

splines plugin

- [splines plugin code default](#)

splines plugin code default

```
using System;
using System.Collections.Generic;
using System.Linq;
using Unity.Collections;
using Unity.Mathematics;
using UnityEngine;
using UnityEngine.Serialization;
using UnityEngine.Splines;
using Random = UnityEngine.Random;

#if UNITY_EDITOR
using UnityEditor;
#endif

namespace UnityEngine.Splines
{
    /// <summary>
    /// SplineInstantiate is used to automatically instantiate prefabs or objects along a spline.
    /// </summary>
    [ExecuteInEditMode]
    [AddComponentMenu("Splines/Spline Instantiate")]
    public class SplineInstantiate : SplineComponent
    {
        /// <summary>
        /// The space in which to interpret the offset, this can be different from the orientation space used to
        instantiate objects.
        /// </summary>
        public enum OffsetSpace
        {
            /// <summary> Use the spline space to orient instances.</summary>
            [InspectorName("Spline Element")]
            Spline = Space.Spline,
            /// <summary> Use the spline GameObject space to orient instances.</summary>
            [InspectorName("Spline Object")]
            Local = Space.Local,
```

```

    /// <summary> Use world space to orient instances.</summary>
    [InspectorName("World Space")]
    World = Space.World,
    /// <summary> Use the original object space to orient instances.</summary>
    [InspectorName("Instantiated Object")]
    Object
}

```

```

[Serializable]

```

```

internal struct Vector3Offset

```

```

{
    [Flags]
    public enum Setup
    {
        None = 0x0,
        HasOffset = 0x1,
        HasCustomSpace = 0x2
    }
}

```

```

    public Setup setup;
    public Vector3 min;
    public Vector3 max;

```

```

    public bool randomX;
    public bool randomY;
    public bool randomZ;

```

```

    public OffsetSpace space;

```

```

    public bool hasOffset => (setup & Setup.HasOffset) != 0;
    public bool hasCustomSpace => (setup & Setup.HasCustomSpace) != 0;

```

```

    internal Vector3 GetNextOffset()
    {
        if ((setup & Setup.HasOffset) != 0)
        {
            return new Vector3(
                randomX ? Random.Range(min.x, max.x) : min.x,
                randomY ? Random.Range(min.y, max.y) : min.y,
                randomZ ? Random.Range(min.z, max.z) : min.z);
        }
    }

```

```

    }

    return Vector3.zero;
}

internal void CheckMinMaxValidity()
{
    max.x = Mathf.Max(min.x, max.x);
    max.y = Mathf.Max(min.y, max.y);
    max.z = Mathf.Max(min.z, max.z);
}

internal void CheckMinMax()
{
    CheckMinMaxValidity();
    if (max.magnitude > 0)
        setup |= Setup.HasOffset;
    else
        setup &= ~Setup.HasOffset;
}

internal void CheckCustomSpace(Space instanceSpace)
{
    if ((int)space == (int)instanceSpace)
        setup &= ~Setup.HasCustomSpace;
    else
        setup |= Setup.HasCustomSpace;
}
}

/// <summary>
/// Describe the item prefab to instantiate and associate it with a probability
/// </summary>
[Serializable]
public struct InstantiableItem
{
    /// <summary> The prefab to instantiate.</summary>
    [HideInInspector]
    [Obsolete("Use Prefab instead.", false)]
    public GameObject prefab;

```

```

/// <summary> The prefab to instantiate.</summary>
[FormerlySerializedAs("prefab")]
public GameObject Prefab;
/// <summary> Probability for this prefab. </summary>
[HideInInspector]
[Obsolete("Use Probability instead.", false)]
public float probability;
/// <summary> Probability for this prefab. </summary>
[FormerlySerializedAs("probability")]
public float Probability;
}

/// <summary>
/// Describe the possible methods to instantiate instances along the spline.
/// </summary>
public enum Method
{
    /// <summary> Use exact number of instances.</summary>
    [InspectorName("Instance Count")]
    InstanceCount,
    /// <summary> Use distance along the spline between 2 instances.</summary>
    [InspectorName("Spline Distance")]
    SpacingDistance,
    /// <summary> Use distance in straight line between 2 instances.</summary>
    [InspectorName("Linear Distance")]
    LinearDistance
}

/// <summary>
/// Describes the coordinate space that is used to orient the instantiated object.
/// </summary>
public enum Space
{
    /// <summary> Use the spline space to orient instances.</summary>
    [InspectorName("Spline Element")]
    Spline,
    /// <summary> Use the spline GameObject space to orient instances.</summary>
    [InspectorName("Spline Object")]
    Local,
    /// <summary> Use world space to orient instances.</summary>

