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# Namespace SODD.AI

## Classes

### [CollisionDetector](#)

Detects collisions and triggers events when objects collide.

### [CollisionDetector2D](#)

Detects 2D collisions and triggers events when objects collide.

### [State](#)

Represents a state in a state machine, managing its entry and exit logic.

### [StateMachine](#)

Manages the states in a state machine, handling state transitions and maintaining a state queue.

## Enums

### [CollisionDetectionStrategy](#)

Specifies the strategies for collision detection.

# Enum CollisionDetectionStrategy

Namespace: [SODD.AI](#)

Specifies the strategies for collision detection.

```
[Flags]  
public enum CollisionDetectionStrategy
```

## Fields

**Colliders** = 1

Detects collisions with colliders.

**None** = 0

No collision detection.

**TriggerColliders** = 2

Detects collisions with trigger colliders.

# Class CollisionDetector

Namespace: [SODD.AI](#)

Detects collisions and triggers events when objects collide.

```
public class CollisionDetector : MonoBehaviour
```

## Inheritance

[object](#) ← CollisionDetector

## Remarks

The [CollisionDetector](#) class is responsible for detecting collisions and invoking corresponding events. It supports detection for both regular and trigger colliders, making it versatile for various collision detection scenarios.

# Class CollisionDetector2D

Namespace: [SODD.AI](#)

Detects 2D collisions and triggers events when objects collide.

```
public sealed class CollisionDetector2D : MonoBehaviour
```

## Inheritance

[object](#) ← CollisionDetector2D

## Remarks

The [CollisionDetector2D](#) class is responsible for detecting 2D collisions and invoking corresponding events. It supports detection for both regular and trigger colliders in a 2D environment, making it versatile for various collision detection scenarios.

# Class State

Namespace: [SODD.AI](#)

Represents a state in a state machine, managing its entry and exit logic.

```
public sealed class State : MonoBehaviour
```

## Inheritance

[object](#) ← State

## Remarks

The [State](#) class is used within a state machine to define specific states and their associated behaviors. Each state can execute actions upon entering and exiting, which are managed by Unity events.

## Methods

### Enter()

Activates the state and invokes the [onEnter](#) event.

```
public void Enter()
```

### Remarks

This method sets the game object associated with the state to active and triggers any actions associated with entering the state. It is typically called by the state machine managing this state.

### Exit()

Deactivates the state and invokes the [onExit](#) event.

```
public void Exit()
```

## Remarks

This method sets the game object associated with the state to inactive and triggers any actions associated with exiting the state. It is typically called by the state machine managing this state.

# Class StateMachine

Namespace: [SODD.AI](#)

Manages the states in a state machine, handling state transitions and maintaining a state queue.

```
public class StateMachine : MonoBehaviour
```

## Inheritance

[object](#) ← StateMachine

## Remarks

The [StateMachine](#) class is responsible for managing the lifecycle of states within a state machine. It provides mechanisms to transition between states, queue states for later execution, and maintain the current state.

## Properties

### CurrentState

Gets or sets the current state. Exits the previous state and enters the new state.

```
public State CurrentState { get; set; }
```

## Property Value

### [State](#)

The current state of the state machine.

## Remarks

When setting the [CurrentState](#), the state machine exits the previous state (if any) and enters the new state. If the new state is the same as the current state, no transition occurs.

## Methods

## AddCurrentStateFirstToQueue()

Adds the current state to the beginning of the state queue.

```
public void AddCurrentStateFirstToQueue()
```

### Remarks

This method inserts the current state of the state machine at the beginning of the state queue.

## AddCurrentStateLastToQueue()

Adds the current state to the end of the state queue.

```
public void AddCurrentStateLastToQueue()
```

### Remarks

This method appends the current state of the state machine to the end of the state queue.

## AddFirstToQueue(State)

Adds a state to the beginning of the state queue.

```
public void AddFirstToQueue(State state)
```

### Parameters

**state** State

The state to add to the queue.

### Remarks

This method inserts the specified **state** at the beginning of the state queue. The state queue is processed in a first-in-first-out (FIFO) manner.

## AddLastToQueue(State)

Adds a state to the end of the state queue.

```
public void AddLastToQueue(State state)
```

### Parameters

**state** [State](#)

The state to add to the queue.

### Remarks

This method appends the specified **state** to the end of the state queue. The state queue is processed in a first-in-first-out (FIFO) manner.

## ConsumeFirstFromQueue()

Sets the current state to the first state in the queue and removes it from the queue.

```
public void ConsumeFirstFromQueue()
```

### Remarks

This method transitions the state machine to the first state in the queue and removes that state from the queue. If the queue is empty, no state transition occurs.

## ConsumeLastFromQueue()

Sets the current state to the last state in the queue and removes it from the queue.

```
public void ConsumeLastFromQueue()
```

### Remarks

This method transitions the state machine to the last state in the queue and removes that state from the queue. If the queue is empty, no state transition occurs.



# Namespace SODD.Attributes

## Classes

### [CollapsibleAttribute](#)

Makes a property collapsible in the Unity Inspector.

