Items in the invemtory

Definition at line 15 of file Inventory.cs.

0.3.1.3.4 slots

```
InventorySlot [] BeeGame.Inventory.Inventory.slots
```

Slots in the inventory

Definition at line 19 of file Inventory.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Inventory/Inventory.cs

0.3.2 BeeGame.Inventory.ItemsInInventory Class Reference

Class that holds all of the items in the inventory. Can be serialized so inventory may be saved

Public Member Functions

- ItemsInInventory (int numberOfInventorySlots)
  Sets the size of the inventory
- void AddItem (int index, Item item)
  Add an Item to a specific index in the inventory
- bool AddItem (Item item)
  Adds a Item to the inventory

Public Attributes

- Item [ ] itemsInInventory

  All of the items in the inventory

0.3.2.1 Detailed Description

Class that holds all of the items in the inventory. Can be serialized so inventory may be saved

Definition at line 10 of file ItemsInInventory.cs.

0.3.2.2 Constructor & Destructor Documentation

0.3.2.2.1 ItemsInInventory()

```
BeeGame.Inventory.ItemsInInventory.ItemsInInventory (
            int numberOfInventorySlots )
```

Sets the size of the inventory

Parameters

numberOfInventorySlots	

Definition at line 21 of file ItemsInInventory.cs.

```
00022         {
00023             itemsInInventory = new Item[numberOfInventorySlots];
00024         }
```

0.3.2.3 Member Function Documentation

0.3.2.3.1 AddItem() [1/2]

```
void BeeGame.Inventory.ItemsInInventory.AddItem (
            int index,
            Item item )
```

Add an Item to a specific index in the inventory

Parameters

index	Were to add the item
item	What Item to put in the inventory

Definition at line 31 of file ItemsInInventory.cs.

```
00032         {
00033             itemsInInventory[index] = item;
00034         }
```

0.3.2.3.2 AddItem() [2/2]

```
bool BeeGame.Inventory.ItemsInInventory.AddItem (
            Item item )
```

Adds a Item to the inventory

Parameters

item	Item to add

Returns

true if *item* was added to the inventory

Definition at line 41 of file ItemsInInventory.cs.

```
00042         {
00043             for (int i = 0; i < itemsInInventory.Length; i++)
00044             {
00045                 if (itemsInInventory[i] == null)
00046                 {
00047                     itemsInInventory[i] = item;
00048                     return true;
00049                 }
00050                 if (itemsInInventory[i] == item &&
      itemsInInventory[i].itemStackCount + 1 <= itemsInInventory[i].maxStackCount
      )
00051                 {
00052                     itemsInInventory[i].itemStackCount++;
00053                     return true;
00054                 }
00055             }
00056 
00057             return false;
00058         }
```

0.3.2.4 Member Data Documentation

0.3.2.4.1 itemsInInventory

```
Item [] BeeGame.Inventory.ItemsInInventory.itemsInInventory
```

All of the items in the inventory

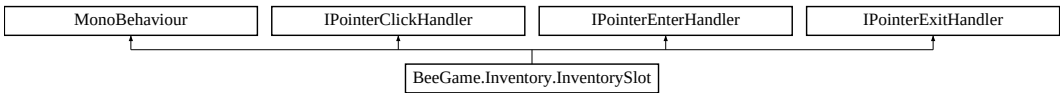
Definition at line 15 of file ItemsInInventory.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Inventory/ItemsInInventory.cs

0.3.3 BeeGame.Inventory.InventorySlot Class Reference

Inheritance diagram for BeeGame.Inventory.InventorySlot:



Public Member Functions

- void OnPointerClick (PointerEventData eventData)

  Allows the player to interact with the item slot
- void OnPointerEnter (PointerEventData eventData)

  Makes the text object when the cursor is over the slot
- void OnPointerExit (PointerEventData eventData)

  Destroys the text object when the cursor is not over the slot anymore

Public Attributes

- Item item

  The item this slot has in it
- Inventory myInventory

  The Inventory this slot is in
- GameObject itemText

  If the slot currently has the item text object made this will be not null otherwise it is null
- bool selectedSlot = false

  Is this slot currently the selected slot in the hotbar?

Package Attributes

- int slotIndex

  The slot in the inventory this is

Private Member Functions

- void Update ()

  Updates the slot
- void UpdateIcon ()

  Applies the correct icon to the slot depending on what is in the slot
- void AddToSlot (int numerToAdd)

  Adds a number to items into the slot
- void SplitStack ()

  Halfs a Item.itemStackCount between the slot and the Inventory.floatingItem
- void SwapItems ()

  Swaps the Item in the Inventory.floatingItem with the slots item
- void CheckFloatingItem ()

  Checks if the Inventory.floatingItem should be null
- void OnDisable ()

  Destroys the item text when the inventory is closed

0.3.3.1 Detailed Description

Definition at line 9 of file InventorySlot.cs.

0.3.3.2 Member Function Documentation

0.3.3.2.1 AddToSlot()

```
void BeeGame.Inventory.InventorySlot.AddToSlot (
            int numerToAdd )  [private]
```

Adds a number to items into the slot

Parameters

numerToAdd	Numebr or items to add to the slot

Definition at line 150 of file InventorySlot.cs.

```
00151         {
00152             //* if the item in the slot is null create it
00153             if (item == null)
00154             {
00155                 item = myInventory.floatingItem.CloneObject();
00156                 item.itemStackCount = 0;
00157             }
00158 
00159             //* add to number to add to the stack count
00160             item.itemStackCount += numerToAdd;
00161 
00162             //* if the stack count is now larger than it should be dont let it be
00163             if (item.itemStackCount > item.maxStackCount)
00164             {
00165                 item.itemStackCount = item.maxStackCount;
00166             }
00167 
00168             //* remove the numebr if items form the floating item then check the floating item is not null
00169             myInventory.floatingItem.itemStackCount -= numerToAdd;
00170             CheckFloatingItem();
00171             //* save the inventory changes
00172             myInventory.AddItemToSlots(slotIndex,
      item);
00173         }
```

0.3.3.2.2 CheckFloatingItem()

```
void BeeGame.Inventory.InventorySlot.CheckFloatingItem ( )  [private]
```

Checks if the Inventory.floatingItem should be null

Definition at line 215 of file InventorySlot.cs.

```
00216         {
00217             if(myInventory.floatingItem.itemStackCount <= 0)
00218             {
00219                 myInventory.floatingItem = null;
00220             }
00221         }
```

0.3.3.2.3 OnDisable()

```
void BeeGame.Inventory.InventorySlot.OnDisable ( )  [private]
```

Destroys the item text when the inventory is closed

Definition at line 254 of file InventorySlot.cs.

```
00255         {
00256             Destroy(itemText);
00257         }
```

0.3.3.2.4 OnPointerClick()

```
void BeeGame.Inventory.InventorySlot.OnPointerClick (
             PointerEventData eventData )
```

Allows the player to interact with the item slot

Parameters

eventData	Right or Left click

Called by the unity event handler when the slot is clicked on

Definition at line 75 of file InventorySlot.cs.

```
00076         {
00077             if (myInventory.floatingItem != null)
00078             {
00079                 //* Left click moves whole stacks if items
00080                 if (eventData.button == PointerEventData.InputButton.Left)
00081                 {
00082                     //* If the item in the slot is empty put the floating item into it then clear it
00083                     if (item == null)
00084                     {
00085                         item = myInventory.floatingItem;
00086                         myInventory.floatingItem = null;
00087                         myInventory.AddItemToSlots(
      slotIndex, item);
00088                         return;
00089                     }
00090                     //* if the items are the same
00091                     if(myInventory.floatingItem == item)
00092                     {
00093                         //* if the item in the inventoys stack count + the floating items stack count is
       less than the max stack count
00094                         if (myInventory.floatingItem.
      itemStackCount + item.itemStackCount <= item.
      maxStackCount)
00095                         {
00096                             AddToSlot(myInventory.
      floatingItem.itemStackCount);
00097                             return;
00098                         }
00099                         //* if the item stack added is larger than the max count add as many as you can and
       move on
00100                         else
00101                         {
00102                             AddToSlot(item.maxStackCount -
      item.itemStackCount);
00103                             return;
00104                         }
00105                     }
00106                     //* If the items were not == swap them
```

```
00107                     else
00108                     {
00109                         SwapItems();
00110                         return;
00111                     }
00112                 }
00113                 else if(eventData.button == PointerEventData.InputButton.Right)
00114                 {
00115                     //* if the item in slot is null add 1 from the floating item to it
00116                     if(item == null)
00117                     {
00118                         AddToSlot(1);
00119                         return;
00120                     }
00121                     //* if the items are the same add 1 from the floating item to this item
00122                     else if(item == myInventory.floatingItem)
00123                     {
00124                         AddToSlot(1);
00125                         return;
00126                     }
00127                 }
00128             }
00129             //* if the floating item is null
00130             else
00131             {
00132                 //* add 1/2 of the stack into the floating item if right click was pressed
00133                 if(eventData.button == PointerEventData.InputButton.Right)
00134                 {
00135                     SplitStack();
00136                     return;
00137                 }
00138 
00139                 //* otherwie add the items into the floating item slot
00140                 SwapItems();
00141                 return;
00142             }
00143 
00144         }
```

0.3.3.2.5 OnPointerEnter()

```
void BeeGame.Inventory.InventorySlot.OnPointerEnter (
            PointerEventData eventData )
```

Makes the text object when the cursor is over the slot

Parameters

eventData	Not used but required for the interface

Definition at line 229 of file InventorySlot.cs.

```
00230         {
00231             //* if the item is null or the floating item has something in it dont display the item text as
       it is not necissary
00232             if (item != null && myInventory.floatingItem == null)
00233             {
00234                 itemText = Instantiate(PrefabDictionary.
      GetPrefab("ItemDetails"));
00235                 //* sets the text to the correct postion
00236                 itemText.transform.GetChild(0).position = Input.mousePosition;
00237                 //* puts the correct text in the box
00238                 itemText.transform.GetChild(0).GetChild(0).GetComponent<Text>().text = $"
      {item.GetItemName()}\nStack: {item.itemStackCount}";
00239             }
00240         }
```

0.3.3.2.6 OnPointerExit()

```
void BeeGame.Inventory.InventorySlot.OnPointerExit (
            PointerEventData eventData )
```

Destroys the text object when the cursor is not over the slot anymore

Parameters

eventData	Not used but required for the interface

Definition at line 246 of file InventorySlot.cs.

```
00247         {
00248             Destroy(itemText);
00249         }
```

0.3.3.2.7 SplitStack()

```
void BeeGame.Inventory.InventorySlot.SplitStack ( )  [private]
```

Halfs a Item.itemStackCount between the slot and the Inventory.floatingItem

If the stack count is the slot is not an even number more items go to the floating item than go to the slot. This is so that right clicking on a slot when their is only 1 item in it actually make the item in that slot go into the floating item

Definition at line 181 of file InventorySlot.cs.

```
00182         {
00183             myInventory.floatingItem = item.CloneObject();
00184             int give = (item.itemStackCount + 1) / 2;
00185             myInventory.floatingItem.itemStackCount = give;
00186             item.itemStackCount -= give;
00187 
00188             if (item.itemStackCount <= 0)
00189                 item = null;
00190 
00191             myInventory.AddItemToSlots(slotIndex,
      item);
00192             Destroy(itemText);
00193         }
```

0.3.3.2.8 SwapItems()

```
void BeeGame.Inventory.InventorySlot.SwapItems ( )  [private]
```

Swaps the Item in the Inventory.floatingItem with the slots item

Definition at line 198 of file InventorySlot.cs.

```
00199         {
00200             //* temp copy of the item
00201             Item temp = myInventory.floatingItem;
00202             //* sets the floating item
00203             myInventory.floatingItem = item;
00204             //* sets the item that was in the floating item to the item in the the slot
00205             item = temp;
00206             //* Saves the changes to the inventory
00207             myInventory.AddItemToSlots(slotIndex,
      item);
00208             //* destroys the text as it is not needed anymore
00209             Destroy(itemText);
00210         }
```

0.3.3.2.9 Update()

```
void BeeGame.Inventory.InventorySlot.Update ( )  [private]
```

Updates the slot

Definition at line 37 of file InventorySlot.cs.

```
00038         {
00039             UpdateIcon();
00040         }
```

0.3.3.2.10 UpdateIcon()

```
void BeeGame.Inventory.InventorySlot.UpdateIcon ( )  [private]
```

Applies the correct icon to the slot depending on what is in the slot

Definition at line 45 of file InventorySlot.cs.

```
00046         {
00047             if(item == null)
00048             {
00049                 GetComponent<Image>().sprite = null;
00050             }
00051             else
00052             {
00053                 GetComponent<Image>().sprite = item.GetItemSprite();
00054             }
00055 
00056             //* if the slot is selected in the hotbar give the player some indication by colouring it grey
00057             if (selectedSlot)
00058             {
00059                 GetComponent<Image>().color = Color.gray;
00060             }
00061             else
00062             {
00063                 GetComponent<Image>().color = Color.white;
00064             }
00065         }
```

0.3.3.3 Member Data Documentation

0.3.3.3.1 item

```
Item BeeGame.Inventory.InventorySlot.item
```

The item this slot has in it

Definition at line 19 of file InventorySlot.cs.

0.3.3.3.2 itemText

```
GameObject BeeGame.Inventory.InventorySlot.itemText
```

If the slot currently has the item text object made this will be not null otherwise it is null

Definition at line 27 of file InventorySlot.cs.

0.3.3.3.3 myInventory

```
Inventory BeeGame.Inventory.InventorySlot.myInventory
```

The Inventory this slot is in

Definition at line 23 of file InventorySlot.cs.

0.3.3.3.4 selectedSlot

```
bool BeeGame.Inventory.InventorySlot.selectedSlot = false
```

Is this slot currently the selected slot in the hotbar?

Definition at line 31 of file InventorySlot.cs.

0.3.3.3.5 slotIndex

```
int BeeGame.Inventory.InventorySlot.slotIndex  [package]
```

The slot in the inventory this is

Definition at line 15 of file InventorySlot.cs.

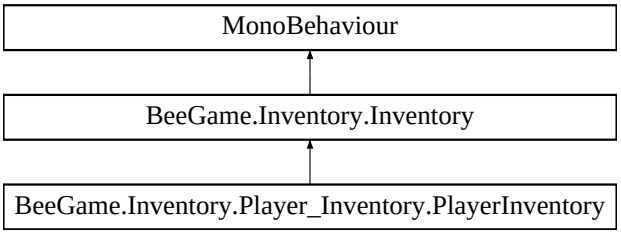
The documentation for this class was generated from the following file:

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Inventory/InventorySlot.cs

0.3.4 BeeGame.Inventory.Player_Inventory.PlayerInventory Class Reference

Controlls the player inventory

Inheritance diagram for BeeGame.Inventory.Player_Inventory.PlayerInventory:



Public Member Functions

- void SelectedSlot (int index)

  Updates the currrently selected hotbar slot
- bool GetItemFromHotBar (int slotIndex, out Item outItem)

  Gets an item from the hotbar (9 InventorySlots at the bottom of the screen)
- void RemoveItemFromInventory (int index)

  Removes 1 item from the given inventory index

Public Attributes

- GameObject playerInventory

  Object that the inventory is

Private Member Functions

- void Start ()

  Sets all requred params for the inventory and loads ant saved versions of it
- void SetPlayerInventory ()

  Set the size of the player inventory
- void Update ()

  Goves the inventory update ticks
- void OpenPlayerInventory ()

  Show/Hide the player inventory
- void PickupItem (ItemGameObject item)

  Pickup an item and put it into the Inventory

Additional Inherited Members

0.3.4.1 Detailed Description

Controlls the player inventory

Definition at line 10 of file PlayerInventory.cs.

0.3.4.2 Member Function Documentation

0.3.4.2.1 GetItemFromHotBar()

```
bool BeeGame.Inventory.Player_Inventory.PlayerInventory.GetItemFromHotBar (
            int slotIndex,
            out Item outItem )
```

Gets an item from the hotbar (9 InventorySlots at the bottom of the screen)

Parameters

slotIndex	Index to get Item from
outItem	Item in the slot

Returns

true if *outItem* is placeable, false if *outItem* is null or not placeable

Definition at line 83 of file PlayerInventory.cs.

```
00084         {
00085             //* get the item
00086             outItem = GetAllItems().itemsInInventory[slotIndex];
00087 
00088             if (outItem == null)
00089                 return false;
00090 
00091             //* if the item is placebale and is not null remove 1 from the inventory as it is assumed it is
      about to be placed in the world
00092             if(outItem.placeable)
00093                 RemoveItemFromInventory(slotIndex);
00094 
00095             return outItem.placeable;
00096         }
```

0.3.4.2.2 OpenPlayerInventory()

```
void BeeGame.Inventory.Player_Inventory.PlayerInventory.OpenPlayerInventory ( )  [private]
```

Show/Hide the player inventory

Definition at line 103 of file PlayerInventory.cs.

```
00104         {
00105             playerInventory.SetActive(!playerInventory.activeInHierarchy);
00106             THInput.isAnotherInventoryOpen = !
      THInput.isAnotherInventoryOpen;
00107 
00108             //* hides/ shows the mouse depending on if te inventory is open or not
00109             if (playerInventory.activeInHierarchy)
00110             {
00111                 Cursor.lockState = CursorLockMode.None;
00112                 Cursor.visible = true;
00113             }
00114             else
00115             {
00116                 Cursor.visible = false;
00117                 Cursor.lockState = CursorLockMode.Locked;
00118             }
00119         }
```

0.3.4.2.3 PickupItem()

```
void BeeGame.Inventory.Player_Inventory.PlayerInventory.PickupItem (
             ItemGameObject item )  [private]
```

Pickup an item and put it into the Inventory

Parameters

item	Item to try to put into the inventory

Definition at line 144 of file PlayerInventory.cs.

```
00145         {
00146             //* if the item can be added to the inventory do that
00147             if (AddItemToInventory(item.item))
00148             {
00149                 //* if the item was added destroyits gameobject and save the inventory
00150                 Destroy(item.gameObject);
00151                 Serialization.Serialization.SerializeInventory(this,
      inventoryName);
00152             }
00153         }
```

0.3.4.2.4 RemoveItemFromInventory()

```
void BeeGame.Inventory.Player_Inventory.PlayerInventory.RemoveItemFromInventory (
              int index )
```

Removes 1 item from the given inventory index

Parameters

index	

Definition at line 125 of file PlayerInventory.cs.

```
00126         {
00127             //* if the item is already null nothign needs to be removed
00128             if (GetAllItems().itemsInInventory[index] != null)
00129             {
00130                 //* remove 1 item and if that was the last in the stack remove the item from the inventory
00131                 GetAllItems().itemsInInventory[index].
      itemStackCount -= 1;
00132
00133                 if (GetAllItems().itemsInInventory[index].itemStackCount <= 0)
00134                     GetAllItems().itemsInInventory[index] = null;
00135
00136                 Serialization.Serialization.SerializeInventory(this,
      inventoryName);
00137             }
00138         }
```

0.3.4.2.5 SelectedSlot()

```
void BeeGame.Inventory.Player_Inventory.PlayerInventory.SelectedSlot (
              int index )
```

Updates the currrently selected hotbar slot

Parameters

index	Slot that is selected

Definition at line 67 of file PlayerInventory.cs.

```
00068         {
00069             for (int i = 0; i < slots.Length; i++)
00070             {
00071                 slots[i].selectedSlot = false;
00072             }
00073 
00074             slots[index].selectedSlot = true;
00075         }
```

0.3.4.2.6 SetPlayerInventory()

```
void BeeGame.Inventory.Player_Inventory.PlayerInventory.SetPlayerInventory ( )  [private]
```

Set the size of the player inventory

Definition at line 33 of file PlayerInventory.cs.

```
00034         {
00035             if (InventorySet())
00036                 SetInventorySize(20);
00037         }
```

0.3.4.2.7 Start()

```
void BeeGame.Inventory.Player_Inventory.PlayerInventory.Start ( )  [private]
```

Sets all requred params for the inventory and loads ant saved versions of it

Definition at line 23 of file PlayerInventory.cs.

```
00024         {
00025             SetPlayerInventory();
00026             inventoryName = "PlayerInventory";
00027             Serialization.Serialization.DeSerializeInventory(this, inventoryName);
00028         }
```

0.3.4.2.8 Update()

```
void BeeGame.Inventory.Player_Inventory.PlayerInventory.Update ( )  [private]
```

Goves the inventory update ticks

Definition at line 43 of file PlayerInventory.cs.

```
00044         {
00045             UpdateBase();
00046 
00047             //* whecks if the inventory should be opened/closed
00048             if (THInput.GetButtonDown("Player Inventory"))
00049                 OpenPlayerInventory();
00050 
00051             //* checks if somethig shoul dbe picked up and put into the inventory
00052             RaycastHit[] hit = Physics.SphereCastAll(transform.position, 1f, transform.forward);
00053 
00054             for (int i = hit.Length - 1; i >= 0; i--)
00055             {
00056                 if (hit[i].collider.GetComponent<ItemGameObject>())
00057                     PickupItem(hit[i].collider.GetComponent<
      ItemGameObject>());
00058             }
00059 
00060         }
```

0.3.4.3 Member Data Documentation

0.3.4.3.1 playerInventory

```
GameObject BeeGame.Inventory.Player_Inventory.PlayerInventory.playerInventory
```

Object that the inventory is

Definition at line 16 of file PlayerInventory.cs.

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

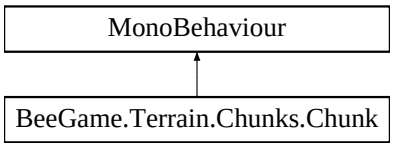
- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Inventory/Player Inventory/PlayerInventory.cs

0.4 Chunk

0.4.1 BeeGame.Terrain.Chunks.Chunk Class Reference

A section of land for the game, used so that land can be generated in parts and not all at once

Inheritance diagram for BeeGame.Terrain.Chunks.Chunk:



Public Member Functions

- Block GetBlock (int x, int y, int z, bool checkNebouringChunks=true)

  Returns the Block in the given x, y, z
- void SetBlock (int x, int y, int z, Block block)

  Sets a Block in the given position
- void SetBlocksUnmodified ()

  Sets all of the Blocks in the blocks array to unmodifed so that the whole chunk is not saved when it does not need to be

Static Public Member Functions

- static bool InRange (int i)

  Checks that a given value is within the Chunk

Public Attributes

- Block [„] blocks = new Block[chunkSize, chunkSize, chunkSize]

  All of the Blocks in the Chunk
- bool update = true

  Should the Chunk be updated?
- bool rendered

  Is the Chunk rendered?
- bool updateCollsionMesh = false

  Should the chunks collision mesh be updated?
- bool applyCollisionMesh = false

  Should the collision mesh be applied
- World world

  World that this chunk is in as MonoBehaviours cannot be static this is for convenicence
- ChunkWorldPos chunkWorldPos

  Chunks position in the world as a ChunkWorldPos (int verson of Core.THVector3)

Static Public Attributes

- static int chunkSize = 16

  Size of the Chunk

Private Member Functions

- void Start ()

  Sets the meshCollider and filter variables
- void Update ()

  Checks if the Chunk should be updated
- void UpdateChunk ()

  Updates the mesh for the Chunk
- void RenderMesh (MeshData meshData)

  Renders the given MeshData into a unity Mesh
- void ColliderMesh ()

  Makes a collision mesh from the mesh

Private Attributes

- MeshData mesh = new MeshData()

  MeshData of this chunk
- MeshFilter filter

  This Chunks mesh filter
- MeshCollider meshCollider

  This Chunks mesh colldier

0.4.1.1 Detailed Description

A section of land for the game, used so that land can be generated in parts and not all at once

Definition at line 14 of file Chunk.cs.

0.4.1.2 Member Function Documentation

0.4.1.2.1 ColliderMesh()

```
void BeeGame.Terrain.Chunks.Chunk.ColliderMesh ( )  [private]
```

Makes a collision mesh from the mesh

Definition at line 234 of file Chunk.cs.

```
00235         {
00236             //if the chunk has been told to update the collsions but the chunk has ne verts dont do it as
      their is no point
00237             if (this.mesh.verts.Count == 0)
00238                 return;
00239 
00240             //if the render and collision meshes should be shared set the render mesh to the collision mesh
      otherwise make a collision mesh
00241             if (this.mesh.shareMeshes)
00242             {
00243                 world.chunkHasMadeCollisionMesh = true;
00244                 applyCollisionMesh = false;
00245                 meshCollider.sharedMesh = filter.mesh;
00246                 return;
00247             }
00248 
00249             world.chunkHasMadeCollisionMesh = true;
00250             //Applying the mesh takes the longest but nothing can be dont with the mesh class in a
      secondary thread...thanks Unity
00251 
00252             //makes a new mesh setting the name for convenience
00253             Mesh mesh = new Mesh()
00254             {
00255                 name = "Collider Mesh",
00256                 vertices = this.mesh.colVerts.ToArray(),
00257                 triangles = this.mesh.colTris.ToArray()
00258             };
00259 
00260             //recalcs the normals and applies the mesh
00261             mesh.RecalculateNormals();
00262 
00263             meshCollider.sharedMesh = mesh;
00264 
00265             applyCollisionMesh = false;
00266         }
```

0.4.1.2.2 GetBlock()

```
Block BeeGame.Terrain.Chunks.Chunk.GetBlock (
            int x,
            int y,
            int z,
            bool checkNebouringChunks = true )
```

Returns the Block in the given x, y, z

Parameters

x	X pos if the Block
y	Z pos if the Block
z	Y pos if the Block
checkNebouringChunks	Shoud this check nebouring chunks? Only set to false when chunk mesh is being built for performance

Returns

Block at given x, y, z

Definition at line 123 of file Chunk.cs.

```
00124         {
00125             //checks that block is in the chunk
00126             if (InRange(x) && InRange(y) && InRange(z))
00127                 return blocks[x, y, z];
00128 
00129             //if the block is not in the chunk and we should check other chunks do that, otherwise return
      an air block (empty block)
00130             if(checkNebouringChunks)
00131                 return world.GetBlock(chunkWorldPos.x + x,
     chunkWorldPos.y + y, chunkWorldPos.z + z);
00132 
00133             return new Air();
00134         }
```

0.4.1.2.3 InRange()

```
static bool BeeGame.Terrain.Chunks.Chunk.InRange (
            int i )  [static]
```

Checks that a given value is within the Chunk

Parameters

i	Value to check

Returns

true if the value is in the Chunk

Definition at line 160 of file Chunk.cs.

```
00161         {
00162             //if the value is less then 0 or greater than 16 the value is outside the chunk
00163             if (i < 0 || i >= chunkSize)
00164                 return false;
00165             return true;
00166         }
```

0.4.1.2.4 RenderMesh()

```
void BeeGame.Terrain.Chunks.Chunk.RenderMesh (
            MeshData meshData )  [private]
```

Renders the given MeshData into a unity Mesh

Parameters

meshData	Mesh data to render

Definition at line 211 of file Chunk.cs.

```
00212         {
00213             //Applying the mesh takes the longest but nothing can be dont with the mesh class in a
      secondary thread...thanks unity
00214
00215             mesh.done = false;
00216             //clears the current chunk mesh
00217             filter.mesh.Clear();
00218             //name for convenience
00219             filter.mesh.name = "Render Mesh";
00220             //puts the tris and verts from the meshdata into the chunk mesh
00221             filter.mesh.vertices = meshData.verts.ToArray();
00222             filter.mesh.triangles = meshData.tris.ToArray();
00223
00224             //sets the uvs
00225             filter.mesh.uv = meshData.uv.ToArray();
00226
00227             //redoes the normals incase they got messed up
00228             filter.mesh.RecalculateNormals();
00229         }
```

0.4.1.2.5 SetBlock()

```
void BeeGame.Terrain.Chunks.Chunk.SetBlock (
            int x,
            int y,
            int z,
            Block block )
```

Sets a Block in the given position

Parameters

x	X pos of the Block
y	Y pos of the Block
z	Z pos of the Block
block	Block to set

Definition at line 143 of file Chunk.cs.

```
00144         {
00145             //sets the block in the position if it is in the chunk, then return early
00146             if (InRange(x) && InRange(y) && InRange(z))
00147             {
00148                 blocks[x, y, z] = block;
00149                 return;
00150             }
00151             //if the block is not in the chunk find its chunk and set it their
00152             world.SetBlock(chunkWorldPos.x + x,
      chunkWorldPos.y + y, chunkWorldPos.z + z, block);
00153         }
```

0.4.1.2.6 SetBlocksUnmodified()

```
void BeeGame.Terrain.Chunks.Chunk.SetBlocksUnmodified ( )
```

Sets all of the Blocks in the blocks array to unmodifed so that the whole chunk is not saved when it does not need to be

A modifed Block is a Block removed or added by the player

Definition at line 176 of file Chunk.cs.

```
00177         {
00178             foreach (var block in blocks)
00179             {
00180                 block.changed = false;
00181             }
00182         }
```

0.4.1.2.7 Start()

```
void BeeGame.Terrain.Chunks.Chunk.Start ( )  [private]
```

Sets the meshCollider and filter variables

Definition at line 77 of file Chunk.cs.

```
00078         {
00079             filter = GetComponent<MeshFilter>();
00080             meshCollider = GetComponent<MeshCollider>();
00081         }
```

0.4.1.2.8 Update()

```
void BeeGame.Terrain.Chunks.Chunk.Update ( )  [private]
```

Checks if the Chunk should be updated

Definition at line 86 of file Chunk.cs.

```
00087         {
00088             lock(mesh)
00089             {
00090                 if (update)
00091                 {
00092                     update = false;
00093                     updateCollsionMesh = true;
00094                     mesh = new MeshData();
00095                     //Enabling threading here works in editor but not in build?
00096                     //ok whatever...
00097                     //Thread thread = new Thread(UpdateChunk);
00098 
00099                     //thread.Start();
00100                     UpdateChunk();
00101                 }
00102 
00103                 if (mesh.done && mesh != new MeshData())
00104                 {
00105                     RenderMesh(mesh);
00106                 }
00107 
00108                 if (applyCollisionMesh)
00109                     ColliderMesh();
00110             }
00111         }
```

0.4.1.2.9 UpdateChunk()

```
void BeeGame.Terrain.Chunks.Chunk.UpdateChunk ( )  [private]
```

Updates the mesh for the Chunk

Definition at line 187 of file Chunk.cs.

```
00188         {
00189             //says that this chunk is rendered and initialtes the mesh
00190             rendered = true;
00191 
00192             //goes through every block in the blocks array getting their mesh data
00193             for (int x = 0; x < chunkSize; x ++)
00194             {
00195                 for (int z = 0; z < chunkSize; z ++)
00196                 {
00197                     for (int y = 0; y < chunkSize; y ++)
00198                     {
00199                         blocks[x, y, z].UpdateBlock(x, y, z, this);
00200                         mesh = blocks[x, y, z].BlockData(this, x, y, z,
      mesh);
00201                     }
00202                 }
00203             }
00204             mesh.done = true;
00205         }
```

0.4.1.3 Member Data Documentation

0.4.1.3.1 applyCollisionMesh

```
bool BeeGame.Terrain.Chunks.Chunk.applyCollisionMesh = false
```

Should the collision mesh be applied

Definition at line 47 of file Chunk.cs.

0.4.1.3.2 blocks

```
Block [,,] BeeGame.Terrain.Chunks.Chunk.blocks = new Block[chunkSize, chunkSize, chunkSize]
```

All of the Blocks in the Chunk

Definition at line 29 of file Chunk.cs.

0.4.1.3.3 chunkSize

```
int BeeGame.Terrain.Chunks.Chunk.chunkSize = 16  [static]
```

Size of the Chunk

Same size for x, y, z
Posibly some place has 16 hard coded as reduceing the number breaks things TODO: find

Definition at line 24 of file Chunk.cs.

0.4.1.3.4 chunkWorldPos

```
ChunkWorldPos BeeGame.Terrain.Chunks.Chunk.chunkWorldPos
```

Chunks position in the world as a ChunkWorldPos (int verson of Core.THVector3)

Definition at line 56 of file Chunk.cs.

0.4.1.3.5 filter

```
MeshFilter BeeGame.Terrain.Chunks.Chunk.filter  [private]
```

This Chunks mesh filter

Definition at line 66 of file Chunk.cs.

0.4.1.3.6 mesh

```
MeshData BeeGame.Terrain.Chunks.Chunk.mesh = new MeshData()  [private]
```

MeshData of this chunk

Definition at line 61 of file Chunk.cs.

0.4.1.3.7 meshCollider

```
MeshCollider BeeGame.Terrain.Chunks.Chunk.meshCollider  [private]
```

This Chunks mesh colldier

Definition at line 70 of file Chunk.cs.

0.4.1.3.8 rendered

```
bool BeeGame.Terrain.Chunks.Chunk.rendered
```

Is the Chunk rendered?

Definition at line 38 of file Chunk.cs.

0.4.1.3.9 update

```
bool BeeGame.Terrain.Chunks.Chunk.update = true
```

Should the Chunk be updated?

Definition at line 34 of file Chunk.cs.

0.4.1.3.10 updateCollsionMesh

```
bool BeeGame.Terrain.Chunks.Chunk.updateCollsionMesh = false
```

Should the chunks collision mesh be updated?

Definition at line 43 of file Chunk.cs.

0.4.1.3.11 world

```
World BeeGame.Terrain.Chunks.Chunk.world
```

World that this chunk is in as MonoBehaviours cannot be static this is for convenicence

Definition at line 52 of file Chunk.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/Chunks/Chunk.cs

0.4.2 BeeGame.Terrain.Chunks.MeshData Class Reference

The data for a Chunks's Mesh

Public Member Functions

- void AddQuadTriangles (bool addToRenderMesh=true)
  Adds 2 triangles to the triangle list
- void AddVertices (THVector3 pos, bool addToRenderMesh=true, Direction direction=Direction.DOWN)
  Adds vertices to the render and collision Meshes
- void AddTriangle (int tri)
  Adds a triangle to both the render and collidson meshes

Public Attributes

- List< Vector3 > verts = new List<Vector3>()
  Verticies for the Chunk render Mesh
- List< int > tris = new List<int>()
  Triangles for the Chunk render Mesh
- List< Vector2 > uv = new List<Vector2>()
  UV mapping for the Chunk render Mesh
- List< Vector3 > colVerts = new List<Vector3>()
  Vertices for the Chunk collider Mesh
- List< int > colTris = new List<int>()
  Triangles for the Chunk collider Mesh
- bool shareMeshes = true
  Should thic chunk share is collider and render Meshes
- bool done = false

0.4.2.1 Detailed Description

The data for a Chunks's Mesh

Definition at line 11 of file MeshData.cs.

0.4.2.2 Member Function Documentation

0.4.2.2.1 AddQuadTriangles()

```
void BeeGame.Terrain.Chunks.MeshData.AddQuadTriangles (
            bool addToRenderMesh = true )
```

Adds 2 triangles to the triangle list

Parameters

addToRenderMesh	Should the triangles be added to the render Mesh

Definition at line 46 of file MeshData.cs.

```
00047         {
00048             //*adds the triangles in an anticlockwise order
00049 
00050             if (addToRenderMesh)
00051             {
00052                 tris.Add(verts.Count - 4);
00053                 tris.Add(verts.Count - 3);
00054                 tris.Add(verts.Count - 2);
00055                 tris.Add(verts.Count - 4);
00056                 tris.Add(verts.Count - 2);
00057                 tris.Add(verts.Count - 1);
00058             }
00059 
00060             colTris.Add(colVerts.Count - 4);
00061             colTris.Add(colVerts.Count - 3);
00062             colTris.Add(colVerts.Count - 2);
00063             colTris.Add(colVerts.Count - 4);
00064             colTris.Add(colVerts.Count - 2);
00065             colTris.Add(colVerts.Count - 1);
00066         }
```

0.4.2.2.2 AddTriangle()

```
void BeeGame.Terrain.Chunks.MeshData.AddTriangle (
            int tri )
```

Adds a triangle to both the render and collidson meshes

Parameters

tri	triangle

not used anymore remove?

Definition at line 91 of file MeshData.cs.

```
00092         {
00093             tris.Add(tri);
00094 
00095             colTris.Add(tri - (verts.Count - colVerts.Count));
00096         }
```

0.4.2.2.3 AddVertices()

```
void BeeGame.Terrain.Chunks.MeshData.AddVertices (
            THVector3 pos,
            bool addToRenderMesh = true,
            Direction direction = Direction.DOWN )
```

Adds vertices to the render and collision Meshes

Parameters

pos	Position of the vertice
addToRenderMesh	Should the vertice be added to the render Mesh
direction	What face is this vertice on

Definition at line 74 of file MeshData.cs.

```
00075         {
00076             if (addToRenderMesh)
00077                 verts.Add(pos);
00078 
00079             //*if the vertice is on the top face make its positon slightly smaller
00080             if(direction == Direction.UP)
00081                 colVerts.Add(pos - new THVector3(0.01f, 0, 0.01f));
00082         }
```

0.4.2.3 Member Data Documentation

0.4.2.3.1 colTris

```
List<int> BeeGame.Terrain.Chunks.MeshData.colTris = new List<int>()
```

Triangles for the Chunk collider Mesh

Definition at line 33 of file MeshData.cs.

0.4.2.3.2 colVerts

```
List<Vector3> BeeGame.Terrain.Chunks.MeshData.colVerts = new List<Vector3>()
```

Vertices for the Chunk collider Mesh

Definition at line 29 of file MeshData.cs.

0.4.2.3.3 done

```
bool BeeGame.Terrain.Chunks.MeshData.done = false
```

Definition at line 40 of file MeshData.cs.

0.4.2.3.4 shareMeshes

```
bool BeeGame.Terrain.Chunks.MeshData.shareMeshes = true
```

Should thic chunk share is collider and render Meshes

Definition at line 38 of file MeshData.cs.

0.4.2.3.5 tris

```
List<int> BeeGame.Terrain.Chunks.MeshData.tris = new List<int>()
```

Triangles for the Chunk render Mesh

Definition at line 20 of file MeshData.cs.

0.4.2.3.6 uv

```
List<Vector2> BeeGame.Terrain.Chunks.MeshData.uv = new List<Vector2>()
```

UV mapping for the Chunk render Mesh

Definition at line 24 of file MeshData.cs.

0.4.2.3.7 verts

```
List<Vector3> BeeGame.Terrain.Chunks.MeshData.verts = new List<Vector3>()
```

Verticies for the Chunk render Mesh

Definition at line 16 of file MeshData.cs.