```

```
[InspectorName("World Space")]
World,
}
```

```
[SerializeField]
```

```
SplineContainer m_Container;
```

```
/// <summary>
```

```
/// The SplineContainer containing the targeted spline.
```

```
/// </summary>
```

```
[Obsolete("Use Container instead.", false)]
```

```
public SplineContainer container => Container;
```

```
/// <summary>
```

```
/// The SplineContainer containing the targeted spline.
```

```
/// </summary>
```

```
public SplineContainer Container
```

```
{
```

```
    get => m_Container;
```

```
    set => m_Container = value;
```

```
}
```

```
[SerializeField]
```

```
List<InstantiableItem> m_ItemsToInstantiate = new List<InstantiableItem>();
```

```
/// <summary>
```

```
/// The items to use in the instantiation.
```

```
/// </summary>
```

```
public InstantiableItem[] itemsToInstantiate
```

```
{
```

```
    get => m_ItemsToInstantiate.ToArray();
```

```
    set
```

```
    {
```

```
        m_ItemsToInstantiate.Clear();
```

```
        m_ItemsToInstantiate.AddRange(value);
```

```
    }
```

```
}
```

```
[SerializeField]
```

```
Method m_Method = Method.SpacingDistance;
```

```

/// <summary>
/// The instantiation method to use.
/// </summary>
[Obsolete("Use InstantiateMethod instead.", false)]
public Method method => InstantiateMethod;

/// <summary>
/// The instantiation method to use.
/// </summary>
public Method InstantiateMethod
{
    get => m_Method;
    set => m_Method = value;
}

[SerializeField]
Space m_Space = Space.Spline;

/// <summary>
/// The coordinate space in which to orient the instanced object.
/// </summary>
[Obsolete("Use CoordinateSpace instead.", false)]
public Space space => CoordinateSpace;

/// <summary>
/// The coordinate space in which to orient the instanced object.
/// </summary>
public Space CoordinateSpace
{
    get => m_Space;
    set => m_Space = value;
}

[SerializeField]
Vector2 m_Spacing = new Vector2(1f, 1f);

/// <summary>
/// Minimum spacing between 2 generated instances,
/// if equal to the maxSpacing, then all instances will have the exact same spacing.
/// </summary>
public float MinSpacing
{

```

```

    get => m_Spacing.x;
    set
    {
        m_Spacing = new Vector2(value, m_Spacing.y);
        ValidateSpacing();
    }
}

/// <summary>
/// Maximum spacing between 2 generated instances,
/// if equal to the minSpacing, then all instances will have the exact same spacing
/// </summary>
public float MaxSpacing
{
    get => m_Spacing.y;
    set
    {
        m_Spacing = new Vector2(m_Spacing.x, value);
        ValidateSpacing();
    }
}

[SerializeField]
AlignAxis m_Up = AlignAxis.YAxis;

/// <summary>
/// Up axis of the object, by default set to the y-axis.
/// </summary>
[Obsolete("Use UpAxis instead.", false)]
public AlignAxis upAxis => UpAxis;
/// <summary>
/// Up axis of the object, by default set to the y-axis.
/// </summary>
public AlignAxis UpAxis
{
    get => m_Up;
    set => m_Up = value;
}

[SerializeField]