### [DisableIfAttribute](#)

Disables the property or field in the Unity Inspector based on the result of a [Comparison](#) between the value of the named field or property and a specified value.

### [DisableIfMatchAttribute](#)

Disables the property or field in the Unity Inspector if the value of the specified field or property matches any of the given values.

### [DisabledAttribute](#)

Disables the property or field, making it visible in the Unity Inspector but not editable.

### [HideIfAttribute](#)

Hides the property or field in the Unity Inspector if the specified [Comparison](#) between the value of the named field or property and a given value evaluates to true.

### [HideIfMatchAttribute](#)

Hides the property or field in the Unity Inspector if the value of the specified field or property matches any of the given values.

### [OnValueChangedAttribute](#)

Calls the specified method when the associated field's value is changed in the Unity Editor.

### [ShowIfAttribute](#)

Shows the property or field in the Unity Inspector if the specified [Comparison](#) between the value of the named field or property and a given value evaluates to true. The property or field is hidden otherwise.

### [ShowIfMatchAttribute](#)

Shows the property or field in the Unity Inspector if the value of the specified field or property matches any of the given values, and hides it otherwise.

# Class CollapsibleAttribute

Namespace: [SODD.Attributes](#)

Makes a property collapsible in the Unity Inspector.

```
[AttributeUsage(AttributeTargets.Property | AttributeTargets.Field)]
public class CollapsibleAttribute : PropertyAttribute
```

## Inheritance

[object](#) ← CollapsibleAttribute

## Examples

```
public class MyComponent : MonoBehaviour
{
    [Collapsible("Click to Expand/Collapse")]
    public int myCollapsibleInt;
}
```

## Remarks

This attribute can be applied to any serializable field to enable it to be collapsed or expanded in the Inspector with an optional custom label.

## Constructors

### CollapsibleAttribute(string)

```
public CollapsibleAttribute(string label = "")
```

## Parameters

**label** [string](#)

## Properties

## Label

```
public string Label { get; }
```

Property Value

[string](#)

# Class DisableIfAttribute

Namespace: [SODD.Attributes](#)

Disables the property or field in the Unity Inspector based on the result of a [Comparison](#) between the value of the named field or property and a specified value.

```
[AttributeUsage(AttributeTargets.Property|AttributeTargets.Field)]
public class DisableIfAttribute : PropertyAttribute
```

## Inheritance

[object](#) ← DisableIfAttribute

## Examples

The following example demonstrates the use of the DisableIfAttribute to disable a property based on the runtime value of another property:

```
public class ExampleBehavior : MonoBehaviour
{
    public bool toggle = true;

    [DisableIf("toggle", false)]
    public float disabledIfToggleIsFalse;
}
```

In this example, the 'disabledIfToggleIsFalse' float property becomes non-editable in the Inspector if the 'toggle' boolean property is set to false.

## Remarks

This attribute allows dynamic control over the editability of properties and fields in the Unity Inspector, enhancing the interactivity based on the current state of the object's properties or fields.

## Constructors

**DisableIfAttribute(string, object, Comparison)**

```
public DisableIfAttribute(string name, object value, Comparison comparison
= Comparison.Equals)
```

## Parameters

name [string](#)

value [object](#)

comparison [Comparison](#)

## Fields

### Comparison

```
public readonly Comparison Comparison
```

### Field Value

[Comparison](#)

### Name

```
public readonly string Name
```

### Field Value

[string](#)

### Value

```
public readonly object Value
```

### Field Value

## object

# Class DisableIfMatchAttribute

Namespace: [SODD.Attributes](#)

Disables the property or field in the Unity Inspector if the value of the specified field or property matches any of the given values.

```
[AttributeUsage(AttributeTargets.Property|AttributeTargets.Field)]
public class DisableIfMatchAttribute : PropertyAttribute
```

## Inheritance

[object](#) ← DisableIfMatchAttribute

## Examples

The following example demonstrates how to use the DisableIfMatchAttribute to disable a property when another property's value matches any specified value:

```
public class ExampleBehaviour : MonoBehaviour
{
    public string state;

    [DisableIfMatch("state", "initial", "loading")]
    public float progress;
}
```

In this example, the 'progress' float property becomes non-editable in the Inspector if the 'state' string property is either "initial" or "loading".

## Remarks

This attribute is useful for dynamically controlling the editability of properties and fields based on the state of other properties or fields in the same object, particularly when multiple conditions could trigger a disable state.

## Constructors

`DisableIfMatchAttribute(string, params object[])`

```
public DisableIfMatchAttribute(string name, params object[] values)
```

## Parameters

name [string](#)

values [object](#)[]

## Fields

### Name

```
public readonly string Name
```

### Field Value

[string](#)

### Values

```
public readonly object[] Values
```

### Field Value

[object](#)[]

# Class DisabledAttribute

Namespace: [SODD.Attributes](#)

Disables the property or field, making it visible in the Unity Inspector but not editable.

```
[AttributeUsage(AttributeTargets.Property | AttributeTargets.Field)]
public class DisabledAttribute : PropertyAttribute
```

## Inheritance

[object](#) ← DisabledAttribute

## Examples

Here is how you can apply the DisabledAttribute to a property in your class:

```
public class ExampleClass : MonoBehaviour
{
    [Disabled]
    public float ReadOnlyValue;

    void Update()
    {
        ReadOnlyValue = CalculateSomeValue();
    }

    private float CalculateSomeValue()
    {
        return Time.deltaTime * 100;
    }
}
```

In this example, `ReadOnlyValue` is displayed in the Unity Inspector but cannot be modified by users, ensuring that only calculated values are shown.