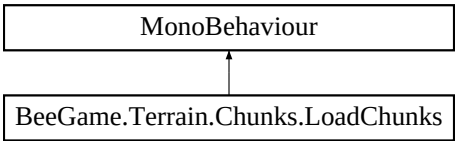
The documentation for this class was generated from the following file:

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/Chunks/MeshData.cs

0.4.3 BeeGame.Terrain.Chunks.LoadChunks Class Reference

Loads the Chunks around the player

Inheritance diagram for BeeGame.Terrain.Chunks.LoadChunks:



Public Attributes

- World world

  The world the player is in

Private Member Functions

- void Start ()

  Sets the world
- void Update ()

  Builds, Renders, and Remmoves Chunks
- void ApplyCollsionMeshToNearbyChunks ()

  Makes a collsion mesh for the Chunks nearest to the player to reduce lag created by PhysX mesh bakeing
- void LoadAndRenderChunks ()

  Gets the chunks that sould be built and renders then renders them
- void FindChunksToLoad ()

  Finds the Chunks that should be rendered
- void BuildChunk (ChunkWorldPos pos)

  Makes a chunk in the given positon if it does not already exist
- bool DeleteChunks ()

  Destroys Chunks every 10 calls

Private Attributes

- List< ChunkWorldPos > buildList = new List<ChunkWorldPos>()

  List if chunks to build

Static Private Attributes

- static ChunkWorldPos [ ] chunkPositions

  Positions to make chunks aroud the player ///
- static ChunkWorldPos [ ] nearbyChunks

  Chunks in a 3x3 radius around the player that should have a collision mesh
- static int timer = 0

  Timer for chunk removal

0.4.3.1 Detailed Description

Loads the Chunks around the player

Definition at line 11 of file LoadChunks.cs.

0.4.3.2 Member Function Documentation

0.4.3.2.1 ApplyCollsionMeshToNearbyChunks()

```
void BeeGame.Terrain.Chunks.LoadChunks.ApplyCollsionMeshToNearbyChunks ( )  [private]
```

Makes a collsion mesh for the Chunks nearest to the player to reduce lag created by PhysX mesh bakeing

We dont need to worry about removeing Chunk collision meshes as once PhysX has baked then they have minimal performance impact Doing things this wayt also spreads out the PhysX mesh bakeing

Definition at line 109 of file LoadChunks.cs.

```
00110         {
00111             //gets the player position in chunk coordinates
00112             ChunkWorldPos playerPos = new ChunkWorldPos(Mathf.FloorToInt(transform.position.x / Chunk.
      chunkSize) * Chunk.chunkSize, Mathf.FloorToInt(transform.position.y / Chunk.chunkSize) * Chunk.chunkSize, Mathf.
      FloorToInt(transform.position.z / Chunk.chunkSize) * Chunk.chunkSize);
00113
00114             for (int i = 0; i < nearbyChunks.Length; i++)
00115             {
00116                 ChunkWorldPos chunkPos = new ChunkWorldPos(nearbyChunks[i].x * Chunk.chunkSize
      + playerPos.x, 0, nearbyChunks[i].z * Chunk.chunkSize + playerPos.z);
00117
00118                 for (int j = -1; j < 2; j++)
00119                 {
00120                     Chunk nearbyChunk = world.GetChunk(chunkPos.x, j * Chunk.chunkSize,
      chunkPos.z);
00121
00122                     if (nearbyChunk != null)
00123                         nearbyChunk.applyCollisionMesh = true;
00124                 }
00125             }
00126         }
```

0.4.3.2.2 BuildChunk()

```
void BeeGame.Terrain.Chunks.LoadChunks.BuildChunk (
             ChunkWorldPos pos )  [private]
```

Makes a chunk in the given positon if it does not already exist

Parameters

pos	hte positon of the new chunk

Definition at line 184 of file LoadChunks.cs.

```
00185         {
00186             if (world.GetChunk(pos.x, pos.y, pos.z) == null)
00187                 world.CreateChunk(pos.x, pos.y, pos.z);
00188         }
```

0.4.3.2.3 DeleteChunks()

```
bool BeeGame.Terrain.Chunks.LoadChunks.DeleteChunks ( )  [private]
```

Destroys Chunks every 10 calls

Returns

true if Chunks were destroyed

Definition at line 194 of file LoadChunks.cs.

```
00195         {
00196             //destroys every 10 call to reduce load on CPU so that chunks are not destroyed and created at
      the same time
00197             if(timer == 10)
00198             {
00199                 timer = 0;
00200                 var chunksToDelete = new List<ChunkWorldPos>();
00201 
00202                 //go through all of the built chunks and if the chunk is 256 units away it is assumed to be
      out of sight so is added to the destroy list
00203                 foreach (var chunk in world.chunks)
00204                 {
00205                     float distance = Vector3.Distance(chunk.Value.transform.position, transform.position);
00206 
00207                     if (distance > 256)
00208                         chunksToDelete.Add(chunk.Key);
00209                 }
00210 
00211                 foreach (var chunk in chunksToDelete)
00212                 {
00213                     world.DestroyChunk(chunk.x, chunk.y, chunk.z);
00214                 }
00215 
00216                 return true;
00217             }
00218 
00219             timer++;
00220 
00221             return false;
00222         }
```

0.4.3.2.4 FindChunksToLoad()

```
void BeeGame.Terrain.Chunks.LoadChunks.FindChunksToLoad ( )  [private]
```

Finds the Chunks that should be rendered

Definition at line 148 of file LoadChunks.cs.

```
00149         {
00150             if (buildList.Count == 0)
00151             {
00152                 //gets the player position in chunk coordinates
00153                 ChunkWorldPos playerPos = new ChunkWorldPos(Mathf.FloorToInt(transform.position.x / Chunk.
      chunkSize) * Chunk.chunkSize, Mathf.FloorToInt(transform.position.y / Chunk.chunkSize) * Chunk.chunkSize,
      Mathf.FloorToInt(transform.position.z / Chunk.chunkSize) * Chunk.chunkSize);
00154 
00155                 //check all of the chunk positions and if that position does not have a chunk in it make it
00156                 for (int i = 0; i < chunkPositions.Length; i++)
00157                 {
00158                     ChunkWorldPos newChunkPos = new ChunkWorldPos(chunkPositions[i].x * Chunk
      .chunkSize + playerPos.x, 0, chunkPositions[i].z * Chunk.chunkSize + playerPos.z);
00159 
00160                     Chunk newChunk = world.GetChunk(newChunkPos.x, newChunkPos.y, newChunkPos.
      z);
00161 
00162                     if (newChunk != null && (newChunk.rendered || buildList.Contains(newChunkPos))
      )
00163                         continue;
00164 
00165                     for (int y = -1; y < 2; y++)
00166                     {
00167                         for (int x = newChunkPos.x - Chunk.chunkSize; x < newChunkPos.x + Chunk.chunkSize;
      x += Chunk.chunkSize)
00168                         {
00169                             for (int z = newChunkPos.z - Chunk.chunkSize; z < newChunkPos.z + Chunk.
      chunkSize; z += Chunk.chunkSize)
```

```
00170                               {
00171                                   buildList.Add(new ChunkWorldPos(x, y * Chunk.chunkSize, z));
00172                               }
00173                           }
00174                       }
00175                       return;
00176                   }
00177               }
00178           }
```

0.4.3.2.5 LoadAndRenderChunks()

`void BeeGame.Terrain.Chunks.LoadChunks.LoadAndRenderChunks ( )  [private]`

Gets the chunks that sould be built and renders then renders them

Definition at line 131 of file LoadChunks.cs.

```
00132           {
00133               //if their is somethign in the build list new chunks can be made
00134               if (buildList.Count != 0)
00135               {
00136                   //makes all of the chunks in the build list. Works backwards through the list so that no
        chunk is missed because chunks are removed from the list as they are made
00137                   for (int i = buildList.Count - 1, j = 0; i >= 0 && j < 8; i--, j++)
00138                   {
00139                       BuildChunk(buildList[0]);
00140                       buildList.RemoveAt(0);
00141                   }
00142               }
00143           }
```

0.4.3.2.6 Start()

`void BeeGame.Terrain.Chunks.LoadChunks.Start ( )  [private]`

Sets the world

Definition at line 80 of file LoadChunks.cs.

```
00081           {
00082               LandGeneration.Terrain.world = world;
00083           }
```

0.4.3.2.7 Update()

`void BeeGame.Terrain.Chunks.LoadChunks.Update ( )  [private]`

Builds, Renders, and Remmoves Chunks

Definition at line 88 of file LoadChunks.cs.

```
00089           {
00090               if (DeleteChunks())
00091                   return;
00092               if (!world.chunkHasMadeCollisionMesh)
00093               {
00094                   FindChunksToLoad();
00095                   LoadAndRenderChunks();
00096                   ApplyCollsionMeshToNearbyChunks();
00097               }
00098               //stops chunks being made and collision meshes being made at the same time
00099               world.chunkHasMadeCollisionMesh = false;
00100           }
```

0.4.3.3 Member Data Documentation

0.4.3.3.1 buildList

```
List<ChunkWorldPos> BeeGame.Terrain.Chunks.LoadChunks.buildList = new List<ChunkWorldPos>()
[private]
```

List if chunks to build

Definition at line 21 of file LoadChunks.cs.

0.4.3.3.2 chunkPositions

```
ChunkWorldPos [] BeeGame.Terrain.Chunks.LoadChunks.chunkPositions  [static], [private]
```

Positions to make chunks aroud the player ///

Definition at line 26 of file LoadChunks.cs.

0.4.3.3.3 nearbyChunks

```
ChunkWorldPos [] BeeGame.Terrain.Chunks.LoadChunks.nearbyChunks  [static], [private]
```

Initial value:

```
= new ChunkWorldPos[] { new ChunkWorldPos(0, 0, 0), new ChunkWorldPos(1, 0, 0), new ChunkWorldPos(-1, 0, 0)
      , new ChunkWorldPos(0, 0, 1), new ChunkWorldPos(0, 0, -1),
                                                                  new ChunkWorldPos(1, 0, 1), new
       ChunkWorldPos(1, 0, -1), new ChunkWorldPos(-1, 0, 1), new ChunkWorldPos(-1, 0, -1)}
```

Chunks in a 3x3 radius around the player that should have a collision mesh

Definition at line 69 of file LoadChunks.cs.

0.4.3.3.4 timer

```
int BeeGame.Terrain.Chunks.LoadChunks.timer = 0  [static], [private]
```

Timer for chunk removal

Definition at line 75 of file LoadChunks.cs.

0.4.3.3.5 world

```
World BeeGame.Terrain.Chunks.LoadChunks.world
```

The world the player is in

Definition at line 16 of file LoadChunks.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/Chunks/LoadChunks.cs

0.4.4 BeeGame.Terrain.Chunks.SaveChunk Class Reference

Saves a Chunks modified Blocks for save optimisation

Public Member Functions

- SaveChunk (Block[,,] blockArray)
  Will search all the the given Blocks for modified blocks

Public Attributes

- Dictionary< ChunkWorldPos, Block > blocks = new Dictionary<ChunkWorldPos, Block>()
  Blocks to be saved

0.4.4.1 Detailed Description

Saves a Chunks modified Blocks for save optimisation

Definition at line 12 of file SaveChunk.cs.

0.4.4.2 Constructor & Destructor Documentation

0.4.4.2.1 SaveChunk()

```
BeeGame.Terrain.Chunks.SaveChunk.SaveChunk (
            Block blockArray[,,] )
```

Will search all the the given Blocks for modified blocks

Parameters

blockArray	Chunks blocks (Must be [16, 16, 16])

Definition at line 23 of file SaveChunk.cs.

```
00024         {
00025             for (int x = 0; x < Chunk.chunkSize; x++)
00026             {
00027                 for (int y = 0; y < Chunk.chunkSize; y++)
00028                 {
00029                     for (int z = 0; z < Chunk.chunkSize; z++)
00030                     {
00031                         //*if the block has changed save it
00032                         if (blockArray[x, y, z].changed)
00033                             blocks.Add(new ChunkWorldPos(x, y, z), blockArray[x, y, z]);
00034                     }
00035                 }
00036             }
00037         }
```

0.4.4.3 Member Data Documentation

0.4.4.3.1 blocks

```
Dictionary<ChunkWorldPos, Block> BeeGame.Terrain.Chunks.SaveChunk.blocks = new Dictionary<Chunk↩
WorldPos, Block>()
```

Blocks to be saved

Definition at line 17 of file SaveChunk.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/Chunks/SaveChunk.cs

0.4.5 BeeGame.Terrain.ChunkWorldPos Struct Reference

Serializable int version of THVector3

Public Member Functions

- ChunkWorldPos (int x, int y, int z)

  Constructor so that values can be input on creation of the vector
- override string ToString ()

  Formats the values nicely incase it is needed
- override bool Equals (object obj)
- override int GetHashCode ()

  Makes a unique hascode for the vector

Static Public Member Functions

- static implicit operator THVector3 (ChunkWorldPos pos)

  Converts a ChunkWorldPos to a THVector3 without the need for an explicit cast as no data will be lost
- static operator ChunkWorldPos (THVector3 pos)

  Converts a ChunkWorldPos to a THVector3

Public Attributes

- int x

  x, y, z values for the vector
- int y
- int z

0.4.5.1 Detailed Description

Serializable int version of THVector3

Definition at line 10 of file ChunkWorldPos.cs.

0.4.5.2 Constructor & Destructor Documentation

0.4.5.2.1 ChunkWorldPos()

```
BeeGame.Terrain.ChunkWorldPos.ChunkWorldPos (
            int x,
            int y,
            int z )
```

Constructor so that values can be input on creation of the vector

Parameters

x	X Value
y	Y Value
z	Z Value

Definition at line 23 of file ChunkWorldPos.cs.

```
00024         {
00025             this.x = x;
00026             this.y = y;
00027             this.z = z;
00028         }
```

0.4.5.3 Member Function Documentation

0.4.5.3.1 Equals()

```
override bool BeeGame.Terrain.ChunkWorldPos.Equals (
            object obj )
```

Definition at line 41 of file ChunkWorldPos.cs.

```
00042         {
00043             //possibly remove and just check if obj is null
00044             if (!(obj is ChunkWorldPos))
00045                 return false;
00046 
00047             ChunkWorldPos temp = (ChunkWorldPos)obj;
00048 
00049             //possibly change to hashcode checking
00050             if (temp.x == x && temp.y == y && temp.z == z)
00051                 return true;
00052 
00053             return false;
00054         }
```

0.4.5.3.2 GetHashCode()

```
override int BeeGame.Terrain.ChunkWorldPos.GetHashCode ( )
```

Makes a unique hascode for the vector

Returns

unique int value for the vector

Possible that 2 defferent values can give the same hashcode but chance of that happening and the vectors needing to be checked against each other is low

Definition at line 63 of file ChunkWorldPos.cs.

```
00064         {
00065             unchecked
00066             {
00067                 int hashcode = 47;
00068 
00069                 hashcode *= 227 + x.GetHashCode();
00070                 hashcode *= 227 + y.GetHashCode();
00071                 hashcode *= 227 + z.GetHashCode();
00072 
00073                 return hashcode;
00074             }
00075         }
```

0.4.5.3.3 operator ChunkWorldPos()

```
static BeeGame.Terrain.ChunkWorldPos.operator ChunkWorldPos (
            THVector3 pos )  [explicit], [static]
```

Converts a ChunkWorldPos to a THVector3

Parameters

pos	A THVector3

Operator is explicit as data could be lost, THVector3 is a float and ChunkWorldPos is a int

Definition at line 93 of file ChunkWorldPos.cs.

```
00094         {
00095             return new ChunkWorldPos((int)pos.x, (int)pos.y, (int)pos.
      z);
00096         }
```

0.4.5.3.4 operator THVector3()

```
static implicit BeeGame.Terrain.ChunkWorldPos.operator THVector3 (
              ChunkWorldPos pos )  [static]
```

Converts a ChunkWorldPos to a THVector3 without the need for an explicit cast as no data will be lost

Parameters

pos	this ChunkWorldPos

Definition at line 81 of file ChunkWorldPos.cs.

```
00082         {
00083             return new THVector3(pos.x, pos.y, pos.z);
00084         }
```

0.4.5.3.5 ToString()

```
override string BeeGame.Terrain.ChunkWorldPos.ToString ( )
```

Formats the values nicely incase it is needed

Returns

Definition at line 34 of file ChunkWorldPos.cs.

```
00035         {
00036             return $"({x}, {y}, {z})";
00037         }
```

0.4.5.4 Member Data Documentation

0.4.5.4.1 x

```
int BeeGame.Terrain.ChunkWorldPos.x
```

x, y, z values for the vector

Definition at line 15 of file ChunkWorldPos.cs.

0.4.5.4.2 y

```
int BeeGame.Terrain.ChunkWorldPos.y
```

Definition at line 15 of file ChunkWorldPos.cs.

0.4.5.4.3 z

```
int BeeGame.Terrain.ChunkWorldPos.z
```

Definition at line 15 of file ChunkWorldPos.cs.

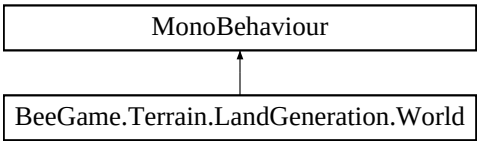
The documentation for this struct was generated from the following file:

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/ChunkWorldPos.cs

0.4.6 BeeGame.Terrain.LandGeneration.World Class Reference

Allows inter Chunk communication as it stores a list of active chunks

Inheritance diagram for BeeGame.Terrain.LandGeneration.World:



Public Member Functions

- void CreateChunk (int x, int y, int z)
  Creates a chunk at the given x, y, z
- void DestroyChunk (int x, int y, int z)
  Destroys a Chunk st the given x, y, z postion
- void SetBlock (int x, int y, int z, Block block, bool saveChunk=false)
  Sets a Block at the given position
- Chunk GetChunk (int x, int y, int z)
  Gets a chunk at eh given x, y, z
- Block GetBlock (int x, int y, int z)
  Gets a Block at the given position

Public Attributes

- Dictionary< ChunkWorldPos, Chunk > chunks = new Dictionary<ChunkWorldPos, Chunk>()
  All of the currently loaded chunks
- GameObject chunkPrefab
  The chunk prefab
- bool chunkHasMadeCollisionMesh = false
  Has a Chunk made a collision mesh?

Private Member Functions

- void UpdateIfEqual (int value1, int value2, ChunkWorldPos pos)

  Updates a chunk if value1 and value2 are equal

0.4.6.1 Detailed Description

Allows inter Chunk communication as it stores a list of active chunks

Definition at line 14 of file World.cs.

0.4.6.2 Member Function Documentation

0.4.6.2.1 CreateChunk()

```
void BeeGame.Terrain.LandGeneration.World.CreateChunk (
            int x,
            int y,
            int z )
```

Creates a chunk at the given x, y, z

Parameters

x	X pos to make the new chunk
y	Y pos to make the new chunk
z	Z pos to make the new chunk

Definition at line 41 of file World.cs.

```
00042         {
00043             //*pos of the chunk
00044             ChunkWorldPos pos = new ChunkWorldPos(x, y, z);
00045 
00046             //*makes the chunk at the given position
00047             GameObject newChunk = Instantiate(chunkPrefab, new Vector3(x, y, z), Quaternion.
      identity);
00048 
00049             Chunk chunk = newChunk.GetComponent<Chunk>();
00050 
00051             //*setting the chunks pos and a reference to this
00052             chunk.chunkWorldPos = pos;
00053             chunk.world = this;
00054 
00055             //*adds the nwe chunk to the dictionary
00056             chunks.Add(pos, chunk);
00057 
00058             //*generates the new chunks blocks
00059             chunk = new TerrainGeneration().ChunkGen(chunk);
00060 
00061             //loads any blocks that the chunk has had modified
00062             Serialization.Serialization.LoadChunk(chunk);
00063 
00064             //*updates all chunks around this one to reduce drawing of unecisary faces
00065             chunks.TryGetValue(new ChunkWorldPos(x, y - 16, z), out chunk);
00066             if (chunk != null)
00067                 chunk.update = true;
00068 
```

```
00069             chunks.TryGetValue(new ChunkWorldPos(x, y, z - 16), out chunk);
00070             if (chunk != null)
00071                 chunk.update = true;
00072
00073             chunks.TryGetValue(new ChunkWorldPos(x - 16, y, z), out chunk);
00074             if (chunk != null)
00075                 chunk.update = true;
00076
00077             chunks.TryGetValue(new ChunkWorldPos(x, y + 16, z), out chunk);
00078             if (chunk != null)
00079                 chunk.update = true;
00080
00081             chunks.TryGetValue(new ChunkWorldPos(x, y, z + 16), out chunk);
00082             if (chunk != null)
00083                 chunk.update = true;
00084
00085             chunks.TryGetValue(new ChunkWorldPos(x + 16, y, z), out chunk);
00086             if (chunk != null)
00087                 chunk.update = true;
00088             //*the chunk will then make its meshes
00089         }
```

0.4.6.2.2 DestroyChunk()

```
void BeeGame.Terrain.LandGeneration.World.DestroyChunk (
              int x,
              int y,
              int z )
```

Destroys a Chunk st the given x, y, z postion

Parameters

x	X pos if the chunk
y	Y pos if the chunk
z	Z pos if the chunk

Definition at line 97 of file World.cs.

```
00098         {
00099             //*if teh chnks exists destroy it
00100             if (chunks.TryGetValue(new ChunkWorldPos(x, y, z), out Chunk chunk))
00101             {
00102                 //*saves the chunk before destroying it incase any block were changed in it
00103                 Serialization.Serialization.SaveChunk(chunk);
00104                 Destroy(chunk.gameObject);
00105                 chunks.Remove(new ChunkWorldPos(x, y, z));
00106             }
00107         }
```

0.4.6.2.3 GetBlock()

```
Block BeeGame.Terrain.LandGeneration.World.GetBlock (
              int x,
              int y,
              int z )
```

Gets a Block at the given position

Parameters

x	X pos of the block
y	Y pos of the block
z	Z pos of the block

Returns

Block at given x, y, z position

Definition at line 184 of file World.cs.

```
00185         {
00186             //*gets the chunk that the block is in
00187             Chunk chunk = GetChunk(x, y, z);
00188 
00189             if(chunk != null)
00190             {
00191                 //*gets the block in the chunk
00192                 return chunk.GetBlock(x - chunk.chunkWorldPos.
      x, y - chunk.chunkWorldPos.y, z - chunk.chunkWorldPos.
      z);
00193             }
00194 
00195             //*returns an empty block is the chunk was not found
00196             return new Air();
00197         }
```

0.4.6.2.4 GetChunk()

```
Chunk BeeGame.Terrain.LandGeneration.World.GetChunk (
              int x,
              int y,
              int z )
```

Gets a chunk at eh given x, y, z

Parameters

x	X pos of the chunk
y	Y pos of the chunk
z	Z pos of the chunk

Returns

Chunk at given x, y, z

Definition at line 160 of file World.cs.

```
00161         {
00162             float multiple = Chunk.chunkSize;
00163             //*rounds the given x, y, z to a multiple of 16 as chunks are 16x16x16 in size
00164             ChunkWorldPos pos = new ChunkWorldPos()
00165             {
00166                 x = Mathf.FloorToInt(x / multiple) * Chunk.chunkSize,
```

```
00167                 y = Mathf.FloorToInt(y / multiple) * Chunk.chunkSize,
00168                 z = Mathf.FloorToInt(z / multiple) * Chunk.chunkSize
00169             };
00170 
00171             //*gets the chunk if it exists
00172             chunks.TryGetValue(pos, out Chunk chunk);
00173             //*if the chunk does not exist will return null
00174             return chunk;
00175         }
```

0.4.6.2.5 SetBlock()

```
void BeeGame.Terrain.LandGeneration.World.SetBlock (
              int x,
              int y,
              int z,
              Block block,
              bool saveChunk = false )
```

Sets a Block at the given position

Parameters

x	X pos of the block
y	Y pos of the block
z	Z pos of the block
block	Block to be placed

Definition at line 118 of file World.cs.

```
00119         {
00120             //*gets the chunk for the block to be placed in
00121             Chunk chunk = GetChunk(x, y, z);
00122 
00123             //*if the chunk is not null and the block trying to be replaced is replaceable, replace it
00124             if(chunk != null && chunk.blocks[x - chunk.chunkWorldPos.
      x, y - chunk.chunkWorldPos.y, z - chunk.chunkWorldPos.
      z].breakable)
00125             {
00126 
00127                 chunk.SetBlock(x - chunk.chunkWorldPos.x, y - chunk.
      chunkWorldPos.y, z - chunk.chunkWorldPos.z, block);
00128                 chunk.update = true;
00129 
00130                 //*updates the nebouring chunks as when a block is broken it may be in the edje of the
       chunk so their meshes also need to be updated
00131                 //*only updates chunks that need to be updated as not every chunk will need to be and
       sometines none of them will need to be
00132 
00133                 //*checks if the block chaged is in the edge if the x value for the chunk
00134                 UpdateIfEqual(x - chunk.chunkWorldPos.
      x, 0, new ChunkWorldPos(x - 1, y, z));
00135                 UpdateIfEqual(x - chunk.chunkWorldPos.
      x, Chunk.chunkSize - 1, new ChunkWorldPos(x + 1, y, z));
00136 
00137                 //*checks if the block chaged is in the edge if the y value for the chunk
00138                 UpdateIfEqual(y - chunk.chunkWorldPos.
      y, 0, new ChunkWorldPos(x, y - 1, z));
00139                 UpdateIfEqual(y - chunk.chunkWorldPos.
      y, Chunk.chunkSize - 1, new ChunkWorldPos(x, y + 1, z));
00140 
00141                 //*checks if the block chaged is in the edge if the z value for the chunk
00142                 UpdateIfEqual(z - chunk.chunkWorldPos.
      z, 0, new ChunkWorldPos(x, y, z - 1));
00143                 UpdateIfEqual(z - chunk.chunkWorldPos.
      z, Chunk.chunkSize - 1, new ChunkWorldPos(x, y, z + 1));
00144 
```

```
00145                 if (saveChunk)
00146                     Serialization.Serialization.SaveChunk(chunk);
00147             }
00148         }
```

0.4.6.2.6 UpdateIfEqual()

```
void BeeGame.Terrain.LandGeneration.World.UpdateIfEqual (
            int value1,
            int value2,
            ChunkWorldPos pos )  [private]
```

Updates a chunk if *value1* and *value2* are equal

Parameters

value1	First value to check
value2	Second value to check
pos	Position of chunk to update if values are equal

Definition at line 206 of file World.cs.

```
00207         {
00208             if(value1 == value2)
00209             {
00210                 Chunk chunk = GetChunk(pos.x, pos.y, pos.z);
00211 
00212                 if (chunk != null)
00213                     chunk.update = true;
00214             }
00215         }
```

0.4.6.3 Member Data Documentation

0.4.6.3.1 chunkHasMadeCollisionMesh

```
bool BeeGame.Terrain.LandGeneration.World.chunkHasMadeCollisionMesh = false
```

Has a Chunk made a collision mesh?

Definition at line 30 of file World.cs.

0.4.6.3.2 chunkPrefab

```
GameObject BeeGame.Terrain.LandGeneration.World.chunkPrefab
```

The chunk prefab

Definition at line 25 of file World.cs.

0.4.6.3.3 chunks

```
Dictionary<ChunkWorldPos, Chunk> BeeGame.Terrain.LandGeneration.World.chunks = new Dictionary<Chunk↩
WorldPos, Chunk>()
```

All of the currently loaded chunks

Definition at line 20 of file World.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/LandGeneration/World.↩
cs

0.4.7 BeeGame.Terrain.LandGeneration.Terrain Class Reference

Should use as an interface between the rest of the game and the terrain

Static Public Member Functions

- static ChunkWorldPos GetBlockPos (THVector3 pos)

  Gets a block postion from a THVector3
- static THVector3 GetBlockPos (RaycastHit hit)

  Returns the positon of the block hit as a THVector3
- static ChunkWorldPos GetBlockPosFromRayCast (RaycastHit hit)

  GetBlockPos(THVector3) does the same thing but returns a ChunkWorldPos
- static float Round (float pos, float norm, bool adjacent=false)

  Rounds the given pos to the correct position
- static ChunkWorldPos GetBlockPos (RaycastHit hit, bool adjacent=false)

  Gets a Chunks world positon
- static Block GetBlock (RaycastHit hit, bool adjacent=false)

  Get a Block at the given position
- static Block GetBlock (THVector3 pos)
- static bool BlockInPosition (THVector3 pos, Chunk chunk)
- static Chunk GetChunk (THVector3 vec3)
- static bool SetBlock (RaycastHit hit, Block block, bool adjacent=false)

  Sets the Block at the given point the given Block

Static Public Attributes

- static World world

Static Private Member Functions

- static float RoundXZ (float pos, float normal)

  Used to round the X/Z values when getting a block
- static float RoundY (float pos, float normal)

  Round the Y value of the given coord

0.4.7.1 Detailed Description

Should use as an interface between the rest of the game and the terrain

Definition at line 15 of file Terrain.cs.

0.4.7.2 Member Function Documentation

0.4.7.2.1 BlockInPosition()

```
static bool BeeGame.Terrain.LandGeneration.Terrain.BlockInPosition (
            THVector3 pos,
            Chunk chunk )  [static]
```

Definition at line 250 of file Terrain.cs.

```
00251         {
00252             if (chunk == null)
00253                 return false;
00254
00255             if (chunk.GetBlock((int)pos.x, (int)pos.y, (int)pos.z) != new
      Air())
00256                 return true;
00257
00258             return false;
00259         }
```

0.4.7.2.2 GetBlock() [1/2]

```
static Block BeeGame.Terrain.LandGeneration.Terrain.GetBlock (
            RaycastHit hit,
            bool adjacent = false )  [static]
```

Get a Block at the given position

Parameters

hit	Where to get the block from
adjacent	Should the adjacent Block be returned

Returns

Block at *hit.point* , Null if no block was found

Definition at line 224 of file Terrain.cs.

```
00225         {
00226             //*checks that a chunk was hit and if it wasnt return early
00227             Chunk chunk = hit.collider.GetComponent<Chunk>();
```

```
00228
00229             if (chunk == null)
00230                 return null;
00231
00232             //*allignes the hit to the block grid and returns the block
00233             ChunkWorldPos pos = GetBlockPos(hit, adjacent);
00234
00235             return chunk.world.GetBlock(pos.x, pos.y, pos.z);
00236         }
```

0.4.7.2.3 GetBlock() [2/2]

```
static Block BeeGame.Terrain.LandGeneration.Terrain.GetBlock (
            THVector3 pos )  [static]
```

Definition at line 238 of file Terrain.cs.

```
00239         {
00240             Chunk chunk = GetChunk(pos);
00241
00242             if (chunk == null)
00243                 return new Air();
00244
00245             chunk.world.GetBlock((int)pos.x, (int)pos.y, (int)pos.z);
00246
00247             return new Block();
00248         }
```

0.4.7.2.4 GetBlockPos() [1/3]

```
static ChunkWorldPos BeeGame.Terrain.LandGeneration.Terrain.GetBlockPos (
            THVector3 pos )  [static]
```

Gets a block postion from a THVector3

Parameters

pos	Position of the block as a THVector3

Returns

ChunkWorldPos of the Block

Definition at line 25 of file Terrain.cs.

```
00026         {
00027             return new ChunkWorldPos()
00028             {
00029                 x = Mathf.RoundToInt(pos.x),
00030                 y = Mathf.RoundToInt(pos.y),
00031                 z = Mathf.RoundToInt(pos.z)
00032             };
00033         }
```

0.4.7.2.5 GetBlockPos() [2/3]

```
static THVector3 BeeGame.Terrain.LandGeneration.Terrain.GetBlockPos (
            RaycastHit hit )  [static]
```

Returns the positon of the block hit as a THVector3

Parameters

hit	RaycastHit
adjacent	Do you want the face adjecent to the block hit

Returns

THVector3 of the block you hit in world cordinates

Definition at line 41 of file Terrain.cs.

```
00042         {
00043             THVector3 vec3 = new THVector3()
00044             {
00045                 x = RoundXZ(hit.point.x, hit.normal.x),
00046                 y = RoundY(hit.point.y, hit.normal.y),
00047                 z = RoundXZ(hit.point.z, hit.normal.z)
00048             };
00049             return (vec3);
00050         }
```

0.4.7.2.6 GetBlockPos() [3/3]

```
static ChunkWorldPos BeeGame.Terrain.LandGeneration.Terrain.GetBlockPos (
            RaycastHit hit,
            bool adjacent = false )  [static]
```

Gets a Chunks world positon

Parameters

hit	Where the raycast hit
adjacent	Should the adjacent Chunk position be returned?

Returns

ChunkWorldPos of the Chunk

Returns

Definition at line 207 of file Terrain.cs.

```
00208         {
00209             return GetBlockPos(new THVector3()
```

```
00210             {
00211                 //*rounds the hit to the correct position
00212                 x = Round(hit.point.x, hit.normal.x, adjacent),
00213                 y = Round(hit.point.y, hit.normal.y, adjacent),
00214                 z = Round(hit.point.z, hit.normal.z, adjacent)
00215             });
00216         }
```

0.4.7.2.7 GetBlockPosFromRayCast()

```
static ChunkWorldPos BeeGame.Terrain.LandGeneration.Terrain.GetBlockPosFromRayCast (
            RaycastHit hit )  [static]
```

GetBlockPos(THVector3) does the same thing but returns a ChunkWorldPos

Parameters

hit	

Returns

Definition at line 57 of file Terrain.cs.

```
00058         {
00059             return new ChunkWorldPos((int)RoundXZ(hit.point.x, hit.normal.x), (int)
      RoundY(hit.point.y, hit.normal.y), (int)RoundXZ(hit.point.z, hit.normal.z));
00060         }
```

0.4.7.2.8 GetChunk()

```
static Chunk BeeGame.Terrain.LandGeneration.Terrain.GetChunk (
            THVector3 vec3 )  [static]
```

Definition at line 262 of file Terrain.cs.

```
00263         {
00264             return world.GetChunk((int)vec3.x, (int)vec3.y, (int)vec3.
      z);
00265         }
```

0.4.7.2.9 Round()

```
static float BeeGame.Terrain.LandGeneration.Terrain.Round (
            float pos,
            float norm,
            bool adjacent = false )  [static]
```

Rounds the given pos to the correct position

Parameters

pos	Position that needs to be rounded
norm	Normal for the face
adjacent	Should the adjacent block be recived

Returns

rounded value of *pos* as a float

Check how this performs. Possibly change all uses of this to RoundXZ(float, float) and RoundY(float, float)

Definition at line 182 of file Terrain.cs.

```
00183         {
00184             if(pos - (int)pos == 0.5f || pos - (int)pos == -0.5f)
00185             {
00186                 if(adjacent)
00187                 {
00188                     pos += (norm / 2);
00189                 }
00190                 else
00191                 {
00192                     pos -= (norm / 2);
00193                 }
00194             }
00195 
00196             return pos;
00197         }
```

0.4.7.2.10 RoundXZ()

```
static float BeeGame.Terrain.LandGeneration.Terrain.RoundXZ (
              float pos,
              float normal )  [static], [private]
```

Used to round the X/Z values when getting a block

Parameters

pos	X/Y pos
normal	X/Y normal

Returns

rounded *pos*

Do I realy need to do all this?

Definition at line 71 of file Terrain.cs.

```
00072         {
00073             //*if we are looking at + x/z vlaues
00074             if (pos > 0)
```

```
00075             {
00076                 if (normal > 0)
00077                 {
00078                     pos = (int)pos;
00079                     return pos;
00080                 }
00081                 else if (normal < 0)
00082                 {
00083                     pos = (int)pos;
00084                     return pos - -1;
00085                 }
00086                 else
00087                 {
00088                     if ((pos - (int)pos) > 0.5)
00089                     {
00090                         return (int)pos + 1;
00091                     }
00092                     return (int)pos;
00093                 }
00094             }
00095             //*if we are looking at - x/z values
00096             else
00097             {
00098                 //*if poitive normal
00099                 if (normal > 0)
00100                 {
00101                     pos = (int)pos;
00102                     return pos - 1;
00103                 }
00104 
00105                 //*if negative nomrmal
00106                 if (normal < 0)
00107                 {
00108                     pos = (int)pos;
00109                     return pos;
00110                 }
00111                 //*if their is no normal
00112 
00113                 //*if pos is greater than 0.5 we are in the next block so go to it
00114                 if ((-pos - (int)-pos) > 0.5)
00115                 {
00116                     return (int)pos - 1;
00117                 }
00118 
00119                 return (int)pos;
00120             }
00121         }
```

0.4.7.2.11 RoundY()

```
static float BeeGame.Terrain.LandGeneration.Terrain.RoundY (
            float pos,
            float normal )  [static], [private]
```

Round the Y value of the given coord

Parameters

pos	Y pos
normal	Y normal

Returns

pos rounded to 1 DP

Do I have to do this? or is their an easier way to do this

Definition at line 132 of file Terrain.cs.

```
00133         {
00134             pos = (float)Math.Round(pos, 1);
00135             if (pos >= 0)
00136             {
00137                 if(normal > 0)
00138                 {
00139                     if((int)pos % 2 == 0)
00140                         return Mathf.RoundToInt((float)Math.Round(pos, 1));
00141 
00142                     return Mathf.RoundToInt((float)Math.Round(pos, 1)) - normal;
00143                 }
00144 
00145                 if((int)pos % 2 == 0)
00146                     return Mathf.RoundToInt((float)Math.Round(pos, 1)) - normal;
00147 
00148                 return Mathf.RoundToInt((float)Math.Round(pos, 1));
00149             }
00150 
00151             if(pos <= 0)
00152             {
00153                 if (normal > 0)
00154                 {
00155                     if ((int)pos % 2 == 0)
00156                         //*the Math.Round removes strange rounding errors shown with Mathf.Round eg
       sometimes 0.5 would round to 0 not 1
00157                         return Mathf.RoundToInt((float)Math.Round(pos, 1)) - normal;
00158 
00159                     return Mathf.RoundToInt((float)Math.Round(pos, 1));// - normal;
00160                 }
00161 
00162                 if ((int)pos % 2 == 0)
00163                     return Mathf.RoundToInt((float)Math.Round(pos, 1));
00164 
00165                 return Mathf.RoundToInt((float)Math.Round(pos, 1)) - normal;
00166             }
00167 
00168 
00169             return Mathf.RoundToInt((float)Math.Round(pos, 1));
00170         }
```

0.4.7.2.12 SetBlock()

```
static bool BeeGame.Terrain.LandGeneration.Terrain.SetBlock (
            RaycastHit hit,
            Block block,
            bool adjacent = false )  [static]
```

Sets the Block at the given point the given Block

Parameters

hit	Where the block should be set
block	Block to be set
adjacent	Should the adjacent Block be set

Returns

true if block was set

Definition at line 275 of file Terrain.cs.

```
00276         {
00277             //*checks that a chnk was hit
00278             Chunk chunk = hit.collider.GetComponent<Chunk>();
00279 
00280             if (chunk == null)
```

```
00281                 return false;
00282
00283             //*alligns the hit to the block grid
00284             ChunkWorldPos pos = GetBlockPosFromRayCast(hit);
00285
00286             //*checks that the block tryign to be replaced can be replaced eg bedrock cannot be replaced
00287             if (GetBlock(hit, adjacent).breakable)
00288             {
00289                 //*sets the position of the block and saves the chunk
00290                 chunk.world.SetBlock(pos.x, pos.y, pos.z, block);
00291                 Serialization.Serialization.SaveChunk(chunk);
00292             }
00293
00294             return true;
00295         }
```

0.4.7.3 Member Data Documentation

0.4.7.3.1 world

```
World BeeGame.Terrain.LandGeneration.Terrain.world  [static]
```

Definition at line 17 of file Terrain.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/LandGeneration/Terrain.cs

0.4.8 BeeGame.Terrain.LandGeneration.TerrainGeneration Class Reference

Generates the terrain for the game

Public Member Functions

- Chunk ChunkGen (Chunk chunk)

  Generates a Chunk in a new thread
- void ChunkGenThread (Chunk chunk, out Chunk outChunk)

  Generates a new Chunk
- Chunk GenChunkColum (Chunk chunk, int x, int z)

  Generates a colum of the Chunk

Static Public Member Functions

- static int GetNoise (int x, int y, int z, float scale, int max)

  Get a noise value
- static void SetBlock (int x, int y, int z, Blocks.Block block, Chunk chunk, bool replacesBlocks=false)

  Sets a Block in the position

Private Attributes

- float stoneBaseHeight = -24

  Base height of stone
- float stoneBaseNoise = 0.05f

  Base noise of stone
- float stoneBaseNoiseHeight = 4

  Base noise heigh for stone
- float stoneMountainHeight = 48

  Base height for a mountain
- float stoneMountainFrequency = 0.008f

  Frequency of mountains (larger value = more choppy terrain)
- float stoneMinHeight = -12

  Minimun height for stone
- float dirtBaseHeight = 1

  Where does dirt start
- float dirtNoise = 0.04f

  How much of the surface is dirt
- float dirtNoiseHeight = 3

  How tall dirt can be
- float caveFrequency = 0.025f

  How often do caves happen
- int caveSize = 8

  Threashold for makeing a cave

0.4.8.1 Detailed Description

Generates the terrain for the game

Definition at line 13 of file TerrainGeneration.cs.

