# Data Structures

| Class/Interface Name | Member | Description |
|---|---|---|
| BinaryTree<TNode, TData> | Root | A property which returns the root node of the binary tree. |
| | Height | A property that represents the height of the binary tree. |
| | BinaryTree() | The constructor of the BinaryTree class which initializes a new binary tree. |
| | Add(TData data) | A method that adds data to the binary tree. |
| | Remove(TData data) | A method that removes data from the binary tree, if present. |
| IBinaryTreeNode | Center | A property which returns the center of the node. |
| | Size | A property which returns the size of the node. |
| | Bounds | A property which returns the bounds of the node. |
| | HasChilds | A property which indicates whether the node has child nodes. |
| | IsLeaf | A property which indicates whether the node is a leaf node. |
| | GetLeft() | A method which returns the left child node. |
| | GetRight() | A method which returns the right child node. |

| Class/Interface Name | Member | Description |
|---|---|---|
| BinaryTreeNode<TData> | Left | A property which returns the left child node. |
|  | Right | A property which returns the right child node. |
|  | IsLeaf | A property which indicates whether the node is a leaf node. |
|  | HasChilds | A property which indicates whether the node has child nodes. |
|  | BinaryTreeNode(Vector3 center, Vector3 size, bool isLeaf) | The constructor of the BinaryTreeNode class which initializes a new binary tree node. |
|  | SetChilds(BinaryTreeNode<TData> left, BinaryTreeNode<TData> right) | A method that sets the left and right child nodes. |
|  | Add(TData data) | An abstract method that needs to be implemented by subclasses to add data to the node. |
|  | Remove(TData data) | An abstract method that needs to be implemented by subclasses to remove data from the node. |

# MeshTools

| Class/Interface Name | Member | Description |
|---|---|---|
| IMeshCombiner | Combine(Mesh mesh, IList<MeshCombineInfo> combineInfos) | Combines multiple meshes into one according to the provided combine information. |
| IMeshCutter | Cut(Mesh mesh, MeshCuttingInfo cuttingInfo) | Performs a cut operation on the given mesh according to the cutting information. |
|  | Cut(Mesh mesh, IList<MeshCuttingInfo> cuttingInfos) | Performs a cut operation on the given mesh according to a list of cutting information. |
| LightweightVertex | Position | Get/Set property for position of the vertex. |
|  | Normal | Get/Set property for the normalized direction from the origin to the vertex. |
| MeshCombineInfo | MeshCombineInfo(Mesh mesh, int submeshIndex = 0) | Constructor that initializes a new instance of the MeshCombineInfo structure using the specified mesh and optional submesh index. |
|  | MeshCombineInfo(Mesh mesh, Matrix4x4 transformMatrix, int submeshIndex = 0) | Constructor that initializes a new instance of the MeshCombineInfo structure using the specified mesh, transformation matrix and optional submesh index. |
|  | MeshCombineInfo(Mesh mesh, Matrix4x4 transformMatrix, Vector4 lightmapScaleOffset, Vector4 realtimeLightmapScaleOffset, int submeshIndex = 0) | Constructor that initializes a new instance of the MeshCombineInfo structure using the specified mesh, transformation matrix, lightmap scale offset, realtime lightmap scale offset and optional submesh index. |
| MeshCuttingInfo | MeshCuttingInfo(int vertexStart, int vertexCount, int triangleStart, int triangleCount) | Constructor that initializes a new instance of the MeshCuttingInfo structure with the specified vertex start, vertex count, triangle start and triangle count. |
| VertexBufferUtil | IsStandardBuffer(Mesh mesh) | Checks if the given mesh uses standard buffer. |

| Class/Interface Name | Member | Description |
|---|---|---|
| | IsLightweightBuffer(Mesh mesh) | Checks if the given mesh uses lightweight buffer. |
| | ToStandardBuffer(Mesh mesh) | Converts the given mesh's buffer to a standard buffer if it isn't already. |
| | ToLightweightBuffer(Mesh mesh) | Converts the given mesh's buffer to a lightweight buffer if it isn't already. |