## Remarks

This attribute is useful for displaying properties or fields in the Inspector without allowing changes at runtime. This can be particularly helpful for debugging or for showing calculated values.

# Class HidelfAttribute

Namespace: [SODD.Attributes](#)

Hides the property or field in the Unity Inspector if the specified [Comparison](#) between the value of the named field or property and a given value evaluates to true.

```
[AttributeUsage(AttributeTargets.Property|AttributeTargets.Field)]
public class HideIfAttribute : PropertyAttribute
```

## Inheritance

[object](#) ← HidelfAttribute

## Examples

Here is how you can apply the HidelfAttribute:

```
public class MyComponent : MonoBehaviour
{
    public bool showAdvancedOptions;

    [HideIf("showAdvancedOptions", false)]
    public float advancedSetting;
}
```

In this example, 'advancedSetting' will be hidden in the Inspector if 'showAdvancedOptions' is false.

## Remarks

Use this attribute to conditionally hide properties or fields from the Unity Inspector based on the state of other properties or fields within the same object. This can be particularly useful for cleaning up the inspector by hiding irrelevant options based on the current configuration or state.

## Constructors

**HidelfAttribute(string, object, Comparison)**

```
public HideIfAttribute(string name, object value, Comparison comparison
= Comparison.Equals)
```

## Parameters

name [string](#)

value [object](#)

comparison [Comparison](#)

## Fields

### Comparison

```
public readonly Comparison Comparison
```

### Field Value

[Comparison](#)

### Name

```
public readonly string Name
```

### Field Value

[string](#)

### Value

```
public readonly object Value
```

### Field Value

object

# Class HideIfMatchAttribute

Namespace: [SODD.Attributes](#)

Hides the property or field in the Unity Inspector if the value of the specified field or property matches any of the given values.

```
[AttributeUsage(AttributeTargets.Property|AttributeTargets.Field)]
public class HideIfMatchAttribute : PropertyAttribute
```

## Inheritance

[object](#) ← HideIfMatchAttribute

## Examples

The following example shows how to use the HideIfMatchAttribute to hide a property when another property's value matches any of the specified conditions:

```
public class MyComponent : MonoBehaviour
{
    public string currentState;

    [HideIfMatch("currentState", "init", "start")]
    public float sensitiveSetting;
}
```

In this example, the 'sensitiveSetting' float property will be hidden in the Inspector if the 'currentState' string property is either "init" or "start".

## Remarks

This attribute can be used to conditionally hide properties or fields from the Unity Inspector based on the state of other properties or fields within the same object. It is particularly useful for simplifying user interfaces by hiding irrelevant options dependent on other configurations.

## Constructors

`HideIfMatchAttribute(string, params object[])`

```
public HideIfMatchAttribute(string name, params object[] values)
```

## Parameters

name [string](#)

values [object](#)[]

## Fields

### Name

```
public readonly string Name
```

### Field Value

[string](#)

### Values

```
public readonly object[] Values
```

### Field Value

[object](#)[]

# Class OnValueChangedAttribute

Namespace: [SODD.Attributes](#)

Calls the specified method when the associated field's value is changed in the Unity Editor.

```
[AttributeUsage(AttributeTargets.Property | AttributeTargets.Field)]
public class OnValueChangedAttribute : PropertyAttribute
```

## Inheritance

[object](#) ← OnValueChangedAttribute

## Examples

```
using UnityEngine;
using SODD.Attributes;

public class Example : MonoBehaviour
{
    [OnValueChanged("OnHealthChanged")]
    public int health;

    private void OnHealthChanged()
    {
        Debug.Log("Health value changed to: " + health);
    }
}
```

This example demonstrates the attribute applied to a health field, where any change in the editor will automatically call the OnHealthChanged method to handle related updates or logic.

## Remarks

This attribute is designed to automatically invoke a method when a serialized field's value is updated. It is primarily used within the SODD Framework to log changes of scriptable variable values in the console when their debug option is enabled.

The method specified by the attribute should have no parameters and exist within the same class as the field it is associated with.

# Constructors

## OnValueChangedAttribute(string)

```
public OnValueChangedAttribute(string methodName)
```

# Parameters

methodName [string](#)

# Fields

## MethodName

```
public readonly string MethodName
```

# Field Value

[string](#)

# Class ShowIfAttribute

Namespace: [SODD.Attributes](#)

Shows the property or field in the Unity Inspector if the specified [Comparison](#) between the value of the named field or property and a given value evaluates to true. The property or field is hidden otherwise.

```
[AttributeUsage(AttributeTargets.Property | AttributeTargets.Field)]
public class ShowIfAttribute : PropertyAttribute
```

## Inheritance

[object](#) ← ShowIfAttribute

## Examples

Here is an example of how to use the ShowIfAttribute:

```
public class MyComponent : MonoBehaviour
{
    public bool toggleFeature;

    [ShowIf("toggleFeature", true)]
    public float featureSpecificSetting;
}
```

In this example, 'featureSpecificSetting' will be visible in the Inspector only if 'toggleFeature' is true.