0.4.8.2 Member Function Documentation

0.4.8.2.1 ChunkGen()

```
Chunk BeeGame.Terrain.LandGeneration.TerrainGeneration.ChunkGen (
            Chunk chunk )
```

Generates a Chunk in a new thread

Parameters

chunk	Chunk to populate with Blocks

Returns

Chunk with Blocks generated

Definition at line 70 of file TerrainGeneration.cs.

```
00071         {
00072             Chunk outChunk = chunk;
00073             lock (chunk)
00074             {
00075                 Thread thread = new Thread(() => ChunkGenThread(chunk, out outChunk)) { Name
      = $"Generate Chunk Thread @ {chunk.chunkWorldPos}"};
00076 
00077                 thread.Start();
00078                 return outChunk;
00079             }
00080         }
```

0.4.8.2.2 ChunkGenThread()

```
void BeeGame.Terrain.LandGeneration.TerrainGeneration.ChunkGenThread (
              Chunk chunk,
              out Chunk outChunk )
```

Generates a new Chunk

Parameters

chunk	Chunk to be generated
outChunk	Generated Chunk to return

Definition at line 87 of file TerrainGeneration.cs.

```
00088         {
00089             //*for each x and z position in teh chunk
00090             for (int x = chunk.chunkWorldPos.x; x < chunk.
      chunkWorldPos.x + Chunk.chunkSize; x++)
00091             {
00092                 for (int z = chunk.chunkWorldPos.z; z < chunk.
      chunkWorldPos.z + Chunk.chunkSize; z++)
00093                 {
00094                     chunk = GenChunkColum(chunk, x, z);
00095                 }
00096             }
00097 
00098             chunk.SetBlocksUnmodified();
00099             outChunk = chunk;
00100         }
```

0.4.8.2.3 GenChunkColum()

```
Chunk BeeGame.Terrain.LandGeneration.TerrainGeneration.GenChunkColum (
              Chunk chunk,
              int x,
              int z )
```

Generates a colum of the Chunk

Parameters

chunk	Chunk to generate a colum for
x	X pos to make the colum
z	Z pos to make the colum

Returns

Chunk with a new colum ob blocks generated

Definition at line 109 of file TerrainGeneration.cs.

```
00110         {
00111             //*the height of the mountain
00112             int stoneHeight = Mathf.FloorToInt(stoneBaseHeight);
00113             stoneHeight += GetNoise(-x, 0, z, stoneMountainFrequency, Mathf.
      FloorToInt(stoneMountainHeight));
00114 
00115             //*if the colum is currenly to low make it not so low
00116             if (stoneHeight < stoneMinHeight)
00117                 stoneHeight = Mathf.FloorToInt(stoneMinHeight);
00118 
00119             //*add the height of normal stone on to the mountain
00120             stoneHeight += GetNoise(x, 0, -z, stoneBaseNoise, Mathf.RoundToInt(
      stoneBaseNoiseHeight));
00121 
00122             //*put dirt on top
00123             int dirtHeight = stoneHeight + Mathf.FloorToInt(dirtBaseHeight);
00124             dirtHeight += GetNoise(x, 100, z, dirtNoise, Mathf.FloorToInt(
      dirtNoiseHeight));
00125 
00126             //*set the colum to the correct blocks
00127             for (int y = chunk.chunkWorldPos.y; y < chunk.
      chunkWorldPos.y + Chunk.chunkSize; y ++)
00128             {
00129                 int caveChance = GetNoise(x + 40, y + 100, z - 50,
      caveFrequency, 200);
00130 
00131                 //*puts a layer of bedrock at the botton the the world
00132                 if (y <= (chunk.chunkWorldPos.y) && chunk.
      chunkWorldPos.y == -16)
00133                 {
00134                     SetBlock(x, y, z, new Blocks.Bedrock(), chunk);
00135                 }
00136                 else if (y <= stoneHeight && caveSize < caveChance)
00137                 {
00138                     SetBlock(x, y, z, new Blocks.Block(), chunk);
00139                 }
00140                 else if (y <= dirtHeight && caveSize < caveChance)
00141                 {
00142                     SetBlock(x, y, z, new Blocks.Grass(), chunk);
00143                 }
00144                 else
00145                 {
00146                     SetBlock(x, y, z, new Blocks.Air(), chunk);
00147                 }
00148             }
00149 
00150                 return chunk;
00151         }
```

0.4.8.2.4 GetNoise()

```
static int BeeGame.Terrain.LandGeneration.TerrainGeneration.GetNoise (
              int x,
              int y,
              int z,
              float scale,
              int max )  [static]
```

Get a noise value

Parameters

x	X pos of the noise
y	Y pos of the noise
z	Z pos of the noise
scale	What the step shout bee from the last x, y, z
max	Max value of the noise

Returns

A noise value as an int

Definition at line 162 of file TerrainGeneration.cs.

```
00163         {
00164             return Mathf.FloorToInt((SimplexNoise.Generate(x * scale, y * scale, z *
      scale) + 1f) * (max / 2f));
00165         }
```

0.4.8.2.5 SetBlock()

```
static void BeeGame.Terrain.LandGeneration.TerrainGeneration.SetBlock (
              int x,
              int y,
              int z,
              Blocks.Block block,
              Chunk chunk,
              bool replacesBlocks = false )  [static]
```

Sets a Block in the position

Parameters

x	X pos of the block
y	Y pos of the block
z	Z pos of the block
block	Block to set
chunk	Chunk to set the block in
replacesBlocks	Can it replace blocks

Definition at line 176 of file TerrainGeneration.cs.

```
00177         {
00178             //*corrects the x, y, z pos of the so that the block is placed in the correct position
00179             x -= chunk.chunkWorldPos.x;
00180             y -= chunk.chunkWorldPos.y;
00181             z -= chunk.chunkWorldPos.z;
00182 
00183             //*chechs that the block is in the chunk and that no block is already their then sets it
00184             if (Chunk.InRange(x) && Chunk.InRange(y) &&
      Chunk.InRange(z))
00185                 if (replacesBlocks || chunk.blocks[x, y, z] == null)
00186                     chunk.SetBlock(x, y, z, block);
00187         }
```

0.4.8.3 Member Data Documentation

0.4.8.3.1 caveFrequency

```
float BeeGame.Terrain.LandGeneration.TerrainGeneration.caveFrequency = 0.025f  [private]
```

How often do caves happen

Definition at line 58 of file TerrainGeneration.cs.

0.4.8.3.2 caveSize

```
int BeeGame.Terrain.LandGeneration.TerrainGeneration.caveSize = 8  [private]
```

Threashold for makeing a cave

Definition at line 62 of file TerrainGeneration.cs.

0.4.8.3.3 dirtBaseHeight

```
float BeeGame.Terrain.LandGeneration.TerrainGeneration.dirtBaseHeight = 1  [private]
```

Where does dirt start

Definition at line 45 of file TerrainGeneration.cs.

0.4.8.3.4 dirtNoise

```
float BeeGame.Terrain.LandGeneration.TerrainGeneration.dirtNoise = 0.04f  [private]
```

How much of the surface is dirt

Definition at line 49 of file TerrainGeneration.cs.

0.4.8.3.5 dirtNoiseHeight

```
float BeeGame.Terrain.LandGeneration.TerrainGeneration.dirtNoiseHeight = 3  [private]
```

How tall dirt can be

Definition at line 53 of file TerrainGeneration.cs.

0.4.8.3.6 stoneBaseHeight

```
float BeeGame.Terrain.LandGeneration.TerrainGeneration.stoneBaseHeight = -24  [private]
```

Base height of stone

Definition at line 19 of file TerrainGeneration.cs.

0.4.8.3.7 stoneBaseNoise

```
float BeeGame.Terrain.LandGeneration.TerrainGeneration.stoneBaseNoise = 0.05f  [private]
```

Base noise of stone

Definition at line 23 of file TerrainGeneration.cs.

0.4.8.3.8 stoneBaseNoiseHeight

```
float BeeGame.Terrain.LandGeneration.TerrainGeneration.stoneBaseNoiseHeight = 4  [private]
```

Base noise heigh for stone

Definition at line 27 of file TerrainGeneration.cs.

0.4.8.3.9 stoneMinHeight

```
float BeeGame.Terrain.LandGeneration.TerrainGeneration.stoneMinHeight = -12  [private]
```

Minimun height for stone

Definition at line 40 of file TerrainGeneration.cs.

0.4.8.3.10 stoneMountainFrequency

```
float BeeGame.Terrain.LandGeneration.TerrainGeneration.stoneMountainFrequency = 0.008f  [private]
```

Frequency of mountains (larger value = more choppy terrain)

Definition at line 36 of file TerrainGeneration.cs.

0.4.8.3.11 stoneMountainHeight

```
float BeeGame.Terrain.LandGeneration.TerrainGeneration.stoneMountainHeight = 48  [private]
```

Base height for a mountain

Definition at line 32 of file TerrainGeneration.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/LandGeneration/TerrainGeneration.cs

0.4.9 BeeGame.Terrain.LandGeneration.Noise.SimplexNoise Class Reference

Implementation of the Perlin simplex noise, an improved Perlin noise algorithm. Based loosely on SimplexNoise1234 by Stefan Gustavson <http://∗staffwww.itn.liu.se/∼stegu/aqsis/aqsis-newnoise/>

Static Public Member Functions

- static float Generate (float x)

  1D simplex noise
- static float Generate (float x, float y)

  2D simplex noise
- static float Generate (float x, float y, float z)

Static Public Attributes

- static byte [ ] perm

Static Private Member Functions

- static int FastFloor (float x)
- static int Mod (int x, int m)
- static float grad (int hash, float x)
- static float grad (int hash, float x, float y)
- static float grad (int hash, float x, float y, float z)
- static float grad (int hash, float x, float y, float z, float t)

0.4.9.1 Detailed Description

Implementation of the Perlin simplex noise, an improved Perlin noise algorithm. Based loosely on SimplexNoise1234 by Stefan Gustavson <http://∗staffwww.itn.liu.se/∼stegu/aqsis/aqsis-newnoise/>

Definition at line 37 of file SimplexNoise.cs.

0.4.9.2 Member Function Documentation

0.4.9.2.1 FastFloor()

```
static int BeeGame.Terrain.LandGeneration.Noise.SimplexNoise.FastFloor (
            float x )  [static], [private]
```

Definition at line 272 of file SimplexNoise.cs.

```
00273         {
00274             return (x > 0) ? ((int)x) : (((int)x) - 1);
00275         }
```

0.4.9.2.2 Generate() [1/3]

```
static float BeeGame.Terrain.LandGeneration.Noise.SimplexNoise.Generate (
            float x )  [static]
```

1D simplex noise

Parameters

x	

Returns

Definition at line 44 of file SimplexNoise.cs.

```
00045         {
00046             int i0 = FastFloor(x);
00047             int i1 = i0 + 1;
00048             float x0 = x - i0;
00049             float x1 = x0 - 1.0f;
00050 
00051             float n0, n1;
00052 
00053             float t0 = 1.0f - x0 * x0;
00054             t0 *= t0;
00055             n0 = t0 * t0 * grad(perm[i0 & 0xff], x0);
00056 
00057             float t1 = 1.0f - x1 * x1;
00058             t1 *= t1;
00059             n1 = t1 * t1 * grad(perm[i1 & 0xff], x1);
00060             //* The maximum value of this noise is 8*(3/4)^4 = 2.53125
00061             //* A factor of 0.395 scales to fit exactly within [-1,1]
00062             return 0.395f * (n0 + n1);
00063         }
```

0.4.9.2.3 Generate() [2/3]

```
static float BeeGame.Terrain.LandGeneration.Noise.SimplexNoise.Generate (
            float x,
            float y )  [static]
```

2D simplex noise

Parameters

x	
y	

Returns

Definition at line 71 of file SimplexNoise.cs.

```
00072         {
00073             const float F2 = 0.366025403f; //* F2 = 0.5*(sqrt(3.0)-1.0)
00074             const float G2 = 0.211324865f; //* G2 = (3.0-Math.sqrt(3.0))/6.0
00075 
00076             float n0, n1, n2; //* Noise contributions from the three corners
00077 
00078             //* Skew the input space to determine which simplex cell we're in
00079             float s = (x + y) * F2; //* Hairy factor for 2D
00080             float xs = x + s;
00081             float ys = y + s;
00082             int i = FastFloor(xs);
00083             int j = FastFloor(ys);
00084 
00085             float t = (float)(i + j) * G2;
00086             float X0 = i - t; //* Unskew the cell origin back to (x,y) space
00087             float Y0 = j - t;
00088             float x0 = x - X0; //* The x,y distances from the cell origin
00089             float y0 = y - Y0;
00090 
00091             //* For the 2D case, the simplex shape is an equilateral triangle.
00092             //* Determine which simplex we are in.
00093             int i1, j1; //* Offsets for second (middle) corner of simplex in (i,j) coords
00094             if (x0 > y0) { i1 = 1; j1 = 0; } //* lower triangle, XY order: (0,0)->(1,0)->(1,1)
00095             else { i1 = 0; j1 = 1; }      //* upper triangle, YX order: (0,0)->(0,1)->(1,1)
00096 
00097             //* A step of (1,0) in (i,j) means a step of (1-c,-c) in (x,y), and
00098             //* a step of (0,1) in (i,j) means a step of (-c,1-c) in (x,y), where
00099             //* c = (3-sqrt(3))/6
00100 
00101             float x1 = x0 - i1 + G2; //* Offsets for middle corner in (x,y) unskewed coords
00102             float y1 = y0 - j1 + G2;
00103             float x2 = x0 - 1.0f + 2.0f * G2; //* Offsets for last corner in (x,y) unskewed coords
00104             float y2 = y0 - 1.0f + 2.0f * G2;
00105 
00106             //* Wrap the integer indices at 256, to avoid indexing perm[] out of bounds
00107             int ii = i % 256;
00108             int jj = j % 256;
00109 
00110             //* Calculate the contribution from the three corners
00111             float t0 = 0.5f - x0 * x0 - y0 * y0;
00112             if (t0 < 0.0f) n0 = 0.0f;
00113             else
00114             {
00115                 t0 *= t0;
00116                 n0 = t0 * t0 * grad(perm[ii + perm[jj]], x0, y0);
00117             }
00118 
00119             float t1 = 0.5f - x1 * x1 - y1 * y1;
00120             if (t1 < 0.0f) n1 = 0.0f;
00121             else
00122             {
00123                 t1 *= t1;
00124                 n1 = t1 * t1 * grad(perm[ii + i1 + perm[jj + j1]], x1, y1);
00125             }
00126 
00127             float t2 = 0.5f - x2 * x2 - y2 * y2;
00128             if (t2 < 0.0f) n2 = 0.0f;
00129             else
00130             {
00131                 t2 *= t2;
00132                 n2 = t2 * t2 * grad(perm[ii + 1 + perm[jj + 1]], x2, y2);
00133             }
00134 
00135             //* Add contributions from each corner to get the final noise value.
00136             //* The result is scaled to return values in the interval [-1,1].
00137             return 40.0f * (n0 + n1 + n2); //* TODO: The scale factor is preliminary!
00138         }
```

0.4.9.2.4 Generate() [3/3]

```
static float BeeGame.Terrain.LandGeneration.Noise.SimplexNoise.Generate (
            float x,
            float y,
            float z )  [static]
```

Definition at line 141 of file SimplexNoise.cs.

```
00142         {
00143             //* Simple skewing factors for the 3D case
00144             const float F3 = 0.333333333f;
00145             const float G3 = 0.166666667f;
00146 
00147             float n0, n1, n2, n3; //* Noise contributions from the four corners
00148 
00149             //* Skew the input space to determine which simplex cell we're in
00150             float s = (x + y + z) * F3; //* Very nice and simple skew factor for 3D
00151             float xs = x + s;
00152             float ys = y + s;
00153             float zs = z + s;
00154             int i = FastFloor(xs);
00155             int j = FastFloor(ys);
00156             int k = FastFloor(zs);
00157 
00158             float t = (float)(i + j + k) * G3;
00159             float X0 = i - t; //* Unskew the cell origin back to (x,y,z) space
00160             float Y0 = j - t;
00161             float Z0 = k - t;
00162             float x0 = x - X0; //* The x,y,z distances from the cell origin
00163             float y0 = y - Y0;
00164             float z0 = z - Z0;
00165 
00166             //* For the 3D case, the simplex shape is a slightly irregular tetrahedron.
00167             //* Determine which simplex we are in.
00168             int i1, j1, k1; //* Offsets for second corner of simplex in (i,j,k) coords
00169             int i2, j2, k2; //* Offsets for third corner of simplex in (i,j,k) coords
00170 
00171             /* This code would benefit from a backport from the GLSL version! */
00172             if (x0 >= y0)
00173             {
00174                 if (y0 >= z0)
00175                 { i1 = 1; j1 = 0; k1 = 0; i2 = 1; j2 = 1; k2 = 0; } //* X Y Z order
00176                 else if (x0 >= z0) { i1 = 1; j1 = 0; k1 = 0; i2 = 1; j2 = 0; k2 = 1; } //* X Z Y order
00177                 else { i1 = 0; j1 = 0; k1 = 1; i2 = 1; j2 = 0; k2 = 1; } //* Z X Y order
00178             }
00179             else
00180             { //* x0<y0
00181                 if (y0 < z0) { i1 = 0; j1 = 0; k1 = 1; i2 = 0; j2 = 1; k2 = 1; } //* Z Y X order
00182                 else if (x0 < z0) { i1 = 0; j1 = 1; k1 = 0; i2 = 0; j2 = 1; k2 = 1; } //* Y Z X order
00183                 else { i1 = 0; j1 = 1; k1 = 0; i2 = 1; j2 = 1; k2 = 0; } //* Y X Z order
00184             }
00185 
00186             //* A step of (1,0,0) in (i,j,k) means a step of (1-c,-c,-c) in (x,y,z),
00187             //* a step of (0,1,0) in (i,j,k) means a step of (-c,1-c,-c) in (x,y,z), and
00188             //* a step of (0,0,1) in (i,j,k) means a step of (-c,-c,1-c) in (x,y,z), where
00189             //* c = 1/6.
00190 
00191             float x1 = x0 - i1 + G3; //* Offsets for second corner in (x,y,z) coords
00192             float y1 = y0 - j1 + G3;
00193             float z1 = z0 - k1 + G3;
00194             float x2 = x0 - i2 + 2.0f * G3; //* Offsets for third corner in (x,y,z) coords
00195             float y2 = y0 - j2 + 2.0f * G3;
00196             float z2 = z0 - k2 + 2.0f * G3;
00197             float x3 = x0 - 1.0f + 3.0f * G3; //* Offsets for last corner in (x,y,z) coords
00198             float y3 = y0 - 1.0f + 3.0f * G3;
00199             float z3 = z0 - 1.0f + 3.0f * G3;
00200 
00201             //* Wrap the integer indices at 256, to avoid indexing perm[] out of bounds
00202             int ii = Mod(i, 256);
00203             int jj = Mod(j, 256);
00204             int kk = Mod(k, 256);
00205 
00206             //* Calculate the contribution from the four corners
00207             float t0 = 0.6f - x0 * x0 - y0 * y0 - z0 * z0;
00208             if (t0 < 0.0f) n0 = 0.0f;
00209             else
00210             {
00211                 t0 *= t0;
00212                 n0 = t0 * t0 * grad(perm[ii + perm[jj + perm[kk]]], x0, y0, z0);
00213             }
00214 
```

```
00215             float t1 = 0.6f - x1 * x1 - y1 * y1 - z1 * z1;
00216             if (t1 < 0.0f) n1 = 0.0f;
00217             else
00218             {
00219                 t1 *= t1;
00220                 n1 = t1 * t1 * grad(perm[ii + i1 + perm[jj + j1 +
      perm[kk + k1]]], x1, y1, z1);
00221             }
00222
00223             float t2 = 0.6f - x2 * x2 - y2 * y2 - z2 * z2;
00224             if (t2 < 0.0f) n2 = 0.0f;
00225             else
00226             {
00227                 t2 *= t2;
00228                 n2 = t2 * t2 * grad(perm[ii + i2 + perm[jj + j2 +
      perm[kk + k2]]], x2, y2, z2);
00229             }
00230
00231             float t3 = 0.6f - x3 * x3 - y3 * y3 - z3 * z3;
00232             if (t3 < 0.0f) n3 = 0.0f;
00233             else
00234             {
00235                 t3 *= t3;
00236                 n3 = t3 * t3 * grad(perm[ii + 1 + perm[jj + 1 + perm[kk + 1]]], x3, y3, z3)
      ;
00237             }
00238
00239             //* Add contributions from each corner to get the final noise value.
00240             //* The result is scaled to stay just inside [-1,1]
00241             return 32.0f * (n0 + n1 + n2 + n3); //* TODO: The scale factor is preliminary!
00242         }
```

0.4.9.2.5 grad() [1/4]

```
static float BeeGame.Terrain.LandGeneration.Noise.SimplexNoise.grad (
             int hash,
             float x )  [static], [private]
```

Definition at line 283 of file SimplexNoise.cs.

```
00284         {
00285             int h = hash & 15;
00286             float grad = 1.0f + (h & 7);   //* Gradient value 1.0, 2.0, ..., 8.0
00287             if ((h & 8) != 0) grad = -grad;         //* Set a random sign for the gradient
00288             return (grad * x);           //* Multiply the gradient with the distance
00289         }
```

0.4.9.2.6 grad() [2/4]

```
static float BeeGame.Terrain.LandGeneration.Noise.SimplexNoise.grad (
             int hash,
             float x,
             float y )  [static], [private]
```

Definition at line 291 of file SimplexNoise.cs.

```
00292         {
00293             int h = hash & 7;      //* Convert low 3 bits of hash code
00294             float u = h < 4 ? x : y;  //* into 8 simple gradient directions,
00295             float v = h < 4 ? y : x;  //* and compute the dot product with (x,y).
00296             return ((h & 1) != 0 ? -u : u) + ((h & 2) != 0 ? -2.0f * v : 2.0f * v);
00297         }
```

0.4.9.2.7 grad() [3/4]

```
static float BeeGame.Terrain.LandGeneration.Noise.SimplexNoise.grad (
             int hash,
             float x,
             float y,
             float z )  [static], [private]
```

Definition at line 299 of file SimplexNoise.cs.

```
00300         {
00301             int h = hash & 15;     //* Convert low 4 bits of hash code into 12 simple
00302             float u = h < 8 ? x : y; //* gradient directions, and compute dot product.
00303             float v = h < 4 ? y : h == 12 || h == 14 ? x : z; //* Fix repeats at h = 12 to 15
00304             return ((h & 1) != 0 ? -u : u) + ((h & 2) != 0 ? -v : v);
00305         }
```

0.4.9.2.8 grad() [4/4]

```
static float BeeGame.Terrain.LandGeneration.Noise.SimplexNoise.grad (
             int hash,
             float x,
             float y,
             float z,
             float t )  [static], [private]
```

Definition at line 307 of file SimplexNoise.cs.

```
00308         {
00309             int h = hash & 31;      //* Convert low 5 bits of hash code into 32 simple
00310             float u = h < 24 ? x : y; //* gradient directions, and compute dot product.
00311             float v = h < 16 ? y : z;
00312             float w = h < 8 ? z : t;
00313             return ((h & 1) != 0 ? -u : u) + ((h & 2) != 0 ? -v : v) + ((h & 4) != 0 ? -w : w);
00314         }
```

0.4.9.2.9 Mod()

```
static int BeeGame.Terrain.LandGeneration.Noise.SimplexNoise.Mod (
             int x,
             int m )  [static], [private]
```

Definition at line 277 of file SimplexNoise.cs.

```
00278         {
00279             int a = x % m;
00280             return a < 0 ? a + m : a;
00281         }
```

0.4.9.3 Member Data Documentation

0.4.9.3.1 perm

```
byte [] BeeGame.Terrain.LandGeneration.Noise.SimplexNoise.perm  [static]
```

Initial value:

```
= new byte[512] { 151,160,137,91,90,15,
                131,13,201,95,96,53,194,233,7,225,140,36,103,30,69,142,8,99,37,240,21,10,23,
                190, 6,148,247,120,234,75,0,26,197,62,94,252,219,203,117,35,11,32,57,177,33,
                88,237,149,56,87,174,20,125,136,171,168, 68,175,74,165,71,134,139,48,27,166,
                77,146,158,231,83,111,229,122,60,211,133,230,220,105,92,41,55,46,245,40,244,
                102,143,54, 65,25,63,161, 1,216,80,73,209,76,132,187,208, 89,18,169,200,196,
                135,130,116,188,159,86,164,100,109,198,173,186, 3,64,52,217,226,250,124,123,
                5,202,38,147,118,126,255,82,85,212,207,206,59,227,47,16,58,17,182,189,28,42,
                223,183,170,213,119,248,152, 2,44,154,163, 70,221,153,101,155,167, 43,172,9,
                129,22,39,253, 19,98,108,110,79,113,224,232,178,185, 112,104,218,246,97,228,
                251,34,242,193,238,210,144,12,191,179,162,241, 81,51,145,235,249,14,239,107,
                49,192,214, 31,181,199,106,157,184, 84,204,176,115,121,50,45,127, 4,150,254,
                138,236,205,93,222,114,67,29,24,72,243,141,128,195,78,66,215,61,156,180,
                151,160,137,91,90,15,
                131,13,201,95,96,53,194,233,7,225,140,36,103,30,69,142,8,99,37,240,21,10,23,
                190, 6,148,247,120,234,75,0,26,197,62,94,252,219,203,117,35,11,32,57,177,33,
                88,237,149,56,87,174,20,125,136,171,168, 68,175,74,165,71,134,139,48,27,166,
                77,146,158,231,83,111,229,122,60,211,133,230,220,105,92,41,55,46,245,40,244,
                102,143,54, 65,25,63,161, 1,216,80,73,209,76,132,187,208, 89,18,169,200,196,
                135,130,116,188,159,86,164,100,109,198,173,186, 3,64,52,217,226,250,124,123,
                5,202,38,147,118,126,255,82,85,212,207,206,59,227,47,16,58,17,182,189,28,42,
                223,183,170,213,119,248,152, 2,44,154,163, 70,221,153,101,155,167, 43,172,9,
                129,22,39,253, 19,98,108,110,79,113,224,232,178,185, 112,104,218,246,97,228,
                251,34,242,193,238,210,144,12,191,179,162,241, 81,51,145,235,249,14,239,107,
                49,192,214, 31,181,199,106,157,184, 84,204,176,115,121,50,45,127, 4,150,254,
                138,236,205,93,222,114,67,29,24,72,243,141,128,195,78,66,215,61,156,180
            }
```

Definition at line 244 of file SimplexNoise.cs.

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

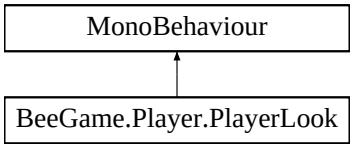
- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/LandGeneration/↩ Noise/SimplexNoise.cs

0.5 Player

0.5.1 BeeGame.Player.PlayerLook Class Reference

The look for the player

Inheritance diagram for BeeGame.Player.PlayerLook:



Public Attributes

- Transform myTransform

  Player transfrom
- Transform cameraTransform

  Camera transfom
- float rotationLock

  Lock for camera X rotation
- float speed = 5

  Look move speed

Private Member Functions

- void Start ()

  Locks teh cursor and hides it
- void Update ()

  Every fixed update check if the look shoud be moved
- void Look ()

  Moves the look rotation

Private Attributes

- float yRot = 0

  Current Y rotation
- float xRot = 0

  Current X rotation

0.5.1.1 Detailed Description

The look for the player

Definition at line 9 of file PlayerLook.cs.

0.5.1.2 Member Function Documentation

0.5.1.2.1 Look()

```
void BeeGame.Player.PlayerLook.Look ( )  [private]
```

Moves the look rotation

Definition at line 66 of file PlayerLook.cs.

```
00067         {
00068             //Only X/Y rotation needed as Z rotation would be wierd
00069             yRot += Input.GetAxis("Mouse X") * speed * Time.timeScale;
00070             xRot -= Input.GetAxis("Mouse Y") * speed * Time.timeScale;
00071 
00072             //clamps the X rotation so the player camera cannot do flips
00073             xRot = Mathf.Clamp(xRot, -rotationLock,
      rotationLock);
00074 
00075             myTransform.rotation = Quaternion.Euler(0, yRot, 0);
00076             cameraTransform.localRotation = Quaternion.Euler(xRot, 0, 0);
00077         }
```

0.5.1.2.2 Start()

```
void BeeGame.Player.PlayerLook.Start ( )  [private]
```

Locks teh cursor and hides it

Definition at line 43 of file PlayerLook.cs.

```
00044         {
00045             Cursor.lockState = CursorLockMode.Locked;
00046             Cursor.visible = false;
00047         }
```

0.5.1.2.3 Update()

```
void BeeGame.Player.PlayerLook.Update ( )  [private]
```

Every fixed update check if the look shoud be moved

Definition at line 52 of file PlayerLook.cs.

```
00053         {
00054             //*the look wil not update when a inventory GUI is open
00055             if (!THInput.isAnotherInventoryOpen)
00056             {
00057                 Look();
00058             }
00059         }
```

0.5.1.3 Member Data Documentation

0.5.1.3.1 cameraTransform

```
Transform BeeGame.Player.PlayerLook.cameraTransform
```

Camera transfom

Definition at line 19 of file PlayerLook.cs.

0.5.1.3.2 myTransform

```
Transform BeeGame.Player.PlayerLook.myTransform
```

Player transfrom

Definition at line 15 of file PlayerLook.cs.

0.5.1.3.3 rotationLock

```
float BeeGame.Player.PlayerLook.rotationLock
```

Lock for camera X rotation

Definition at line 24 of file PlayerLook.cs.

0.5.1.3.4 speed

```
float BeeGame.Player.PlayerLook.speed = 5
```

Look move speed

Definition at line 28 of file PlayerLook.cs.

0.5.1.3.5 xRot

```
float BeeGame.Player.PlayerLook.xRot = 0  [private]
```

Current X rotation

Definition at line 36 of file PlayerLook.cs.

0.5.1.3.6 yRot

```
float BeeGame.Player.PlayerLook.yRot = 0  [private]
```

Current Y rotation

Definition at line 32 of file PlayerLook.cs.

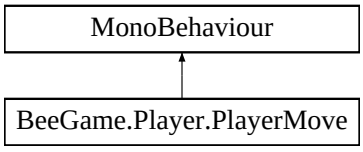
The documentation for this class was generated from the following file:

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Player/PlayerLook.cs

0.5.2 BeeGame.Player.PlayerMove Class Reference

Moves the player

Inheritance diagram for BeeGame.Player.PlayerMove:



Public Attributes

- float speed = 10f

  Speed of the player
- float gravity = 9.81f

  Gravity of the player
- float maxVelocity = 10f

  Max velocity of the player
- float jumpHeight = 2f

  How high can the player jump

Private Member Functions

- void Awake ()

  Gets the rigidbody and sets its variables
- void FixedUpdate ()

  Updates the player move
- void OnCollisionStay (Collision collision)

  Sets that the player can jump when it hits the ground
- void MovePlayer ()

  Moves the player
- float VerticalJumpSpeed ()

  Vertical Jump speed of the character

Private Attributes

- bool canJump = false

  Can the player jump?
- Rigidbody myRigidBody

  Rigidbody for the player

0.5.2.1 Detailed Description

Moves the player

Definition at line 14 of file PlayerMove.cs.

0.5.2.2 Member Function Documentation

0.5.2.2.1 Awake()

```
void BeeGame.Player.PlayerMove.Awake ( )  [private]
```

Gets the rigidbody and sets its variables

Definition at line 49 of file PlayerMove.cs.

```
00050         {
00051             myRigidBody = GetComponent<Rigidbody>();
00052 
00053             //i want to use myown gravity and rotation
00054             myRigidBody.useGravity = false;
00055             myRigidBody.freezeRotation = true;
00056         }
```

0.5.2.2.2 FixedUpdate()

```
void BeeGame.Player.PlayerMove.FixedUpdate ( )  [private]
```

Updates the player move

Definition at line 61 of file PlayerMove.cs.

```
00062         {
00063             //If the player is grounded it can move
00064             if (canJump)
00065             {
00066                 MovePlayer();
00067             }
00068 
00069             //adds the downward force
00070             myRigidBody.AddForce(new Vector3(0, myRigidBody.mass * -
      gravity, 0));
00071         }
```

0.5.2.2.3 MovePlayer()

```
void BeeGame.Player.PlayerMove.MovePlayer ( )  [private]
```

Moves the player

Definition at line 87 of file PlayerMove.cs.

```
00088         {
00089             //Calculate the speed we want to achive
00090             Vector3 targetVelocity = new Vector3(THInput.GetAxis("Horizontal"), 0,
      THInput.GetAxis("Vertical"));
00091             targetVelocity = transform.TransformDirection(targetVelocity);
00092             targetVelocity *= speed;
00093 
00094             //Apply a force to reach the target speed
00095             Vector3 velocity = myRigidBody.velocity;
00096             Vector3 velocityChange = (targetVelocity - velocity);
00097 
00098             //Clamping the velocity so that the player does not infinatly accelerate
00099             velocityChange.x = Mathf.Clamp(velocityChange.x, -maxVelocity,
      maxVelocity);
00100             velocityChange.z = Mathf.Clamp(velocityChange.z, -maxVelocity,
      maxVelocity);
00101             velocityChange.y = 0;
00102 
00103             //Adds the force to the player so they move in the correct direction
00104             myRigidBody.AddForce(velocityChange, ForceMode.Impulse);
00105 
00106             //Jumping
00107             if (canJump && THInput.GetButton("Jump"))
00108             {
00109                 canJump = false;
00110                 myRigidBody.velocity = new Vector3(velocity.x,
      VerticalJumpSpeed(), velocity.z);
00111             }
00112         }
```

0.5.2.2.4 OnCollisionStay()

```
void BeeGame.Player.PlayerMove.OnCollisionStay (
            Collision collision )  [private]
```

Sets that the player can jump when it hits the ground

Parameters

collision	What the player hit

Definition at line 77 of file PlayerMove.cs.

```
00078         {
00079             canJump = true;
00080         }
```

0.5.2.2.5 VerticalJumpSpeed()

```
float BeeGame.Player.PlayerMove.VerticalJumpSpeed ( )  [private]
```

Vertical Jump speed of the character

Returns

Speed of the jump

Definition at line 118 of file PlayerMove.cs.

```
00119         {
00120             //*Gets the correct of fore required for the player to reach the desired apex
00121             //*Can this be done without Square Root as that take alot of work?
00122             return Mathf.Sqrt(2 * jumpHeight * gravity);
00123         }
```

0.5.2.3 Member Data Documentation

0.5.2.3.1 canJump

```
bool BeeGame.Player.PlayerMove.canJump = false  [private]
```

Can the player jump?

Definition at line 33 of file PlayerMove.cs.

0.5.2.3.2 gravity

```
float BeeGame.Player.PlayerMove.gravity = 9.81f
```

Gravity of the player

Definition at line 24 of file PlayerMove.cs.

0.5.2.3.3 jumpHeight

```
float BeeGame.Player.PlayerMove.jumpHeight = 2f
```

How high can the player jump

Definition at line 37 of file PlayerMove.cs.

0.5.2.3.4 maxVelocity

```
float BeeGame.Player.PlayerMove.maxVelocity = 10f
```

Max velocity of the player

Definition at line 28 of file PlayerMove.cs.

0.5.2.3.5 myRigidBody

```
Rigidbody BeeGame.Player.PlayerMove.myRigidBody  [private]
```

Rigidbody for the player

Definition at line 42 of file PlayerMove.cs.

0.5.2.3.6 speed

```
float BeeGame.Player.PlayerMove.speed = 10f
```

Speed of the player

Definition at line 20 of file PlayerMove.cs.

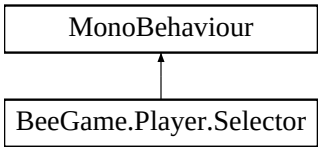
The documentation for this class was generated from the following file:

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Player/PlayerMove.cs

0.5.3 BeeGame.Player.Selector Class Reference

Moves the Block selector

Inheritance diagram for BeeGame.Player.Selector:



Public Attributes

- GameObject selector
  Selector
- LayerMask layers
  Layers for the selector to look at
- int selectedHotbarSlot = 27
  What slot in the hotbar is selected

Private Member Functions

- void Awake ()
  Make the selector
- void FixedUpdate ()
  Updates the selector if an inventory is not open
- void Update ()
  Breaks and places a Block if an inventory is no open
- void UpdateSelector ()
  Updates teh selectors position
- void SelectedSlot ()
  Chanages what slot in the hotbar is currently selected by the player
- void BreakBlock ()
  Breaks the Block in the selectors postion
- void PlaceBlock ()
  Places s Block in the selector postion

Private Attributes

- RaycastHit hit
  Where the raycast hit

0.5.3.1 Detailed Description

Moves the Block selector

Definition at line 14 of file Selector.cs.