```



```
AlignAxis m_Forward = AlignAxis.ZAxis;
```

```
/// <summary>
```

```
/// Forward axis of the object, by default set to the Z Axis
```

```
/// </summary>
```

```
[Obsolete("Use ForwardAxis instead.", false)]
```

```
public AlignAxis forwardAxis => ForwardAxis;
```

```
/// <summary>
```

```
/// Forward axis of the object, by default set to the Z Axis
```

```
/// </summary>
```

```
public AlignAxis ForwardAxis
```

```
{
```

```
    get => m_Forward;
```

```
    set
```

```
    {
```

```
        m_Forward = value;
```

```
        ValidateAxis();
```

```
    }
```

```
}
```

```
[SerializeField]
```

```
Vector3Offset m_PositionOffset;
```

```
/// <summary>
```

```
/// Minimum (X,Y,Z) position offset to randomize instanced objects positions.
```

```
/// (X,Y and Z) values have to be lower to the ones of maxPositionOffset.
```

```
/// </summary>
```

```
[Obsolete("Use MinPositionOffset instead.", false)]
```

```
public Vector3 minPositionOffset => MinPositionOffset;
```

```
/// <summary>
```

```
/// Minimum (X,Y,Z) position offset to randomize instanced objects positions.
```

```
/// (X,Y and Z) values have to be lower to the ones of maxPositionOffset.
```

```
/// </summary>
```

```
public Vector3 MinPositionOffset
```

```
{
```

```
    get => m_PositionOffset.min;
```

```
    set
```

```
    {
```

```
        m_PositionOffset.min = value;
```

```
        m_PositionOffset.CheckMinMax();
```

```

    }
}

/// <summary>
/// Maximum (X,Y,Z) position offset to randomize instanced objects positions.
/// (X,Y and Z) values have to be higher to the ones of minPositionOffset.
/// </summary>
[Obsolete("Use MaxPositionOffset instead.", false)]
public Vector3 maxPositionOffset => MaxPositionOffset;

/// <summary>
/// Maximum (X,Y,Z) position offset to randomize instanced objects positions.
/// (X,Y and Z) values have to be higher to the ones of minPositionOffset.
/// </summary>
public Vector3 MaxPositionOffset
{
    get => m_PositionOffset.max;
    set
    {
        m_PositionOffset.max = value;
        m_PositionOffset.CheckMinMax();
    }
}

/// <summary>
/// Coordinate space to use to offset positions of the instances.
/// </summary>
[Obsolete("Use PositionSpace instead.", false)]
public OffsetSpace positionSpace => PositionSpace;

/// <summary>
/// Coordinate space to use to offset positions of the instances.
/// </summary>
public OffsetSpace PositionSpace
{
    get => m_PositionOffset.space;
    set
    {
        m_PositionOffset.space = value;
        m_PositionOffset.CheckCustomSpace(m_Space);
    }
}

```

[SerializeField]

Vector3Offset m_RotationOffset;

/// <summary>

/// Minimum (X,Y,Z) euler rotation offset to randomize instanced objects rotations.

/// (X,Y and Z) values have to be lower to the ones of maxRotationOffset.

/// </summary>

[Obsolete("Use MinRotationOffset instead.", false)]

public Vector3 minRotationOffset => MinRotationOffset;

/// <summary>

/// Minimum (X,Y,Z) euler rotation offset to randomize instanced objects rotations.

/// (X,Y and Z) values have to be lower to the ones of maxRotationOffset.

/// </summary>

public Vector3 MinRotationOffset

{

 get => m_RotationOffset.min;

 set

 {

 m_RotationOffset.min = value;

 m_RotationOffset.CheckMinMax();

 }

}

/// <summary>

/// Maximum (X,Y,Z) euler rotation offset to randomize instanced objects rotations.

/// (X,Y and Z) values have to be higher to the ones of minRotationOffset.

/// </summary>

[Obsolete("Use MaxRotationOffset instead.", false)]

public Vector3 maxRotationOffset => MaxRotationOffset;

/// <summary>

/// Maximum (X,Y,Z) euler rotation offset to randomize instanced objects rotations.

/// (X,Y and Z) values have to be higher to the ones of minRotationOffset.

/// </summary>

public Vector3 MaxRotationOffset

{

 get => m_RotationOffset.max;

 set

 {

 m_RotationOffset.max = value;

```

        m_RotationOffset.CheckMinMax();
    }
}

/// <summary>
/// Coordinate space to use to offset rotations of the instances.
/// </summary>
[Obsolete("Use RotationSpace instead.", false)]
public OffsetSpace rotationSpace => RotationSpace;
/// <summary>
/// Coordinate space to use to offset rotations of the instances.
/// </summary>
public OffsetSpace RotationSpace
{
    get => m_RotationOffset.space;
    set
    {
        m_RotationOffset.space = value;
        m_RotationOffset.CheckCustomSpace(m_Space);
    }
}

[SerializeField]
Vector3Offset m_ScaleOffset;

/// <summary>
/// Minimum (X,Y,Z) scale offset to randomize instanced objects scales.
/// (X,Y and Z) values have to be lower to the ones of maxScaleOffset.
/// </summary>
[Obsolete("Use MinScaleOffset instead.", false)]
public Vector3 minScaleOffset => MinScaleOffset;
/// <summary>
/// Minimum (X,Y,Z) scale offset to randomize instanced objects scales.
/// (X,Y and Z) values have to be lower to the ones of maxScaleOffset.
/// </summary>
public Vector3 MinScaleOffset
{
    get => m_ScaleOffset.min;
    set
    {