## Remarks

This attribute enables dynamic control over the visibility of properties and fields in the Unity Inspector, depending on the state of other properties or fields within the same object. It is particularly useful for creating more intuitive and manageable interfaces by displaying only relevant options based on conditional logic.

## Constructors

**ShowIfAttribute(string, object, Comparison)**

```
public ShowIfAttribute(string name, object value, Comparison comparison
= Comparison.Equals)
```

## Parameters

name [string](#)

value [object](#)

comparison [Comparison](#)

## Fields

### Comparison

```
public readonly Comparison Comparison
```

### Field Value

[Comparison](#)

### Name

```
public readonly string Name
```

### Field Value

[string](#)

### Value

```
public readonly object Value
```

### Field Value

object

# Class ShowIfMatchAttribute

Namespace: [SODD.Attributes](#)

Shows the property or field in the Unity Inspector if the value of the specified field or property matches any of the given values, and hides it otherwise.

```
[AttributeUsage(AttributeTargets.Property|AttributeTargets.Field)]
public class ShowIfMatchAttribute : PropertyAttribute
```

## Inheritance

[object](#) ← ShowIfMatchAttribute

## Examples

The following example shows how to use the ShowIfMatchAttribute to conditionally show a property:

```
public class GameplaySettings : MonoBehaviour
{
    public string difficultyLevel;

    [ShowIfMatch("difficultyLevel", "Hard", "Extreme")]
    public float damageMultiplier;
}
```

In this example, the 'damageMultiplier' property will only be visible in the Inspector when 'difficultyLevel' is set to "Hard" or "Extreme".

## Remarks

This attribute can be used to conditionally show or hide properties or fields from the Unity Inspector based on the state of other properties or fields within the same object. It is particularly useful for managing complex user interfaces, allowing the display of relevant options only when appropriate.

## Constructors

ShowIfMatchAttribute(string, params object[])

```
public ShowIfMatchAttribute(string name, params object[] values)
```

## Parameters

name [string](#)

values [object](#)[]

## Fields

### Name

```
public readonly string Name
```

### Field Value

[string](#)

### Values

```
public readonly object[] Values
```

### Field Value

[object](#)[]

# Namespace SODD.Collections

## Classes

### [AudioClipCollection](#)

Represents a scriptable collection that stores AudioClip objects.

### [Collection<T>](#)

Represents an abstract collection of items of type T.

### [ComponentCollection](#)

Represents a scriptable collection that stores Unity Components.

### [GameObjectCollection](#)

Represents a collection that stores GameObjects.

### [ObjectCollection](#)

Represents a collection that stores Objects.

### [ScriptableObjectCollection](#)

Represents a collection that stores ScriptableObjects.

# Class AudioClipCollection

Namespace: [SODD.Collections](#)

Represents a scriptable collection that stores AudioClip objects.

```
public sealed class AudioClipCollection : Collection<AudioClip>, IList<AudioClip>,  
ICollection<AudioClip>, IEnumerable<AudioClip>, IEnumerable
```

## Inheritance

[object](#) ← [Collection](#)<AudioClip> ← [AudioClipCollection](#)

## Implements

[IList](#)<AudioClip>, [ICollection](#)<AudioClip>, [IEnumerable](#)<AudioClip>, [IEnumerable](#)

## Inherited Members

[Collection<AudioClip>.OnItemAdded](#), [Collection<AudioClip>.OnItemRemoved](#),  
[Collection<AudioClip>.GetEnumerator\(\)](#), [Collection<AudioClip>.Add\(AudioClip\)](#),  
[Collection<AudioClip>.Clear\(\)](#), [Collection<AudioClip>.Contains\(AudioClip\)](#),  
[Collection<AudioClip>.CopyTo\(AudioClip\[\], int\)](#),  
[Collection<AudioClip>.Remove\(AudioClip\)](#), [Collection<AudioClip>.Count](#),  
[Collection<AudioClip>.IsReadOnly](#), [Collection<AudioClip>.IndexOf\(AudioClip\)](#),  
[Collection<AudioClip>.Insert\(int, AudioClip\)](#), [Collection<AudioClip>.RemoveAt\(int\)](#),  
[Collection<AudioClip>.this\[int\]](#), [Collection<AudioClip>.GetRandom\(\)](#).

## Extension Methods

[EnumerableExtensions.ForEach<T>\(IEnumerable<T>, Action<T>\)](#),  
[EnumerableExtensions.IsEmpty<T>\(IEnumerable<T>\)](#),  
[EnumerableExtensions.TryFind<T>\(IEnumerable<T>, Func<T, bool>, out T\)](#),  
[EnumerableExtensions.WrapAround<T>\(IEnumerable<T>\)](#).