0.5.3.2 Member Function Documentation

0.5.3.2.1 Awake()

```
void BeeGame.Player.Selector.Awake ( )  [private]
```

Make the selector

Definition at line 41 of file Selector.cs.

```
00042         {
00043             selector = Instantiate(selector);
00044         }
```

0.5.3.2.2 BreakBlock()

```
void BeeGame.Player.Selector.BreakBlock ( )  [private]
```

Breaks the Block in the selectors postion

Definition at line 117 of file Selector.cs.

```
00118         {
00119             Chunk chunk = GetChunk(selector.transform.position);
00120 
00121             Block block = chunk.world.GetBlock((int)selector.transform.position.x, (int)
      selector.transform.position.y, (int)selector.transform.position.z);
00122 
00123             if (!block.breakable)
00124                 return;
00125 
00126             chunk.world.SetBlock((int)selector.transform.position.x, (int)
      selector.transform.position.y, (int)selector.transform.position.z, new
      Air(), true);
00127             //* set to changed so when block is placed down again it will be saved
00128             block.changed = true;
00129             block.BreakBlock(selector.transform.position);
00130         }
```

0.5.3.2.3 FixedUpdate()

```
void BeeGame.Player.Selector.FixedUpdate ( )  [private]
```

Updates the selector if an inventory is not open

Definition at line 49 of file Selector.cs.

```
00050         {
00051             if(!isAnotherInventoryOpen)
00052                 UpdateSelector();
00053         }
```

0.5.3.2.4 PlaceBlock()

```
void BeeGame.Player.Selector.PlaceBlock ( )  [private]
```

Places s Block in the selector postion

Definition at line 135 of file Selector.cs.

```
00136         {
00137             Chunk chunk = GetChunk(selector.transform.position);
00138 
00139             if (chunk == null)
00140                 return;
00141 
00142             //* gets the item in the hotbar and if the item is placeable place it
00143             if(transform.parent.GetComponentInChildren<PlayerInventory>().
      GetItemFromHotBar(selectedHotbarSlot, out
      Item blockToPlace))
00144                 chunk.world.SetBlock((int)(selector.transform.position.x +
      hit.normal.x), (int)(selector.transform.position.y + hit.normal.y), (int)(
      selector.transform.position.z + hit.normal.z), (Block)blockToPlace, true);
00145         }
```

0.5.3.2.5 SelectedSlot()

```
void BeeGame.Player.Selector.SelectedSlot ( )  [private]
```

Chanages what slot in the hotbar is currently selected by the player

Definition at line 92 of file Selector.cs.

```
00093         {
00094             //* adds 1 to the selected slot and if that is out of range set it to the first hotbar slot
00095             if(Input.GetAxis("Mouse ScrollWheel") > 0)
00096             {
00097                 selectedHotbarSlot += 1;
00098                 if (selectedHotbarSlot == 36)
00099                     selectedHotbarSlot = 27;
00100             }
00101             //* removes one from the hotbar selector and if the selector would be inside the inventory set
       it to the last slot in the hotbar
00102             else if (Input.GetAxis("Mouse ScrollWheel") < 0)
00103             {
00104                 selectedHotbarSlot -= 1;
00105                 if (selectedHotbarSlot == 26)
00106                     selectedHotbarSlot = 35;
00107             }
00108 
00109             transform.parent.GetComponentInChildren<PlayerInventory>().
      SelectedSlot(selectedHotbarSlot);
00110         }
```

0.5.3.2.6 Update()

```
void BeeGame.Player.Selector.Update ( )  [private]
```

Breaks and places a Block if an inventory is no open

Definition at line 58 of file Selector.cs.

```
00059         {
00060             if (!isAnotherInventoryOpen)
00061             {
00062                 if (GetButtonDown("Break Block"))
00063                     BreakBlock();
00064                 if (GetButtonDown("Place"))
00065                     PlaceBlock();
00066             }
00067         }
```

0.5.3.2.7 UpdateSelector()

```
void BeeGame.Player.Selector.UpdateSelector ( )  [private]
```

Updates teh selectors position

Definition at line 74 of file Selector.cs.

```
00075         {
00076             if (Physics.Raycast(transform.position, transform.forward, out hit, 15,
      layers))
00077             {
00078                 selector.SetActive(true);
00079                 selector.transform.position = GetBlockPos(hit);
00080                 //*selector.SetActive(BlockInPosition(GetBlockPos(hit),
       hit.collider.GetComponent<Chunk>()));
00081             }
00082             else
00083             {
00084                 selector.SetActive(false);
00085             }
00086             SelectedSlot();
00087         }
```

0.5.3.3 Member Data Documentation

0.5.3.3.1 hit

```
RaycastHit BeeGame.Player.Selector.hit  [private]
```

Where the raycast hit

Definition at line 29 of file Selector.cs.

0.5.3.3.2 layers

```
LayerMask BeeGame.Player.Selector.layers
```

Layers for the selector to look at

Definition at line 25 of file Selector.cs.

0.5.3.3.3 selectedHotbarSlot

```
int BeeGame.Player.Selector.selectedHotbarSlot = 27
```

What slot in the hotbar is selected

Definition at line 34 of file Selector.cs.

0.5.3.3.4 selector

```
GameObject BeeGame.Player.Selector.selector
```

Selector

Definition at line 20 of file Selector.cs.

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

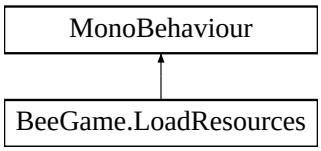
- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Player/Selector.cs

0.6 Resources

0.6.1 BeeGame.LoadResources Class Reference

Loads all of the resources in the game

Inheritance diagram for BeeGame.LoadResources:



Private Member Functions

- void Awake ()

  Loads the sprites and prefab dictionarys

0.6.1.1 Detailed Description

Loads all of the resources in the game

Definition at line 9 of file LoadResources.cs.

0.6.1.2 Member Function Documentation

0.6.1.2.1 Awake()

```
void BeeGame.LoadResources.Awake ( )  [private]
```

Loads the sprites and prefab dictionarys

Definition at line 14 of file LoadResources.cs.

```
00015         {
00016             Serialization.Serialization.MakeDirectorys();
00017             SpriteDictionary.LoadSprites();
00018             PrefabDictionary.LoadPrefabs();
00019         }
```

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/LoadResources.cs

0.6.2 BeeGame.Core.PrefabDictionary Class Reference

The prefabs avaliable to the game

Static Public Member Functions

- static void LoadPrefabs ()
  Loads the prefabs into the Dictionary
- static GameObject GetPrefab (string prefab)
  Returns a GameObject in the prefab dictionary

Static Private Attributes

- static Dictionary< string, GameObject > prefabDictionary = new Dictionary<string, GameObject>()
  All of the prefabs avaliable to spawn in

0.6.2.1 Detailed Description

The prefabs avaliable to the game

Definition at line 9 of file PrefabDictionary.cs.

0.6.2.2 Member Function Documentation

0.6.2.2.1 GetPrefab()

```
static GameObject BeeGame.Core.PrefabDictionary.GetPrefab (
            string prefab )  [static]
```

Returns a GameObject in the prefab dictionary

Parameters

prefab	Name of th prefab to get

Returns

Prefab of the given name

Definition at line 29 of file PrefabDictionary.cs.

```
00030         {
00031             return prefabDictionary[prefab];
00032         }
```

0.6.2.2.2 LoadPrefabs()

```
static void BeeGame.Core.PrefabDictionary.LoadPrefabs ( )  [static]
```

Loads the prefabs into the Dictionary

Definition at line 19 of file PrefabDictionary.cs.

```
00020         {
00021             prefabDictionary = Resources.Resources.GetPrefabs();
00022         }
```

0.6.2.3 Member Data Documentation

0.6.2.3.1 prefabDictionary

```
Dictionary<string, GameObject> BeeGame.Core.PrefabDictionary.prefabDictionary = new Dictionary<string,
GameObject>()  [static], [private]
```

All of the prefabs avaliable to spawn in

Definition at line 14 of file PrefabDictionary.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Core/PrefabDictionary.cs

0.6.3 BeeGame.Core.SpriteDictionary Class Reference

All of the sprites avaliable to the game

Static Public Member Functions

- static Sprite GetSprite (string spriteName)

  Get a sprite of the given name
- static void LoadSprites ()

  Loads the sprites into the dictionary

Static Private Attributes

- static Dictionary< string, Sprite > itemSpriteDictionary = new Dictionary<string, Sprite>()

  All of the sprites avaliable to spawn in

0.6.3.1 Detailed Description

All of the sprites avaliable to the game

Definition at line 9 of file SpriteDictionary.cs.

0.6.3.2 Member Function Documentation

0.6.3.2.1 GetSprite()

```
static Sprite BeeGame.Core.SpriteDictionary.GetSprite (
            string spriteName )  [static]
```

Get a sprite of the given name

Parameters

spriteName	Name of sprite to get

Returns

A sprite of the given name, null if no sprite of that name exists

Definition at line 21 of file SpriteDictionary.cs.

```
00022         {
00023             itemSpriteDictionary.TryGetValue(spriteName, out Sprite sprite);
00024
00025             if (sprite == null)
00026                 return new Sprite();
00027
00028             return sprite;
00029         }
```

0.6.3.2.2 LoadSprites()

```
static void BeeGame.Core.SpriteDictionary.LoadSprites ( )  [static]
```

Loads the sprites into the dictionary

Definition at line 34 of file SpriteDictionary.cs.

```
00035         {
00036             itemSpriteDictionary = Resources.Resources.GetSprites();
00037         }
```

0.6.3.3 Member Data Documentation

0.6.3.3.1 itemSpriteDictionary

```
Dictionary<string, Sprite> BeeGame.Core.SpriteDictionary.itemSpriteDictionary = new Dictionary<string,
Sprite>()  [static], [private]
```

All of the sprites avaliable to spawn in

Definition at line 14 of file SpriteDictionary.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Core/SpriteDictionary.cs

0.6.4 BeeGame.Resources.Resources Class Reference

A strongly-typed resource class, for looking up localized strings, etc.

Package Functions

- Resources ()

Static Package Functions

- static Dictionary< string, Sprite > GetSprites ()
- static Dictionary< string, GameObject > GetPrefabs ()

Properties

- static global::System.Resources.ResourceManager ResourceManager [get]

  Returns the cached ResourceManager instance used by this class.
- static global::System.Globalization.CultureInfo Culture [get, set]

  Overrides the current thread's CurrentUICulture property for all resource lookups using this strongly typed resource class.
- static byte [ ] Prefabs [get]

  Looks up a localized resource of type System.Byte[].
- static byte [ ] Sprites [get]

  Looks up a localized resource of type System.Byte[].

Static Private Attributes

- static global::System.Resources.ResourceManager resourceMan
- static global::System.Globalization.CultureInfo resourceCulture

0.6.4.1 Detailed Description

A strongly-typed resource class, for looking up localized strings, etc.

Definition at line 26 of file Resources.Designer.cs.

0.6.4.2 Constructor & Destructor Documentation

0.6.4.2.1 Resources()

```
BeeGame.Resources.Resources.Resources ( )  [package]
```

Definition at line 33 of file Resources.Designer.cs.

```
00033                             {
00034         }
```

0.6.4.3 Member Function Documentation

0.6.4.3.1 GetPrefabs()

```
static Dictionary<string, GameObject> BeeGame.Resources.Resources.GetPrefabs ( )  [static],
[package]
```

Definition at line 118 of file Resources.Designer.cs.

```
00119         {
00120             string[] splitCharacters = new string[] { "," };
00121             object obj = ResourceManager.GetObject("Prefabs",
      resourceCulture);
00122 
00123             string text = System.Text.Encoding.Default.GetString((byte[])obj);
00124             text = text.Remove(0, 3);
00125             string lineText = "";
00126             string[] splitText;
00127             Dictionary<string, GameObject> objects = new Dictionary<string, GameObject>();
00128 
00129             for (int i = 0; i < text.Length; i++)
00130             {
00131                 if(text[i] != '\n')
00132                 {
00133                     lineText += text[i];
00134                 }
00135                 else
00136                 {
00137                     splitText = lineText.Split(splitCharacters, StringSplitOptions.RemoveEmptyEntries);
00138                     lineText = "";
00139                     objects.Add(splitText[0], UnityEngine.Resources.Load("Prefabs/" + splitText[
      1]) as GameObject);
00140                 }
00141             }
00142 
00143             splitText = lineText.Split(splitCharacters, StringSplitOptions.RemoveEmptyEntries);
00144             lineText = "";
00145             objects.Add(splitText[0], UnityEngine.Resources.Load("Prefabs/" + splitText[1]) as
      GameObject);
00146 
00147             return objects;
00148         }
```

0.6.4.3.2 GetSprites()

```
static Dictionary<string, Sprite> BeeGame.Resources.Resources.GetSprites ( )  [static], [package]
```

Definition at line 84 of file Resources.Designer.cs.

```
00085         {
00086             string[] splitCharacters = new string[] { "," };
00087             object obj = ResourceManager.GetObject("Sprites",
      resourceCulture);
00088
00089             string text = System.Text.Encoding.Default.GetString((byte[])obj);
00090             string lineText = "";
00091             string[] splitText;
00092             Texture2D tex;
00093             Dictionary<string, Sprite> sprites = new Dictionary<string, Sprite>();
00094
00095             for (int i = 0; i < text.Length; i++)
00096             {
00097                 if (text[i] != '\n')
00098                 {
00099                     lineText += text[i];
00100                 }
00101                 else
00102                 {
00103                     splitText = lineText.Split(splitCharacters, StringSplitOptions.RemoveEmptyEntries);
00104                     lineText = "";
00105                     tex = UnityEngine.Resources.Load("Sprites/" + splitText[1]) as Texture2D;
00106                     sprites.Add(splitText[0], Sprite.Create(tex, new UnityEngine.Rect(0, 0, tex.
      width, tex.height), Vector2.zero));
00107                 }
00108             }
00109
00110             splitText = lineText.Split(splitCharacters, StringSplitOptions.RemoveEmptyEntries);
00111             lineText = "";
00112             tex = UnityEngine.Resources.Load("Sprites/" + splitText[1]) as Texture2D;
00113             sprites.Add(splitText[0], Sprite.Create(tex, new UnityEngine.Rect(0, 0, tex.width,
      tex.height), Vector2.zero));
00114
00115             return sprites;
00116         }
```

0.6.4.4 Member Data Documentation

0.6.4.4.1 resourceCulture

```
global.System.Globalization.CultureInfo BeeGame.Resources.Resources.resourceCulture  [static],
[private]
```

Definition at line 30 of file Resources.Designer.cs.

0.6.4.4.2 resourceMan

```
global.System.Resources.ResourceManager BeeGame.Resources.Resources.resourceMan  [static],
[private]
```

Definition at line 28 of file Resources.Designer.cs.

0.6.4.5 Property Documentation

0.6.4.5.1 Culture

```
global.System.Globalization.CultureInfo BeeGame.Resources.Resources.Culture  [static], [get],
[set], [package]
```

Overrides the current thread's CurrentUICulture property for all resource lookups using this strongly typed resource class.

Definition at line 55 of file Resources.Designer.cs.

0.6.4.5.2 Prefabs

```
byte [] BeeGame.Resources.Resources.Prefabs  [static], [get], [package]
```

Looks up a localized resource of type System.Byte[].

Definition at line 67 of file Resources.Designer.cs.

0.6.4.5.3 ResourceManager

```
global.System.Resources.ResourceManager BeeGame.Resources.Resources.ResourceManager  [static],
[get], [package]
```

Returns the cached ResourceManager instance used by this class.

Definition at line 40 of file Resources.Designer.cs.

0.6.4.5.4 Sprites

```
byte [] BeeGame.Resources.Resources.Sprites  [static], [get], [package]
```

Looks up a localized resource of type System.Byte[].

Definition at line 77 of file Resources.Designer.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Resources/Resources.↩ Designer.cs

0.7 Unity Type & Method Replacements

0.7.1 BeeGame.Core.THInput Class Reference

My implementation of the unity input system. Acts as a buffer layer to the unity system so that the input keys can be changed at runtime

Static Public Member Functions

- static bool GetButtonDown (string button)

  Has the given button been pressed this update
- static bool GetButton (string button)

  Is the given button currently being held down
- static bool GetButtonUp (string button)

  Has the given button been relesed this update
- static int GetAxis (string axis)

  Gets the axis of a button press

Static Public Attributes

- static bool isAnotherInventoryOpen

  If another inventory is open true, else false

Static Private Attributes

- static Dictionary< string, object > inputButtons

  Button identifiers and KeyCode

0.7.1.1 Detailed Description

My implementation of the unity input system. Acts as a buffer layer to the unity system so that the input keys can be changed at runtime

Definition at line 10 of file THInput.cs.

0.7.1.2 Member Function Documentation

0.7.1.2.1 GetAxis()

```
static int BeeGame.Core.THInput.GetAxis (
            string axis )  [static]
```

Gets the axis of a button press

Parameters

axis	Axis to check, Horizontal or Vertical

Returns

+1 or -1

Definition at line 130 of file THInput.cs.

```
00131         {
00132             int returnAxis = 0;
00133 
00134             if (axis == "Horizontal")
00135             {
00136                 if (GetButton("Right"))
00137                 {
00138                     returnAxis += 1;
00139                 }
00140 
00141                 if (GetButton("Left"))
00142                 {
00143                     returnAxis -= 1;
00144                 }
00145             }
00146             else if (axis == "Vertical")
00147             {
00148                 if (GetButton("Forward"))
00149                 {
00150                     returnAxis += 1;
00151                 }
00152 
00153                 if (GetButton("Backward"))
00154                 {
00155                     returnAxis -= 1;
00156                 }
00157             }
00158 
00159             return returnAxis;
00160         }
```

0.7.1.2.2 GetButton()

```
static bool BeeGame.Core.THInput.GetButton (
            string button )  [static]
```

Is the given button currently being held down

Parameters

button	The button name eg "Forward"

Returns

true if the given button is currently being held down

Definition at line 70 of file THInput.cs.

```
00071         {
00072             if (!inputButtons.ContainsKey(button))
00073             {
00074                 throw new Exception("Input Manager: Key button name not defined: " + button);
00075             }
00076 
00077             switch (inputButtons[button])
00078             {
00079                 case KeyCode[] arry:
00080                     //*for each posible key, check if it was pressed and if it was return that it was, if
      none of them was poressed return false
00081                     foreach (var item in arry)
00082                     {
00083                         if (Input.GetKey(item))
00084                         {
00085                             return true;
00086                         }
00087                     }
00088 
00089                     return false;
00090                 default:
00091                     return Input.GetKey((KeyCode)inputButtons[button]);
00092             }
00093         }
```

0.7.1.2.3 GetButtonDown()

```
static bool BeeGame.Core.THInput.GetButtonDown (
            string button )  [static]
```

Has the given button been pressed this update

Parameters

button	The button name eg "Inventory"

Returns

true if the given button has been pressed this update

Definition at line 40 of file THInput.cs.

```
00041         {
00042             if (!inputButtons.ContainsKey(button))
00043             {
00044                 throw new Exception("Input Manager: Key button name not defined: " + button);
00045             }
00046 
00047             switch (inputButtons[button])
00048             {
00049                 case KeyCode[] arry:
00050                     //*for each posible key, check if it was pressed and if it was return that it was, if
      none of them was poressed return false
00051                     foreach (var item in arry)
00052                     {
00053                         if (Input.GetKeyDown(item))
00054                         {
00055                             return true;
00056                         }
00057                     }
00058 
00059                     return false;
00060                 default:
00061                     return Input.GetKeyDown((KeyCode)inputButtons[button]);
00062             }
00063         }
```

0.7.1.2.4 GetButtonUp()

```
static bool BeeGame.Core.THInput.GetButtonUp (
            string button )  [static]
```

Has the given button been relesed this update

Parameters

button	Button name eg "Inventory"

Returns

true if the button has been relesed during this update

Definition at line 100 of file THInput.cs.

```
00101         {
00102             if (!inputButtons.ContainsKey(button))
00103             {
00104                 throw new Exception("Input Manager: Key button name not defined: " + button);
00105             }
00106 
00107             switch (inputButtons[button])
00108             {
00109                 case KeyCode[] arry:
00110                     //*for each posible key, check if it was pressed and if it was return that it was, if
       none of them was poressed return false
00111                     foreach (var item in arry)
00112                     {
00113                         if (Input.GetKeyUp(item))
00114                         {
00115                             return true;
00116                         }
00117                     }
00118 
00119                     return false;
00120                 default:
00121                     return Input.GetKeyUp((KeyCode)inputButtons[button]);
00122             }
00123         }
```

0.7.1.3 Member Data Documentation

0.7.1.3.1 inputButtons

```
Dictionary<string, object> BeeGame.Core.THInput.inputButtons  [static], [private]
```

Initial value:

```
= new Dictionary<string, object>()
        {
            {"Forward" , KeyCode.W},
            {"Backward", KeyCode.S },
            {"Right", KeyCode.D },
            {"Left", KeyCode.A },
            {"Player Inventory", KeyCode.E },
            {"Quest Book", KeyCode.Mouse1 },
            {"Interact", KeyCode.Mouse1 },
            {"Place", KeyCode.Mouse1 },
            {"Break Block", KeyCode.Mouse0 },
            {"Close Menu/Inventory", new KeyCode[2] { KeyCode.Escape, KeyCode.E } },
            {"Jump", KeyCode.Space }
        }
```

Button identifiers and KeyCode

Definition at line 15 of file THInput.cs.

0.7.1.3.2 isAnotherInventoryOpen

```
bool BeeGame.Core.THInput.isAnotherInventoryOpen  [static]
```

If another inventory is open true, else false

Definition at line 33 of file THInput.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Core/UnityTypeReplacements/THInput.cs

0.7.2 BeeGame.Core.THVector2 Struct Reference

Serilializable version of Vector2

Public Member Functions

- THVector2 (float x, float y)

  Constructor from 2 floats
- THVector2 (THVector2 vec2)

  Constructor from another THVector2
- THVector2 (Vector2 vec2)

  Constructor from Vector2
- override bool Equals (object obj)
- override int GetHashCode ()
- override string ToString ()

Static Public Member Functions

- static bool operator== (THVector2 a, THVector2 b)
- static bool operator!= (THVector2 a, THVector2 b)
- static THVector2 operator+ (THVector2 a, THVector2 b)
- static THVector2 operator+ (THVector2 a, float b)
- static THVector2 operator+ (float a, THVector2 b)
- static THVector2 operator- (THVector2 a, THVector2 b)
- static THVector2 operator- (THVector2 a, float b)
- static THVector2 operator- (float a, THVector2 b)
- static THVector2 operator* (THVector2 a, THVector2 b)
- static THVector2 operator* (THVector2 a, float b)
- static THVector2 operator* (float a, THVector2 b)
- static THVector2 operator/ (THVector2 a, THVector2 b)
- static THVector2 operator/ (THVector2 a, float b)
- static THVector2 operator/ (float a, THVector2 b)
- static implicit operator Vector2 (THVector2 vec2)
- static implicit operator THVector2 (Vector2 vec2)

Public Attributes

- float x

  X position
- float y

  Y position

0.7.2.1 Detailed Description

Serilializable version of Vector2

Definition at line 10 of file THVector2.cs.

0.7.2.2 Constructor & Destructor Documentation

0.7.2.2.1 THVector2() [1/3]

```
BeeGame.Core.THVector2.THVector2 (
            float x,
            float y )
```

Constructor from 2 floats

Parameters

x	X position
y	Y position

Definition at line 29 of file THVector2.cs.

```
00030         {
00031             this.x = x;
00032             this.y = y;
00033         }
```

0.7.2.2.2 THVector2() [2/3]

```
BeeGame.Core.THVector2.THVector2 (
            THVector2 vec2 )
```

Constructor from another THVector2

Parameters

vec2	Vector to make this from

Definition at line 39 of file THVector2.cs.

```
00040         {
00041             this = vec2;
00042         }
```

0.7.2.2.3 THVector2() [3/3]

```
BeeGame.Core.THVector2.THVector2 (
            Vector2 vec2 )
```

Constructor from Vector2

Parameters

vec2	Vector to make this from

Definition at line 48 of file THVector2.cs.

```
00049         {
00050             this = vec2;
00051         }
```

0.7.2.3 Member Function Documentation

0.7.2.3.1 Equals()

```
override bool BeeGame.Core.THVector2.Equals (
            object obj )
```

Definition at line 55 of file THVector2.cs.

```
00056         {
00057             if (!(obj is THVector2))
00058                 return false;
00059             if (obj.GetHashCode() == GetHashCode())
00060                 return true;
00061             return false;
00062         }
```

0.7.2.3.2 GetHashCode()

```
override int BeeGame.Core.THVector2.GetHashCode ( )
```

Definition at line 64 of file THVector2.cs.

```
00065         {
00066             unchecked
00067             {
00068                 int hash = 13;
00069 
00070                 hash *= 443 * x.GetHashCode();
00071                 hash *= 373 * y.GetHashCode();
00072 
00073                 return hash;
00074             }
00075         }
```

0.7.2.3.3 operator THVector2()

```
static implicit BeeGame.Core.THVector2.operator THVector2 (
            Vector2 vec2 )  [static]
```

Definition at line 171 of file THVector2.cs.

```
00172         {
00173             return new THVector2(vec2.x, vec2.y);
00174         }
```

0.7.2.3.4 operator Vector2()

```
static implicit BeeGame.Core.THVector2.operator Vector2 (
            THVector2 vec2 )  [static]
```

Definition at line 166 of file THVector2.cs.

```
00167         {
00168             return new Vector2(vec2.x, vec2.y);
00169         }
```

0.7.2.3.5 operator"!=()

```
static bool BeeGame.Core.THVector2.operator!= (
            THVector2 a,
            THVector2 b )  [static]
```

Definition at line 86 of file THVector2.cs.

```
00087         {
00088             return !(a == b);
00089         }
```

0.7.2.3.6 operator∗() [1/3]

```
static THVector2 BeeGame.Core.THVector2.operator* (
            THVector2 a,
            THVector2 b )  [static]
```

Definition at line 127 of file THVector2.cs.

```
00128         {
00129             a.x *= b.x;
00130             a.y *= b.y;
00131 
00132             return a;
00133         }
```

0.7.2.3.7 operator∗() [2/3]

```
static THVector2 BeeGame.Core.THVector2.operator* (
            THVector2 a,
            float b )  [static]
```

Definition at line 134 of file THVector2.cs.

```
00135         {
00136             a.x *= b;
00137             a.y *= b;
00138 
00139             return a;
00140         }
```

0.7.2.3.8 operator∗() [3/3]

```
static THVector2 BeeGame.Core.THVector2.operator* (
            float a,
            THVector2 b )  [static]
```

Definition at line 141 of file THVector2.cs.

```
00142         {
00143             return new THVector2(a * b.x, a * b.y);
00144         }
```

0.7.2.3.9 operator+() [1/3]

```
static THVector2 BeeGame.Core.THVector2.operator+ (
            THVector2 a,
            THVector2 b )  [static]
```

Definition at line 91 of file THVector2.cs.

```
00092         {
00093             a.x += b.x;
00094             a.y += b.y;
00095 
00096             return a;
00097         }
```

0.7.2.3.10 operator+() [2/3]

```
static THVector2 BeeGame.Core.THVector2.operator+ (
            THVector2 a,
            float b )  [static]
```

Definition at line 98 of file THVector2.cs.

```
00099         {
00100             a.x += b;
00101             a.y += b;
00102 
00103             return a;
00104         }
```

0.7.2.3.11 operator+() [3/3]

```
static THVector2 BeeGame.Core.THVector2.operator+ (
            float a,
            THVector2 b )  [static]
```

Definition at line 105 of file THVector2.cs.

```
00106         {
00107             return new THVector2(a + b.x, a + b.y);
00108         }
```

0.7.2.3.12 operator-() [1/3]

```
static THVector2 BeeGame.Core.THVector2.operator- (
            THVector2 a,
            THVector2 b )  [static]
```

Definition at line 109 of file THVector2.cs.

```
00110         {
00111             a.x -= b.x;
00112             a.y -= b.y;
00113 
00114             return a;
00115         }
```

0.7.2.3.13 operator-() [2/3]

```
static THVector2 BeeGame.Core.THVector2.operator- (
            THVector2 a,
            float b )  [static]
```

Definition at line 116 of file THVector2.cs.

```
00117         {
00118             a.x += b;
00119             a.y += b;
00120 
00121             return a;
00122         }
```

0.7.2.3.14 operator-() [3/3]

```
static THVector2 BeeGame.Core.THVector2.operator- (
            float a,
            THVector2 b )  [static]
```

Definition at line 123 of file THVector2.cs.

```
00124         {
00125             return new THVector2(a - b.x, a - b.y);
00126         }
```

0.7.2.3.15 operator/() [1/3]

```
static THVector2 BeeGame.Core.THVector2.operator/ (
            THVector2 a,
            THVector2 b )  [static]
```

Definition at line 145 of file THVector2.cs.

```
00146         {
00147             a.x /= b.x;
00148             a.y /= b.y;
00149 
00150             return a;
00151         }
```

0.7.2.3.16 operator/() [2/3]

```
static THVector2 BeeGame.Core.THVector2.operator/ (
            THVector2 a,
            float b )  [static]
```

Definition at line 152 of file THVector2.cs.

```
00153         {
00154             a.x /= b;
00155             a.y /= b;
00156 
00157             return a;
00158         }
```

0.7.2.3.17 operator/() [3/3]

```
static THVector2 BeeGame.Core.THVector2.operator/ (
            float a,
            THVector2 b )  [static]
```

Definition at line 159 of file THVector2.cs.

```
00160         {
00161             return new THVector2(a / b.x, a / b.y);
00162         }
```

0.7.2.3.18 operator==()

```
static bool BeeGame.Core.THVector2.operator== (
            THVector2 a,
            THVector2 b )  [static]
```

Definition at line 82 of file THVector2.cs.

```
00083         {
00084             return a.Equals(b);
00085         }
```

0.7.2.3.19 ToString()

```
override string BeeGame.Core.THVector2.ToString ( )
```

Definition at line 77 of file THVector2.cs.

```
00078         {
00079             return $"{x}, {y}";
00080         }
```

0.7.2.4 Member Data Documentation

0.7.2.4.1 x

```
float BeeGame.Core.THVector2.x
```

X position

Definition at line 16 of file THVector2.cs.

0.7.2.4.2 y

```
float BeeGame.Core.THVector2.y
```

Y position

Definition at line 20 of file THVector2.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Core/UnityTypeReplacements/THVector2.cs

0.7.3 BeeGame.Core.THVector3 Struct Reference

Serializable version of Vector3

Public Member Functions

- THVector3 (float x, float y, float z)
  Constructor from 3 floats
- THVector3 (THVector3 vec3)
  Constructor from another THVector3
- THVector3 (Vector3 vec3)
  Constructor from another Vector3
- THVector3 (Terrain.ChunkWorldPos vec3)
  Constructor from another Terrain.ChunkWorldPos
- override bool Equals (object obj)
  This this vector == to another
- override int GetHashCode ()
  Gets the hascode for the vector
- override string ToString ()
  Formats the vector as a nice string

Static Public Member Functions

- static float Distance (THVector3 a, THVector3 b)

  Distance between 2 vectors
- static bool operator== (THVector3 a, THVector3 b)

  Checks if a == b
- static bool operator!= (THVector3 a, THVector3 b)

  Inverse of ==
- static THVector3 operator+ (THVector3 a, THVector3 b)

  Adds vector a and b
- static THVector3 operator+ (THVector3 a, float b)

  Adds b to vector a
- static THVector3 operator+ (float a, THVector3 b)

  Adds a to vector b
- static THVector3 operator- (THVector3 a, THVector3 b)

  Subtracs vector a and b
- static THVector3 operator- (THVector3 a, float b)

  Subtracts b from vector a
- static THVector3 operator- (float a, THVector3 b)

  Subtracts a from vector b
- static THVector3 operator∗ (THVector3 a, THVector3 b)

  Multiplies vector a and b
- static THVector3 operator∗ (THVector3 a, float b)

  Multiples b to vector a
- static THVector3 operator∗ (float a, THVector3 b)

  Multiples a to vector b
- static THVector3 operator/ (THVector3 a, THVector3 b)

  Divides vector a and b
- static THVector3 operator/ (THVector3 a, float b)

  Divides a by b
- static THVector3 operator/ (float a, THVector3 b)

  Divides b by a
- static implicit operator Vector3 (THVector3 vec3)

  Converts THVector3 to Vector3 implicetly
- static implicit operator THVector3 (Vector3 vec3)

  Converts Vector3 to THVector3 implicetly

Public Attributes

- float x

  X position
- float y

  Y postion
- float z

  Z position

0.7.3.1 Detailed Description

Serializable version of Vector3

Definition at line 10 of file THVector3.cs.

0.7.3.2 Constructor & Destructor Documentation

0.7.3.2.1 THVector3() [1/4]

```
BeeGame.Core.THVector3.THVector3 (
            float x,
            float y,
            float z )
```

Constructor from 3 floats

Parameters

x	X position
y	Y position
z	Z position

Definition at line 34 of file THVector3.cs.

```
00035         {
00036             this.x = x;
00037             this.y = y;
00038             this.z = z;
00039         }
```

0.7.3.2.2 THVector3() [2/4]

```
BeeGame.Core.THVector3.THVector3 (
            THVector3 vec3 )
```

Constructor from another THVector3

Parameters

vec3	Vector to make this from

Definition at line 45 of file THVector3.cs.

```
00046         {
00047             this = vec3;
00048         }
```

0.7.3.2.3 THVector3() [3/4]

```
BeeGame.Core.THVector3.THVector3 (
            Vector3 vec3 )
```

Constructor from another Vector3

Parameters

vec3	Vector to make this from

Definition at line 54 of file THVector3.cs.

```
00055         {
00056             this = vec3;
00057         }
```

0.7.3.2.4 THVector3() [4/4]

```
BeeGame.Core.THVector3.THVector3 (
            Terrain.ChunkWorldPos vec3 )
```

Constructor from another Terrain.ChunkWorldPos

Parameters

vec3	Vector to make this from

Definition at line 63 of file THVector3.cs.

```
00064         {
00065             this = vec3;
00066         }
```

0.7.3.3 Member Function Documentation

0.7.3.3.1 Distance()

```
static float BeeGame.Core.THVector3.Distance (
            THVector3 a,
            THVector3 b )  [static]
```

Distance between 2 vectors

Parameters

a	First Vector
b	Second Vector

Returns

Distance between *a* and *b*

Definition at line 76 of file THVector3.cs.

```
00077         {
00078             return (float)Math.Sqrt(Math.Pow((a.x - b.x), 2) + Math.Pow((a.y - b.y), 2) + Math.Pow((a.z - b
      .z), 2));
00079         }
```

0.7.3.3.2 Equals()

```
override bool BeeGame.Core.THVector3.Equals (
              object obj )
```

This this vector == to another

Parameters

obj	object to check against

Returns

Definition at line 88 of file THVector3.cs.

```
00089         {
00090             if (!(obj is THVector3))
00091                 return false;
00092             if (obj.GetHashCode() == GetHashCode())
00093                 return true;
00094             return false;
00095         }
```

0.7.3.3.3 GetHashCode()

```
override int BeeGame.Core.THVector3.GetHashCode ( )
```

Gets the hascode for the vector

Returns

Definition at line 101 of file THVector3.cs.

```
00102         {
00103             unchecked
00104             {
00105                 int hash = 13;
00106 
00107                 hash *= 443 * x.GetHashCode();
00108                 hash *= 373 * y.GetHashCode();
00109                 hash *= 127 * z.GetHashCode();
00110 
00111                 return hash;
00112             }
00113         }
```

0.7.3.3.4 operator THVector3()

```
static implicit BeeGame.Core.THVector3.operator THVector3 (
              Vector3 vec3 )  [static]
```

Converts Vector3 to THVector3 implicetly

Parameters

vec3	Vector to convert

Definition at line 313 of file THVector3.cs.

```
00314         {
00315             return new THVector3(vec3.x, vec3.y, vec3.z);
00316         }
```

0.7.3.3.5 operator Vector3()

```
static implicit BeeGame.Core.THVector3.operator Vector3 (
             THVector3 vec3 )  [static]
```

Converts THVector3 to Vector3 implicetly

Parameters

vec3	Vector to convert

Definition at line 304 of file THVector3.cs.

```
00305         {
00306             return new Vector3(vec3.x, vec3.y, vec3.z);
00307         }
```

0.7.3.3.6 operator"!=()

```
static bool BeeGame.Core.THVector3.operator!= (
             THVector3 a,
             THVector3 b )  [static]
```

Inverse of ==

Parameters

a	First vector
b	Second vector

Returns

true if *a* != *b*

Definition at line 140 of file THVector3.cs.

```
00141         {
00142             return !(a == b);
00143         }
```

0.7.3.3.7 operator∗() [1/3]

```
static THVector3 BeeGame.Core.THVector3.operator* (
            THVector3 a,
            THVector3 b )  [static]
```

Multiplies vector a and b

Parameters

a	Vector a
b	Vector b

Returns

returns new vector that is the product of a and b

Definition at line 227 of file THVector3.cs.

```
00228         {
00229             a.x *= b.x;
00230             a.y *= b.y;
00231             a.z *= b.z;
00232 
00233             return a;
00234         }
```

0.7.3.3.8 operator∗() [2/3]

```
static THVector3 BeeGame.Core.THVector3.operator* (
            THVector3 a,
            float b )  [static]
```

Multiples b to vector a

Parameters

a	Vector a
b	float b

Returns

returns new vector that is the product of a and b

Definition at line 241 of file THVector3.cs.

```
00242         {
00243             a.x *= b;
00244             a.y *= b;
00245             a.z *= b;
00246 
00247             return a;
00248         }
```

0.7.3.3.9 operator∗() [3/3]

```
static THVector3 BeeGame.Core.THVector3.operator* (
            float a,
            THVector3 b )  [static]
```

Multiples a to vector b

Parameters

a	Vector a
b	float b

Returns

returns new vector that is the product of a and b

Definition at line 255 of file THVector3.cs.

```
00256         {
00257             return new THVector3(a * b.x, a * b.y, a * b.z);
00258         }
```

0.7.3.3.10 operator+() [1/3]

```
static THVector3 BeeGame.Core.THVector3.operator+ (
            THVector3 a,
            THVector3 b )  [static]
```

Adds vector a and b

Parameters

a	Vector a
b	Vector b

Returns

returns new vector that is the sum of a and b

Definition at line 151 of file THVector3.cs.

```
00152         {
00153             a.x += b.x;
00154             a.y += b.y;
00155             a.z += b.z;
00156 
00157             return a;
00158         }
```

0.7.3.3.11 operator+() [2/3]

```
static THVector3 BeeGame.Core.THVector3.operator+ (
            THVector3 a,
            float b )  [static]
```

Adds b to vector a

Parameters

a	Vector a
b	float b

Returns

returns new vector that is the sum of a and b

Definition at line 165 of file THVector3.cs.

```
00166         {
00167             a.x += b;
00168             a.y += b;
00169             a.z += b;
00170 
00171             return a;
00172         }
```

0.7.3.3.12 operator+() [3/3]

```
static THVector3 BeeGame.Core.THVector3.operator+ (
            float a,
            THVector3 b )  [static]
```

Adds a to vector b

Parameters

a	Vector a
b	float b

Returns

returns new vector that is the sum of a and b

Definition at line 179 of file THVector3.cs.

```
00180         {
00181             return new THVector3(a + b.x, a + b.y, a + b.z);
00182         }
```

0.7.3.3.13 operator-() [1/3]

```
static THVector3 BeeGame.Core.THVector3.operator- (
            THVector3 a,
            THVector3 b )  [static]
```

Subtracs vector a and b

Parameters

a	Vector a
b	Vector b

Returns

returns new vector that is the subtraction of a and b

Definition at line 189 of file THVector3.cs.

```
00190         {
00191             a.x -= b.x;
00192             a.y -= b.y;
00193             a.z -= b.z;
00194 
00195             return a;
00196         }
```

0.7.3.3.14 operator-() [2/3]

```
static THVector3 BeeGame.Core.THVector3.operator- (
            THVector3 a,
            float b )  [static]
```

Subtracts b from vector a

Parameters

a	Vector a
b	float b

Returns

returns new vector that is the subtraction of a and b

Definition at line 203 of file THVector3.cs.

```
00204         {
00205             a.x += b;
00206             a.y += b;
00207             a.z += b;
00208 
00209             return a;
00210         }
```

0.7.3.3.15 operator-() [3/3]

```
static THVector3 BeeGame.Core.THVector3.operator- (
            float a,
            THVector3 b )  [static]
```

Subtracts a from vector b

Parameters

a	Vector a
b	float b

Returns

returns new vector that is the subtraction of a and b

Definition at line 217 of file THVector3.cs.

```
00218         {
00219             return new THVector3(a - b.x, a - b.y, a - b.z);
00220         }
```

0.7.3.3.16 operator/() [1/3]

```
static THVector3 BeeGame.Core.THVector3.operator/ (
            THVector3 a,
            THVector3 b )  [static]
```

Divides vector a and b

Parameters

a	Vector a
b	Vector b

Returns

returns new vector that is the division of a and b

Definition at line 265 of file THVector3.cs.

```
00266         {
00267             a.x /= b.x;
00268             a.y /= b.y;
00269             a.z /= b.z;
00270 
00271             return a;
00272         }
```

0.7.3.3.17 operator/() [2/3]

```
static THVector3 BeeGame.Core.THVector3.operator/ (
            THVector3 a,
            float b )  [static]
```

Divides a by b

Parameters

a	Vector a
b	float b

Returns

returns new vector that is the division of a and b

Definition at line 279 of file THVector3.cs.

```
00280         {
00281             a.x /= b;
00282             a.y /= b;
00283             a.z /= b;
00284 
00285             return a;
00286         }
```

0.7.3.3.18 operator/() [3/3]

```
static THVector3 BeeGame.Core.THVector3.operator/ (
            float a,
            THVector3 b )  [static]
```

Divides b by a

Parameters

a	Vector a
b	float b

Returns

returns new vector that is the division of a and b

Definition at line 293 of file THVector3.cs.

```
00294         {
00295             return new THVector3(a / b.x, a / b.y, a / b.z);
00296         }
```

0.7.3.3.19 operator==()

```
static bool BeeGame.Core.THVector3.operator== (
              THVector3 a,
              THVector3 b )  [static]
```

Checks if *a* == *b*

Parameters

a	First vector
b	Second vector

Returns

true if *a* == *b*

Definition at line 130 of file THVector3.cs.

```
00131         {
00132             return a.Equals(b);
00133         }
```

0.7.3.3.20 ToString()

```
override string BeeGame.Core.THVector3.ToString ( )
```

Formats the vector as a nice string

Returns

The vector as a nice string

Definition at line 119 of file THVector3.cs.

```
00120         {
00121             return $"{x}, {y}, {z}";
00122         }
```

0.7.3.4 Member Data Documentation

0.7.3.4.1 x

```
float BeeGame.Core.THVector3.x
```

X position

Definition at line 16 of file THVector3.cs.