```

```
        m_ScaleOffset.min = value;
        m_ScaleOffset.CheckMinMax();
    }
}
```

```
/// <summary>
/// Maximum (X,Y,Z) scale offset to randomize instanced objects scales.
/// (X,Y and Z) values have to be higher to the ones of minScaleOffset.
/// </summary>
```

```
[Obsolete("Use MaxScaleOffset instead.", false)]
```

```
public Vector3 maxScaleOffset => MaxScaleOffset;
```

```
/// <summary>
/// Maximum (X,Y,Z) scale offset to randomize instanced objects scales.
/// (X,Y and Z) values have to be higher to the ones of minScaleOffset.
/// </summary>
```

```
public Vector3 MaxScaleOffset
```

```
{
    get => m_ScaleOffset.max;
    set
    {
        m_ScaleOffset.max = value;
        m_ScaleOffset.CheckMinMax();
    }
}
```

```
/// <summary>
/// Coordinate space to use to offset rotations of the instances (usually OffsetSpace.Object).
/// </summary>
```

```
[Obsolete("Use ScaleSpace instead.", false)]
```

```
public OffsetSpace scaleSpace => ScaleSpace;
```

```
/// <summary>
/// Coordinate space to use to offset rotations of the instances (usually OffsetSpace.Object).
/// </summary>
```

```
public OffsetSpace ScaleSpace
```

```
{
    get => m_ScaleOffset.space;
    set
    {
        m_ScaleOffset.space = value;
        m_ScaleOffset.CheckCustomSpace(m_Space);
    }
}
```

```

    }
}

// Keep old serialization of instances to ensure that no zombie instances will remain serialized.
[SerializeField, HideInInspector, FormerlySerializedAs("m_Instances")]
List<GameObject> m_DeprecatedInstances = new List<GameObject>();

const string k_InstancesRootName = "root-";
GameObject m_InstancesRoot;

Transform instancesRootTransform
{
    get
    {
        if (m_InstancesRoot == null)
        {
            m_InstancesRoot = new GameObject(k_InstancesRootName+GetInstanceID());
            m_InstancesRoot.hideFlags |= HideFlags.HideAndDontSave;
            m_InstancesRoot.transform.parent = transform;
            m_InstancesRoot.transform.localPosition = Vector3.zero;
            m_InstancesRoot.transform.localRotation = Quaternion.identity;
        }
        return m_InstancesRoot.transform;
    }
}

readonly List<GameObject> m_Instances = new List<GameObject>();
internal List<GameObject> instances => m_Instances;
bool m_InstancesCacheDirty = false;

[SerializeField]
bool m_AutoRefresh = true;

InstantiableItem m_CurrentItem;

bool m_SplineDirty = false;
float m_MaxProbability = 1f;

float maxProbability
{
    get => m_MaxProbability;
}

```

```

set
{
    if (m_MaxProbability != value)
    {
        m_MaxProbability = value;
        m_InstancesCacheDirty = true;
    }
}
}

```

[HideInInspector]

[SerializeField]

int m_Seed = 0;

int seed

```

{
    get => m_Seed;
    set
    {
        m_Seed = value;
        m_InstancesCacheDirty = true;
        Random.InitState(m_Seed);
    }
}

```

List<float> m_TimesCache = new();

List<float> m_LengthsCache = new();

void OnEnable()

```

{
    if (m_Seed == 0)
        m_Seed = GetInstanceID();
}

```

#if UNITY_EDITOR

Undo.undoRedoPerformed += UndoRedoPerformed;

#endif

//Bugfix for SPLB-107: Duplicating a SplineInstantiate is making children visible

//This ensure to delete the invalid children.