## Examples

Example of using an [AudioClipCollection](#) to play audio at a specific location triggered by an event:

```
using UnityEngine;  
using SODD.Collections;  
using SODD.Events;  
  
public class Example : MonoBehaviour
```

```
{  
    public AudioClipCollection shotsAudioPool; // Assign this through the  
    Unity Editor.  
    public Vector3Event onShotFired; // Assign this through the Unity Editor.  
  
    private void OnEnable()  
    {  
        onShotFired.AddListener(OnShotFired);  
    }  
  
    private void OnDisable()  
    {  
        onShotFired.RemoveListener(OnShotFired);  
    }  
  
    private void OnShotFired(Vector3 position)  
    {  
        var audioClip = shotsAudioPool.GetRandom();  
        AudioSource.PlayClipAtPoint(audioClip, position);  
    }  
}
```

This script demonstrates how an [AudioClipCollection](#) can be used in conjunction with a [Vector3Event](#) to play a random audio clip from a collection at the position specified by the event.

## Remarks

This collection provides a concrete implementation of the abstract [Collection<T>](#) class, specifically for managing audio clips within a game. It facilitates the organized storage and access of sound assets, such as music tracks, sound effects, and other audio samples, which can be manipulated and referenced dynamically throughout the game's lifecycle.

# Class Collection<T>

Namespace: [SODD.Collections](#)

Represents an abstract collection of items of type T.

```
public abstract class Collection<T> : ScriptableObject, IList<T>, ICollection<T>,  
IEnumerable<T>, IEnumerable
```

## Type Parameters

T

The type of elements in the collection.

## Inheritance

[object](#) ← Collection<T>

## Implements

[IList](#)<T>, [ICollection](#)<T>, [IEnumerable](#)<T>, [IEnumerable](#)

## Derived

[AudioClipCollection](#), [ComponentCollection](#), [GameObjectCollection](#), [ObjectCollection](#),  
[ScriptableObjectCollection](#)

## Extension Methods

[EnumerableExtensions.ForEach](#)<T>(IEnumerable<T>, Action<T>),  
[EnumerableExtensions.IsEmpty](#)<T>(IEnumerable<T>),  
[EnumerableExtensions.TryFind](#)<T>(IEnumerable<T>, Func<T, bool>, out T),  
[EnumerableExtensions.WrapAround](#)<T>(IEnumerable<T>).

## Examples

Example of a GameObject collection implementation:

```
[CreateAssetMenu(menuName = "My Collections/GameObject Collection", fileName =  
nameof(GameObjectCollection)]  
public class GameObjectCollection : Collection<GameObject> {}
```

## Remarks

This abstract class provides the foundation for creating scriptable collection implementations. It enables the encapsulation and serialization of a list of items, allowing for easy manipulation and reference within the Unity Editor and across different game components. Such collections are beneficial for managing groups of related items, such as inventory items, enemies, or waypoints, in a centralized and organized manner.

The collection supports adding and removing items and provides events for tracking these modifications. This functionality facilitates reactive programming patterns, where changes to the collection can trigger corresponding actions or updates within the game.

To create a custom collection, inherit from this class and specify the item type `T`, which can be any type supported by Unity (e.g., `GameObject`, `int`, `string`).

## Fields

### OnItemAdded

Event triggered when an item is added to the collection.

```
public GenericEvent<T> OnItemAdded
```

### Field Value

[GenericEvent<T>](#)

### OnItemRemoved

Event triggered when an item is removed from the collection.

```
public GenericEvent<T> OnItemRemoved
```

### Field Value

[GenericEvent<T>](#)

## Properties

# Count

Gets the number of elements contained in the collection.

```
public int Count { get; }
```

Property Value

[int](#)

## IsReadOnly

Gets a value indicating whether the collection is read-only.

```
public bool IsReadOnly { get; }
```

Property Value

[bool](#)

## this[int]

Gets or sets the element at the specified index.

```
public T this[int index] { get; set; }
```

Parameters

[index](#) [int](#)

The zero-based index of the element to get or set.

Property Value

[T](#)

The element at the specified index.

# Methods

## Add(T)

Adds an item to the collection, triggering the `OnItemAdded` event.

```
public void Add(T item)
```

### Parameters

`item T`

The item to add to the collection.

## Clear()

Removes all items from the collection, triggering the `OnItemRemoved` event for each item.

```
public void Clear()
```

## Contains(T)

Determines whether the collection contains a specific value.

```
public bool Contains(T item)
```

### Parameters

`item T`

The object to locate in the collection.

### Returns

[bool](#)

true if item is found in the collection; otherwise, false.

## CopyTo(T[], int)

Copies the elements of the collection to an Array, starting at a particular Array index.

```
public void CopyTo(T[] array, int arrayIndex)
```

### Parameters

**array** T[]

The one-dimensional Array that is the destination of the elements copied from the collection.

**arrayIndex** [int](#)

The zero-based index in array at which copying begins.

## GetEnumerator()

Returns an enumerator that iterates through the collection.

```
public IEnumarator<T> GetEnumerator()
```

### Returns

[IEnumarator](#)<T>

An enumerator for the collection of items.