0.7.3.4.2 y

```
float BeeGame.Core.THVector3.y
```

Y postion

Definition at line 20 of file THVector3.cs.

0.7.3.4.3 z

```
float BeeGame.Core.THVector3.z
```

Z position

Definition at line 24 of file THVector3.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Core/UnityTypeReplacements/THVector3.cs

0.8 Misc

0.8.1 BeeGame.Serialization.Serialization Class Reference

Serializes and Deserialises things

Static Public Member Functions

- static void MakeDirectorys ()
  Sets the paths for the save files
- static void SerializeInventory (Inventory.Inventory inventory, string inventoryName)
  Serializes a given Inventory
- static void DeSerializeInventory (Inventory.Inventory inventory, string inventoryName)
  Deserializesd an Inventory from its name into a given inventory
- static void SaveChunk (Chunk chunk)
  Saves a given Chunk if a block in it has been changed
- static bool LoadChunk (Chunk chunk)
  Load a Chunk
- static string FileName (ChunkWorldPos pos)
  Sets the file name of the Chunk

Static Public Attributes

- static string worldName = "World"
  Name if the world. If multiple world are ever added
- static string saveFolderName = "Saves"
  Save folder

Static Private Member Functions

- static void SaveFile (object obj, string file)
  Saves the given data in the given file
- static object LoadFile (string file)
  Loads the file at the given path

Static Private Attributes

- static string savePath
  Path to save things

0.8.1.1 Detailed Description

Serializes and Deserialises things

Binary serialization is SLOW try to only serialize only what is absolutly necessary

Definition at line 18 of file Serialization.cs.

0.8.1.2 Member Function Documentation

0.8.1.2.1 DeSerializeInventory()

```
static void BeeGame.Serialization.Serialization.DeSerializeInventory (
            Inventory.Inventory inventory,
            string inventoryName )  [static]
```

Deserializesd an Inventory from its name into a given *inventory*

Parameters

inventory	Inventory to apply the data to
inventoryName	Inventory to deserialize

Definition at line 71 of file Serialization.cs.

```
00072         {
00073             //* make the path
00074             string inventorySavePath = $"{savePath}/Inventorys/{inventoryName}.dat";
00075 
00076             //* checks that the file exists
00077             if (!File.Exists(inventorySavePath))
00078                 return;
00079 
00080             inventory.SetAllItems((ItemsInInventory)LoadFile($"{inventorySavePath}"
      ));
00081         }
```

0.8.1.2.2 FileName()

```
static string BeeGame.Serialization.Serialization.FileName (
            ChunkWorldPos pos )  [static]
```

Sets the file name of the Chunk

Parameters

pos	Position of teh Chunk

Returns

The string of pos

Definition at line 134 of file Serialization.cs.

```
00135         {
00136             return $"{pos.x}, {pos.y}, {pos.z}";
00137         }
```

0.8.1.2.3 LoadChunk()

```
static bool BeeGame.Serialization.Serialization.LoadChunk (
            Chunk chunk )  [static]
```

Load a Chunk

Parameters

chunk	

Returns

Definition at line 109 of file Serialization.cs.

```
00110         {
00111             //* gets the save file
00112             string saveFile = $"{savePath}/{FileName(chunk.chunkWorldPos)}.dat";
00113 
00114             //* if the file does not exist return false
00115             if (!File.Exists(saveFile))
00116                 return false;
00117 
00118             //* set all of the changed blocks in the chunk
00119             SaveChunk save = (SaveChunk)LoadFile(saveFile);
00120 
00121             foreach (var block in save.blocks)
00122             {
00123                 chunk.blocks[block.Key.x, block.Key.y, block.Key.z] = block.Value;
00124             }
00125 
00126             return true;
00127         }
```

0.8.1.2.4 LoadFile()

```
static object BeeGame.Serialization.Serialization.LoadFile (
            string file )  [static], [private]
```

Loads the file at the given path

Parameters

file	File to load

Returns

returns the loaded file as an object

Definition at line 171 of file Serialization.cs.

```
00172         {
00173             BinaryFormatter bf = new BinaryFormatter();
00174             FileStream fs = new FileStream(file, FileMode.Open);
00175 
00176             try
00177             {
00178                 return bf.Deserialize(fs);
00179             }
00180             catch(SerializationException e)
00181             {
00182                 Debug.Log($"Deserialization Exception {e}");
00183                 throw new SerializationException();
00184             }
00185             finally
00186             {
00187                 fs.Close();
00188             }
00189         }
```

0.8.1.2.5 MakeDirectorys()

```
static void BeeGame.Serialization.Serialization.MakeDirectorys ( )  [static]
```

Sets the paths for the save files

Definition at line 38 of file Serialization.cs.

```
00039         {
00040             savePath = $"{Application.dataPath}/{saveFolderName}/{worldName}";
00041 
00042             if (!(Directory.Exists(savePath)))
00043                 Directory.CreateDirectory(savePath);
00044         }
```

0.8.1.2.6 SaveChunk()

```
static void BeeGame.Serialization.Serialization.SaveChunk (
             Chunk chunk )  [static]
```

Saves a given Chunk if a block in it has been changed

Parameters

chunk	

Definition at line 89 of file Serialization.cs.

```
00090         {
00091             //* saves the blocks
00092             SaveChunk save = new SaveChunk(chunk.blocks);
00093 
00094             //* if no block was changed return early
00095             if (save.blocks.Count == 0)
00096                 return;
00097 
00098             //* otherwise save the file
00099             string saveFile = $"{savePath}/{FileName(chunk.chunkWorldPos)}.dat";
00100 
00101             SaveFile(save, saveFile);
00102         }
```

0.8.1.2.7 SaveFile()

```
static void BeeGame.Serialization.Serialization.SaveFile (
             object obj,
             string file )  [static], [private]
```

Saves the given data in the given file

Parameters

obj	Object to save
file	File path to save to

Definition at line 146 of file Serialization.cs.

```
00147         {
00148             BinaryFormatter bf = new BinaryFormatter();
00149             FileStream fs = new FileStream(file, FileMode.OpenOrCreate);
00150 
00151             try
00152             {
00153                 bf.Serialize(fs, obj);
00154             }
00155             catch(SerializationException e)
00156             {
00157                 Debug.Log($"Serialization Exception: {e}");
00158                 throw new SerializationException();
00159             }
00160             finally
00161             {
00162                 fs.Close();
00163             }
00164         }
```

0.8.1.2.8 SerializeInventory()

```
static void BeeGame.Serialization.Serialization.SerializeInventory (
            Inventory.Inventory inventory,
            string inventoryName )  [static]
```

Serializes a given Inventory

Parameters

inventory	Invenotry to Serialize
inventoryName	Name of the inventory

The name of the inventory for the player is "PlayerInventory".
For all other ivnetorys the name is the block type + its position eg, Apiay@0, 0, 0

Definition at line 56 of file Serialization.cs.

```
00057         {
00058             string inventorySavePath = $"{savePath}/Inventorys";
00059 
00060             if (!Directory.Exists(inventorySavePath))
00061                 Directory.CreateDirectory(inventorySavePath);
00062 
00063             SaveFile(inventory.GetAllItems(), $"{inventorySavePath}/{inventoryName}.dat");
00064         }
```

0.8.1.3 Member Data Documentation

0.8.1.3.1 saveFolderName

```
string BeeGame.Serialization.Serialization.saveFolderName = "Saves"  [static]
```

Save folder

Definition at line 28 of file Serialization.cs.

0.8.1.3.2 savePath

```
string BeeGame.Serialization.Serialization.savePath  [static], [private]
```

Path to save things

Definition at line 32 of file Serialization.cs.

0.8.1.3.3 worldName

```
string BeeGame.Serialization.Serialization.worldName = "World"  [static]
```

Name if the world. If multiple world are ever added

Definition at line 24 of file Serialization.cs.

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Serialization/Serialization.cs

0.8.2 BeeGame.Core.Extensions Class Reference

Static Public Member Functions

- static T CloneObject< T > (this T obj)
  Allows the copying of a class by value useing reflection

0.8.2.1 Detailed Description

Definition at line 9 of file Extensions.cs.

0.8.2.2 Member Function Documentation

0.8.2.2.1 CloneObject< T >()

```
static T BeeGame.Core.Extensions.CloneObject< T > (
            this T obj )  [static]
```

Allows the copying of a class by value useing reflection

Parameters

obj	Object to copy

Returns

a new object with all values copyed

Mush faster than the serialize method however alot more complicated

Definition at line 19 of file Extensions.cs.

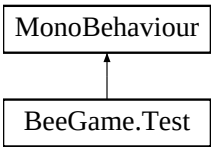
```
00020         {
00021             //*gets the tyoe of the given object
00022             Type typeSource = obj.GetType();
00023 
00024             //*makes a new object of type T
00025             T objTarget = (T)Activator.CreateInstance(typeSource);
00026 
00027             //*gets the properties in T
00028             PropertyInfo[] propertyInfo = typeSource.GetProperties(BindingFlags.Public | BindingFlags.
      NonPublic | BindingFlags.Instance);
00029 
00030             //*applies the properties in T to the new type T object
00031             foreach (var property in propertyInfo)
00032             {
00033                 if (property.CanWrite)
00034                 {
00035                     //*if the propertly is a value just set it
00036                     if (property.PropertyType.IsValueType || property.PropertyType.IsEnum || property.
      PropertyType.Equals(typeof(string)))
00037                     {
00038                         property.SetValue(objTarget, property.GetValue(obj, null), null);
00039                     }
00040                     else
00041                     {
00042                         //*if the propertly is not a value type this function will need to be called
       recursivly as it could also have non value type veriables
00043                         object propertyValue = property.GetValue(obj, null);
00044 
00045                         if (propertyValue == null)
00046                         {
00047                             property.SetValue(obj, null, null);
00048                         }
00049                         else
00050                         {
00051                             property.SetValue(obj, propertyValue.CloneObject(), null);
00052                         }
00053                     }
00054                 }
00055 
00056             }
00057             return objTarget;
00058         }
```

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Core/Extensions.cs

0.8.3 BeeGame.Test Class Reference

Inheritance diagram for BeeGame.Test:



Private Member Functions

- void Start ()

0.8.3.1 Detailed Description

Definition at line 10 of file test.cs.

0.8.3.2 Member Function Documentation

0.8.3.2.1 Start()

```
void BeeGame.Test.Start ( )  [private]
```

Definition at line 12 of file test.cs.

```
00013         {
00014             Instantiate(BeeGame.Core.PrefabDictionary.
      GetPrefab("Selector"));
00015         }
```

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

- C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/test.cs

Part III

File Documentation

0.1 Items

0.1.1 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Items/Item.cs File Reference

Classes

- class BeeGame.Items.Item

  Base class for all Items and Blocks in the game
- struct BeeGame.Items.Tile

  Position of the items texture

Namespaces

- namespace BeeGame.Items

0.1.2 Item.cs

```
00001 using System;
00002 using UnityEngine;
00003 using BeeGame.Terrain.Chunks;
00004 using BeeGame.Core.Enums;
00005 using BeeGame.Core;
00006 using System.Runtime.Serialization.Formatters.Binary;
00007 using System.IO;
00008
00009 namespace BeeGame.Items
00010 {
00014     [Serializable]
00015     public class Item : ICloneable
00016     {
00017         #region Data
00018         internal string itemName = "Test Item";
00025         public bool placeable = false;
00029         public bool usesGameObject = false;
00033         private const float tileSize = 0.1f;
00034
00038         public int itemStackCount = 1;
00042         public int maxStackCount = 64;
00043         #endregion
00044
00045         #region Constructors
00046         public Item()
00047         {
00048             itemName = "TestItem";
00049         }
00050
00051         public Item(string name)
00052         {
00053             itemName = name;
00054         }
00055         #endregion
00056
00057         #region Item Stuff
00058         public virtual GameObject GetGameObject() { return null; }
00063
00068         public virtual string GetItemID()
00069         {
00070             return $"{GetHashCode()}";
00071         }
00072
00077         public virtual Sprite GetItemSprite()
00078         {
00079             return SpriteDictionary.GetSprite("TestSprite");
00080         }
00081
00082         public virtual string GetItemName()
00083         {
00084             return $"{itemName}";
00085         }
00086         #endregion
```

```
00087
00088         #region Item Mesh
00089         public virtual Tile TexturePosition(Direction direction)
00095         {
00096             return new Tile() { x = 1, y = 9 };
00097         }
00098
00107         public virtual MeshData ItemMesh(int x, int y, int z,
      MeshData meshData)
00108         {
00109             //adds all faces of the item to the mesh as all faces could be seen at any time
00110             meshData = FaceDataUp(x, y, z, meshData, true, 0.25f);
00111             meshData = FaceDataDown(x, y, z, meshData, true, 0.25f);
00112             meshData = FaceDataNorth(x, y, z, meshData, true, 0.25f);
00113             meshData = FaceDataEast(x, y, z, meshData, true, 0.25f);
00114             meshData = FaceDataSouth(x, y, z, meshData, true, 0.25f);
00115             meshData = FaceDataWest(x, y, z, meshData, true, 0.25f);
00116
00117             return meshData;
00118         }
00119
00125         public virtual Vector2[] FaceUVs(Direction direction)
00126         {
00127             //only 4 uvs per face
00128             Vector2[] UVs = new Vector2[4];
00129             Tile tilePos = TexturePosition(direction);
00130
00131             //sets the UVs for each vertex
00132             UVs[0] = new THVector2(tileSize * tilePos.x + tileSize - 0.01f, tileSize * tilePos.
      y + 0.01f);
00133             UVs[1] = new THVector2(tileSize * tilePos.x + tileSize - 0.01f, tileSize * tilePos.
      y + tileSize - 0.01f);
00134             UVs[2] = new THVector2(tileSize * tilePos.x + 0.01f, tileSize * tilePos.
      y + tileSize - 0.01f);
00135             UVs[3] = new THVector2(tileSize * tilePos.x + 0.01f, tileSize * tilePos.
      y + 0.01f);
00136
00137             return UVs;
00138         }
00139
00150         protected virtual MeshData FaceDataUp(int x, int y, int z,
      MeshData meshData, bool addToRenderMesh = true, float blockSize = 0.5f)
00151         {
00152             //Adds vertices in a anti-clockwise order
00153             meshData.AddVertices(new THVector3(x - blockSize, y + blockSize, z +
      blockSize), addToRenderMesh, Direction.UP);
00154             meshData.AddVertices(new THVector3(x + blockSize, y + blockSize, z +
      blockSize), addToRenderMesh, Direction.UP);
00155             meshData.AddVertices(new THVector3(x + blockSize, y + blockSize, z -
      blockSize), addToRenderMesh, Direction.UP);
00156             meshData.AddVertices(new THVector3(x - blockSize, y + blockSize, z -
      blockSize), addToRenderMesh, Direction.UP);
00157
00158             //adds teh tirs for the quad
00159             meshData.AddQuadTriangles(addToRenderMesh);
00160
00161             //if the data should be added to the render mesh also add the uvs to the mesh
00162             if (addToRenderMesh)
00163                 meshData.uv.AddRange(FaceUVs(Direction.UP));
00164
00165             return meshData;
00166         }
00167
00178         protected virtual MeshData FaceDataDown(int x, int y, int z,
      MeshData meshData, bool addToRenderMesh = true, float blockSize = 0.5f)
00179         {
00180             //Adds vertices in a anti-clockwise order
00181             meshData.AddVertices(new THVector3(x - blockSize, y - blockSize, z -
      blockSize), addToRenderMesh);
00182             meshData.AddVertices(new THVector3(x + blockSize, y - blockSize, z -
      blockSize), addToRenderMesh);
00183             meshData.AddVertices(new THVector3(x + blockSize, y - blockSize, z +
      blockSize), addToRenderMesh);
00184             meshData.AddVertices(new THVector3(x - blockSize, y - blockSize, z +
      blockSize), addToRenderMesh);
00185
00186             //adds teh tirs for the quad
00187             meshData.AddQuadTriangles(addToRenderMesh);
00188
00189             //if the data should be added to the render mesh also add the uvs to the mesh
00190             if (addToRenderMesh)
00191                 meshData.uv.AddRange(FaceUVs(Direction.DOWN));
00192
00193             return meshData;
00194         }
00195
00206         protected virtual MeshData FaceDataNorth(int x, int y, int z,
```

```
      MeshData meshData, bool addToRenderMesh = true, float blockSize = 0.5f)
00207         {
00208             //Adds vertices in a anti-clockwise order
00209             meshData.AddVertices(new THVector3(x + blockSize, y - blockSize, z +
      blockSize), addToRenderMesh);
00210             meshData.AddVertices(new THVector3(x + blockSize, y + blockSize, z +
      blockSize), addToRenderMesh);
00211             meshData.AddVertices(new THVector3(x - blockSize, y + blockSize, z +
      blockSize), addToRenderMesh);
00212             meshData.AddVertices(new THVector3(x - blockSize, y - blockSize, z +
      blockSize), addToRenderMesh);
00213 
00214             //adds teh tirs for the quad
00215             meshData.AddQuadTriangles(addToRenderMesh);
00216 
00217             //if the data should be added to the render mesh also add the uvs to the mesh
00218             if (addToRenderMesh)
00219                 meshData.uv.AddRange(FaceUVs(Direction.NORTH));
00220 
00221             return meshData;
00222         }
00223 
00234         protected virtual MeshData FaceDataEast(int x, int y, int z,
      MeshData meshData, bool addToRenderMesh = true, float blockSize = 0.5f)
00235         {
00236             //Adds vertices in a anti-clockwise order
00237             meshData.AddVertices(new THVector3(x + blockSize, y - blockSize, z -
      blockSize), addToRenderMesh);
00238             meshData.AddVertices(new THVector3(x + blockSize, y + blockSize, z -
      blockSize), addToRenderMesh);
00239             meshData.AddVertices(new THVector3(x + blockSize, y + blockSize, z +
      blockSize), addToRenderMesh);
00240             meshData.AddVertices(new THVector3(x + blockSize, y - blockSize, z +
      blockSize), addToRenderMesh);
00241 
00242             //adds teh tirs for the quad
00243             meshData.AddQuadTriangles(addToRenderMesh);
00244 
00245             //if the data should be added to the render mesh also add the uvs to the mesh
00246             if (addToRenderMesh)
00247                 meshData.uv.AddRange(FaceUVs(Direction.EAST));
00248 
00249             return meshData;
00250         }
00251 
00262         protected virtual MeshData FaceDataSouth(int x, int y, int z,
      MeshData meshData, bool addToRenderMesh = true, float blockSize = 0.5f)
00263         {
00264             //Adds vertices in a anti-clockwise order
00265             meshData.AddVertices(new THVector3(x - blockSize, y - blockSize, z -
      blockSize), addToRenderMesh);
00266             meshData.AddVertices(new THVector3(x - blockSize, y + blockSize, z -
      blockSize), addToRenderMesh);
00267             meshData.AddVertices(new THVector3(x + blockSize, y + blockSize, z -
      blockSize), addToRenderMesh);
00268             meshData.AddVertices(new THVector3(x + blockSize, y - blockSize, z -
      blockSize), addToRenderMesh);
00269 
00270             //adds teh tirs for the quad
00271             meshData.AddQuadTriangles(addToRenderMesh);
00272 
00273             //if the data should be added to the render mesh also add the uvs to the mesh
00274             if (addToRenderMesh)
00275                 meshData.uv.AddRange(FaceUVs(Direction.SOUTH));
00276 
00277             return meshData;
00278         }
00279 
00290         protected virtual MeshData FaceDataWest(int x, int y, int z,
      MeshData meshData, bool addToRenderMesh = true, float blockSize = 0.5f)
00291         {
00292             //Adds vertices in a anti-clockwise order
00293             meshData.AddVertices(new THVector3(x - blockSize, y - blockSize, z +
      blockSize), addToRenderMesh);
00294             meshData.AddVertices(new THVector3(x - blockSize, y + blockSize, z +
      blockSize), addToRenderMesh);
00295             meshData.AddVertices(new THVector3(x - blockSize, y + blockSize, z -
      blockSize), addToRenderMesh);
00296             meshData.AddVertices(new THVector3(x - blockSize, y - blockSize, z -
      blockSize), addToRenderMesh);
00297 
00298             //adds teh tirs for the quad
00299             meshData.AddQuadTriangles(addToRenderMesh);
00300 
00301             //if the data should be added to the render mesh also add the uvs to the mesh
00302             if (addToRenderMesh)
00303                 meshData.uv.AddRange(FaceUVs(Direction.WEST));
```

```
00304
00305             return meshData;
00306         }
00307         #endregion
00308
00309         #region Interfaces
00310         public object Clone()
00315         {
00316             //Saves this to a file then reads it back so that a copy and not a reference is passed
00317             BinaryFormatter bf = new BinaryFormatter();
00318             MemoryStream ms = new MemoryStream();
00319
00320             bf.Serialize(ms, this);
00321             ms.Seek(0, SeekOrigin.Begin);
00322
00323             return bf.Deserialize(ms);
00324         }
00325         #endregion
00326
00327         #region Overrides
00328         public override string ToString()
00333         {
00334             return $"{itemName} \nID: {GetItemID()}";
00335         }
00336
00341         public override int GetHashCode()
00342         {
00343             return 1;
00344         }
00345
00351         public override bool Equals(object obj)
00352         {
00353             if (!(obj is Item))
00354                 return false;
00355
00356             return this == (obj as Item);
00357         }
00358
00365         public static bool operator ==(Item a, Item b)
00366         {
00367             if (ReferenceEquals(a, null) && ReferenceEquals(b, null))
00368                 return true;
00369             if (ReferenceEquals(a, null) || ReferenceEquals(b, null))
00370                 return false;
00371
00372             if(a.GetItemID() == b.GetItemID())
00373                 return true;
00374
00375             return false;
00376         }
00377
00384         public static bool operator !=(Item a, Item b)
00385         {
00386             return !(a == b);
00387         }
00388         #endregion
00389     }
00390
00394     [Serializable]
00395     public struct Tile
00396     {
00400         public int x;
00404         public int y;
00405     }
00406 }
```

0.1.3 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Items/ItemGameObject.cs File Reference

Classes

- class BeeGame.Items.ItemGameObject

  Interface between item and inity gameobjects

Namespaces

- namespace BeeGame.Items

0.1.4 ItemGameObject.cs

```
00001 using System;
00002 using System.Collections.Generic;
00003 using System.Linq;
00004 using System.Text;
00005 using BeeGame.Terrain.Chunks;
00006 using BeeGame.Blocks;
00007 using UnityEngine;
00008
00009 namespace BeeGame.Items
00010 {
00014     [RequireComponent(typeof(Rigidbody))]
00015     [RequireComponent(typeof(MeshFilter))]
00016     [RequireComponent(typeof(MeshRenderer))]
00017     [RequireComponent(typeof(BoxCollider))]
00018     public class ItemGameObject : MonoBehaviour
00019     {
00023         public Item item;
00027         public GameObject go;
00028
00032         private void Start()
00033         {
00034             if (!item.usesGameObject)
00035                 MakeMesh();
00036
00037             if (item.usesGameObject)
00038             {
00039                 GetComponent<BoxCollider>().enabled = false;
00040                 Instantiate(item.GetGameObject(), transform, false);
00041             }
00042         }
00043
00047         void MakeMesh()
00048         {
00049             MeshData meshData = new MeshData();
00050             if(item != null)
00051                 meshData = item.ItemMesh(0, 0, 0, meshData);
00052
00053             Mesh mesh = new Mesh()
00054             {
00055                 vertices = meshData.verts.ToArray(),
00056                 triangles = meshData.tris.ToArray(),
00057                 uv = meshData.uv.ToArray()
00058             };
00059
00060             mesh.RecalculateNormals();
00061
00062             GetComponent<MeshFilter>().mesh = mesh;
00063         }
00064     }
00065 }
```

0.2 Blocks

0.2.1 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Blocks/Block.cs File Reference

Classes

- class BeeGame.Blocks.Block

  Base class for blocks

Namespaces

- namespace BeeGame.Blocks

0.2.2 Block.cs

```
00001 using UnityEngine;
00002 using BeeGame.Terrain.Chunks;
00003 using BeeGame.Core.Enums;
00004 using BeeGame.Items;
00005 using BeeGame.Core;
00006
00007 namespace BeeGame.Blocks
00008 {
00012     [System.Serializable]
00013     public class Block : Item
00014     {
00015         #region Data
00016         public bool breakable = true;
00023         public bool changed = true;
00024         #endregion
00025
00026         #region Constructor
00027         public Block() : base()
00031         {
00032             itemName = "Stone";
00033             placeable = true;
00034         }
00035
00036         public Block(string name) : base(name)
00037         {
00038             placeable = true;
00039         }
00040         #endregion
00041
00042         #region Update/Break Block
00043         public virtual void BreakBlock(THVector3 pos)
00048         {
00049             GameObject go = Object.Instantiate(UnityEngine.Resources.Load("
      Prefabs/ItemGameObject") as GameObject, pos, Quaternion.identity) as GameObject;
00050             go.GetComponent<ItemGameObject>().item = this;
00051         }
00052
00060         public virtual void UpdateBlock(int x, int y, int z, Chunk chunk) { }
00061         #endregion
00062
00063         #region Mesh
00064         public virtual MeshData BlockData(Chunk chunk, int x, int y, int z,
      MeshData meshData, bool addToRenderMesh = true)
00079         {
00080             //Adds the Top face of the block
00081             if (!chunk.GetBlock(x, y + 1, z, false).IsSolid(Direction.DOWN))
00082             {
00083                 meshData = FaceDataUp(x, y, z, meshData, addToRenderMesh);
00084             }
00085
00086             //Adds the Bottom face of the block
00087             if (!chunk.GetBlock(x, y - 1, z, false).IsSolid(Direction.UP))
00088             {
00089                 meshData = FaceDataDown(x, y, z, meshData, addToRenderMesh);
00090             }
00091
00092             //Adds the North face of the block
00093             if (!chunk.GetBlock(x, y, z + 1, false).IsSolid(Direction.SOUTH))
00094             {
00095                 meshData = FaceDataNorth(x, y, z, meshData, addToRenderMesh);
00096             }
00097
00098             //Adds the South face of the block
00099             if (!chunk.GetBlock(x, y, z - 1, false).IsSolid(Direction.NORTH))
00100             {
00101                 meshData = FaceDataSouth(x, y, z, meshData, addToRenderMesh);
00102             }
00103
00104             //Adds the East face of the block
00105             if (!chunk.GetBlock(x + 1, y, z, false).IsSolid(Direction.WEST))
00106             {
00107                 meshData = FaceDataEast(x, y, z, meshData, addToRenderMesh);
00108             }
00109
00110             //Adds the West face of the block
00111             if (!chunk.GetBlock(x - 1, y, z, false).IsSolid(Direction.EAST))
00112             {
00113                 meshData = FaceDataWest(x, y, z, meshData, addToRenderMesh);
00114             }
00115
00116             return meshData;
00117
00118         }
00119
```

```
00125         public virtual bool IsSolid(Direction direction)
00126         {
00127             return true;
00128         }
00129         #endregion
00130
00131         #region Overrides
00132         public override int GetHashCode()
00137         {
00138             return 1;
00139         }
00140
00145         public override string ToString()
00146         {
00147             return $"{itemName} \nID: {GetHashCode()}";
00148         }
00149         #endregion
00150     }
00151 }
```

0.2.3 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Blocks/Air.cs File Reference

Classes

- class BeeGame.Blocks.Air

  Air Block is an empty block that does not render and has no collider

Namespaces

- namespace BeeGame.Blocks

0.2.4 Air.cs

```
00001 using System;
00002 using BeeGame.Core.Enums;
00003 using BeeGame.Terrain.Chunks;
00004 using BeeGame.Core;
00005
00006 namespace BeeGame.Blocks
00007 {
00011     [Serializable]
00012     public class Air : Block
00013     {
00014         public Air() : base("Air")
00015         {
00016         }
00017
00022         public override void BreakBlock(THVector3 pos)
00023         {
00024             return;
00025         }
00026
00031         public override MeshData BlockData(Chunk chunk, int x, int y, int z,
      MeshData meshData, bool addRoRenderMesh = true)
00032         {
00033             return meshData;
00034         }
00035
00041         public override bool IsSolid(Direction direction)
00042         {
00043             return false;
00044         }
00045
00050         public override int GetHashCode()
00051         {
00052             return 2;
00053         }
00054
00059         public override string ToString()
00060         {
00061             return $"{itemName} \nID: {GetItemID()}";
00062         }
00063     }
00064 }
```

0.2.5 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Blocks/Bedrock.cs File Reference

Classes

- class BeeGame.Blocks.Bedrock

  Bedrock Block

Namespaces

- namespace BeeGame.Blocks

0.2.6 Bedrock.cs

```
00001 using System;
00002 using BeeGame.Core.Enums;
00003 using BeeGame.Items;
00004 using BeeGame.Core;
00005
00006 namespace BeeGame.Blocks
00007 {
00011     [Serializable]
00012     public class Bedrock : Block
00013     {
00014         #region Constructor
00015         public Bedrock() : base("Bedrock")
00019         {
00020             breakable = false;
00021         }
00022         #endregion
00023
00024         #region Break Block
00025         public override void BreakBlock(THVector3 pos)
00030         {
00031             return;
00032         }
00033         #endregion
00034
00035         #region Mesh
00036         public override Tile TexturePosition(Direction direction)
00042         {
00043             return new Tile() { x = 0, y = 0};
00044         }
00045         #endregion
00046
00047         #region Overrides
00048         public override int GetHashCode()
00053         {
00054             return -1;
00055         }
00056
00061         public override string ToString()
00062         {
00063             return $"{itemName} \nID: {GetItemID()}";
00064         }
00065         #endregion
00066     }
00067 }
```

0.2.7 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Blocks/Apiary.cs File Reference

Classes

- class BeeGame.Blocks.Apiary

  Apiary Block

Namespaces

- namespace BeeGame.Blocks

0.2.8 Apiary.cs

```
00001 using System.Runtime.Serialization;
00002
00003 namespace BeeGame.Blocks
00004 {
00008     public class Apiary : Block
00009     {
00010         #region Constructor
00011         public Apiary() : base("Apiary")
00015         {
00016         }
00017         #endregion
00018
00019         public Apiary(SerializationInfo info, StreamingContext context)
00020         {
00021             //*use info.getvalue("valuename", typeof(valueType))
00022             UnityEngine.MonoBehaviour.print("hi");
00023         }
00024
00025         #region Overrides
00026         public override int GetHashCode()
00031         {
00032             return 3;
00033         }
00034
00039         public override string ToString()
00040         {
00041             return $"{itemName} \nID: {GetItemID()}";
00042         }
00043         #endregion
00044     }
00045 }
```

0.2.9 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Blocks/Dirt.cs File Reference

Classes

- class BeeGame.Blocks.Dirt

  Dirt Block

Namespaces

- namespace BeeGame.Blocks

0.2.10 Dirt.cs

```
00001 using System;
00002 using BeeGame.Core.Enums;
00003 using BeeGame.Items;
00004
00005 namespace BeeGame.Blocks
00006 {
00010     [Serializable]
00011     public class Dirt : Block
00012     {
00013         #region Constructor
00014         public Dirt() : base("Dirt"){}
00018         #endregion
00019
00020         #region Mesh
```

```
00021         public override Tile TexturePosition(Direction direction)
00027         {
00028             return new Tile { x = 2, y = 9 };
00029         }
00030         #endregion
00031
00032         #region Overrides
00033         public override int GetHashCode()
00038         {
00039             return 5;
00040         }
00041
00046         public override string ToString()
00047         {
00048             return $"{itemName} \nID: {GetItemID()}";
00049         }
00050         #endregion
00051     }
00052 }
```

0.2.11 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Blocks/Grass.cs File Reference

Classes

- class BeeGame.Blocks.Grass

  Grass Block

Namespaces

- namespace BeeGame.Blocks

0.2.12 Grass.cs

```
00001 using System;
00002 using BeeGame.Core.Enums;
00003 using BeeGame.Terrain.Chunks;
00004 using BeeGame.Items;
00005
00006 namespace BeeGame.Blocks
00007 {
00011     [Serializable]
00012     public class Grass : Block
00013     {
00014         #region Constructor
00015         public Grass() : base("Grass"){}
00019         #endregion
00020
00021         #region Mesh
00022         public override void UpdateBlock(int x, int y, int z, Chunk chunk)
00030         {
00031             if (chunk.GetBlock(x, y + 1, z, false).IsSolid(Direction.DOWN))
00032                 chunk.blocks[x, y, z] = new Dirt() { changed = changed };
00033         }
00034
00040         public override Tile TexturePosition(Direction direction)
00041         {
00042             //All textures are on the dame Y value for the texture atlas so Y can be set
00043             Tile tile = new Tile()
00044             {
00045                 y = 9
00046             };
00047
00048             switch (direction)
00049             {
00050                 //if we want the top face return the full grass texture
00051                 case Direction.UP:
00052                     tile.x = 3;
00053                     return tile;
00054                 //if we want the bottom face return the dirt texture
00055                 case Direction.DOWN:
00056                     tile.x = 2;
```

```
00057                     return tile;
00058                 //return the 1/2 grass testure if a side face is wanted
00059                 default:
00060                     tile.x = 4;
00061                     return tile;
00062             }
00063         }
00064         #endregion
00065
00066         #region Overrides
00067         public override string GetItemName()
00068         {
00069             return "Grass";
00070         }
00071
00076         public override int GetHashCode()
00077         {
00078             return 4;
00079         }
00080
00085         public override string ToString()
00086         {
00087             return $"{itemName} \nID: {GetItemID()}";
00088         }
00089         #endregion
00090     }
00091 }
```

0.3 Inventorys

0.3.1 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Inventory/Inventory.cs File Reference

Classes

- class BeeGame.Inventory.Inventory

  Base class for all inventorys in the game

Namespaces

- namespace BeeGame.Inventory

0.3.2 Inventory.cs

```
00001 using UnityEngine;
00002 using BeeGame.Items;
00003
00004 namespace BeeGame.Inventory
00005 {
00009     public class Inventory : MonoBehaviour
00010     {
00011         #region Data
00012         private ItemsInInventory items;
00019         public InventorySlot[] slots;
00023         internal Item floatingItem;
00027         public string inventoryName = "";
00028         #endregion
00029
00030         #region Init
00031         public bool InventorySet()
00036         {
00037             if (items == null)
00038                 return true;
00039
00040             return false;
00041         }
00042
00047         public void SetInventorySize(int inventorySize)
```

```
00048         {
00049             items = new ItemsInInventory(slots.Length);
00050         }
00051 
00059         public void SetAllItems(ItemsInInventory items)
00060         {
00061             this.items = items;
00062         }
00063         #endregion
00064 
00065         #region Update
00066         public void UpdateBase()
00070         {
00071             PutItemsInSlots();
00072         }
00073         #endregion
00074 
00075         #region Edit Inventory
00076         void PutItemsInSlots()
00080         {
00081             //* goes through all of the items in the array setting then all to a slot
00082             for (int i = 0; i < slots.Length; i++)
00083             {
00084                 slots[i].slotIndex = i;
00085                 slots[i].myInventory = this;
00086                 slots[i].item = items.itemsInInventory[i];
00087             }
00088         }
00089 
00094         public ItemsInInventory GetAllItems()
00095         {
00096             return items;
00097         }
00098 
00104         public void AddItemToSlots(int slotIndex, Item item)
00105         {
00106             items.AddItem(slotIndex, item);
00107             //* saves the inventory changes
00108             Serialization.Serialization.SerializeInventory(this, inventoryName);
00109         }
00110 
00116         public bool AddItemToInventory(Item item)
00117         {
00118             return items.AddItem(item);
00119         }
00120         #endregion
00121     }
00122 }
```