CheckChildrenValidity();

```

        Spline.Changed += OnSplineChanged;
        UpdateInstances();
    }

    void OnDisable()
    {
#ifdef UNITY_EDITOR
        Undo.undoRedoPerformed -= UndoRedoPerformed;
#endif
        Spline.Changed -= OnSplineChanged;
        Clear();
    }

    void UndoRedoPerformed()
    {
        m_InstancesCacheDirty = true;
        m_SplineDirty = true;
    }

    void OnValidate()
    {
        ValidateSpacing();

        m_SplineDirty = m_AutoRefresh;

        EnsureItemsValidity();

        m_PositionOffset.CheckMinMaxValidity();
        m_RotationOffset.CheckMinMaxValidity();
        m_ScaleOffset.CheckMinMaxValidity();
    }

    void EnsureItemsValidity()
    {
        float probability = 0;
        for (int i = 0; i < m_ItemsToInstantiate.Count; i++)
        {
            var item = m_ItemsToInstantiate[i];

```



```

        if (item.Prefab != null)
        {
            if (transform.IsChildOf(item.Prefab.transform))
            {
                Debug.LogWarning("Instantiating a parent of the SplineInstantiate object itself is not permitted"
+
                $" ({item.Prefab.name} is a parent of {transform.gameObject.name}).");
                item.Prefab = null;
                m_ItemsToInstantiate[i] = item;
            }
            else
            {
                probability += item.Probability;
            }
        }
        maxProbability = probability;
    }

    void CheckChildrenValidity()
    {
        // All the children have to be checked in case multiple SplineInstantiate components are used on the
same GameObject.

        // We want to be able to have multiple components as it allows for example to instantiate grass and
        // trees with different parameters on the same object.
        var ids = GetComponents<SplineInstantiate>().Select(sInstantiate =>
sInstantiate.GetInstanceID()).ToList();
        var childCount = transform.childCount;
        for (int i = childCount - 1; i >= 0; --i)
        {
            var child = transform.GetChild(i).gameObject;
            if (child.name.StartsWith(k_InstancesRootName))
            {
                var invalid = true;
                foreach (var instanceID in ids)
                {
                    if (child.name.Equals(k_InstancesRootName + instanceID))
                    {
                        invalid = false;
                        break;
                    }
                }
            }
        }
    }

```

```

        if (invalid)
    #if UNITY_EDITOR
        DestroyImmediate(child);
    #else
        Destroy(child);
    #endif
    }
}

void ValidateSpacing()
{
    var xSpacing = Mathf.Max(0.1f, m_Spacing.x);
    if (m_Method != Method.LinearDistance)
    {
        var ySpacing = float.IsNaN(m_Spacing.y) ? xSpacing : Mathf.Max(0.1f, m_Spacing.y);
        m_Spacing = new Vector2(xSpacing, Mathf.Max(xSpacing, ySpacing));
    }
    else if (m_Method == Method.LinearDistance)
    {
        var ySpacing = float.IsNaN(m_Spacing.y) ? m_Spacing.y : xSpacing;
        m_Spacing = new Vector2(xSpacing, ySpacing);
    }
}

/// <summary>
/// This method prevents Up and Forward axis to be aligned.
/// Up axis will always be kept as the prioritized one.
/// If Forward axis is in the same direction than the Up (or -Up) it'll be changed to the next axis.
/// </summary>
void ValidateAxis()
{
    if (m_Forward == m_Up || (int)m_Forward == ((int)m_Up + 3) % 6)
        m_Forward = (AlignAxis)(((int)m_Forward + 1) % 6);
}

internal void SetSplineDirty(Spline spline)
{
    if (m_Container != null && m_Container.Splines.Contains(spline) && m_AutoRefresh)

```

```

        UpdateInstances();
    }

void InitContainer()
{
    if (m_Container == null)
        m_Container = GetComponent<SplineContainer>();
}

/// <summary>
/// Clear all the created instances along the spline
/// </summary>
public void Clear()
{
    SetDirty();
    TryClearCache();
}

/// <summary>
/// Set the created instances dirty to erase them next time instances will be generated
/// (otherwise the next generation will reuse cached instances)
/// </summary>
public void SetDirty()
{
    m_InstancesCacheDirty = true;
}

void TryClearCache()
{
    if (!m_InstancesCacheDirty)
    {
        for (int i = 0; i < m_Instances.Count; i++)
        {
            if (m_Instances[i] == null)
            {
                m_InstancesCacheDirty = true;
                break;
            }
        }
    }
}