## GetRandom()

Returns a random item from the collection.

```
public T GetRandom()
```

### Returns

T

A randomly selected item from the collection.

## IndexOf(T)

Retrieves the index of a specific item in the collection.

```
public int IndexOf(T item)
```

### Parameters

item T

The item to locate in the collection.

### Returns

int

The index of the item if found in the collection; otherwise, -1.

## Insert(int, T)

Inserts an item at the specified index in the collection.

```
public void Insert(int index, T item)
```

### Parameters

index int

The zero-based index at which item should be inserted.

item T

The item to insert.

## Remove(T)

Removes the first occurrence of a specific object from the collection, triggering the `OnItemRemoved` event.

```
public bool Remove(T item)
```

## Parameters

`item` [T](#)

The item to remove from the collection.

## Returns

[bool](#)

true if item was successfully removed from the collection; otherwise, false.

## RemoveAt(int)

Removes the item at the specified index from the collection.

```
public void RemoveAt(int index)
```

## Parameters

`index` [int](#)

The zero-based index of the item to remove.

# Class ComponentCollection

Namespace: [SODD.Collections](#)

Represents a scriptable collection that stores Unity Components.

```
public sealed class ComponentCollection : Collection<Component>, IList<Component>,  
ICollection<Component>, IEnumerable<Component>, IEnumerable
```

## Inheritance

[object](#) ← [Collection](#)<Component> ← ComponentCollection

## Implements

[IList](#)<Component>, [ICollection](#)<Component>, [IEnumerable](#)<Component>, [IEnumerable](#)

## Inherited Members

[Collection](#)<Component>.OnItemAdded , [Collection](#)<Component>.OnItemRemoved ,  
[Collection](#)<Component>.GetEnumerator() , [Collection](#)<Component>.Add(Component) ,  
[Collection](#)<Component>.Clear() , [Collection](#)<Component>.Contains(Component) ,  
[Collection](#)<Component>.CopyTo(Component[], int) ,  
[Collection](#)<Component>.Remove(Component) , [Collection](#)<Component>.Count ,  
[Collection](#)<Component>.IsReadOnly , [Collection](#)<Component>.IndexOf(Component) ,  
[Collection](#)<Component>.Insert(int, Component) , [Collection](#)<Component>.RemoveAt(int) ,  
[Collection](#)<Component>.this[int] , [Collection](#)<Component>.GetRandom().

## Extension Methods

[EnumerableExtensions.ForEach](#)<T>(IEnumerable<T>, Action<T>) ,  
[EnumerableExtensions.IsEmpty](#)<T>(IEnumerable<T>) ,  
[EnumerableExtensions.TryFind](#)<T>(IEnumerable<T>, Func<T, bool>, out T) ,  
[EnumerableExtensions.WrapAround](#)<T>(IEnumerable<T>).

## Examples

Example of using [ComponentCollection](#) to manage explosives in a game:

```
public class Detonator : MonoBehaviour  
{  
    public ComponentCollection placedExplosives; // Assign this via the  
    Unity Editor.  
    public VoidEvent onDetonateExplosives;
```

```

private void OnEnable()
{
    onDetonateExplosives.AddListener(DetonateExplosives);
}

private void OnDisable()
{
    onDetonateExplosives.RemoveListener(DetonateExplosives);
}

private void DetonateExplosives(Void o)
{
    foreach (var component in placedExplosives)
    {
        var explosive = (Explosive) component;
        explosive.Detonate();
    }
    placedExplosives.Clear();
}
}

```

This script shows how explosives can dynamically add themselves to the 'placedExplosives' collection when instantiated and how a detonator can trigger their detonation without needing to directly gather or reference individual explosives. This allows the detonator to operate independently of the explosives' management.

## Remarks

This collection provides a concrete implementation of the abstract [Collection<T>](#) class, specifically designed for managing Unity Components. It enables the structured and dynamic management of components within a game, facilitating operations like adding, removing, or iterating over components without requiring direct management by other objects. An essential use of this collection is in scenarios where components need to be managed independently of the objects that use them, enhancing modularity and reducing coupling in game architecture.

# Class GameObjectCollection

Namespace: [SODD.Collections](#)

Represents a collection that stores GameObjects.

```
public sealed class GameObjectCollection : Collection<GameObject>,
    IList<GameObject>, ICollection<GameObject>, IEnumerable<GameObject>, IEnumerable
```

## Inheritance

[object](#) ← [Collection](#)<GameObject> ← GameObjectCollection

## Implements

[IList](#)<GameObject>, [ICollection](#)<GameObject>, [IEnumerable](#)<GameObject>, [IEnumerable](#)

## Inherited Members

[Collection<GameObject>.OnItemAdded](#) , [Collection<GameObject>.OnItemRemoved](#) ,  
[Collection<GameObject>.GetEnumerator\(\)](#) , [Collection<GameObject>.Add\(GameObject\)](#) ,  
[Collection<GameObject>.Clear\(\)](#) , [Collection<GameObject>.Contains\(GameObject\)](#) ,  
[Collection<GameObject>.CopyTo\(GameObject\[\], int\)](#) ,  
[Collection<GameObject>.Remove\(GameObject\)](#) , [Collection<GameObject>.Count](#) ,  
[Collection<GameObject>.IsReadOnly](#) , [Collection<GameObject>.IndexOf\(GameObject\)](#) ,  
[Collection<GameObject>.Insert\(int, GameObject\)](#) ,  
[Collection<GameObject>.RemoveAt\(int\)](#) , [Collection<GameObject>.this\[int\]](#) ,  
[Collection<GameObject>.GetRandom\(\)](#).