0.3.3 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Inventory/ItemsIn↩ Inventory.cs File Reference

Classes

- class BeeGame.Inventory.ItemsInInventory

  Class that holds all of the items in the inventory. Can be serialized so inventory may be saved

Namespaces

- namespace BeeGame.Inventory

0.3.4 ItemsInInventory.cs

```
00001 using System;
00002 using BeeGame.Items;
00003 
00004 namespace BeeGame.Inventory
00005 {
00009     [Serializable]
00010     public class ItemsInInventory
00011     {
00015         public Item[] itemsInInventory;
```

```
00016
00021         public ItemsInInventory(int numberOfInventorySlots)
00022         {
00023             itemsInInventory = new Item[numberOfInventorySlots];
00024         }
00025
00031         public void AddItem(int index, Item item)
00032         {
00033             itemsInInventory[index] = item;
00034         }
00035
00041         public bool AddItem(Item item)
00042         {
00043             for (int i = 0; i < itemsInInventory.Length; i++)
00044             {
00045                 if (itemsInInventory[i] == null)
00046                 {
00047                     itemsInInventory[i] = item;
00048                     return true;
00049                 }
00050                 if (itemsInInventory[i] == item && itemsInInventory[i].itemStackCount + 1 <=
      itemsInInventory[i].maxStackCount)
00051                 {
00052                     itemsInInventory[i].itemStackCount++;
00053                     return true;
00054                 }
00055             }
00056
00057             return false;
00058         }
00059     }
00060 }
```

0.3.5 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Inventory/Inventory↩ Slot.cs File Reference

Classes

- class BeeGame.Inventory.InventorySlot

Namespaces

- namespace BeeGame.Inventory

0.3.6 InventorySlot.cs

```
00001 using UnityEngine;
00002 using UnityEngine.UI;
00003 using UnityEngine.EventSystems;
00004 using BeeGame.Items;
00005 using BeeGame.Core;
00006
00007 namespace BeeGame.Inventory
00008 {
00009     public class InventorySlot : MonoBehaviour, IPointerClickHandler, IPointerEnterHandler,
      IPointerExitHandler
00010     {
00011         #region Data
00012         internal int slotIndex;
00019         public Item item;
00023         public Inventory myInventory;
00027         public GameObject itemText;
00031         public bool selectedSlot = false;
00032         #endregion
00033
00037         private void Update()
00038         {
00039             UpdateIcon();
00040         }
00041
00045         void UpdateIcon()
00046         {
```

```
00047             if(item == null)
00048             {
00049                 GetComponent<Image>().sprite = null;
00050             }
00051             else
00052             {
00053                 GetComponent<Image>().sprite = item.GetItemSprite();
00054             }
00055 
00056             //* if the slot is selected in the hotbar give the player some indication by colouring it grey
00057             if (selectedSlot)
00058             {
00059                 GetComponent<Image>().color = Color.gray;
00060             }
00061             else
00062             {
00063                 GetComponent<Image>().color = Color.white;
00064             }
00065         }
00066 
00067         #region Interact With Slot
00068         public void OnPointerClick(PointerEventData eventData)
00076         {
00077             if (myInventory.floatingItem != null)
00078             {
00079                 //* Left click moves whole stacks if items
00080                 if (eventData.button == PointerEventData.InputButton.Left)
00081                 {
00082                     //* If the item in the slot is empty put the floating item into it then clear it
00083                     if (item == null)
00084                     {
00085                         item = myInventory.floatingItem;
00086                         myInventory.floatingItem = null;
00087                         myInventory.AddItemToSlots(slotIndex, item);
00088                         return;
00089                     }
00090                     //* if the items are the same
00091                     if(myInventory.floatingItem == item)
00092                     {
00093                         //* if the item in the inventoys stack count + the floating items stack count is
       less than the max stack count
00094                         if (myInventory.floatingItem.itemStackCount + item.
      itemStackCount <= item.maxStackCount)
00095                         {
00096                             AddToSlot(myInventory.floatingItem.
      itemStackCount);
00097                             return;
00098                         }
00099                         //* if the item stack added is larger than the max count add as many as you can and
       move on
00100                         else
00101                         {
00102                             AddToSlot(item.maxStackCount - item.
      itemStackCount);
00103                             return;
00104                         }
00105                     }
00106                     //* If the items were not == swap them
00107                     else
00108                     {
00109                         SwapItems();
00110                         return;
00111                     }
00112                 }
00113                 else if(eventData.button == PointerEventData.InputButton.Right)
00114                 {
00115                     //* if the item in slot is null add 1 from the floating item to it
00116                     if(item == null)
00117                     {
00118                         AddToSlot(1);
00119                         return;
00120                     }
00121                     //* if the items are the same add 1 from the floating item to this item
00122                     else if(item == myInventory.floatingItem)
00123                     {
00124                         AddToSlot(1);
00125                         return;
00126                     }
00127                 }
00128             }
00129             //* if the floating item is null
00130             else
00131             {
00132                 //* add 1/2 of the stack into the floating item if right click was pressed
00133                 if(eventData.button == PointerEventData.InputButton.Right)
00134                 {
00135                     SplitStack();
```

```
00136                   return;
00137               }
00138
00139               //* otherwie add the items into the floating item slot
00140               SwapItems();
00141               return;
00142           }
00143
00144       }
00145
00150       void AddToSlot(int numerToAdd)
00151       {
00152           //* if the item in the slot is null create it
00153           if (item == null)
00154           {
00155               item = myInventory.floatingItem.CloneObject();
00156               item.itemStackCount = 0;
00157           }
00158
00159           //* add to number to add to the stack count
00160           item.itemStackCount += numerToAdd;
00161
00162           //* if the stack count is now larger than it should be dont let it be
00163           if (item.itemStackCount > item.maxStackCount)
00164           {
00165               item.itemStackCount = item.maxStackCount;
00166           }
00167
00168           //* remove the numebr if items form the floating item then check the floating item is not null
00169           myInventory.floatingItem.itemStackCount -= numerToAdd;
00170           CheckFloatingItem();
00171           //* save the inventory changes
00172           myInventory.AddItemToSlots(slotIndex, item);
00173       }
00174
00181       void SplitStack()
00182       {
00183           myInventory.floatingItem = item.CloneObject();
00184           int give = (item.itemStackCount + 1) / 2;
00185           myInventory.floatingItem.itemStackCount = give;
00186           item.itemStackCount -= give;
00187
00188           if (item.itemStackCount <= 0)
00189               item = null;
00190
00191           myInventory.AddItemToSlots(slotIndex, item);
00192           Destroy(itemText);
00193       }
00194
00198       void SwapItems()
00199       {
00200           //* temp copy of the item
00201           Item temp = myInventory.floatingItem;
00202           //* sets the floating item
00203           myInventory.floatingItem = item;
00204           //* sets the item that was in the floating item to the item in the the slot
00205           item = temp;
00206           //* Saves the changes to the inventory
00207           myInventory.AddItemToSlots(slotIndex, item);
00208           //* destroys the text as it is not needed anymore
00209           Destroy(itemText);
00210       }
00211
00215       void CheckFloatingItem()
00216       {
00217           if(myInventory.floatingItem.itemStackCount <= 0)
00218           {
00219               myInventory.floatingItem = null;
00220           }
00221       }
00222       #endregion
00223
00224       #region Display Item On Hover
00225       public void OnPointerEnter(PointerEventData eventData)
00230       {
00231           //* if the item is null or the floating item has something in it dont display the item text as
       it is not necissary
00232           if (item != null && myInventory.floatingItem == null)
00233           {
00234               itemText = Instantiate(PrefabDictionary.
      GetPrefab("ItemDetails"));
00235               //* sets the text to the correct postion
00236               itemText.transform.GetChild(0).position = Input.mousePosition;
00237               //* puts the correct text in the box
00238               itemText.transform.GetChild(0).GetChild(0).GetComponent<Text>().text = $"
      {item.GetItemName()}\nStack: {item.itemStackCount}";
00239           }
```

```
00240         }
00241
00246         public void OnPointerExit(PointerEventData eventData)
00247         {
00248             Destroy(itemText);
00249         }
00250
00254         void OnDisable()
00255         {
00256             Destroy(itemText);
00257         }
00258         #endregion
00259     }
00260 }
```

0.3.7 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Inventory/Player Inventory/↩ PlayerInventory.cs File Reference

Classes

- class BeeGame.Inventory.Player_Inventory.PlayerInventory

  Controlls the player inventory

Namespaces

- namespace BeeGame.Inventory.Player_Inventory

0.3.8 PlayerInventory.cs

```
00001 using UnityEngine;
00002 using BeeGame.Items;
00003 using BeeGame.Core;
00004
00005 namespace BeeGame.Inventory.Player_Inventory
00006 {
00010     public class PlayerInventory : Inventory
00011     {
00012         #region Data
00013         public GameObject playerInventory;
00017         #endregion
00018
00019         #region Init
00020         void Start()
00024         {
00025             SetPlayerInventory();
00026             inventoryName = "PlayerInventory";
00027             Serialization.Serialization.DeSerializeInventory(this, inventoryName);
00028         }
00029
00033         void SetPlayerInventory()
00034         {
00035             if (InventorySet())
00036                 SetInventorySize(20);
00037         }
00038         #endregion
00039
00043         void Update()
00044         {
00045             UpdateBase();
00046
00047             //* whecks if the inventory should be opened/closed
00048             if (THInput.GetButtonDown("Player Inventory"))
00049                 OpenPlayerInventory();
00050
00051             //* checks if somethig shoul dbe picked up and put into the inventory
00052             RaycastHit[] hit = Physics.SphereCastAll(transform.position, 1f, transform.forward);
00053
00054             for (int i = hit.Length - 1; i >= 0; i--)
00055             {
00056                 if (hit[i].collider.GetComponent<ItemGameObject>())
00057                     PickupItem(hit[i].collider.GetComponent<ItemGameObject>());
00058             }
```

```
00059
00060         }
00061
00062         #region Hotbar
00063         public void SelectedSlot(int index)
00068         {
00069             for (int i = 0; i < slots.Length; i++)
00070             {
00071                 slots[i].selectedSlot = false;
00072             }
00073
00074             slots[index].selectedSlot = true;
00075         }
00076
00083         public bool GetItemFromHotBar(int slotIndex, out Item outItem)
00084         {
00085             //* get the item
00086             outItem = GetAllItems().itemsInInventory[slotIndex];
00087
00088             if (outItem == null)
00089                 return false;
00090
00091             //* if the item is placebale and is not null remove 1 from the inventory as it is assumed it is
      about to be placed in the world
00092             if(outItem.placeable)
00093                 RemoveItemFromInventory(slotIndex);
00094
00095             return outItem.placeable;
00096         }
00097         #endregion
00098
00099         #region Interact With Inventory
00100         void OpenPlayerInventory()
00104         {
00105             playerInventory.SetActive(!playerInventory.activeInHierarchy);
00106             THInput.isAnotherInventoryOpen = !
      THInput.isAnotherInventoryOpen;
00107
00108             //* hides/ shows the mouse depending on if te inventory is open or not
00109             if (playerInventory.activeInHierarchy)
00110             {
00111                 Cursor.lockState = CursorLockMode.None;
00112                 Cursor.visible = true;
00113             }
00114             else
00115             {
00116                 Cursor.visible = false;
00117                 Cursor.lockState = CursorLockMode.Locked;
00118             }
00119         }
00120
00125         public void RemoveItemFromInventory(int index)
00126         {
00127             //* if the item is already null nothign needs to be removed
00128             if (GetAllItems().itemsInInventory[index] != null)
00129             {
00130                 //* remove 1 item and if that was the last in the stack remove the item from the inventory
00131                 GetAllItems().itemsInInventory[index].itemStackCount -= 1;
00132
00133                 if (GetAllItems().itemsInInventory[index].itemStackCount <= 0)
00134                     GetAllItems().itemsInInventory[index] = null;
00135
00136                 Serialization.Serialization.SerializeInventory(this, inventoryName);
00137             }
00138         }
00139
00144         void PickupItem(ItemGameObject item)
00145         {
00146             //* if the item can be added to the inventory do that
00147             if (AddItemToInventory(item.item))
00148             {
00149                 //* if the item was added destroyits gameobject and save the inventory
00150                 Destroy(item.gameObject);
00151                 Serialization.Serialization.SerializeInventory(this, inventoryName);
00152             }
00153         }
00154         #endregion
00155     }
00156 }
```

0.4 Chunks

0.4.1 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/Chunks/↩ Chunk.cs File Reference

Classes

- class BeeGame.Terrain.Chunks.Chunk

  A section of land for the game, used so that land can be generated in parts and not all at once

Namespaces

- namespace BeeGame.Terrain.Chunks

0.4.2 Chunk.cs

```
00001 using UnityEngine;
00002 using BeeGame.Blocks;
00003 using BeeGame.Terrain.LandGeneration;
00004 using System.Threading;
00005
00006 namespace BeeGame.Terrain.Chunks
00007 {
00011     [RequireComponent(typeof(MeshFilter))]
00012     [RequireComponent(typeof(MeshRenderer))]
00013     [RequireComponent(typeof(MeshCollider))]
00014     public class Chunk : MonoBehaviour
00015     {
00016         #region Data
00017         public static int chunkSize = 16;
00025
00029         public Block[,,] blocks = new Block[chunkSize, chunkSize, chunkSize];
00030
00034         public bool update = true;
00038         public bool rendered;
00039
00043         public bool updateCollsionMesh = false;
00047         public bool applyCollisionMesh = false;
00048
00052         public World world;
00056         public ChunkWorldPos chunkWorldPos;
00057
00061         private MeshData mesh = new MeshData();
00062
00066         private MeshFilter filter;
00070         private MeshCollider meshCollider;
00071         #endregion
00072
00073         #region Unity Methods
00074         void Start()
00078         {
00079             filter = GetComponent<MeshFilter>();
00080             meshCollider = GetComponent<MeshCollider>();
00081         }
00082
00086         void Update()
00087         {
00088             lock(mesh)
00089             {
00090                 if (update)
00091                 {
00092                     update = false;
00093                     updateCollsionMesh = true;
00094                     mesh = new MeshData();
00095                     //Enabling threading here works in editor but not in build?
00096                     //ok whatever...
00097                     //Thread thread = new Thread(UpdateChunk);
00098
00099                     //thread.Start();
00100                     UpdateChunk();
00101                 }
00102
00103                 if (mesh.done && mesh != new MeshData())
00104                 {
00105                     RenderMesh(mesh);
00106                 }
00107
```

```
00108                 if (applyCollisionMesh)
00109                     ColliderMesh();
00110             }
00111         }
00112         #endregion
00113 
00114         #region Get/Set Blocks
00115         public Block GetBlock(int x, int y, int z, bool checkNebouringChunks = true)
00124         {
00125             //checks that block is in the chunk
00126             if (InRange(x) && InRange(y) && InRange(z))
00127                 return blocks[x, y, z];
00128 
00129             //if the block is not in the chunk and we should check other chunks do that, otherwise return an air block (empty block)
00130             if(checkNebouringChunks)
00131                 return world.GetBlock(chunkWorldPos.x + x, chunkWorldPos.y + y, chunkWorldPos.z + z);
00132 
00133             return new Air();
00134         }
00135 
00143         public void SetBlock(int x, int y, int z, Block block)
00144         {
00145             //sets the block in the position if it is in the chunk, then return early
00146             if (InRange(x) && InRange(y) && InRange(z))
00147             {
00148                 blocks[x, y, z] = block;
00149                 return;
00150             }
00151             //if the block is not in the chunk find its chunk and set it their
00152             world.SetBlock(chunkWorldPos.x + x, chunkWorldPos.y + y, chunkWorldPos.z + z, block);
00153         }
00154 
00160         public static bool InRange(int i)
00161         {
00162             //if the value is less then 0 or greater than 16 the value is outside the chunk
00163             if (i < 0 || i >= chunkSize)
00164                 return false;
00165             return true;
00166         }
00167         #endregion
00168 
00169         #region Mesh
00170         public void SetBlocksUnmodified()
00177         {
00178             foreach (var block in blocks)
00179             {
00180                 block.changed = false;
00181             }
00182         }
00183 
00187         void UpdateChunk()
00188         {
00189             //says that this chunk is rendered and initialtes the mesh
00190             rendered = true;
00191 
00192             //goes through every block in the blocks array getting their mesh data
00193             for (int x = 0; x < chunkSize; x ++)
00194             {
00195                 for (int z = 0; z < chunkSize; z ++)
00196                 {
00197                     for (int y = 0; y < chunkSize; y ++)
00198                     {
00199                         blocks[x, y, z].UpdateBlock(x, y, z, this);
00200                         mesh = blocks[x, y, z].BlockData(this, x, y, z, mesh);
00201                     }
00202                 }
00203             }
00204             mesh.done = true;
00205         }
00206 
00211         void RenderMesh(MeshData meshData)
00212         {
00213             //Applying the mesh takes the longest but nothing can be dont with the mesh class in a secondary thread...thanks unity
00214 
00215             mesh.done = false;
00216             //clears the current chunk mesh
00217             filter.mesh.Clear();
00218             //name for convenience
00219             filter.mesh.name = "Render Mesh";
00220             //puts the tris and verts from the meshdata into the chunk mesh
00221             filter.mesh.vertices = meshData.verts.ToArray();
00222             filter.mesh.triangles = meshData.tris.ToArray();
00223 
```

```
00224             //sets the uvs
00225             filter.mesh.uv = meshData.uv.ToArray();
00226 
00227             //redoes the normals incase they got messed up
00228             filter.mesh.RecalculateNormals();
00229         }
00230 
00234         void ColliderMesh()
00235         {
00236             //if the chunk has been told to update the collsions but the chunk has ne verts dont do it as
      their is no point
00237             if (this.mesh.verts.Count == 0)
00238                 return;
00239 
00240             //if the render and collision meshes should be shared set the render mesh to the collision mesh
      otherwise make a collision mesh
00241             if (this.mesh.shareMeshes)
00242             {
00243                 world.chunkHasMadeCollisionMesh = true;
00244                 applyCollisionMesh = false;
00245                 meshCollider.sharedMesh = filter.mesh;
00246                 return;
00247             }
00248 
00249             world.chunkHasMadeCollisionMesh = true;
00250             //Applying the mesh takes the longest but nothing can be dont with the mesh class in a
      secondary thread...thanks Unity
00251 
00252             //makes a new mesh setting the name for convenience
00253             Mesh mesh = new Mesh()
00254             {
00255                 name = "Collider Mesh",
00256                 vertices = this.mesh.colVerts.ToArray(),
00257                 triangles = this.mesh.colTris.ToArray()
00258             };
00259 
00260             //recalcs the normals and applies the mesh
00261             mesh.RecalculateNormals();
00262 
00263             meshCollider.sharedMesh = mesh;
00264 
00265             applyCollisionMesh = false;
00266         }
00267         #endregion
00268     }
00269 }
```

0.4.3 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/Chunks/Mesh↩ Data.cs File Reference

Classes

- class BeeGame.Terrain.Chunks.MeshData

  The data for a Chunks's Mesh

Namespaces

- namespace BeeGame.Terrain.Chunks

0.4.4 MeshData.cs

```
00001 using System.Collections.Generic;
00002 using UnityEngine;
00003 using BeeGame.Core.Enums;
00004 using BeeGame.Core;
00005 
00006 namespace BeeGame.Terrain.Chunks
00007 {
00011     public class MeshData
00012     {
00016         public List<Vector3> verts = new List<Vector3>();
00020         public List<int> tris = new List<int>();
```

```
00024         public List<Vector2> uv = new List<Vector2>();
00025
00029         public List<Vector3> colVerts = new List<Vector3>();
00033         public List<int> colTris = new List<int>();
00034
00038         public bool shareMeshes = true;
00039
00040         public bool done = false;
00041
00046         public void AddQuadTriangles(bool addToRenderMesh = true)
00047         {
00048             //*adds the triangles in an anticlockwise order
00049
00050             if (addToRenderMesh)
00051             {
00052                 tris.Add(verts.Count - 4);
00053                 tris.Add(verts.Count - 3);
00054                 tris.Add(verts.Count - 2);
00055                 tris.Add(verts.Count - 4);
00056                 tris.Add(verts.Count - 2);
00057                 tris.Add(verts.Count - 1);
00058             }
00059
00060             colTris.Add(colVerts.Count - 4);
00061             colTris.Add(colVerts.Count - 3);
00062             colTris.Add(colVerts.Count - 2);
00063             colTris.Add(colVerts.Count - 4);
00064             colTris.Add(colVerts.Count - 2);
00065             colTris.Add(colVerts.Count - 1);
00066         }
00067
00074         public void AddVertices(THVector3 pos, bool addToRenderMesh = true,
      Direction direction = Direction.DOWN)
00075         {
00076             if (addToRenderMesh)
00077                 verts.Add(pos);
00078
00079             //*if the vertice is on the top face make its positon slightly smaller
00080             if(direction == Direction.UP)
00081                 colVerts.Add(pos - new THVector3(0.01f, 0, 0.01f));
00082         }
00083
00091         public void AddTriangle(int tri)
00092         {
00093             tris.Add(tri);
00094
00095             colTris.Add(tri - (verts.Count - colVerts.Count));
00096         }
00097     }
00098 }
```

0.4.5 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/Chunks/LoadChunks.cs File Reference

Classes

- class BeeGame.Terrain.Chunks.LoadChunks

  Loads the Chunks around the player

Namespaces

- namespace BeeGame.Terrain.Chunks

0.4.6 LoadChunks.cs

```
00001 using System;
00002 using System.Collections.Generic;
00003 using UnityEngine;
00004 using BeeGame.Terrain.LandGeneration;
00005
00006 namespace BeeGame.Terrain.Chunks
00007 {
```

```
00011     public class LoadChunks : MonoBehaviour
00012     {
00016         public World world;
00017 
00021         private List<ChunkWorldPos> buildList = new List<ChunkWorldPos>();
00022 
00026         private static ChunkWorldPos[] chunkPositions = new
      ChunkWorldPos[] {   new ChunkWorldPos( 0, 0,  0), new
      ChunkWorldPos(-1, 0,  0), new ChunkWorldPos( 0, 0, -1), new
      ChunkWorldPos( 0, 0,  1), new ChunkWorldPos( 1, 0,  0),
00027                             new ChunkWorldPos(-1, 0, -1), new
      ChunkWorldPos(-1, 0,  1), new ChunkWorldPos( 1, 0, -1), new
      ChunkWorldPos( 1, 0,  1), new ChunkWorldPos(-2, 0,  0),
00028                             new ChunkWorldPos( 0, 0, -2), new
      ChunkWorldPos( 0, 0,  2), new ChunkWorldPos( 2, 0,  0), new
      ChunkWorldPos(-2, 0, -1), new ChunkWorldPos(-2, 0,  1),
00029                             new ChunkWorldPos(-1, 0, -2), new
      ChunkWorldPos(-1, 0,  2), new ChunkWorldPos( 1, 0, -2), new
      ChunkWorldPos( 1, 0,  2), new ChunkWorldPos( 2, 0, -1),
00030                             new ChunkWorldPos( 2, 0,  1), new
      ChunkWorldPos(-2, 0, -2), new ChunkWorldPos(-2, 0,  2), new
      ChunkWorldPos( 2, 0, -2), new ChunkWorldPos( 2, 0,  2),
00031                             new ChunkWorldPos(-3, 0,  0), new
      ChunkWorldPos( 0, 0, -3), new ChunkWorldPos( 0, 0,  3), new
      ChunkWorldPos( 3, 0,  0), new ChunkWorldPos(-3, 0, -1),
00032                             new ChunkWorldPos(-3, 0,  1), new
      ChunkWorldPos(-1, 0, -3), new ChunkWorldPos(-1, 0,  3), new
      ChunkWorldPos( 1, 0, -3), new ChunkWorldPos( 1, 0,  3),
00033                             new ChunkWorldPos( 3, 0, -1), new
      ChunkWorldPos( 3, 0,  1), new ChunkWorldPos(-3, 0, -2), new
      ChunkWorldPos(-3, 0,  2), new ChunkWorldPos(-2, 0, -3),
00034                             new ChunkWorldPos(-2, 0,  3), new
      ChunkWorldPos( 2, 0, -3), new ChunkWorldPos( 2, 0,  3), new
      ChunkWorldPos( 3, 0, -2), new ChunkWorldPos( 3, 0,  2),
00035                             new ChunkWorldPos(-4, 0,  0), new
      ChunkWorldPos( 0, 0, -4), new ChunkWorldPos( 0, 0,  4), new
      ChunkWorldPos( 4, 0,  0), new ChunkWorldPos(-4, 0, -1),
00036                             new ChunkWorldPos(-4, 0,  1), new
      ChunkWorldPos(-1, 0, -4), new ChunkWorldPos(-1, 0,  4), new
      ChunkWorldPos( 1, 0, -4), new ChunkWorldPos( 1, 0,  4),
00037                             new ChunkWorldPos( 4, 0, -1), new
      ChunkWorldPos( 4, 0,  1), new ChunkWorldPos(-3, 0, -3), new
      ChunkWorldPos(-3, 0,  3), new ChunkWorldPos( 3, 0, -3),
00038                             new ChunkWorldPos( 3, 0,  3), new
      ChunkWorldPos(-4, 0, -2), new ChunkWorldPos(-4, 0,  2), new
      ChunkWorldPos(-2, 0, -4), new ChunkWorldPos(-2, 0,  4),
00039                             new ChunkWorldPos( 2, 0, -4), new
      ChunkWorldPos( 2, 0,  4), new ChunkWorldPos( 4, 0, -2), new
      ChunkWorldPos( 4, 0,  2), new ChunkWorldPos(-5, 0,  0),
00040                             new ChunkWorldPos(-4, 0, -3), new
      ChunkWorldPos(-4, 0,  3), new ChunkWorldPos(-3, 0, -4), new
      ChunkWorldPos(-3, 0,  4), new ChunkWorldPos( 0, 0, -5),
00041                             new ChunkWorldPos( 0, 0,  5), new
      ChunkWorldPos( 3, 0, -4), new ChunkWorldPos( 3, 0,  4), new
      ChunkWorldPos( 4, 0, -3), new ChunkWorldPos( 4, 0,  3),
00042                             new ChunkWorldPos( 5, 0,  0), new
      ChunkWorldPos(-5, 0, -1), new ChunkWorldPos(-5, 0,  1), new
      ChunkWorldPos(-1, 0, -5), new ChunkWorldPos(-1, 0,  5),
00043                             new ChunkWorldPos( 1, 0, -5), new
      ChunkWorldPos( 1, 0,  5), new ChunkWorldPos( 5, 0, -1), new
      ChunkWorldPos( 5, 0,  1), new ChunkWorldPos(-5, 0, -2),
00044                             new ChunkWorldPos(-5, 0,  2), new
      ChunkWorldPos(-2, 0, -5), new ChunkWorldPos(-2, 0,  5), new
      ChunkWorldPos( 2, 0, -5), new ChunkWorldPos( 2, 0,  5),
00045                             new ChunkWorldPos( 5, 0, -2), new
      ChunkWorldPos( 5, 0,  2), new ChunkWorldPos(-4, 0, -4), new
      ChunkWorldPos(-4, 0,  4), new ChunkWorldPos( 4, 0, -4),
00046                             new ChunkWorldPos( 4, 0,  4), new
      ChunkWorldPos(-5, 0, -3), new ChunkWorldPos(-5, 0,  3), new
      ChunkWorldPos(-3, 0, -5), new ChunkWorldPos(-3, 0,  5),
00047                             new ChunkWorldPos( 3, 0, -5), new
      ChunkWorldPos( 3, 0,  5), new ChunkWorldPos( 5, 0, -3), new
      ChunkWorldPos( 5, 0,  3), new ChunkWorldPos(-6, 0,  0),
00048                             new ChunkWorldPos( 0, 0, -6), new
      ChunkWorldPos( 0, 0,  6), new ChunkWorldPos( 6, 0,  0), new
      ChunkWorldPos(-6, 0, -1), new ChunkWorldPos(-6, 0,  1),
00049                             new ChunkWorldPos(-1, 0, -6), new
      ChunkWorldPos(-1, 0,  6), new ChunkWorldPos( 1, 0, -6), new
      ChunkWorldPos( 1, 0,  6), new ChunkWorldPos( 6, 0, -1),
00050                             new ChunkWorldPos( 6, 0,  1), new
      ChunkWorldPos(-6, 0, -2), new ChunkWorldPos(-6, 0,  2), new
      ChunkWorldPos(-2, 0, -6), new ChunkWorldPos(-2, 0,  6),
00051                             new ChunkWorldPos( 2, 0, -6), new
      ChunkWorldPos( 2, 0,  6), new ChunkWorldPos( 6, 0, -2), new
      ChunkWorldPos( 6, 0,  2), new ChunkWorldPos(-5, 0, -4),
00052                             new ChunkWorldPos(-5, 0,  4), new
      ChunkWorldPos(-4, 0, -5), new ChunkWorldPos(-4, 0,  5), new
```

```
      ChunkWorldPos( 4, 0, -5), new ChunkWorldPos( 4, 0,  5),
00053                               new ChunkWorldPos( 5, 0, -4), new
      ChunkWorldPos( 5, 0,  4), new ChunkWorldPos(-6, 0, -3), new
      ChunkWorldPos(-6, 0,  3), new ChunkWorldPos(-3, 0, -6),
00054                               new ChunkWorldPos(-3, 0,  6), new
      ChunkWorldPos( 3, 0, -6), new ChunkWorldPos( 3, 0,  6), new
      ChunkWorldPos( 6, 0, -3), new ChunkWorldPos( 6, 0,  3),
00055                               new ChunkWorldPos(-7, 0,  0), new
      ChunkWorldPos( 0, 0, -7), new ChunkWorldPos( 0, 0,  7), new
      ChunkWorldPos( 7, 0,  0), new ChunkWorldPos(-7, 0, -1),
00056                               new ChunkWorldPos(-7, 0,  1), new
      ChunkWorldPos(-5, 0, -5), new ChunkWorldPos(-5, 0,  5), new
      ChunkWorldPos(-1, 0, -7), new ChunkWorldPos(-1, 0,  7),
00057                               new ChunkWorldPos( 1, 0, -7), new
      ChunkWorldPos( 1, 0,  7), new ChunkWorldPos( 5, 0, -5), new
      ChunkWorldPos( 5, 0,  5), new ChunkWorldPos( 7, 0, -1),
00058                               new ChunkWorldPos( 7, 0,  1), new
      ChunkWorldPos(-6, 0, -4), new ChunkWorldPos(-6, 0,  4), new
      ChunkWorldPos(-4, 0, -6), new ChunkWorldPos(-4, 0,  6),
00059                               new ChunkWorldPos( 4, 0, -6), new
      ChunkWorldPos( 4, 0,  6), new ChunkWorldPos( 6, 0, -4), new
      ChunkWorldPos( 6, 0,  4), new ChunkWorldPos(-7, 0, -2),
00060                               new ChunkWorldPos(-7, 0,  2), new
      ChunkWorldPos(-2, 0, -7), new ChunkWorldPos(-2, 0,  7), new
      ChunkWorldPos( 2, 0, -7), new ChunkWorldPos( 2, 0,  7),
00061                               new ChunkWorldPos( 7, 0, -2), new
      ChunkWorldPos( 7, 0,  2), new ChunkWorldPos(-7, 0, -3), new
      ChunkWorldPos(-7, 0,  3), new ChunkWorldPos(-3, 0, -7),
00062                               new ChunkWorldPos(-3, 0,  7), new
      ChunkWorldPos( 3, 0, -7), new ChunkWorldPos( 3, 0,  7), new
      ChunkWorldPos( 7, 0, -3), new ChunkWorldPos( 7, 0,  3),
00063                               new ChunkWorldPos(-6, 0, -5), new
      ChunkWorldPos(-6, 0,  5), new ChunkWorldPos(-5, 0, -6), new
      ChunkWorldPos(-5, 0,  6), new ChunkWorldPos( 5, 0, -6),
00064                               new ChunkWorldPos( 5, 0,  6), new
      ChunkWorldPos( 6, 0, -5), new ChunkWorldPos( 6, 0,  5) };
00065
00069         private static ChunkWorldPos[] nearbyChunks = new
      ChunkWorldPos[] { new ChunkWorldPos(0, 0, 0), new
      ChunkWorldPos(1, 0, 0), new ChunkWorldPos(-1, 0, 0), new
      ChunkWorldPos(0, 0, 1), new ChunkWorldPos(0, 0, -1),
00070                                                                   new
      ChunkWorldPos(1, 0, 1), new ChunkWorldPos(1, 0, -1), new
      ChunkWorldPos(-1, 0, 1), new ChunkWorldPos(-1, 0, -1)};
00071
00075         private static int timer = 0;
00076
00080         private void Start()
00081         {
00082             LandGeneration.Terrain.world = world;
00083         }
00084
00088         void Update()
00089         {
00090             if (DeleteChunks())
00091                 return;
00092             if (!world.chunkHasMadeCollisionMesh)
00093             {
00094                 FindChunksToLoad();
00095                 LoadAndRenderChunks();
00096                 ApplyCollsionMeshToNearbyChunks();
00097             }
00098             //stops chunks being made and collision meshes being made at the same time
00099             world.chunkHasMadeCollisionMesh = false;
00100         }
00101
00109         void ApplyCollsionMeshToNearbyChunks()
00110         {
00111             //gets the player position in chunk coordinates
00112             ChunkWorldPos playerPos = new ChunkWorldPos(Mathf.FloorToInt(
      transform.position.x / Chunk.chunkSize) * Chunk.chunkSize, Mathf.FloorToInt(transform.
      position.y / Chunk.chunkSize) * Chunk.chunkSize, Mathf.FloorToInt(transform.
      position.z / Chunk.chunkSize) * Chunk.chunkSize);
00113
00114             for (int i = 0; i < nearbyChunks.Length; i++)
00115             {
00116                 ChunkWorldPos chunkPos = new ChunkWorldPos(nearbyChunks[i].x *
      Chunk.chunkSize + playerPos.x, 0, nearbyChunks[i].z * Chunk.
      chunkSize + playerPos.z);
00117
00118                 for (int j = -1; j < 2; j++)
00119                 {
00120                     Chunk nearbyChunk = world.GetChunk(chunkPos.x, j *
      Chunk.chunkSize, chunkPos.z);
00121
00122                     if (nearbyChunk != null)
00123                         nearbyChunk.applyCollisionMesh = true;
```

```
00124                 }
00125             }
00126         }
00127
00131         void LoadAndRenderChunks()
00132         {
00133             //if their is somethign in the build list new chunks can be made
00134             if (buildList.Count != 0)
00135             {
00136                 //makes all of the chunks in the build list. Works backwards through the list so that no
       chunk is missed because chunks are removed from the list as they are made
00137                 for (int i = buildList.Count - 1, j = 0; i >= 0 && j < 8; i--, j++)
00138                 {
00139                     BuildChunk(buildList[0]);
00140                     buildList.RemoveAt(0);
00141                 }
00142             }
00143         }
00144
00148         void FindChunksToLoad()
00149         {
00150             if (buildList.Count == 0)
00151             {
00152                 //gets the player position in chunk coordinates
00153                 ChunkWorldPos playerPos = new ChunkWorldPos(Mathf.FloorToInt(
       transform.position.x / Chunk.chunkSize) * Chunk.chunkSize, Mathf.FloorToInt(
       transform.position.y / Chunk.chunkSize) * Chunk.chunkSize, Mathf.FloorToInt(transform.
       position.z / Chunk.chunkSize) * Chunk.chunkSize);
00154
00155                 //check all of the chunk positions and if that position does not have a chunk in it make it
00156                 for (int i = 0; i < chunkPositions.Length; i++)
00157                 {
00158                     ChunkWorldPos newChunkPos = new ChunkWorldPos(chunkPositions[
       i].x * Chunk.chunkSize + playerPos.x, 0, chunkPositions[i].z *
       Chunk.chunkSize + playerPos.z);
00159
00160                     Chunk newChunk = world.GetChunk(newChunkPos.x, newChunkPos.
       y, newChunkPos.z);
00161
00162                     if (newChunk != null && (newChunk.rendered || buildList.Contains(newChunkPos)))
00163                         continue;
00164
00165                     for (int y = -1; y < 2; y++)
00166                     {
00167                         for (int x = newChunkPos.x - Chunk.chunkSize; x < newChunkPos.
       x + Chunk.chunkSize; x += Chunk.chunkSize)
00168                         {
00169                             for (int z = newChunkPos.z - Chunk.chunkSize; z < newChunkPos.
       z + Chunk.chunkSize; z += Chunk.chunkSize)
00170                             {
00171                                 buildList.Add(new ChunkWorldPos(x, y *
       Chunk.chunkSize, z));
00172                             }
00173                         }
00174                     }
00175                     return;
00176                 }
00177             }
00178         }
00179
00184         void BuildChunk(ChunkWorldPos pos)
00185         {
00186             if (world.GetChunk(pos.x, pos.y, pos.z) == null)
00187                 world.CreateChunk(pos.x, pos.y, pos.z);
00188         }
00189
00194         bool DeleteChunks()
00195         {
00196             //destroys every 10 call to reduce load on CPU so that chunks are not destroyed and created at
       the same time
00197             if(timer == 10)
00198             {
00199                 timer = 0;
00200                 var chunksToDelete = new List<ChunkWorldPos>();
00201
00202                 //go through all of the built chunks and if the chunk is 256 units away it is assumed to be
       out of sight so is added to the destroy list
00203                 foreach (var chunk in world.chunks)
00204                 {
00205                     float distance = Vector3.Distance(chunk.Value.transform.position, transform.position);
00206
00207                     if (distance > 256)
00208                         chunksToDelete.Add(chunk.Key);
00209                 }
00210
00211                 foreach (var chunk in chunksToDelete)
00212                 {
```

```
00213                     world.DestroyChunk(chunk.x, chunk.y, chunk.z);
00214                 }
00215
00216                 return true;
00217             }
00218
00219             timer++;
00220
00221             return false;
00222         }
00223     }
00224 }
```

0.4.7 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/Chunks/SaveChunk.cs File Reference

Classes

- class BeeGame.Terrain.Chunks.SaveChunk

  Saves a Chunks modified Blocks for save optimisation

Namespaces

- namespace BeeGame.Terrain.Chunks

0.4.8 SaveChunk.cs

```
00001 using System;
00002 using System.Collections.Generic;
00003 using BeeGame.Blocks;
00004
00005
00006 namespace BeeGame.Terrain.Chunks
00007 {
00011     [Serializable]
00012     public class SaveChunk
00013     {
00017         public Dictionary<ChunkWorldPos, Block> blocks = new Dictionary<ChunkWorldPos, Block>();
00018
00023         public SaveChunk(Block[,,] blockArray)
00024         {
00025             for (int x = 0; x < Chunk.chunkSize; x++)
00026             {
00027                 for (int y = 0; y < Chunk.chunkSize; y++)
00028                 {
00029                     for (int z = 0; z < Chunk.chunkSize; z++)
00030                     {
00031                         //*if the block has changed save it
00032                         if (blockArray[x, y, z].changed)
00033                             blocks.Add(new ChunkWorldPos(x, y, z), blockArray[x, y, z]);
00034                     }
00035                 }
00036             }
00037         }
00038     }
00039 }
```