# Combined Mesh

| Class/Interface/Structure Name | Member | Description |
|---|---|---|
| CombinedMesh | CombinedMesh(IMeshCombiner combiner, IMeshCutter cutter) | Constructor that initializes a new instance of the CombinedMesh class. Throws an exception if either the `IMeshCombiner` or `IMeshCutter` arguments are null. |
| | Combine(IList<MeshCombineInfo> infos) | Combines multiple mesh data into a single mesh. |
| | Cut(IList<CombinedMeshPart> parts) | Cuts the specified parts from the combined mesh. |
| | Dispose() | Releases all resources used by the CombinedMesh. |
| CombinedMesh<TCombinedMeshData> | CombinedMesh(IMeshCombiner combiner, IMeshCutter cutter) | Constructor that initializes a new instance of the CombinedMesh<TCombinedMeshData> class. Inherits from the CombinedMesh class. |
| | MeshDataInternal | Returns the combined mesh data. |
| CombinedMeshPart | CombinedMeshPart(CombinedMesh root, int index, int vertexStart, int vertexCount, int trianglesStart, int trianglesCount) | Constructor that initializes a new instance of the CombinedMeshPart class with the specified root, index, vertex start, vertex count, triangles start, and triangles count. |
| CombinedMeshData | GetBounds() | Abstract method that returns the bounds of the combined mesh data. |
| | GetBounds(CombinedMeshPart part) | Abstract method that returns the bounds of the specified combined mesh part. |

| Class/Interface/Structure Name | Member | Description |
|---|---|---|
| | GetParts() | Abstract method that returns an enumerable collection of combined mesh parts. |

# CombineObject

| Class/Interface/Structure Name | Member | Description |
|---|---|---|
| RendererSettings | RendererSettings(Material material, ShadowCastingMode shadowMode = ShadowCastingMode.On, bool receiveShadows = true, int lightmapIndex = -1, int realtimeLightmapIndex = -1, string tag = "Untagged", int layer = 0) | Constructor that initializes a new instance of the RendererSettings structure with the specified material, shadow casting mode, flag indicating whether the object should receive shadows, lightmap indices, tag, and layer. |
| | RendererSettings(Renderer renderer, int materialIndex = 0) | Constructor that initializes a new instance of the RendererSettings structure using the specified renderer and material index. |
| ICombinedObject | Combine(IEnumerable<ICombineSource> sources) | Combines the specified combine sources. |
| ICombinedObject<TCombinedPart, TCombinedSource> | Combine(IEnumerable<TCombinedSource> sources) | Combines the specified combine sources. The types of the combined part and combine source are generic. |
| ICombinedObjectPart | Destroy() | Destroys the combined object part. |

| Class/Interface/Structure Name | Member | Description |
|---|---|---|
| ICombinedObjectPart<TCombinedObject> | Root | Returns the root combined object. The type of the combined object is generic. |
| ICombineSource | Position | Returns the position of the combine source. |
|  | onCombined | Event that is triggered when the combine source is combined. |
|  | onCombineError | Event that is triggered when an error occurs during combining. |
|  | onCombineFailed | Event that is triggered when combining fails. |
| ICombineSource<TCombinedObject, TCombinedPart> | onCombinedTyped | Event that is triggered when the combine source is combined. The types of the combined object and combined part are generic. |
|  | onCombineErrorTyped | Event that is triggered when an error occurs during combining. The type of the combined object is generic. |
|  | onCombineFailedTyped | Event that is triggered when combining fails. The type of the combined object is generic. |
| Class Name | Member | Description |
| CombinedObject | Combine(IEnumerable<ICombineSource> sources) | Combines the specified combine sources. |

| Class/Interface/Structure Name | Member | Description |
|---|---|---|
| | Combine(IEnumerable<CombineSource> sources) | Overloaded method to combine the specified combine sources of type CombineSource. |
| | Destroy(CombinedObjectPart part) | Destroys the specified combined object part. |
| | ForceUpdate() | Forces an update on the combined object. |
| | GetBounds(CombinedObjectPart part) | Returns the bounds of the specified combined object part. |
| | GetLocalBounds(CombinedObjectPart part) | Returns the local bounds of the specified combined object part. |
| CombinedObjectPart | CombinedObjectPart(CombinedObject root, CombinedMeshPart meshPart) | Constructor that initializes a new instance of the CombinedObjectPart class with the specified root combined object and mesh part. |
| | Destroy() | Destroys the combined object part. |
| CombineSource | CombineSource(GameObject go, int submeshIndex = 0) | Constructor that initializes a new instance of the CombineSource class using the specified game object and submesh index. |
| | CombineSource(Mesh mesh, MeshRenderer renderer, int submeshIndex = 0) | Constructor that initializes a new instance of the CombineSource class using the specified mesh, renderer, and submesh index. |