## Extension Methods

[EnumerableExtensions.ForEach<T>\(IEnumerable<T>, Action<T>\)](#) ,  
[EnumerableExtensions.IsEmpty<T>\(IEnumerable<T>\)](#) ,  
[EnumerableExtensions.TryFind<T>\(IEnumerable<T>, Func<T, bool>, out T\)](#) ,  
[EnumerableExtensions.WrapAround<T>\(IEnumerable<T>\)](#).

## See Also

[Collection<T>](#)

# Class ObjectCollection

Namespace: [SODD.Collections](#)

Represents a collection that stores Objects.

```
public sealed class ObjectCollection : Collection<Object>, IList<Object>,
ICollection<Object>, IEnumerable<Object>, IEnumerable
```

## Inheritance

[object](#) ← [Collection](#)<Object> ← ObjectCollection

## Implements

[IList](#)<Object>, [ICollection](#)<Object>, [IEnumerable](#)<Object>, [IEnumerable](#)

## Inherited Members

[Collection<Object>.OnItemAdded](#) , [Collection<Object>.OnItemRemoved](#) ,  
[Collection<Object>.GetEnumerator\(\)](#) , [Collection<Object>.Add\(Object\)](#) ,  
[Collection<Object>.Clear\(\)](#) , [Collection<Object>.Contains\(Object\)](#) ,  
[Collection<Object>.CopyTo\(Object\[\], int\)](#) , [Collection<Object>.Remove\(Object\)](#) ,  
[Collection<Object>.Count](#) , [Collection<Object>.IsReadOnly](#) ,  
[Collection<Object>.IndexOf\(Object\)](#) , [Collection<Object>.Insert\(int, Object\)](#) ,  
[Collection<Object>.RemoveAt\(int\)](#) , [Collection<Object>.this\[int\]](#) ,  
[Collection<Object>.GetRandom\(\)](#).

## Extension Methods

[EnumerableExtensions.ForEach<T>\(IEnumerable<T>, Action<T>\)](#) ,  
[EnumerableExtensions.IsEmpty<T>\(IEnumerable<T>\)](#) ,  
[EnumerableExtensions.TryFind<T>\(IEnumerable<T>, Func<T, bool>, out T\)](#) ,  
[EnumerableExtensions.WrapAround<T>\(IEnumerable<T>\)](#).

## See Also

[Collection<T>](#)

# Class ScriptableObjectCollection

Namespace: [SODD.Collections](#)

Represents a collection that stores ScriptableObjects.

```
public sealed class ScriptableObjectCollection : Collection<ScriptableObject>,
IList<ScriptableObject>, ICollection<ScriptableObject>,
IEnumerable<ScriptableObject>, IEnumerable
```

## Inheritance

[object](#) ← [Collection](#)<ScriptableObject> ← ScriptableObjectCollection

## Implements

[IList](#)<ScriptableObject>, [ICollection](#)<ScriptableObject>, [IEnumerable](#)<ScriptableObject>, [IEnumerable](#)

## Inherited Members

[Collection<ScriptableObject>.OnItemAdded](#) ,  
[Collection<ScriptableObject>.OnItemRemoved](#) ,  
[Collection<ScriptableObject>.GetEnumerator\(\)](#) ,  
[Collection<ScriptableObject>.Add\(ScriptableObject\)](#) ,  
[Collection<ScriptableObject>.Clear\(\)](#) ,  
[Collection<ScriptableObject>.Contains\(ScriptableObject\)](#) ,  
[Collection<ScriptableObject>.CopyTo\(ScriptableObject\[\], int\)](#) ,  
[Collection<ScriptableObject>.Remove\(ScriptableObject\)](#) ,  
[Collection<ScriptableObject>.Count](#) , [Collection<ScriptableObject>.IsReadOnly](#) ,  
[Collection<ScriptableObject>.IndexOf\(ScriptableObject\)](#) ,  
[Collection<ScriptableObject>.Insert\(int, ScriptableObject\)](#) ,  
[Collection<ScriptableObject>.RemoveAt\(int\)](#) , [Collection<ScriptableObject>.this\[int\]](#) ,  
[Collection<ScriptableObject>.GetRandom\(\)](#)

## Extension Methods

[EnumerableExtensions.ForEach<T>\(IEnumerable<T>, Action<T>\)](#) ,  
[EnumerableExtensions.IsEmpty<T>\(IEnumerable<T>\)](#) ,  
[EnumerableExtensions.TryFind<T>\(IEnumerable<T>, Func<T, bool>, out T\)](#) ,  
[EnumerableExtensions.WrapAround<T>\(IEnumerable<T>\)](#).