```

```

        if (m_InstancesCacheDirty)
        {
            for (int i = m_Instances.Count - 1; i >= 0; --i)
            {
#ifdef UNITY_EDITOR
                DestroyImmediate(m_Instances[i]);
#else
                Destroy(m_Instances[i]);
#endif
            }

#ifdef UNITY_EDITOR
            DestroyImmediate(m_InstancesRoot);
#else
            Destroy(m_InstancesRoot);
#endif

            m_Instances.Clear();
            m_InstancesCacheDirty = false;
        }
    }

    void ClearDeprecatedInstances()
    {
        foreach (var instance in m_DeprecatedInstances)
        {
#ifdef UNITY_EDITOR
            DestroyImmediate(instance);
#else
            Destroy(instance);
#endif
        }

        m_DeprecatedInstances.Clear();
    }

    /// <summary>
    /// Change the Random seed to obtain a new generation along the Spline
    /// </summary>
    public void Randomize()

```

```

{
    seed = Random.Range(int.MinValue, int.MaxValue);
    m_SplineDirty = true;
}

void Update()
{
    if (m_SplineDirty)
        UpdateInstances();
}

/// <summary>
/// Create and update all instances along the spline based on the list of available prefabs/objects.
/// </summary>
public void UpdateInstances()
{
    ClearDeprecatedInstances();
    TryClearCache();

    if (m_Container == null)
        InitContainer();

    if (m_Container == null || m_ItemsToInstantiate.Count == 0)
        return;

    const float k_Epsilon = 0.001f;
    Random.InitState(m_Seed);
    int index = 0;
    int indexOffset = 0;

    m_LengthsCache.Clear();
    var splineLength = 0f;
    var totalSplineLength = 0f;
    for (int splineIndex = 0; splineIndex < m_Container.Splines.Count; splineIndex++)
    {
        var length = m_Container.CalculateLength(splineIndex);
        m_LengthsCache.Add(length);
        totalSplineLength += length;
    }
}

```

```

var spacing = Random.Range(m_Spacing.x, m_Spacing.y);
var currentDist = 0f;
var instanceCountModeStep = 0f;

if (m_Method == Method.InstanceCount)
{
    // Advance dist by half length if we only need to spawn one item - we want to spawn it mid total spline
length
    if (spacing == 1)
        currentDist = totalSplineLength / 2f;
    else if (spacing < 1) // Using less operator here as the spacing setters always clamp spacing to a
minimum value of 0.1
    {
        // If there's nothing to spawn, make currentDist larger than length to effectively skip prefab
spawnning but still trigger previous spawn cleanup
        currentDist = totalSplineLength + 1f;
    }

    // Take into account the Closed property only if there's one spline in container
    if (m_Container.Splines.Count == 1)
        instanceCountModeStep = totalSplineLength / (m_Container.Splines[0].Closed ? (int)spacing :
(int)spacing - 1);
    else
        instanceCountModeStep = totalSplineLength / ((int)spacing - 1);
}

//Needs to ensure the validity of the items to instantiate to be certain we don't have a parent of the
hierarchy in these.
EnsureItemsValidity();

for (int splineIndex = 0; splineIndex < m_Container.Splines.Count; splineIndex++)
{
    var spline = m_Container.Splines[splineIndex];
    using (var nativeSpline = new NativeSpline(spline, m_Container.transform.localToWorldMatrix,
Allocator.TempJob))
    {
        splineLength = m_LengthsCache[splineIndex];
        var terminateSpawning = false;

        if (m_Method == Method.InstanceCount)

```

```

{
    if (currentDist > (splineLength + k_Epsilon) && currentDist <= (totalSplineLength + k_Epsilon))
    {
        currentDist -= splineLength;
        terminateSpawning = true;
    }
}
else
    currentDist = 0f;

m_TimesCache.Clear();

while (currentDist <= (splineLength + k_Epsilon) && !terminateSpawning)
{
    if (!SpawnPrefab(index))
        break;

    m_TimesCache.Add(currentDist / splineLength);

    if (m_Method == Method.SpacingDistance)
    {
        spacing = Random.Range(m_Spacing.x, m_Spacing.y);
        currentDist += spacing;
    }
    else if (m_Method == Method.InstanceCount)
    {
        if (spacing > 1)
        {
            var previousDist = currentDist;

            currentDist += instanceCountModeStep;

            if (previousDist < splineLength && currentDist > (splineLength + k_Epsilon))
            {
                currentDist -= splineLength;
                terminateSpawning = true;
            }
        }

        // If we're here, we're spawning 1 object or none, therefore add total length to currentDist
        // so that we no longer enter the while loop as the object has been spawned already
    }
}