| **Class/Interface/Structure Name** | **Member** | **Description** |
|---|---|---|
| | CombineSource(MeshCombineInfo info, RendererSettings settings) | Constructor that initializes a new instance of the CombineSource class using the specified mesh combine info and renderer settings. |
| | CombineSource(MeshCombineInfo info, RendererSettings settings, Bounds bounds) | Constructor that initializes a new instance of the CombineSource class using the specified mesh combine info, renderer settings, and bounds. |
| | Combined(CombinedObject root, CombinedObjectPart part) | Notifies that the combine source has been combined. |
| | CombineError(CombinedObject root, string errorMessage) | Notifies that an error occurred during combining. |
| | CombineFailed(CombinedObject root) | Notifies that combining failed. |
| Class/Interface Name | Member | Description |
| DynamicCombinedObject | Parts (property) | Returns a read-only list of the parts of the combined object. |
| | RendererSettings (property) | Returns the renderer settings of the base object. |
| | Bounds (property) | Returns the bounds of the base object. |
| | LocalBounds (property) | Returns the local bounds of the base object. |

| Class/Interface/Structure Name | Member | Description |
|---|---|---|
| | VertexCount (property) | Returns the vertex count of the base object. |
| | Create(MeshType meshType, CombineMethod combineMethod, MoveMethod moveMethod, RendererSettings settings) (method) | Static factory method to create a new DynamicCombinedObject. |
| | Create(ICombinedMeshFactory factory, RendererSettings settings) (method) | Overload of the static factory method to create a new DynamicCombinedObject. |
| | Combine(IEnumerable<ICombineSource> sources) (method) | Combines a collection of ICombineSource objects into the combined object. |
| | Combine(IEnumerable<DynamicCombineSource> sources) (method) | Overload of the Combine method for DynamicCombineSource objects. |
| DynamicCombinedObjectPart | Root (property) | Returns the root of the combined object part. |
| | LocalBounds (property) | Returns the local bounds of the combined object part. |
| | Bounds (property) | Returns the bounds of the combined object part. |
| | Move(Vector3 position, Quaternion rotation, Vector3 scale) (method) | Abstract method to move the part using specified position, rotation and scale. |
| | Move(Matrix4x4 transform) (method) | Abstract method to move the part using a specified transformation matrix. |

| Class/Interface/Structure Name | Member | Description |
|---|---|---|
| | MoveLocal(Matrix4x4 localTransform) (method) | Abstract method to move the part using a specified local transformation matrix. |
| | Destroy() (method) | Destroys the part. |
| DynamicCombineSource | Base (property) | Returns the base combine source. |
| | Position (property) | Returns the position of the combine source. |
| | Bounds (property) | Returns the bounds of the combine source. |
| | Combined(DynamicCombinedObject root, DynamicCombinedObjectPart part) (method) | Called when the source is combined. |
| | CombineError(DynamicCombinedObject root, string errorMessage) (method) | Called when there is an error during the combine process. |
| | CombineFailed(DynamicCombinedObject root) (method) | Called when the combine process fails. |

# Objects Combiners

| Class/Interface Name | Member | Description |
|---|---|---|
| `ObjectsCombiner<TCombinedObject, TCombineSource>` | `CombinedObjects` (property) | Returns a read-only list of the combined objects. |
| | `ContainSources` (property) | Boolean indicating whether there are sources in the object combiner. |
| | `onCombinedObjectCreated` (event) | Event triggered when a combined object is created. |
| | `AddSource(TCombineSource source)` (method) | Adds a source to the combiner. |
| | `AddSources(IEnumerable<TCombineSource> sources)` (method) | Adds a collection of sources to the combiner. |
| | `RemoveSource(TCombineSource source)` (method) | Removes a source from the combiner. |
| | `Combine()` (method) | Combines the sources in the combiner. |
| `CombinedObjectMatcher<TCombinedObject, TCombineSource>` | `StartMatching(TCombinedObject combinedObject)` (method) | Abstract method to start matching a combined object. |
| | `CanAddSource(TCombineSource source)` (method) | Abstract method to check if a source can be added to the combined object. |