0.4.9 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/ChunkWorldPos.cs File Reference

Classes

- struct BeeGame.Terrain.ChunkWorldPos

  Serializable int version of THVector3

Namespaces

- namespace BeeGame.Terrain

0.4.10 ChunkWorldPos.cs

```
00001 using System;
00002 using BeeGame.Core;
00003
00004 namespace BeeGame.Terrain
00005 {
00009     [Serializable]
00010     public struct ChunkWorldPos
00011     {
00015         public int x, y, z;
00016
00023         public ChunkWorldPos(int x, int y, int z)
00024         {
00025             this.x = x;
00026             this.y = y;
00027             this.z = z;
00028         }
00029
00034         public override string ToString()
00035         {
00036             return $"({x}, {y}, {z})";
00037         }
00038
00039         //*TODO probly add the == and != but for now this is fine
00040         [System.Diagnostics.CodeAnalysis.SuppressMessage("Microsoft.Usage", "
      CA2231:OverloadOperatorEqualsOnOverridingValueTypeEquals")]
00041         public override bool Equals(object obj)
00042         {
00043             //possibly remove and just check if obj is null
00044             if (!(obj is ChunkWorldPos))
00045                 return false;
00046
00047             ChunkWorldPos temp = (ChunkWorldPos)obj;
00048
00049             //possibly change to hashcode checking
00050             if (temp.x == x && temp.y == y && temp.z == z)
00051                 return true;
00052
00053             return false;
00054         }
00055
00063         public override int GetHashCode()
00064         {
00065             unchecked
00066             {
00067                 int hashcode = 47;
00068
00069                 hashcode *= 227 + x.GetHashCode();
00070                 hashcode *= 227 + y.GetHashCode();
00071                 hashcode *= 227 + z.GetHashCode();
00072
00073                 return hashcode;
00074             }
00075         }
00076
00081         public static implicit operator THVector3(ChunkWorldPos pos)
00082         {
00083             return new THVector3(pos.x, pos.y, pos.z);
00084         }
00085
00093         public static explicit operator ChunkWorldPos(THVector3 pos)
00094         {
00095             return new ChunkWorldPos((int)pos.x, (int)pos.y, (int)pos.
      z);
00096         }
00097     }
00098 }
```

0.4.11 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/LandGeneration/↩ World.cs File Reference

Classes

- class BeeGame.Terrain.LandGeneration.World

  Allows inter Chunk communication as it stores a list of active chunks

Namespaces

- namespace BeeGame.Terrain.LandGeneration

0.4.12 World.cs

```
00001 using System;
00002 using System.Collections.Generic;
00003 using System.Linq;
00004 using System.Text;
00005 using UnityEngine;
00006 using BeeGame.Terrain.Chunks;
00007 using BeeGame.Blocks;
00008
00009 namespace BeeGame.Terrain.LandGeneration
00010 {
00014     public class World : MonoBehaviour
00015     {
00016         #region Data
00017         public Dictionary<ChunkWorldPos, Chunk> chunks = new Dictionary<ChunkWorldPos, Chunk>();
00021
00025         public GameObject chunkPrefab;
00026
00030         public bool chunkHasMadeCollisionMesh = false;
00031         #endregion
00032
00033         #region Creation and Destruction
00034         #region Chunk
00035         public void CreateChunk(int x, int y, int z)
00042         {
00043             //*pos of the chunk
00044             ChunkWorldPos pos = new ChunkWorldPos(x, y, z);
00045
00046             //*makes the chunk at the given position
00047             GameObject newChunk = Instantiate(chunkPrefab, new Vector3(x, y, z), Quaternion.identity);
00048
00049             Chunk chunk = newChunk.GetComponent<Chunk>();
00050
00051             //*setting the chunks pos and a reference to this
00052             chunk.chunkWorldPos = pos;
00053             chunk.world = this;
00054
00055             //*adds the nwe chunk to the dictionary
00056             chunks.Add(pos, chunk);
00057
00058             //*generates the new chunks blocks
00059             chunk = new TerrainGeneration().ChunkGen(chunk);
00060
00061             //loads any blocks that the chunk has had modified
00062             Serialization.Serialization.LoadChunk(chunk);
00063
00064             //*updates all chunks around this one to reduce drawing of unecisary faces
00065             chunks.TryGetValue(new ChunkWorldPos(x, y - 16, z), out chunk);
00066             if (chunk != null)
00067                 chunk.update = true;
00068
00069             chunks.TryGetValue(new ChunkWorldPos(x, y, z - 16), out chunk);
00070             if (chunk != null)
00071                 chunk.update = true;
00072
00073             chunks.TryGetValue(new ChunkWorldPos(x - 16, y, z), out chunk);
00074             if (chunk != null)
00075                 chunk.update = true;
00076
00077             chunks.TryGetValue(new ChunkWorldPos(x, y + 16, z), out chunk);
00078             if (chunk != null)
00079                 chunk.update = true;
00080
00081             chunks.TryGetValue(new ChunkWorldPos(x, y, z + 16), out chunk);
00082             if (chunk != null)
00083                 chunk.update = true;
00084
00085             chunks.TryGetValue(new ChunkWorldPos(x + 16, y, z), out chunk);
00086             if (chunk != null)
00087                 chunk.update = true;
00088             //*the chunk will then make its meshes
00089         }
00090
00097         public void DestroyChunk(int x, int y, int z)
00098         {
00099             //*if teh chnks exists destroy it
00100             if (chunks.TryGetValue(new ChunkWorldPos(x, y, z), out
```

```
      Chunk chunk))
00101             {
00102                 //*saves the chunk before destroying it incase any block were changed in it
00103                 Serialization.Serialization.SaveChunk(chunk);
00104                 Destroy(chunk.gameObject);
00105                 chunks.Remove(new ChunkWorldPos(x, y, z));
00106             }
00107         }
00108         #endregion
00109 
00110         #region Block
00111         public void SetBlock(int x, int y, int z, Block block, bool saveChunk = false)
00119         {
00120             //*gets the chunk for the block to be placed in
00121             Chunk chunk = GetChunk(x, y, z);
00122 
00123             //*if the chunk is not null and the block trying to be replaced is replaceable, replace it
00124             if(chunk != null && chunk.blocks[x - chunk.chunkWorldPos.
      x, y - chunk.chunkWorldPos.y, z - chunk.chunkWorldPos.
      z].breakable)
00125             {
00126 
00127                 chunk.SetBlock(x - chunk.chunkWorldPos.x, y - chunk.
      chunkWorldPos.y, z - chunk.chunkWorldPos.z, block);
00128                 chunk.update = true;
00129 
00130                 //*updates the nebouring chunks as when a block is broken it may be in the edje of the
       chunk so their meshes also need to be updated
00131                 //*only updates chunks that need to be updated as not every chunk will need to be and
       sometines none of them will need to be
00132 
00133                 //*checks if the block chaged is in the edge if the x value for the chunk
00134                 UpdateIfEqual(x - chunk.chunkWorldPos.x, 0, new
      ChunkWorldPos(x - 1, y, z));
00135                 UpdateIfEqual(x - chunk.chunkWorldPos.x, Chunk.
      chunkSize - 1, new ChunkWorldPos(x + 1, y, z));
00136 
00137                 //*checks if the block chaged is in the edge if the y value for the chunk
00138                 UpdateIfEqual(y - chunk.chunkWorldPos.y, 0, new
      ChunkWorldPos(x, y - 1, z));
00139                 UpdateIfEqual(y - chunk.chunkWorldPos.y, Chunk.
      chunkSize - 1, new ChunkWorldPos(x, y + 1, z));
00140 
00141                 //*checks if the block chaged is in the edge if the z value for the chunk
00142                 UpdateIfEqual(z - chunk.chunkWorldPos.z, 0, new
      ChunkWorldPos(x, y, z - 1));
00143                 UpdateIfEqual(z - chunk.chunkWorldPos.z, Chunk.
      chunkSize - 1, new ChunkWorldPos(x, y, z + 1));
00144 
00145                 if (saveChunk)
00146                     Serialization.Serialization.SaveChunk(chunk);
00147             }
00148         }
00149         #endregion
00150         #endregion
00151 
00152         #region Get Things
00153         public Chunk GetChunk(int x, int y, int z)
00161         {
00162             float multiple = Chunk.chunkSize;
00163             //*rounds the given x, y, z to a multiple of 16 as chunks are 16x16x16 in size
00164             ChunkWorldPos pos = new ChunkWorldPos()
00165             {
00166                 x = Mathf.FloorToInt(x / multiple) * Chunk.chunkSize,
00167                 y = Mathf.FloorToInt(y / multiple) * Chunk.chunkSize,
00168                 z = Mathf.FloorToInt(z / multiple) * Chunk.chunkSize
00169             };
00170 
00171             //*gets the chunk if it exists
00172             chunks.TryGetValue(pos, out Chunk chunk);
00173             //*if the chunk does not exist will return null
00174             return chunk;
00175         }
00176 
00184         public Block GetBlock(int x, int y, int z)
00185         {
00186             //*gets the chunk that the block is in
00187             Chunk chunk = GetChunk(x, y, z);
00188 
00189             if(chunk != null)
00190             {
00191                 //*gets the block in the chunk
00192                 return chunk.GetBlock(x - chunk.chunkWorldPos.
      x, y - chunk.chunkWorldPos.y, z - chunk.chunkWorldPos.
      z);
00193             }
00194 
```

```
00195             //*returns an empty block is the chunk was not found
00196             return new Air();
00197         }
00198         #endregion
00199
00206         void UpdateIfEqual(int value1, int value2, ChunkWorldPos pos)
00207         {
00208             if(value1 == value2)
00209             {
00210                 Chunk chunk = GetChunk(pos.x, pos.y, pos.z);
00211
00212                 if (chunk != null)
00213                     chunk.update = true;
00214             }
00215         }
00216     }
00217 }
```

0.4.13 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/LandGeneration/↩ Terrain.cs File Reference

Classes

- class BeeGame.Terrain.LandGeneration.Terrain

  Should use as an interface between the rest of the game and the terrain

Namespaces

- namespace BeeGame.Terrain.LandGeneration

0.4.14 Terrain.cs

```
00001 using System;
00002 using System.Collections.Generic;
00003 using System.Linq;
00004 using System.Text;
00005 using UnityEngine;
00006 using BeeGame.Terrain.Chunks;
00007 using BeeGame.Blocks;
00008 using BeeGame.Core;
00009
00010 namespace BeeGame.Terrain.LandGeneration
00011 {
00015     public class Terrain
00016     {
00017         public static World world;
00018
00019         #region Setting Position To block Grid
00020         public static ChunkWorldPos GetBlockPos(THVector3 pos)
00026         {
00027             return new ChunkWorldPos()
00028             {
00029                 x = Mathf.RoundToInt(pos.x),
00030                 y = Mathf.RoundToInt(pos.y),
00031                 z = Mathf.RoundToInt(pos.z)
00032             };
00033         }
00034
00041         public static THVector3 GetBlockPos(RaycastHit hit)
00042         {
00043             THVector3 vec3 = new THVector3()
00044             {
00045                 x = RoundXZ(hit.point.x, hit.normal.x),
00046                 y = RoundY(hit.point.y, hit.normal.y),
00047                 z = RoundXZ(hit.point.z, hit.normal.z)
00048             };
00049             return (vec3);
00050         }
00051
00057         public static ChunkWorldPos GetBlockPosFromRayCast(RaycastHit
      hit)
00058         {
```

```
00059             return new ChunkWorldPos((int)RoundXZ(hit.point.x, hit.normal.x), (int)RoundY(hit.
      point.y, hit.normal.y), (int)RoundXZ(hit.point.z, hit.normal.z));
00060         }
00061
00071         static float RoundXZ(float pos, float normal)
00072         {
00073             //*if we are looking at + x/z vlaues
00074             if (pos > 0)
00075             {
00076                 if (normal > 0)
00077                 {
00078                     pos = (int)pos;
00079                     return pos;
00080                 }
00081                 else if (normal < 0)
00082                 {
00083                     pos = (int)pos;
00084                     return pos - -1;
00085                 }
00086                 else
00087                 {
00088                     if ((pos - (int)pos) > 0.5)
00089                     {
00090                         return (int)pos + 1;
00091                     }
00092                     return (int)pos;
00093                 }
00094             }
00095             //*if we are looking at - x/z values
00096             else
00097             {
00098                 //*if poitive normal
00099                 if (normal > 0)
00100                 {
00101                     pos = (int)pos;
00102                     return pos - 1;
00103                 }
00104
00105                 //*if negative nomrmal
00106                 if (normal < 0)
00107                 {
00108                     pos = (int)pos;
00109                     return pos;
00110                 }
00111                 //*if their is no normal
00112
00113                 //*if pos is greater than 0.5 we are in the next block so go to it
00114                 if ((-pos - (int)-pos) > 0.5)
00115                 {
00116                     return (int)pos - 1;
00117                 }
00118
00119                 return (int)pos;
00120             }
00121         }
00122
00132         static float RoundY(float pos, float normal)
00133         {
00134             pos = (float)Math.Round(pos, 1);
00135             if (pos >= 0)
00136             {
00137                 if(normal > 0)
00138                 {
00139                     if((int)pos % 2 == 0)
00140                         return Mathf.RoundToInt((float)Math.Round(pos, 1));
00141
00142                     return Mathf.RoundToInt((float)Math.Round(pos, 1)) - normal;
00143                 }
00144
00145                 if((int)pos % 2 == 0)
00146                     return Mathf.RoundToInt((float)Math.Round(pos, 1)) - normal;
00147
00148                 return Mathf.RoundToInt((float)Math.Round(pos, 1));
00149             }
00150
00151             if(pos <= 0)
00152             {
00153                 if (normal > 0)
00154                 {
00155                     if ((int)pos % 2 == 0)
00156                         //*the Math.Round removes strange rounding errors shown with Mathf.Round eg
      sometimes 0.5 would round to 0 not 1
00157                         return Mathf.RoundToInt((float)Math.Round(pos, 1)) - normal;
00158
00159                     return Mathf.RoundToInt((float)Math.Round(pos, 1));// - normal;
00160                 }
00161
```

```
00162                 if ((int)pos % 2 == 0)
00163                     return Mathf.RoundToInt((float)Math.Round(pos, 1));
00164 
00165                 return Mathf.RoundToInt((float)Math.Round(pos, 1)) - normal;
00166             }
00167 
00168 
00169             return Mathf.RoundToInt((float)Math.Round(pos, 1));
00170         }
00171 
00182         public static float Round(float pos, float norm, bool adjacent = false)
00183         {
00184             if(pos - (int)pos == 0.5f || pos - (int)pos == -0.5f)
00185             {
00186                 if(adjacent)
00187                 {
00188                     pos += (norm / 2);
00189                 }
00190                 else
00191                 {
00192                     pos -= (norm / 2);
00193                 }
00194             }
00195 
00196             return pos;
00197         }
00198         #endregion
00199 
00200         #region Get Block
00201         public static ChunkWorldPos GetBlockPos(RaycastHit hit, bool adjacent = false)
00208         {
00209             return GetBlockPos(new THVector3()
00210             {
00211                 //*rounds the hit to the correct position
00212                 x = Round(hit.point.x, hit.normal.x, adjacent),
00213                 y = Round(hit.point.y, hit.normal.y, adjacent),
00214                 z = Round(hit.point.z, hit.normal.z, adjacent)
00215             });
00216         }
00217 
00224         public static Block GetBlock(RaycastHit hit, bool adjacent = false)
00225         {
00226             //*checks that a chunk was hit and if it wasnt return early
00227             Chunk chunk = hit.collider.GetComponent<Chunk>();
00228 
00229             if (chunk == null)
00230                 return null;
00231 
00232             //*allignes the hit to the block grid and returns the block
00233             ChunkWorldPos pos = GetBlockPos(hit, adjacent);
00234 
00235             return chunk.world.GetBlock(pos.x, pos.y, pos.z);
00236         }
00237 
00238         public static Block GetBlock(THVector3 pos)
00239         {
00240             Chunk chunk = GetChunk(pos);
00241 
00242             if (chunk == null)
00243                 return new Air();
00244 
00245             chunk.world.GetBlock((int)pos.x, (int)pos.y, (int)pos.z);
00246 
00247             return new Block();
00248         }
00249 
00250         public static bool BlockInPosition(THVector3 pos,
    Chunk chunk)
00251         {
00252             if (chunk == null)
00253                 return false;
00254 
00255             if (chunk.GetBlock((int)pos.x, (int)pos.y, (int)pos.z) != new
    Air())
00256                 return true;
00257 
00258             return false;
00259         }
00260         #endregion
00261 
00262         public static Chunk GetChunk(THVector3 vec3)
00263         {
00264             return world.GetChunk((int)vec3.x, (int)vec3.y, (int)vec3.
    z);
00265         }
00266 
00267         #region Set Block
```

```
00268         public static bool SetBlock(RaycastHit hit, Block block, bool adjacent = false)
00276         {
00277             //*checks that a chnk was hit
00278             Chunk chunk = hit.collider.GetComponent<Chunk>();
00279 
00280             if (chunk == null)
00281                 return false;
00282 
00283             //*alligns the hit to the block grid
00284             ChunkWorldPos pos = GetBlockPosFromRayCast(hit);
00285 
00286             //*checks that the block tryign to be replaced can be replaced eg bedrock cannot be replaced
00287             if (GetBlock(hit, adjacent).breakable)
00288             {
00289                 //*sets the position of the block and saves the chunk
00290                 chunk.world.SetBlock(pos.x, pos.y, pos.z, block);
00291                 Serialization.Serialization.SaveChunk(chunk);
00292             }
00293 
00294             return true;
00295         }
00296         #endregion
00297     }
00298 }
```

0.4.15 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/LandGeneration/↩ TerrainGeneration.cs File Reference

Classes

- class BeeGame.Terrain.LandGeneration.TerrainGeneration

  Generates the terrain for the game

Namespaces

- namespace BeeGame.Terrain.LandGeneration

0.4.16 TerrainGeneration.cs

```
00001 using UnityEngine;
00002 using BeeGame.Terrain.Chunks;
00003 using BeeGame.Terrain.LandGeneration.Noise;
00004 using BeeGame.Serialization;
00005 using System.Collections.Generic;
00006 using System.Threading;
00007 
00008 namespace BeeGame.Terrain.LandGeneration
00009 {
00013     public class TerrainGeneration
00014     {
00015         #region Data
00016         private float stoneBaseHeight = -24;
00023         private float stoneBaseNoise = 0.05f;
00027         private float stoneBaseNoiseHeight = 4;
00028 
00032         private float stoneMountainHeight = 48;
00036         private float stoneMountainFrequency = 0.008f;
00040         private float stoneMinHeight = -12;
00041 
00045         private float dirtBaseHeight = 1;
00049         private float dirtNoise = 0.04f;
00053         private float dirtNoiseHeight = 3;
00054 
00058         private float caveFrequency = 0.025f;
00062         private int caveSize = 8;
00063         #endregion
00064 
00070         public Chunk ChunkGen(Chunk chunk)
00071         {
00072             Chunk outChunk = chunk;
00073             lock (chunk)
00074             {
```

```
00075                 Thread thread = new Thread(() => ChunkGenThread(chunk, out outChunk)) { Name = $"Generate
       Chunk Thread @ {chunk.chunkWorldPos}"};
00076
00077                 thread.Start();
00078                 return outChunk;
00079             }
00080         }
00081
00087         public void ChunkGenThread(Chunk chunk, out Chunk outChunk)
00088         {
00089             //*for each x and z position in teh chunk
00090             for (int x = chunk.chunkWorldPos.x; x < chunk.
      chunkWorldPos.x + Chunk.chunkSize; x++)
00091             {
00092                 for (int z = chunk.chunkWorldPos.z; z < chunk.
      chunkWorldPos.z + Chunk.chunkSize; z++)
00093                 {
00094                     chunk = GenChunkColum(chunk, x, z);
00095                 }
00096             }
00097
00098             chunk.SetBlocksUnmodified();
00099             outChunk = chunk;
00100         }
00101
00109         public Chunk GenChunkColum(Chunk chunk, int x, int z)
00110         {
00111             //*the height of the mountain
00112             int stoneHeight = Mathf.FloorToInt(stoneBaseHeight);
00113             stoneHeight += GetNoise(-x, 0, z, stoneMountainFrequency, Mathf.FloorToInt(stoneMountainHeight)
      );
00114
00115             //*if the colum is currenly to low make it not so low
00116             if (stoneHeight < stoneMinHeight)
00117                 stoneHeight = Mathf.FloorToInt(stoneMinHeight);
00118
00119             //*add the height of normal stone on to the mountain
00120             stoneHeight += GetNoise(x, 0, -z, stoneBaseNoise, Mathf.RoundToInt(stoneBaseNoiseHeight));
00121
00122             //*put dirt on top
00123             int dirtHeight = stoneHeight + Mathf.FloorToInt(dirtBaseHeight);
00124             dirtHeight += GetNoise(x, 100, z, dirtNoise, Mathf.FloorToInt(dirtNoiseHeight));
00125
00126             //*set the colum to the correct blocks
00127             for (int y = chunk.chunkWorldPos.y; y < chunk.
      chunkWorldPos.y + Chunk.chunkSize; y ++)
00128             {
00129                 int caveChance = GetNoise(x + 40, y + 100, z - 50, caveFrequency, 200);
00130
00131                 //*puts a layer of bedrock at the botton the the world
00132                 if (y <= (chunk.chunkWorldPos.y) && chunk.
      chunkWorldPos.y == -16)
00133                 {
00134                     SetBlock(x, y, z, new Blocks.Bedrock(), chunk);
00135                 }
00136                 else if (y <= stoneHeight && caveSize < caveChance)
00137                 {
00138                     SetBlock(x, y, z, new Blocks.Block(), chunk);
00139                 }
00140                 else if (y <= dirtHeight && caveSize < caveChance)
00141                 {
00142                     SetBlock(x, y, z, new Blocks.Grass(), chunk);
00143                 }
00144                 else
00145                 {
00146                     SetBlock(x, y, z, new Blocks.Air(), chunk);
00147                 }
00148             }
00149
00150                 return chunk;
00151         }
00152
00162         public static int GetNoise(int x, int y, int z, float scale, int max)
00163         {
00164             return Mathf.FloorToInt((SimplexNoise.Generate(x * scale, y * scale, z *
      scale) + 1f) * (max / 2f));
00165         }
00166
00176         public static void SetBlock(int x, int y, int z, Blocks.Block block,
      Chunk chunk, bool replacesBlocks = false)
00177         {
00178             //*corrects the x, y, z pos of the so that the block is placed in the correct position
00179             x -= chunk.chunkWorldPos.x;
00180             y -= chunk.chunkWorldPos.y;
00181             z -= chunk.chunkWorldPos.z;
00182
00183             //*chechs that the block is in the chunk and that no block is already their then sets it
```

```
00184             if (Chunk.InRange(x) && Chunk.InRange(y) &&
      Chunk.InRange(z))
00185                 if (replacesBlocks || chunk.blocks[x, y, z] == null)
00186                     chunk.SetBlock(x, y, z, block);
00187         }
00188     }
00189 }
```

0.4.17 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Terrain/LandGeneration/↩ Noise/SimplexNoise.cs File Reference

Classes

- class BeeGame.Terrain.LandGeneration.Noise.SimplexNoise

  Implementation of the Perlin simplex noise, an improved Perlin noise algorithm. Based loosely on SimplexNoise1234 by Stefan Gustavson <http://∗staffwww.itn.liu.se/∼stegu/aqsis/aqsis-newnoise/>

Namespaces

- namespace BeeGame.Terrain.LandGeneration.Noise

0.4.18 SimplexNoise.cs

```
00001 //* SimplexNoise for C#
00002 //* Author: Heikki Törmälä
00003
00004 //*This is free and unencumbered software released into the public domain.
00005
00006 //*Anyone is free to copy, modify, publish, use, compile, sell, or
00007 //*distribute this software, either in source code form or as a compiled
00008 //*binary, for any purpose, commercial or non-commercial, and by any
00009 //*means.
00010
00011 //*In jurisdictions that recognize copyright laws, the author or authors
00012 //*of this software dedicate any and all copyright interest in the
00013 //*software to the public domain. We make this dedication for the benefit
00014 //*of the public at large and to the detriment of our heirs and
00015 //*successors. We intend this dedication to be an overt act of
00016 //*relinquishment in perpetuity of all present and future rights to this
00017 //*software under copyright law.
00018
00019 //*THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND,
00020 //*EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF
00021 //*MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT.
00022 //*IN NO EVENT SHALL THE AUTHORS BE LIABLE FOR ANY CLAIM, DAMAGES OR
00023 //*OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE,
00024 //*ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR
00025 //*OTHER DEALINGS IN THE SOFTWARE.
00026
00027 //*For more information, please refer to <http://*unlicense.org/>
00028
00029
00030 namespace BeeGame.Terrain.LandGeneration.Noise
00031 {
00037     public class SimplexNoise
00038     {
00044         public static float Generate(float x)
00045         {
00046             int i0 = FastFloor(x);
00047             int i1 = i0 + 1;
00048             float x0 = x - i0;
00049             float x1 = x0 - 1.0f;
00050
00051             float n0, n1;
00052
00053             float t0 = 1.0f - x0 * x0;
00054             t0 *= t0;
00055             n0 = t0 * t0 * grad(perm[i0 & 0xff], x0);
00056
00057             float t1 = 1.0f - x1 * x1;
00058             t1 *= t1;
```

```
00059             n1 = t1 * t1 * grad(perm[i1 & 0xff], x1);
00060             //* The maximum value of this noise is 8*(3/4)^4 = 2.53125
00061             //* A factor of 0.395 scales to fit exactly within [-1,1]
00062             return 0.395f * (n0 + n1);
00063         }
00064 
00071         public static float Generate(float x, float y)
00072         {
00073             const float F2 = 0.366025403f; //* F2 = 0.5*(sqrt(3.0)-1.0)
00074             const float G2 = 0.211324865f; //* G2 = (3.0-Math.sqrt(3.0))/6.0
00075 
00076             float n0, n1, n2; //* Noise contributions from the three corners
00077 
00078             //* Skew the input space to determine which simplex cell we're in
00079             float s = (x + y) * F2; //* Hairy factor for 2D
00080             float xs = x + s;
00081             float ys = y + s;
00082             int i = FastFloor(xs);
00083             int j = FastFloor(ys);
00084 
00085             float t = (float)(i + j) * G2;
00086             float X0 = i - t; //* Unskew the cell origin back to (x,y) space
00087             float Y0 = j - t;
00088             float x0 = x - X0; //* The x,y distances from the cell origin
00089             float y0 = y - Y0;
00090 
00091             //* For the 2D case, the simplex shape is an equilateral triangle.
00092             //* Determine which simplex we are in.
00093             int i1, j1; //* Offsets for second (middle) corner of simplex in (i,j) coords
00094             if (x0 > y0) { i1 = 1; j1 = 0; } //* lower triangle, XY order: (0,0)->(1,0)->(1,1)
00095             else { i1 = 0; j1 = 1; }      //* upper triangle, YX order: (0,0)->(0,1)->(1,1)
00096 
00097             //* A step of (1,0) in (i,j) means a step of (1-c,-c) in (x,y), and
00098             //* a step of (0,1) in (i,j) means a step of (-c,1-c) in (x,y), where
00099             //* c = (3-sqrt(3))/6
00100 
00101             float x1 = x0 - i1 + G2; //* Offsets for middle corner in (x,y) unskewed coords
00102             float y1 = y0 - j1 + G2;
00103             float x2 = x0 - 1.0f + 2.0f * G2; //* Offsets for last corner in (x,y) unskewed coords
00104             float y2 = y0 - 1.0f + 2.0f * G2;
00105 
00106             //* Wrap the integer indices at 256, to avoid indexing perm[] out of bounds
00107             int ii = i % 256;
00108             int jj = j % 256;
00109 
00110             //* Calculate the contribution from the three corners
00111             float t0 = 0.5f - x0 * x0 - y0 * y0;
00112             if (t0 < 0.0f) n0 = 0.0f;
00113             else
00114             {
00115                 t0 *= t0;
00116                 n0 = t0 * t0 * grad(perm[ii + perm[jj]], x0, y0);
00117             }
00118 
00119             float t1 = 0.5f - x1 * x1 - y1 * y1;
00120             if (t1 < 0.0f) n1 = 0.0f;
00121             else
00122             {
00123                 t1 *= t1;
00124                 n1 = t1 * t1 * grad(perm[ii + i1 + perm[jj + j1]], x1, y1);
00125             }
00126 
00127             float t2 = 0.5f - x2 * x2 - y2 * y2;
00128             if (t2 < 0.0f) n2 = 0.0f;
00129             else
00130             {
00131                 t2 *= t2;
00132                 n2 = t2 * t2 * grad(perm[ii + 1 + perm[jj + 1]], x2, y2);
00133             }
00134 
00135             //* Add contributions from each corner to get the final noise value.
00136             //* The result is scaled to return values in the interval [-1,1].
00137             return 40.0f * (n0 + n1 + n2); //* TODO: The scale factor is preliminary!
00138         }
00139 
00140 
00141         public static float Generate(float x, float y, float z)
00142         {
00143             //* Simple skewing factors for the 3D case
00144             const float F3 = 0.333333333f;
00145             const float G3 = 0.166666667f;
00146 
00147             float n0, n1, n2, n3; //* Noise contributions from the four corners
00148 
00149             //* Skew the input space to determine which simplex cell we're in
00150             float s = (x + y + z) * F3; //* Very nice and simple skew factor for 3D
00151             float xs = x + s;
```

```
00152             float ys = y + s;
00153             float zs = z + s;
00154             int i = FastFloor(xs);
00155             int j = FastFloor(ys);
00156             int k = FastFloor(zs);
00157 
00158             float t = (float)(i + j + k) * G3;
00159             float X0 = i - t; //* Unskew the cell origin back to (x,y,z) space
00160             float Y0 = j - t;
00161             float Z0 = k - t;
00162             float x0 = x - X0; //* The x,y,z distances from the cell origin
00163             float y0 = y - Y0;
00164             float z0 = z - Z0;
00165 
00166             //* For the 3D case, the simplex shape is a slightly irregular tetrahedron.
00167             //* Determine which simplex we are in.
00168             int i1, j1, k1; //* Offsets for second corner of simplex in (i,j,k) coords
00169             int i2, j2, k2; //* Offsets for third corner of simplex in (i,j,k) coords
00170 
00171             /* This code would benefit from a backport from the GLSL version! */
00172             if (x0 >= y0)
00173             {
00174                 if (y0 >= z0)
00175                 { i1 = 1; j1 = 0; k1 = 0; i2 = 1; j2 = 1; k2 = 0; } //* X Y Z order
00176                 else if (x0 >= z0) { i1 = 1; j1 = 0; k1 = 0; i2 = 1; j2 = 0; k2 = 1; } //* X Z Y order
00177                 else { i1 = 0; j1 = 0; k1 = 1; i2 = 1; j2 = 0; k2 = 1; } //* Z X Y order
00178             }
00179             else
00180             { //* x0<y0
00181                 if (y0 < z0) { i1 = 0; j1 = 0; k1 = 1; i2 = 0; j2 = 1; k2 = 1; } //* Z Y X order
00182                 else if (x0 < z0) { i1 = 0; j1 = 1; k1 = 0; i2 = 0; j2 = 1; k2 = 1; } //* Y Z X order
00183                 else { i1 = 0; j1 = 1; k1 = 0; i2 = 1; j2 = 1; k2 = 0; } //* Y X Z order
00184             }
00185 
00186             //* A step of (1,0,0) in (i,j,k) means a step of (1-c,-c,-c) in (x,y,z),
00187             //* a step of (0,1,0) in (i,j,k) means a step of (-c,1-c,-c) in (x,y,z), and
00188             //* a step of (0,0,1) in (i,j,k) means a step of (-c,-c,1-c) in (x,y,z), where
00189             //* c = 1/6.
00190 
00191             float x1 = x0 - i1 + G3; //* Offsets for second corner in (x,y,z) coords
00192             float y1 = y0 - j1 + G3;
00193             float z1 = z0 - k1 + G3;
00194             float x2 = x0 - i2 + 2.0f * G3; //* Offsets for third corner in (x,y,z) coords
00195             float y2 = y0 - j2 + 2.0f * G3;
00196             float z2 = z0 - k2 + 2.0f * G3;
00197             float x3 = x0 - 1.0f + 3.0f * G3; //* Offsets for last corner in (x,y,z) coords
00198             float y3 = y0 - 1.0f + 3.0f * G3;
00199             float z3 = z0 - 1.0f + 3.0f * G3;
00200 
00201             //* Wrap the integer indices at 256, to avoid indexing perm[] out of bounds
00202             int ii = Mod(i, 256);
00203             int jj = Mod(j, 256);
00204             int kk = Mod(k, 256);
00205 
00206             //* Calculate the contribution from the four corners
00207             float t0 = 0.6f - x0 * x0 - y0 * y0 - z0 * z0;
00208             if (t0 < 0.0f) n0 = 0.0f;
00209             else
00210             {
00211                 t0 *= t0;
00212                 n0 = t0 * t0 * grad(perm[ii + perm[jj + perm[kk]]], x0, y0, z0);
00213             }
00214 
00215             float t1 = 0.6f - x1 * x1 - y1 * y1 - z1 * z1;
00216             if (t1 < 0.0f) n1 = 0.0f;
00217             else
00218             {
00219                 t1 *= t1;
00220                 n1 = t1 * t1 * grad(perm[ii + i1 + perm[jj + j1 + perm[kk + k1]]], x1, y1, z1);
00221             }
00222 
00223             float t2 = 0.6f - x2 * x2 - y2 * y2 - z2 * z2;
00224             if (t2 < 0.0f) n2 = 0.0f;
00225             else
00226             {
00227                 t2 *= t2;
00228                 n2 = t2 * t2 * grad(perm[ii + i2 + perm[jj + j2 + perm[kk + k2]]], x2, y2, z2);
00229             }
00230 
00231             float t3 = 0.6f - x3 * x3 - y3 * y3 - z3 * z3;
00232             if (t3 < 0.0f) n3 = 0.0f;
00233             else
00234             {
00235                 t3 *= t3;
00236                 n3 = t3 * t3 * grad(perm[ii + 1 + perm[jj + 1 + perm[kk + 1]]], x3, y3, z3);
00237             }
00238 
```

```
00239             //* Add contributions from each corner to get the final noise value.
00240             //* The result is scaled to stay just inside [-1,1]
00241             return 32.0f * (n0 + n1 + n2 + n3); //* TODO: The scale factor is preliminary!
00242         }
00243
00244         public static byte[] perm = new byte[512] { 151,160,137,91,90,15,
00245               131,13,201,95,96,53,194,233,7,225,140,36,103,30,69,142,8,99,37,240,21,10,23,
00246               190, 6,148,247,120,234,75,0,26,197,62,94,252,219,203,117,35,11,32,57,177,33,
00247               88,237,149,56,87,174,20,125,136,171,168, 68,175,74,165,71,134,139,48,27,166,
00248               77,146,158,231,83,111,229,122,60,211,133,230,220,105,92,41,55,46,245,40,244,
00249               102,143,54, 65,25,63,161, 1,216,80,73,209,76,132,187,208, 89,18,169,200,196,
00250               135,130,116,188,159,86,164,100,109,198,173,186, 3,64,52,217,226,250,124,123,
00251               5,202,38,147,118,126,255,82,85,212,207,206,59,227,47,16,58,17,182,189,28,42,
00252               223,183,170,213,119,248,152, 2,44,154,163, 70,221,153,101,155,167, 43,172,9,
00253               129,22,39,253, 19,98,108,110,79,113,224,232,178,185, 112,104,218,246,97,228,
00254               251,34,242,193,238,210,144,12,191,179,162,241, 81,51,145,235,249,14,239,107,
00255               49,192,214, 31,181,199,106,157,184, 84,204,176,115,121,50,45,127, 4,150,254,
00256               138,236,205,93,222,114,67,29,24,72,243,141,128,195,78,66,215,61,156,180,
00257               151,160,137,91,90,15,
00258               131,13,201,95,96,53,194,233,7,225,140,36,103,30,69,142,8,99,37,240,21,10,23,
00259               190, 6,148,247,120,234,75,0,26,197,62,94,252,219,203,117,35,11,32,57,177,33,
00260               88,237,149,56,87,174,20,125,136,171,168, 68,175,74,165,71,134,139,48,27,166,
00261               77,146,158,231,83,111,229,122,60,211,133,230,220,105,92,41,55,46,245,40,244,
00262               102,143,54, 65,25,63,161, 1,216,80,73,209,76,132,187,208, 89,18,169,200,196,
00263               135,130,116,188,159,86,164,100,109,198,173,186, 3,64,52,217,226,250,124,123,
00264               5,202,38,147,118,126,255,82,85,212,207,206,59,227,47,16,58,17,182,189,28,42,
00265               223,183,170,213,119,248,152, 2,44,154,163, 70,221,153,101,155,167, 43,172,9,
00266               129,22,39,253, 19,98,108,110,79,113,224,232,178,185, 112,104,218,246,97,228,
00267               251,34,242,193,238,210,144,12,191,179,162,241, 81,51,145,235,249,14,239,107,
00268               49,192,214, 31,181,199,106,157,184, 84,204,176,115,121,50,45,127, 4,150,254,
00269               138,236,205,93,222,114,67,29,24,72,243,141,128,195,78,66,215,61,156,180
00270             };
00271
00272         private static int FastFloor(float x)
00273         {
00274             return (x > 0) ? ((int)x) : (((int)x) - 1);
00275         }
00276
00277         private static int Mod(int x, int m)
00278         {
00279             int a = x % m;
00280             return a < 0 ? a + m : a;
00281         }
00282
00283         private static float grad(int hash, float x)
00284         {
00285             int h = hash & 15;
00286             float grad = 1.0f + (h & 7);   //* Gradient value 1.0, 2.0, ..., 8.0
00287             if ((h & 8) != 0) grad = -grad;         //* Set a random sign for the gradient
00288             return (grad * x);           //* Multiply the gradient with the distance
00289         }
00290
00291         private static float grad(int hash, float x, float y)
00292         {
00293             int h = hash & 7;      //* Convert low 3 bits of hash code
00294             float u = h < 4 ? x : y;  //* into 8 simple gradient directions,
00295             float v = h < 4 ? y : x;  //* and compute the dot product with (x,y).
00296             return ((h & 1) != 0 ? -u : u) + ((h & 2) != 0 ? -2.0f * v : 2.0f * v);
00297         }
00298
00299         private static float grad(int hash, float x, float y, float z)
00300         {
00301             int h = hash & 15;     //* Convert low 4 bits of hash code into 12 simple
00302             float u = h < 8 ? x : y; //* gradient directions, and compute dot product.
00303             float v = h < 4 ? y : h == 12 || h == 14 ? x : z; //* Fix repeats at h = 12 to 15
00304             return ((h & 1) != 0 ? -u : u) + ((h & 2) != 0 ? -v : v);
00305         }
00306
00307         private static float grad(int hash, float x, float y, float z, float t)
00308         {
00309             int h = hash & 31;      //* Convert low 5 bits of hash code into 32 simple
00310             float u = h < 24 ? x : y; //* gradient directions, and compute dot product.
00311             float v = h < 16 ? y : z;
00312             float w = h < 8 ? z : t;
00313             return ((h & 1) != 0 ? -u : u) + ((h & 2) != 0 ? -v : v) + ((h & 4) != 0 ? -w : w);
00314         }
00315     }
00316 }
```