```

```

else
    currentDist += totalSplineLength;
}
else if (m_Method == Method.LinearDistance)
{
    //m_Spacing.y is set to NaN to trigger automatic computation
    if (float.IsNaN(m_Spacing.y))
    {
        var meshfilter = m_Instances[index].GetComponent<MeshFilter>();
        var axis = Vector3.right;
        if (m_Forward == AlignAxis.ZAxis || m_Forward == AlignAxis.NegativeZAxis)
            axis = Vector3.forward;
        if (m_Forward == AlignAxis.YAxis || m_Forward == AlignAxis.NegativeYAxis)
            axis = Vector3.up;

        if (meshfilter == null)
        {
            meshfilter = m_Instances[index].GetComponentInChildren<MeshFilter>();
            if (meshfilter != null)
                axis =
Vector3.Scale(meshfilter.transform.InverseTransformDirection(m_Instances[index].transform.TransformDirection
(axis)), meshfilter.transform.lossyScale);
        }

        if (meshfilter != null)
        {
            var bounds = meshfilter.sharedMesh.bounds;
            var filters = meshfilter.GetComponentsInChildren<MeshFilter>();
            foreach (var filter in filters)
            {
                var localBounds = filter.sharedMesh.bounds;
                bounds.size = new Vector3(Mathf.Max(bounds.size.x, localBounds.size.x),
                    Mathf.Max(bounds.size.z, localBounds.size.z),
                    Mathf.Max(bounds.size.z, localBounds.size.z));
            }

            spacing = Vector3.Scale(bounds.size, axis).magnitude;
        }
    }
}
else

```



```

        spacing = Random.Range(m_Spacing.x, m_Spacing.y);

        nativeSpline.GetPointAtLinearDistance(m_TimesCache[index], spacing, out var nextT);
        currentDist = nextT >= 1f ? splineLength + 1f : nextT * splineLength;
    }

    index++;
}

//removing extra unnecessary instances
for (int i = m_Instances.Count - 1; i >= index; i--)
{
    if (m_Instances[i] != null)
    {
#if UNITY_EDITOR
        DestroyImmediate(m_Instances[i]);
#else
        Destroy(m_Instances[i]);
#endif

        m_Instances.RemoveAt(i);
    }
}

//Positioning elements
for (int i = indexOffset; i < index; i++)
{
    var instance = m_Instances[i];
    var splineT = m_TimesCache[i - indexOffset];

    nativeSpline.Evaluate(splineT, out var position, out var direction, out var splineUp);
    instance.transform.position = position;

    if (m_Method == Method.LinearDistance)
    {
        var nextPosition = nativeSpline.EvaluatePosition(i + 1 < index ? m_TimesCache[i + 1 -
indexOffset] : 1f);
        direction = nextPosition - position;
    }

    var up = math.normalizesafe(splineUp);

```

```

var forward = math.normalizesafe(direction);
if (m_Space == Space.World)
{
    up = Vector3.up;
    forward = Vector3.forward;
}
else if (m_Space == Space.Local)
{
    up = transform.TransformDirection(Vector3.up);
    forward = transform.TransformDirection(Vector3.forward);
}

// Correct forward and up vectors based on axis remapping parameters
var remappedForward = math.normalizesafe(GetAxis(m_Forward));
var remappedUp = math.normalizesafe(GetAxis(m_Up));
var axisRemapRotation = Quaternion.Inverse(Quaternion.LookRotation(remappedForward,
remappedUp));

instance.transform.rotation = Quaternion.LookRotation(forward, up) * axisRemapRotation;

var customUp = up;
var customForward = forward;
if (m_PositionOffset.hasOffset)
{
    if (m_PositionOffset.hasCustomSpace)
        GetCustomSpaceAxis(m_PositionOffset.space, splineUp, direction, instance.transform, out
customUp, out customForward);

    var offset = m_PositionOffset.GetNextOffset();
    var right = Vector3.Cross(customUp, customForward).normalized;
    instance.transform.position += offset.x * right + offset.y * (Vector3)customUp + offset.z *
(Vector3)customForward;
}

if (m_ScaleOffset.hasOffset)
{
    customUp = up;
    customForward = forward;
    if (m_ScaleOffset.hasCustomSpace)
        GetCustomSpaceAxis(m_ScaleOffset.space, splineUp, direction, instance.transform, out