| Class/Interface Name | Member | Description |
|---|---|---|
| | `SourceAdded(TCombineSource source)` (method) | Abstract method called when a source is added. |
| `StaticObjectsCombiner` | `AddSource(CombineSource source)` (method) | Adds a source to the static objects combiner, considering the vertex limit. |
| | `CombineSources(CombinedObject root, IList<CombineSource> sources)` (method) | Combines the sources in the static objects combiner. |
| | `CreateCombinedObject(CombineSource source)` (method) | Creates a combined object in the static objects combiner. |
| | `GetMatcher()` (method) | Returns the matcher used in the static objects combiner. |
| `DynamicObjectsCombiner` | `AddSource(DynamicCombineSource source)` (method) | Adds a dynamic source to the dynamic objects combiner, considering the vertex limit. |
| | `CombineSources(DynamicCombinedObject root, IList<DynamicCombineSource> sources)` (method) | Combines the dynamic sources in the dynamic objects combiner. |
| | `CreateCombinedObject(DynamicCombineSource source)` (method) | Creates a dynamic combined object in the dynamic objects combiner. |

| Class/Interface Name | Member | Description |
|---|---|---|
| | `GetMatcher()` (method) | Returns the matcher used in the dynamic objects combiner. |
| `LODGroupsCombiner` | `CreateCombinedObject(LODGroupCombineSource source)` (method) | Creates a combined LOD group in the LOD groups combiner. |
| | `CombineSources(CombinedLODGroup root, IList<LODGroupCombineSource> sources)` (method) | Combines the LOD group sources in the LOD groups combiner. |
| | `GetMatcher()` (method) | Returns the matcher used in the LOD groups combiner. |
| `UniversalObjectsCombiner` | `onStaticCombinedObjectCreated` (event) | Event triggered when a static combined object is created. |
| | `onDynamicCombinedObjectCreated` (event) | Event triggered when a dynamic combined object is created. |
| | `onCombinedLODGroupCreated` (event) | Event triggered when a combined LOD group is created. |
| | `AddSource(ICombineSource source)` (method) | Adds a source to the universal objects combiner. |
| | `AddSources(IEnumerable<ICombineSource> sources)` (method) | Adds a collection of sources to the universal objects combiner. |

| Class/Interface Name | Member | Description |
|---|---|---|
| | `RemoveSource(ICombineSource source)` (method) | Removes a source from the universal objects combiner. |
| | `Combine()` (method) | Combines the sources in the universal objects combiner. |

# CombinedLODGroup

| Class/Interface Name | Member | Description |
|---|---|---|
| `LODGroupSettings` (Struct) | `size` | The size of the LOD group. |
| | `lodCount` | The number of LODs in the group. |
| | `fadeMode` | The fade mode of the LOD group. |
| | `animateCrossFading` | A boolean indicating whether cross-fading is animated. |
| | `screenTransitionsHeight` | An array of screen transition heights. |
| | `fadeTransitionsWidth` | An array of fade transition widths. |
| | `LODGroupSettings(LODGroup group)` | Constructor taking an instance of LODGroup. |
| | `IsEqual(LODGroupSettings settings, float screenHeightThreshold = 0.0001f, float fadeWidthThreshold = 0.0001f)` | Method to compare two instances of LODGroupSettings. |
| `LODGroupCombineSource` (Class) | `Position` | The position of the LOD group (read-only property). |
| | `Bounds` | The bounds of the LOD group (read-only property). |
| | `LODGroup` | The LODGroup instance (read-only property). |

| Class/Interface Name | Member | Description |
|---|---|---|
|  | `Settings` | The LODGroupSettings instance (read-only property). |
|  | `BaseSources` | A two-dimensional array of CombineSource instances (read-only property). |
|  | `onCombined` | Event triggered when combining is completed. |
|  | `onCombineError` | Event triggered when an error occurs during combining. |
|  | `onCombineFailed` | Event triggered when combining fails. |
|  | `onCombinedTyped` | Typed event triggered when combining is completed. |
|  | `onCombineErrorTyped` | Typed event triggered when an error occurs during combining. |
|  | `onCombineFailedTyped` | Typed event triggered when combining fails. |
|  | `LODGroupCombineSource(LODGroup group)` | Constructor taking an instance of LODGroup. |
|  | `Combined(CombinedLODGroup root, CombinedLODGroupPart part)` | Method invoked when combining is completed. |

| Class/Interface Name | Member | Description |
|---|---|---|
|  | `CombineError(CombinedLODGroup root, string errorMessage)` | Method invoked when an error occurs during combining. |
|  | `CombineFailed(CombinedLODGroup root)` | Method invoked when combining fails. |
| Class/Interface Name | `Member` | Description |
| CombinedLODGroup (Class) | `Parts` | Returns a read-only list of CombinedLODGroupPart instances. |
|  | `Settings` | Returns the LODGroupSettings of the CombinedLODGroup. |
|  | `Bounds` | Returns the bounds of the CombinedLODGroup. |
|  | `Create(MeshType, CombineMethod, LODGroupSettings, int)` | Static method that creates a new CombinedLODGroup instance. |
|  | `Create(ICombinedMeshFactory, LODGroupSettings, int)` | Static method that creates a new CombinedLODGroup instance. |
|  | `Combine(IEnumerable<ICombineSource>)` | Combines multiple ICombineSource instances. |
|  | `Combine(IEnumerable<LODGroupCombineSource>)` | Combines multiple LODGroupCombineSource instances. |