0.5 Player

0.5.1 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Player/PlayerLook.cs File Reference

Classes

- class BeeGame.Player.PlayerLook

  The look for the player

Namespaces

- namespace BeeGame.Player

0.5.2 PlayerLook.cs

```
00001 using UnityEngine;
00002 using BeeGame.Core;
00003
00004 namespace BeeGame.Player
00005 {
00009     public class PlayerLook : MonoBehaviour
00010     {
00011         #region Data
00012         public Transform myTransform;
00019         public Transform cameraTransform;
00023         [Range(0, 360)]
00024         public float rotationLock;
00028         public float speed = 5;
00032         float yRot = 0;
00036         float xRot = 0;
00037         #endregion
00038
00039         #region Unity Methods
00040         void Start()
00044         {
00045             Cursor.lockState = CursorLockMode.Locked;
00046             Cursor.visible = false;
00047         }
00048
00052         void Update()
00053         {
00054             //*the look wil not update when a inventory GUI is open
00055             if (!THInput.isAnotherInventoryOpen)
00056             {
00057                 Look();
00058             }
00059         }
00060         #endregion
00061
00062         #region Methods
00063         void Look()
00067         {
00068             //Only X/Y rotation needed as Z rotation would be wierd
00069             yRot += Input.GetAxis("Mouse X") * speed * Time.timeScale;
00070             xRot -= Input.GetAxis("Mouse Y") * speed * Time.timeScale;
00071
00072             //clamps the X rotation so the player camera cannot do flips
00073             xRot = Mathf.Clamp(xRot, -rotationLock, rotationLock);
00074
00075             myTransform.rotation = Quaternion.Euler(0, yRot, 0);
00076             cameraTransform.localRotation = Quaternion.Euler(xRot, 0, 0);
00077         }
00078         #endregion
00079     }
00080 }
```

0.5.3 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Player/PlayerMove.cs File Reference

Classes

- class BeeGame.Player.PlayerMove

  Moves the player

Namespaces

- namespace BeeGame.Player

0.5.4 PlayerMove.cs

```
00001 using System;
00002 using System.Collections.Generic;
00003 using System.Linq;
00004 using System.Text;
00005 using UnityEngine;
00006 using BeeGame.Core;
00007
00008 namespace BeeGame.Player
00009 {
00013     [RequireComponent(typeof(Rigidbody))]
00014     public class PlayerMove : MonoBehaviour
00015     {
00016         #region Data
00017         public float speed = 10f;
00024         public float gravity = 9.81f;
00028         public float maxVelocity = 10f;
00029
00033         private bool canJump = false;
00037         public float jumpHeight = 2f;
00038
00042         private Rigidbody myRigidBody;
00043         #endregion
00044
00045         #region Unity Methods
00046         private void Awake()
00050         {
00051             myRigidBody = GetComponent<Rigidbody>();
00052
00053             //i want to use myown gravity and rotation
00054             myRigidBody.useGravity = false;
00055             myRigidBody.freezeRotation = true;
00056         }
00057
00061         void FixedUpdate()
00062         {
00063             //If the player is grounded it can move
00064             if (canJump)
00065             {
00066                 MovePlayer();
00067             }
00068
00069             //adds the downward force
00070             myRigidBody.AddForce(new Vector3(0, myRigidBody.mass * -gravity, 0));
00071         }
00072
00077         private void OnCollisionStay(Collision collision)
00078         {
00079             canJump = true;
00080         }
00081         #endregion
00082
00083         #region Movement Methods
00084         void MovePlayer()
00088         {
00089             //Calculate the speed we want to achive
00090             Vector3 targetVelocity = new Vector3(THInput.GetAxis("Horizontal"), 0,
      THInput.GetAxis("Vertical"));
00091             targetVelocity = transform.TransformDirection(targetVelocity);
00092             targetVelocity *= speed;
00093
00094             //Apply a force to reach the target speed
00095             Vector3 velocity = myRigidBody.velocity;
00096             Vector3 velocityChange = (targetVelocity - velocity);
00097
00098             //Clamping the velocity so that the player does not infinatly accelerate
00099             velocityChange.x = Mathf.Clamp(velocityChange.x, -maxVelocity, maxVelocity);
00100             velocityChange.z = Mathf.Clamp(velocityChange.z, -maxVelocity, maxVelocity);
00101             velocityChange.y = 0;
00102
00103             //Adds the force to the player so they move in the correct direction
00104             myRigidBody.AddForce(velocityChange, ForceMode.Impulse);
00105
00106             //Jumping
00107             if (canJump && THInput.GetButton("Jump"))
00108             {
00109                 canJump = false;
```

```
00110                 myRigidBody.velocity = new Vector3(velocity.x, VerticalJumpSpeed(), velocity.z);
00111             }
00112         }
00113 
00118         float VerticalJumpSpeed()
00119         {
00120             //*Gets the correct of fore required for the player to reach the desired apex
00121             //*Can this be done without Square Root as that take alot of work?
00122             return Mathf.Sqrt(2 * jumpHeight * gravity);
00123         }
00124         #endregion
00125     }
00126 }
```

0.5.5 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Player/Selector.cs File Reference

Classes

- class BeeGame.Player.Selector

  Moves the Block selector

Namespaces

- namespace BeeGame.Player

0.5.6 Selector.cs

```
00001 using UnityEngine;
00002 using BeeGame.Blocks;
00003 using BeeGame.Terrain.Chunks;
00004 using BeeGame.Inventory.Player_Inventory;
00005 using BeeGame.Items;
00006 using static BeeGame.Terrain.LandGeneration.Terrain;
00007 using static BeeGame.Core.THInput;
00008 
00009 namespace BeeGame.Player
00010 {
00014     public class Selector : MonoBehaviour
00015     {
00016         #region Data
00017         public GameObject selector;
00021 
00025         public LayerMask layers;
00029         private RaycastHit hit;
00030 
00034         public int selectedHotbarSlot = 27;
00035         #endregion
00036 
00037         #region Unity Methods
00038         void Awake()
00042         {
00043             selector = Instantiate(selector);
00044         }
00045 
00049         void FixedUpdate()
00050         {
00051             if(!isAnotherInventoryOpen)
00052                 UpdateSelector();
00053         }
00054 
00058         void Update()
00059         {
00060             if (!isAnotherInventoryOpen)
00061             {
00062                 if (GetButtonDown("Break Block"))
00063                     BreakBlock();
00064                 if (GetButtonDown("Place"))
00065                     PlaceBlock();
00066             }
00067         }
00068         #endregion
```

```
00069
00070         #region Update
00071         void UpdateSelector()
00075         {
00076             if (Physics.Raycast(transform.position, transform.forward, out hit, 15, layers))
00077             {
00078                 selector.SetActive(true);
00079                 selector.transform.position = GetBlockPos(hit);
00080                 //*selector.SetActive(BlockInPosition(GetBlockPos(hit),
       hit.collider.GetComponent<Chunk>()));
00081             }
00082             else
00083             {
00084                 selector.SetActive(false);
00085             }
00086             SelectedSlot();
00087         }
00088
00092         void SelectedSlot()
00093         {
00094             //* adds 1 to the selected slot and if that is out of range set it to the first hotbar slot
00095             if(Input.GetAxis("Mouse ScrollWheel") > 0)
00096             {
00097                 selectedHotbarSlot += 1;
00098                 if (selectedHotbarSlot == 36)
00099                     selectedHotbarSlot = 27;
00100             }
00101             //* removes one from the hotbar selector and if the selector would be inside the inventory set
       it to the last slot in the hotbar
00102             else if (Input.GetAxis("Mouse ScrollWheel") < 0)
00103             {
00104                 selectedHotbarSlot -= 1;
00105                 if (selectedHotbarSlot == 26)
00106                     selectedHotbarSlot = 35;
00107             }
00108
00109             transform.parent.GetComponentInChildren<PlayerInventory>().SelectedSlot(
      selectedHotbarSlot);
00110         }
00111         #endregion
00112
00113         #region Break/Place
00114         void BreakBlock()
00118         {
00119             Chunk chunk = GetChunk(selector.transform.position);
00120
00121             Block block = chunk.world.GetBlock((int)selector.transform.position.x, (int)selector.
      transform.position.y, (int)selector.transform.position.z);
00122
00123             if (!block.breakable)
00124                 return;
00125
00126             chunk.world.SetBlock((int)selector.transform.position.x, (int)selector.transform.position.
      y, (int)selector.transform.position.z, new Air(), true);
00127             //* set to changed so when block is placed down again it will be saved
00128             block.changed = true;
00129             block.BreakBlock(selector.transform.position);
00130         }
00131
00135         void PlaceBlock()
00136         {
00137             Chunk chunk = GetChunk(selector.transform.position);
00138
00139             if (chunk == null)
00140                 return;
00141
00142             //* gets the item in the hotbar and if the item is placeable place it
00143             if(transform.parent.GetComponentInChildren<PlayerInventory>().
      GetItemFromHotBar(selectedHotbarSlot, out Item blockToPlace))
00144                 chunk.world.SetBlock((int)(selector.transform.position.x + hit.normal.x), (int)(
      selector.transform.position.y + hit.normal.y), (int)(selector.transform.position.z + hit.normal.z), (
      Block)blockToPlace, true);
00145         }
00146         #endregion
00147     }
00148 }
```

0.6 Resources

0.6.1 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Core/PrefabDictionary.cs File Reference

Classes

- class BeeGame.Core.PrefabDictionary

  The prefabs avaliable to the game

Namespaces

- namespace BeeGame.Core

0.6.2 PrefabDictionary.cs

```
00001 using System.Collections.Generic;
00002 using UnityEngine;
00003
00004 namespace BeeGame.Core
00005 {
00009     public static class PrefabDictionary
00010     {
00014         private static Dictionary<string, GameObject> prefabDictionary = new Dictionary<string, GameObject>
      ();
00015
00019         public static void LoadPrefabs()
00020         {
00021             prefabDictionary = Resources.Resources.GetPrefabs();
00022         }
00023
00029         public static GameObject GetPrefab(string prefab)
00030         {
00031             return prefabDictionary[prefab];
00032         }
00033     }
00034 }
```

0.6.3 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Core/SpriteDictionary.cs File Reference

Classes

- class BeeGame.Core.SpriteDictionary

  All of the sprites avaliable to the game

Namespaces

- namespace BeeGame.Core

0.6.4 SpriteDictionary.cs

```
00001 using System.Collections.Generic;
00002 using UnityEngine;
00003
00004 namespace BeeGame.Core
00005 {
00009     public static class SpriteDictionary
00010     {
00014         private static Dictionary<string, Sprite> itemSpriteDictionary = new Dictionary<string, Sprite>();
00015
00021         public static Sprite GetSprite(string spriteName)
00022         {
00023             itemSpriteDictionary.TryGetValue(spriteName, out Sprite sprite);
00024
00025             if (sprite == null)
00026                 return new Sprite();
00027
00028             return sprite;
00029         }
00030
00034         public static void LoadSprites()
00035         {
00036             itemSpriteDictionary = Resources.Resources.GetSprites();
00037         }
00038     }
00039 }
```

0.6.5 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Resources/Resources.Designer.cs File Reference

Classes

- class BeeGame.Resources.Resources

  A strongly-typed resource class, for looking up localized strings, etc.

Namespaces

- namespace BeeGame.Resources

0.6.6 Resources.Designer.cs

```
00001 //*------------------------------------------------------------------------------
00002 //* <auto-generated>
00003 //*     This code was generated by a tool.
00004 //*     Runtime Version:4.0.30319.42000
00005 //*
00006 //*     Changes to this file may cause incorrect behavior and will be lost if
00007 //*     the code is regenerated.
00008 //* </auto-generated>
00009 //*------------------------------------------------------------------------------
00010
00011 namespace BeeGame.Resources {
00012     using System;
00013     using System.Collections.Generic;
00014     using UnityEngine;
00015
00019     //* This class was auto-generated by the StronglyTypedResourceBuilder
00020     //* class via a tool like ResGen or Visual Studio.
00021     //* To add or remove a member, edit your .ResX file then rerun ResGen
00022     //* with the /str option, or rebuild your VS project.
00023     [global::System.CodeDom.Compiler.GeneratedCodeAttribute("
      System.Resources.Tools.StronglyTypedResourceBuilder", "4.0.0.0")]
00024     [global::System.Diagnostics.DebuggerNonUserCodeAttribute()]
00025     [global::System.Runtime.CompilerServices.CompilerGeneratedAttribute()]
00026     internal class Resources {
00027
00028         private static global::System.Resources.ResourceManager
      resourceMan;
00029
00030         private static global::System.Globalization.CultureInfo resourceCulture;
00031
00032         [global::System.Diagnostics.CodeAnalysis.SuppressMessageAttribute("Microsoft.Performance", "
      CA1811:AvoidUncalledPrivateCode")]
00033         internal Resources() {
00034         }
00035
00039         [global::System.ComponentModel.EditorBrowsableAttribute(global::System.ComponentModel.
      EditorBrowsableState.Advanced)]
00040         internal static global::System.Resources.ResourceManager ResourceManager {
00041             get {
00042                 if (object.ReferenceEquals(resourceMan, null)) {
00043                     global::System.Resources.ResourceManager temp = new global::System.Resources.
      ResourceManager("BeeGame.Resources.Resources", typeof(Resources).Assembly);
00044                     resourceMan = temp;
00045                 }
00046                 return resourceMan;
00047             }
00048         }
00049
00054         [global::System.ComponentModel.EditorBrowsableAttribute(global::System.ComponentModel.
      EditorBrowsableState.Advanced)]
00055         internal static global::System.Globalization.CultureInfo Culture {
00056             get {
00057                 return resourceCulture;
00058             }
00059             set {
00060                 resourceCulture = value;
00061             }
00062         }
00063
00067         internal static byte[] Prefabs {
00068             get {
```

```
00069                 object obj = ResourceManager.GetObject("Prefabs", resourceCulture);
00070                 return ((byte[])(obj));
00071             }
00072         }
00073 
00077         internal static byte[] Sprites {
00078             get {
00079                 object obj = ResourceManager.GetObject("Sprites", resourceCulture);
00080                 return ((byte[])(obj));
00081             }
00082         }
00083 
00084         internal static Dictionary<string, Sprite> GetSprites()
00085         {
00086             string[] splitCharacters = new string[] { "," };
00087             object obj = ResourceManager.GetObject("Sprites", resourceCulture);
00088 
00089             string text = System.Text.Encoding.Default.GetString((byte[])obj);
00090             string lineText = "";
00091             string[] splitText;
00092             Texture2D tex;
00093             Dictionary<string, Sprite> sprites = new Dictionary<string, Sprite>();
00094 
00095             for (int i = 0; i < text.Length; i++)
00096             {
00097                 if (text[i] != '\n')
00098                 {
00099                     lineText += text[i];
00100                 }
00101                 else
00102                 {
00103                     splitText = lineText.Split(splitCharacters, StringSplitOptions.RemoveEmptyEntries);
00104                     lineText = "";
00105                     tex = UnityEngine.Resources.Load("Sprites/" + splitText[1]) as Texture2D;
00106                     sprites.Add(splitText[0], Sprite.Create(tex, new UnityEngine.Rect(0, 0, tex.
      width, tex.height), Vector2.zero));
00107                 }
00108             }
00109 
00110             splitText = lineText.Split(splitCharacters, StringSplitOptions.RemoveEmptyEntries);
00111             lineText = "";
00112             tex = UnityEngine.Resources.Load("Sprites/" + splitText[1]) as Texture2D;
00113             sprites.Add(splitText[0], Sprite.Create(tex, new UnityEngine.Rect(0, 0, tex.width,
      tex.height), Vector2.zero));
00114 
00115             return sprites;
00116         }
00117 
00118         internal static Dictionary<string, GameObject> GetPrefabs()
00119         {
00120             string[] splitCharacters = new string[] { "," };
00121             object obj = ResourceManager.GetObject("Prefabs", resourceCulture);
00122 
00123             string text = System.Text.Encoding.Default.GetString((byte[])obj);
00124             text = text.Remove(0, 3);
00125             string lineText = "";
00126             string[] splitText;
00127             Dictionary<string, GameObject> objects = new Dictionary<string, GameObject>();
00128 
00129             for (int i = 0; i < text.Length; i++)
00130             {
00131                 if(text[i] != '\n')
00132                 {
00133                     lineText += text[i];
00134                 }
00135                 else
00136                 {
00137                     splitText = lineText.Split(splitCharacters, StringSplitOptions.RemoveEmptyEntries);
00138                     lineText = "";
00139                     objects.Add(splitText[0], UnityEngine.Resources.Load("Prefabs/" + splitText[
      1]) as GameObject);
00140                 }
00141             }
00142 
00143             splitText = lineText.Split(splitCharacters, StringSplitOptions.RemoveEmptyEntries);
00144             lineText = "";
00145             objects.Add(splitText[0], UnityEngine.Resources.Load("Prefabs/" + splitText[1]) as
      GameObject);
00146 
00147             return objects;
00148         }
00149     }
00150 }
```

0.6.7 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/LoadResources.cs File Reference

Classes

- class BeeGame.LoadResources

  Loads all of the resources in the game

Namespaces

- namespace BeeGame

0.6.8 LoadResources.cs

```
00001 using UnityEngine;
00002 using BeeGame.Core;
00003
00004 namespace BeeGame
00005 {
00009     public class LoadResources : MonoBehaviour
00010     {
00014         void Awake()
00015         {
00016             Serialization.Serialization.MakeDirectorys();
00017             SpriteDictionary.LoadSprites();
00018             PrefabDictionary.LoadPrefabs();
00019         }
00020     }
00021 }
```

0.7 Unity Type & Method Replacements

0.7.1 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Core/UnityTypeReplacements/THInput.cs File Reference

Classes

- class BeeGame.Core.THInput

  My implementation of the unity input system. Acts as a buffer layer to the unity system so that the input keys can be changed at runtime

Namespaces

- namespace BeeGame.Core

0.7.2 THInput.cs

```
00001 using System;
00002 using System.Collections.Generic;
00003 using UnityEngine;
00004
00005 namespace BeeGame.Core
00006 {
00010     public static class THInput
00011     {
00015         private static Dictionary<string, object> inputButtons = new Dictionary<string, object>()
00016         {
00017             {"Forward" , KeyCode.W},
00018             {"Backward", KeyCode.S },
00019             {"Right", KeyCode.D },
00020             {"Left", KeyCode.A },
00021             {"Player Inventory", KeyCode.E },
00022             {"Quest Book", KeyCode.Mouse1 },
00023             {"Interact", KeyCode.Mouse1 },
00024             {"Place", KeyCode.Mouse1 },
00025             {"Break Block", KeyCode.Mouse0 },
00026             {"Close Menu/Inventory", new KeyCode[2] { KeyCode.Escape, KeyCode.E } },
00027             {"Jump", KeyCode.Space }
00028         };
00029
00033         public static bool isAnotherInventoryOpen;
00034
00040         public static bool GetButtonDown(string button)
00041         {
00042             if (!inputButtons.ContainsKey(button))
00043             {
00044                 throw new Exception("Input Manager: Key button name not defined: " + button);
00045             }
00046
00047             switch (inputButtons[button])
00048             {
00049                 case KeyCode[] arry:
00050                     //*for each posible key, check if it was pressed and if it was return that it was, if
      none of them was poressed return false
00051                     foreach (var item in arry)
00052                     {
00053                         if (Input.GetKeyDown(item))
00054                         {
00055                             return true;
00056                         }
00057                     }
00058
00059                     return false;
00060                 default:
00061                     return Input.GetKeyDown((KeyCode)inputButtons[button]);
00062             }
00063         }
00064
00070         public static bool GetButton(string button)
00071         {
00072             if (!inputButtons.ContainsKey(button))
00073             {
00074                 throw new Exception("Input Manager: Key button name not defined: " + button);
00075             }
00076
00077             switch (inputButtons[button])
00078             {
00079                 case KeyCode[] arry:
00080                     //*for each posible key, check if it was pressed and if it was return that it was, if
      none of them was poressed return false
00081                     foreach (var item in arry)
00082                     {
00083                         if (Input.GetKey(item))
00084                         {
00085                             return true;
00086                         }
00087                     }
00088
00089                     return false;
00090                 default:
00091                     return Input.GetKey((KeyCode)inputButtons[button]);
00092             }
00093         }
00094
00100         public static bool GetButtonUp(string button)
00101         {
00102             if (!inputButtons.ContainsKey(button))
00103             {
00104                 throw new Exception("Input Manager: Key button name not defined: " + button);
00105             }
00106
```

```
00107             switch (inputButtons[button])
00108             {
00109                 case KeyCode[] arry:
00110                     //*for each posible key, check if it was pressed and if it was return that it was, if
      none of them was poressed return false
00111                     foreach (var item in arry)
00112                     {
00113                         if (Input.GetKeyUp(item))
00114                         {
00115                             return true;
00116                         }
00117                     }
00118 
00119                     return false;
00120                 default:
00121                     return Input.GetKeyUp((KeyCode)inputButtons[button]);
00122             }
00123         }
00124 
00130         public static int GetAxis(string axis)
00131         {
00132             int returnAxis = 0;
00133 
00134             if (axis == "Horizontal")
00135             {
00136                 if (GetButton("Right"))
00137                 {
00138                     returnAxis += 1;
00139                 }
00140 
00141                 if (GetButton("Left"))
00142                 {
00143                     returnAxis -= 1;
00144                 }
00145             }
00146             else if (axis == "Vertical")
00147             {
00148                 if (GetButton("Forward"))
00149                 {
00150                     returnAxis += 1;
00151                 }
00152 
00153                 if (GetButton("Backward"))
00154                 {
00155                     returnAxis -= 1;
00156                 }
00157             }
00158 
00159             return returnAxis;
00160         }
00161     }
00162 }
```

0.7.3 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Core/UnityTypeReplacements/↩ THVector2.cs File Reference

Classes

- struct BeeGame.Core.THVector2

  Serilializable version of Vector2

Namespaces

- namespace BeeGame.Core

0.7.4 THVector2.cs

```
00001 using System;
00002 using UnityEngine;
00003 
00004 namespace BeeGame.Core
00005 {
```

```
00009     [Serializable]
00010     public struct THVector2
00011     {
00012         #region Data
00013         public float x;
00020         public float y;
00021         #endregion
00022
00023         #region Constructor
00024         public THVector2(float x, float y)
00030         {
00031             this.x = x;
00032             this.y = y;
00033         }
00034
00039         public THVector2(THVector2 vec2)
00040         {
00041             this = vec2;
00042         }
00043
00048         public THVector2(Vector2 vec2)
00049         {
00050             this = vec2;
00051         }
00052         #endregion
00053
00054         #region Overrides
00055         public override bool Equals(object obj)
00056         {
00057             if (!(obj is THVector2))
00058                 return false;
00059             if (obj.GetHashCode() == GetHashCode())
00060                 return true;
00061             return false;
00062         }
00063
00064         public override int GetHashCode()
00065         {
00066             unchecked
00067             {
00068                 int hash = 13;
00069
00070                 hash *= 443 * x.GetHashCode();
00071                 hash *= 373 * y.GetHashCode();
00072
00073                 return hash;
00074             }
00075         }
00076
00077         public override string ToString()
00078         {
00079             return $"{x}, {y}";
00080         }
00081
00082         public static bool operator ==(THVector2 a, THVector2 b)
00083         {
00084             return a.Equals(b);
00085         }
00086         public static bool operator !=(THVector2 a, THVector2 b)
00087         {
00088             return !(a == b);
00089         }
00090
00091         public static THVector2 operator +(THVector2 a,
      THVector2 b)
00092         {
00093             a.x += b.x;
00094             a.y += b.y;
00095
00096             return a;
00097         }
00098         public static THVector2 operator +(THVector2 a, float b)
00099         {
00100             a.x += b;
00101             a.y += b;
00102
00103             return a;
00104         }
00105         public static THVector2 operator +(float a, THVector2 b)
00106         {
00107             return new THVector2(a + b.x, a + b.y);
00108         }
00109         public static THVector2 operator -(THVector2 a,
      THVector2 b)
00110         {
00111             a.x -= b.x;
00112             a.y -= b.y;
```

```
00113
00114             return a;
00115         }
00116         public static THVector2 operator -(THVector2 a, float b)
00117         {
00118             a.x += b;
00119             a.y += b;
00120
00121             return a;
00122         }
00123         public static THVector2 operator -(float a, THVector2 b)
00124         {
00125             return new THVector2(a - b.x, a - b.y);
00126         }
00127         public static THVector2 operator *(THVector2 a,
      THVector2 b)
00128         {
00129             a.x *= b.x;
00130             a.y *= b.y;
00131
00132             return a;
00133         }
00134         public static THVector2 operator *(THVector2 a, float b)
00135         {
00136             a.x *= b;
00137             a.y *= b;
00138
00139             return a;
00140         }
00141         public static THVector2 operator *(float a, THVector2 b)
00142         {
00143             return new THVector2(a * b.x, a * b.y);
00144         }
00145         public static THVector2 operator /(THVector2 a,
      THVector2 b)
00146         {
00147             a.x /= b.x;
00148             a.y /= b.y;
00149
00150             return a;
00151         }
00152         public static THVector2 operator /(THVector2 a, float b)
00153         {
00154             a.x /= b;
00155             a.y /= b;
00156
00157             return a;
00158         }
00159         public static THVector2 operator /(float a, THVector2 b)
00160         {
00161             return new THVector2(a / b.x, a / b.y);
00162         }
00163         #endregion
00164
00165         #region Implicit Operators
00166         public static implicit operator Vector2(THVector2 vec2)
00167         {
00168             return new Vector2(vec2.x, vec2.y);
00169         }
00170
00171         public static implicit operator THVector2(Vector2 vec2)
00172         {
00173             return new THVector2(vec2.x, vec2.y);
00174         }
00175         #endregion
00176     }
00177 }
```

0.7.5 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Core/UnityTypeReplacements/↩ THVector3.cs File Reference

Classes

- struct BeeGame.Core.THVector3

  Serializable version of Vector3

Namespaces

- namespace BeeGame.Core

0.7.6 THVector3.cs

```
00001 using System;
00002 using UnityEngine;
00003
00004 namespace BeeGame.Core
00005 {
00009     [Serializable]
00010     public struct THVector3
00011     {
00012         #region Data
00013         public float x;
00020         public float y;
00024         public float z;
00025         #endregion
00026
00027         #region Constructors
00028         public THVector3(float x, float y, float z)
00035         {
00036             this.x = x;
00037             this.y = y;
00038             this.z = z;
00039         }
00040
00045         public THVector3(THVector3 vec3)
00046         {
00047             this = vec3;
00048         }
00049
00054         public THVector3(Vector3 vec3)
00055         {
00056             this = vec3;
00057         }
00058
00063         public THVector3(Terrain.ChunkWorldPos vec3)
00064         {
00065             this = vec3;
00066         }
00067         #endregion
00068
00069         #region Methods
00070         public static float Distance(THVector3 a, THVector3 b)
00077         {
00078             return (float)Math.Sqrt(Math.Pow((a.x - b.x), 2) + Math.Pow((a.y - b.
      y), 2) + Math.Pow((a.z - b.z), 2));
00079         }
00080         #endregion
00081
00082         #region Overrides
00083         public override bool Equals(object obj)
00089         {
00090             if (!(obj is THVector3))
00091                 return false;
00092             if (obj.GetHashCode() == GetHashCode())
00093                 return true;
00094             return false;
00095         }
00096
00101         public override int GetHashCode()
00102         {
00103             unchecked
00104             {
00105                 int hash = 13;
00106
00107                 hash *= 443 * x.GetHashCode();
00108                 hash *= 373 * y.GetHashCode();
00109                 hash *= 127 * z.GetHashCode();
00110
00111                 return hash;
00112             }
00113         }
00114
00119         public override string ToString()
00120         {
00121             return $"{x}, {y}, {z}";
00122         }
00123
00130         public static bool operator ==(THVector3 a, THVector3 b)
00131         {
00132             return a.Equals(b);
00133         }
00140         public static bool operator !=(THVector3 a, THVector3 b)
00141         {
00142             return !(a == b);
00143         }
00144
```

```
00151         public static THVector3 operator +(THVector3 a,
      THVector3 b)
00152         {
00153             a.x += b.x;
00154             a.y += b.y;
00155             a.z += b.z;
00156 
00157             return a;
00158         }
00165         public static THVector3 operator +(THVector3 a, float b)
00166         {
00167             a.x += b;
00168             a.y += b;
00169             a.z += b;
00170 
00171             return a;
00172         }
00179         public static THVector3 operator +(float a, THVector3 b)
00180         {
00181             return new THVector3(a + b.x, a + b.y, a + b.z);
00182         }
00189         public static THVector3 operator -(THVector3 a,
      THVector3 b)
00190         {
00191             a.x -= b.x;
00192             a.y -= b.y;
00193             a.z -= b.z;
00194 
00195             return a;
00196         }
00203         public static THVector3 operator -(THVector3 a, float b)
00204         {
00205             a.x += b;
00206             a.y += b;
00207             a.z += b;
00208 
00209             return a;
00210         }
00217         public static THVector3 operator -(float a, THVector3 b)
00218         {
00219             return new THVector3(a - b.x, a - b.y, a - b.z);
00220         }
00227         public static THVector3 operator *(THVector3 a,
      THVector3 b)
00228         {
00229             a.x *= b.x;
00230             a.y *= b.y;
00231             a.z *= b.z;
00232 
00233             return a;
00234         }
00241         public static THVector3 operator *(THVector3 a, float b)
00242         {
00243             a.x *= b;
00244             a.y *= b;
00245             a.z *= b;
00246 
00247             return a;
00248         }
00255         public static THVector3 operator *(float a, THVector3 b)
00256         {
00257             return new THVector3(a * b.x, a * b.y, a * b.z);
00258         }
00265         public static THVector3 operator /(THVector3 a,
      THVector3 b)
00266         {
00267             a.x /= b.x;
00268             a.y /= b.y;
00269             a.z /= b.z;
00270 
00271             return a;
00272         }
00279         public static THVector3 operator /(THVector3 a, float b)
00280         {
00281             a.x /= b;
00282             a.y /= b;
00283             a.z /= b;
00284 
00285             return a;
00286         }
00293         public static THVector3 operator /(float a, THVector3 b)
00294         {
00295             return new THVector3(a / b.x, a / b.y, a / b.z);
00296         }
00297         #endregion
00298 
00299         #region Implicit Operators
```

```
00300         public static implicit operator Vector3(THVector3 vec3)
00305         {
00306             return new Vector3(vec3.x, vec3.y, vec3.z);
00307         }
00308
00313         public static implicit operator THVector3(Vector3 vec3)
00314         {
00315             return new THVector3(vec3.x, vec3.y, vec3.z);
00316         }
00317         #endregion
00318     }
00319 }
```

0.8 Misc

0.8.1 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Serialization/Serialization.cs File Reference

Classes

- class BeeGame.Serialization.Serialization

  Serializes and Deserialises things

Namespaces

- namespace BeeGame.Serialization

0.8.2 Serialization.cs

```
00001 using System.IO;
00002 using System.Runtime.Serialization;
00003 using System.Runtime.Serialization.Formatters.Binary;
00004 using UnityEngine;
00005 using BeeGame.Terrain;
00006 using BeeGame.Terrain.Chunks;
00007 using BeeGame.Inventory;
00008 using BeeGame.Blocks;
00009
00010 namespace BeeGame.Serialization
00011 {
00018     public static class Serialization
00019     {
00020         #region Data
00021         public static string worldName = "World";
00028         public static string saveFolderName = "Saves";
00032         private static string savePath;
00033         #endregion
00034
00038         public static void MakeDirectorys()
00039         {
00040             savePath = $"{Application.dataPath}/{saveFolderName}/{worldName}";
00041
00042             if (!(Directory.Exists(savePath)))
00043                 Directory.CreateDirectory(savePath);
00044         }
00045
00046         #region Inventorys
00047         public static void SerializeInventory(Inventory.Inventory inventory, string inventoryName)
00057         {
00058             string inventorySavePath = $"{savePath}/Inventorys";
00059
00060             if (!Directory.Exists(inventorySavePath))
00061                 Directory.CreateDirectory(inventorySavePath);
00062
00063             SaveFile(inventory.GetAllItems(), $"{inventorySavePath}/{inventoryName}.dat");
00064         }
00065
00071         public static void DeSerializeInventory(Inventory.Inventory inventory,
```

```
    string inventoryName)
00072       {
00073           //* make the path
00074           string inventorySavePath = $"{savePath}/Inventorys/{inventoryName}.dat";
00075
00076           //* checks that the file exists
00077           if (!File.Exists(inventorySavePath))
00078               return;
00079
00080           inventory.SetAllItems((ItemsInInventory)LoadFile($"{inventorySavePath}"));
00081       }
00082       #endregion
00083
00084       #region Chunk
00085       public static void SaveChunk(Chunk chunk)
00090       {
00091           //* saves the blocks
00092           SaveChunk save = new SaveChunk(chunk.blocks);
00093
00094           //* if no block was changed return early
00095           if (save.blocks.Count == 0)
00096               return;
00097
00098           //* otherwise save the file
00099           string saveFile = $"{savePath}/{FileName(chunk.chunkWorldPos)}.dat";
00100
00101           SaveFile(save, saveFile);
00102       }
00103
00109       public static bool LoadChunk(Chunk chunk)
00110       {
00111           //* gets the save file
00112           string saveFile = $"{savePath}/{FileName(chunk.chunkWorldPos)}.dat";
00113
00114           //* if the file does not exist return false
00115           if (!File.Exists(saveFile))
00116               return false;
00117
00118           //* set all of the changed blocks in the chunk
00119           SaveChunk save = (SaveChunk)LoadFile(saveFile);
00120
00121           foreach (var block in save.blocks)
00122           {
00123               chunk.blocks[block.Key.x, block.Key.y, block.Key.z] = block.Value;
00124           }
00125
00126           return true;
00127       }
00128
00134       public static string FileName(ChunkWorldPos pos)
00135       {
00136           return $"{pos.x}, {pos.y}, {pos.z}";
00137       }
00138       #endregion
00139
00140       #region Save/Load Files
00141       private static void SaveFile(object obj, string file)
00147       {
00148           BinaryFormatter bf = new BinaryFormatter();
00149           FileStream fs = new FileStream(file, FileMode.OpenOrCreate);
00150
00151           try
00152           {
00153               bf.Serialize(fs, obj);
00154           }
00155           catch(SerializationException e)
00156           {
00157               Debug.Log($"Serialization Exception: {e}");
00158               throw new SerializationException();
00159           }
00160           finally
00161           {
00162               fs.Close();
00163           }
00164       }
00165
00171       private static object LoadFile(string file)
00172       {
00173           BinaryFormatter bf = new BinaryFormatter();
00174           FileStream fs = new FileStream(file, FileMode.Open);
00175
00176           try
00177           {
00178               return bf.Deserialize(fs);
00179           }
00180           catch(SerializationException e)
00181           {
```

```
00182                 Debug.Log($"Deserialization Exception {e}");
00183                 throw new SerializationException();
00184             }
00185             finally
00186             {
00187                 fs.Close();
00188             }
00189         }
00190         #endregion
00191     }
00192 }
```

0.8.3 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Core/Extensions.cs File Reference

Classes

- class BeeGame.Core.Extensions

Namespaces

- namespace BeeGame.Core

0.8.4 Extensions.cs

```
00001 using System;
00002 using System.Collections.Generic;
00003 using System.Linq;
00004 using System.Reflection;
00005 using System.Text;
00006
00007 namespace BeeGame.Core
00008 {
00009     public static class Extensions
00010     {
00019         public static T CloneObject<T>(this T obj)
00020         {
00021             //*gets the tyoe of the given object
00022             Type typeSource = obj.GetType();
00023
00024             //*makes a new object of type T
00025             T objTarget = (T)Activator.CreateInstance(typeSource);
00026
00027             //*gets the properties in T
00028             PropertyInfo[] propertyInfo = typeSource.GetProperties(BindingFlags.Public | BindingFlags.
      NonPublic | BindingFlags.Instance);
00029
00030             //*applies the properties in T to the new type T object
00031             foreach (var property in propertyInfo)
00032             {
00033                 if (property.CanWrite)
00034                 {
00035                     //*if the propertly is a value just set it
00036                     if (property.PropertyType.IsValueType || property.PropertyType.IsEnum || property.
      PropertyType.Equals(typeof(string)))
00037                     {
00038                         property.SetValue(objTarget, property.GetValue(obj, null), null);
00039                     }
00040                     else
00041                     {
00042                         //*if the propertly is not a value type this function will need to be called
       recursivly as it could also have non value type veriables
00043                         object propertyValue = property.GetValue(obj, null);
00044
00045                         if (propertyValue == null)
00046                         {
00047                             property.SetValue(obj, null, null);
00048                         }
00049                         else
00050                         {
00051                             property.SetValue(obj, propertyValue.CloneObject(), null);
00052                         }
```

```
00053                     }
00054                 }
00055
00056             }
00057             return objTarget;
00058         }
00059     }
00060 }
```

0.8.5 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/test.cs File Reference

Classes

- class BeeGame.Test

Namespaces

- namespace BeeGame

0.8.6 test.cs

```
00001 using System;
00002 using System.Collections.Generic;
00003 using System.Linq;
00004 using System.Text;
00005 using UnityEngine;
00006 using UnityEngine.UI;
00007
00008 namespace BeeGame
00009 {
00010     public class Test : MonoBehaviour
00011     {
00012         private void Start()
00013         {
00014             Instantiate(BeeGame.Core.PrefabDictionary.
      GetPrefab("Selector"));
00015         }
00016     }
00017 }
```

0.8.7 C:/Users/Toothless/Documents/GitHub/BeeGame/Code/BeeGame/BeeGame/Core/Enums/Enums.cs File Reference

Namespaces

- namespace BeeGame.Core.Enums

Enumerations

- enum BeeGame.Core.Enums.Direction { BeeGame.Core.Enums.Direction.NORTH, BeeGame.Core.Enums.Direction.EAST, BeeGame.Core.↩ Enums.Direction.SOUTH, BeeGame.Core.Enums.Direction.WEST, BeeGame.Core.Enums.Direction.UP, BeeGame.Core.Enums.Direction.DOWN }

  Direction in the game

0.8.8 Enums.cs

```
00001 namespace BeeGame.Core.Enums
00002 {
00006     public enum Direction
00007     {
00008         NORTH, EAST, SOUTH, WEST, UP, DOWN
00009     };
00010
00011 }
```

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