```

```

customUp, out customForward);

        customUp = instance.transform.InverseTransformDirection(customUp).normalized;
        customForward = instance.transform.InverseTransformDirection(customForward).normalized;

        var offset = m_ScaleOffset.GetNextOffset();
        var right = Vector3.Cross(customUp, customForward).normalized;
        instance.transform.localScale += offset.x * right + offset.y * (Vector3)customUp + offset.z *
(Vector3)customForward;
    }

    if (m_RotationOffset.hasOffset)
    {
        customUp = up;
        customForward = forward;
        if (m_RotationOffset.hasCustomSpace)
        {
            GetCustomSpaceAxis(m_RotationOffset.space, splineUp, direction, instance.transform, out
customUp, out customForward);
            if (m_RotationOffset.space == OffsetSpace.Object)
                axisRemapRotation = quaternion.identity;
        }

        var offset = m_RotationOffset.GetNextOffset();

        var right = Vector3.Cross(customUp, customForward).normalized;
        customForward = Quaternion.AngleAxis(offset.y, customUp) * Quaternion.AngleAxis(offset.x,
right) * customForward;
        customUp = Quaternion.AngleAxis(offset.x, right) * Quaternion.AngleAxis(offset.z,
customForward) * customUp;
        instance.transform.rotation = Quaternion.LookRotation(customForward, customUp) *
axisRemapRotation;
    }
}

indexOffset = index;
}
}

m_SplineDirty = false;

```

```

}

bool SpawnPrefab(int index)
{
    var prefabIndex = m_ItemsToInstantiate.Count == 1 ? 0 : GetPrefabIndex();
    m_CurrentItem = m_ItemsToInstantiate[prefabIndex];

    if (m_CurrentItem.Prefab == null)
        return false;

    if (index >= m_Instances.Count)
    {
#ifdef UNITY_EDITOR
        var assetType = PrefabUtility.GetPrefabAssetType(m_CurrentItem.Prefab);
        if (assetType == PrefabAssetType.MissingAsset)
        {
            Debug.LogError($"Trying to instantiate a missing asset for item index [{prefabIndex}].");
            return false;
        }

        if (assetType != PrefabAssetType.NotAPrefab && !Application.isPlaying)
            m_Instances.Add(PrefabUtility.InstantiatePrefab(m_CurrentItem.Prefab, instancesRootTransform) as
GameObject);
        else
#endif
            m_Instances.Add(Instantiate(m_CurrentItem.Prefab, instancesRootTransform));

        m_Instances[index].hideFlags |= HideFlags.HideAndDontSave;
    }

    m_Instances[index].transform.localPosition = m_CurrentItem.Prefab.transform.localPosition;
    m_Instances[index].transform.localRotation = m_CurrentItem.Prefab.transform.localRotation;
    m_Instances[index].transform.localScale = m_CurrentItem.Prefab.transform.localScale;

    return true;
}

void GetCustomSpaceAxis(OffsetSpace space, float3 splineUp, float3 direction, Transform
instanceTransform, out float3 customUp, out float3 customForward)
{

```

```

customUp = Vector3.up;
customForward = Vector3.forward;
if (space == OffsetSpace.Local)
{
    customUp = transform.TransformDirection(Vector3.up);
    customForward = transform.TransformDirection(Vector3.forward);
}
else if (space == OffsetSpace.Spline)
{
    customUp = splineUp;
    customForward = direction;
}
else if (space == OffsetSpace.Object)
{
    customUp = instanceTransform.TransformDirection(Vector3.up);
    customForward = instanceTransform.TransformDirection(Vector3.forward);
}
}

int GetPrefabIndex()
{
    var prefabChoice = Random.Range(0, m_MaxProbability);
    var currentProbability = 0f;
    for (int i = 0; i < m_ItemsToInstantiate.Count; i++)
    {
        if (m_ItemsToInstantiate[i].Prefab == null)
            continue;

        var itemProbability = m_ItemsToInstantiate[i].Probability;
        if (prefabChoice < currentProbability + itemProbability)
            return i;

        currentProbability += itemProbability;
    }

    return 0;
}

void OnSplineChanged(Spline spline, int knotIndex, SplineModification modificationType)
{

```

```
        if (m_Container != null && m_Container.Spline == spline)
            m_SplineDirty = m_AutoRefresh;
    }
}
```