| Class/Interface Name | Member | Description |
|---|---|---|
| | `Destroy(CombinedLODGroupPart, IList<CombinedObjectPart>)` | Destroys a part of the CombinedLODGroup. |
| CombinedLODGroup.LevelOfDetailCombiner (Inner Class) | `GetRenderers()` | Returns the renderers for the LevelOfDetailCombiner. |
| | `CalculateBounds()` | Calculates the bounds for the LevelOfDetailCombiner. |
| CombinedLODGroupPart (Class) | `Root` | Returns the CombinedLODGroup root of the CombinedLODGroupPart. |
| | `LocalBounds` | Returns the local bounds of the CombinedLODGroupPart. |
| | `Bounds` | Returns the bounds of the CombinedLODGroupPart. |
| | `CombinedLODGroupPart(CombinedLODGroup, List<CombinedObjectPart>)` | Constructor that creates a new CombinedLODGroupPart instance. |
| | `Destroy()` | Destroys the CombinedLODGroupPart. |

# MeshFusionSource

| Class/Interface name | Member | Description |
|---|---|---|
| MeshFusionSource | | |
| | SourceCombineStatus CombineStatus { get; private set; } | Represents the status of the source combining operation. |
| | int ControllerIndex { get; set; } | Holds the index of the Controller. |
| | bool CombineAtStart { get; set; } | Determines if combination should start at the beginning. |
| | CombineErrorStrategy CombineErrorStrategy { get; set; } | Represents the strategy to handle errors during combination. |
| | AfterCombineAction AfterCombineAction { get; set; } | Represents the action to be taken after combination. |
| | bool IsIncompatible { get; private set; } | Indicates if the source is incompatible. |
| | string IncompatibilityReason { get; private set; } | Holds the reason for incompatibility. |
| | bool HasCombineErrors { get; private set; } | Indicates if there were any errors during combination. |
| | string CombineErrors { get; private set; } | Holds the details of the combine errors. |
| | event Action<MeshFusionSource, IEnumerable<ICombinedObjectPart>> onCombineFinished; | Event that is triggered when the combination operation finishes. |
| | bool TryGetBounds(ref Bounds bounds); | Tries to get the bounds of the source. Returns a boolean indicating success or failure. |
| | bool CheckCompatibility(); | Checks the compatibility of the source. Returns a boolean indicating compatibility. |

| Class/Interface name | Member | Description |
|---|---|---|
| | bool AssignToController(); | Assigns the source to a controller. Returns a boolean indicating success or failure. |
| | void UndoCombine(); | Undoes the combination operation. |

# MeshFusionController

| Class/Interface name | Member | Description |
|---|---|---|
| RuntimeMeshFusion | | |
| | int ControllerIndex | Gets or sets the controller index. Can only be set if Application is not playing. |
| | bool DrawGizmo | Gets or sets a value indicating whether to draw gizmos. |
| | int CellSize | Gets or sets the size of the cell. Can only be set if Application is not playing. |
| | int MaxVertices | Gets or sets the maximum number of vertices per object. Can only be set if Application is not playing. |

| Class/Interface name | Member | Description |
|---|---|---|
| | MeshType MeshType | Gets or sets the mesh type. Can only be set if Application is not playing. |
| | MoveMethod MoveMethod | Gets or sets the move method. Can only be set if Application is not playing. |
| | void Awake() | Initializes the instance and sets up the combine tree and the tree drawer. |
| | void Update() | If a source has been added, it triggers a combination and resets the _sourceAdded flag. |
| | void OnDrawGizmos() | Draws gizmos if conditions are met. |
| | void OnDestroy() | Removes this instance from the static list of instances. |
| | static RuntimeMeshFusion FindByIndex(int index) | Finds an instance by its controller index. |
| | public void AddSource(ICombineSource source) | Adds a source to the combine tree. |

| Class/Interface name | Member | Description |
|---|---|---|
|  | public void RemoveSource(ICombineSource source) | Removes a source from the combine tree. |