## See Also

[Collection<T>](#)

# Namespace SODD.Core

## Classes

### [AudioMixerExtensions](#)

Extends AudioMixer type providing utility methods.

### [ComparisonExtensions](#)

Provides extension methods for the [Comparison](#) enum.

### [CoroutineBuilder](#)

Provides a flexible builder for constructing and managing custom coroutines.

### [EnumerableExtensions](#)

Extends [IEnumerable<T>](#) type providing utility methods.

### [GameObjectExtensions](#)

Extends GameObject type providing utility methods.

### [LifecycleEvents](#)

Invokes Unity events corresponding to the lifecycle events of a Unity MonoBehaviour.

### [Logger](#)

Provides utility functions for logging in the Unity Editor.

### [NavMeshAgentExtensions](#)

Extends NavMeshAgent type providing utility methods.

### [PassiveScriptableObject](#)

Represents a passive ScriptableObject that ensures it is loaded into memory during runtime.

### [PassiveScriptableObjectLoader](#)

Automatically generated component that ensures Passive ScriptableObjects are loaded into memory.

### [PersistentScriptableObject](#)

Represents a ScriptableObject that can be persisted across game sessions.

### [PrimitiveTypeExtensions](#)

Extends primitive types providing utility methods.

### [TransformExtensions](#)

Extends Transform type providing utility methods.

## [Vector2Extensions](#)

Extends Vector2 type providing utility methods.

## [Vector3Extensions](#)

Extends Vector3 type providing utility methods.

# Structs

## [Void](#)

Represents a type that signifies the absence of any value.

# Enums

## [Comparison](#)

Defines comparison operations between values.

## [Scope](#)

Specifies the scope of search for components in a [GameObject](#).

## [ToStringStrategy](#)

# Class AudioMixerExtensions

Namespace: [SODD.Core](#)

Extends AudioMixer type providing utility methods.

```
public static class AudioMixerExtensions
```

## Inheritance

[object](#) ← AudioMixerExtensions

## Methods

### GetVolume(AudioMixer, string, out float)

Gets the volume level of a specific parameter in the AudioMixer.

```
public static bool GetVolume(this AudioMixer mixer, string name, out
float percentage)
```

#### Parameters

**mixer** `AudioMixer`

The AudioMixer instance.

**name** `string`

The name of the parameter whose volume to retrieve.

**percentage** `float`

The output variable that will contain the volume level as a percentage (0 to 100).

#### Returns

`bool`

True if the parameter exists and its volume level was successfully retrieved; otherwise, false if the parameter doesn't exist or an error occurred during retrieval.

## Remarks

This method retrieves the volume level of the specified parameter in the AudioMixer and converts it from the logarithmic scale (decibels) to a linear scale represented as a percentage.

## SetVolume(AudioMixer, string, float)

Sets the volume level of a specific parameter in the AudioMixer.

```
public static void SetVolume(this AudioMixer mixer, string name, float percentage)
```

## Parameters

**mixer** `AudioMixer`

The AudioMixer instance.

**name** `string`

The name of the parameter whose volume to set.

**percentage** `float`

The volume level to set as a percentage (0 to 100).

## Remarks

This method sets the volume level of the specified parameter in the AudioMixer by converting the input percentage from a linear scale to the logarithmic scale (decibels). If the input percentage is less than 0, it will be clamped to 0. If the input percentage is greater than 100, it will be clamped to 100.

# Enum Comparison

Namespace: [SODD.Core](#)

Defines comparison operations between values.

```
public enum Comparison
```

## Extension Methods

[ComparisonExtensions.Evaluate\(Comparison, object, object\)](#)

## Fields

BiggerEqualsThan = 3

BiggerThan = 2

Equals = 0

LessEqualsThan = 5

LessThan = 4

NotEquals = 1

# Class ComparisonExtensions

Namespace: [SODD.Core](#)

Provides extension methods for the [Comparison](#) enum.

```
public static class ComparisonExtensions
```

## Inheritance

[object](#) ← ComparisonExtensions

## Methods

### Evaluate(Comparison, object, object)

Evaluates the comparison between two objects based on the specified [Comparison](#) type.

```
public static bool Evaluate(this Comparison comparison, object value1,  
object value2)
```

#### Parameters

**comparison** [Comparison](#)

The type of comparison to perform.

**value1** [object](#)

The first object to compare.

**value2** [object](#)

The second object to compare.

#### Returns

[bool](#)

A boolean value indicating the result of the comparison.

## Examples

This example shows how to use the Evaluate method:

```
Comparison comparisonType = Comparison.LessThan;  
int value1 = 5;  
int value2 = 10;  
bool result = comparisonType.Evaluate(value1, value2);  
// result will be true because 5 is less than 10
```

## Exceptions

### [ArgumentException](#)

Thrown when the objects are not comparable or the comparison type is not applicable.

# Class CoroutineBuilder

Namespace: [SODD.Core](#)

Provides a flexible builder for constructing and managing custom coroutines.

```
public class CoroutineBuilder : MonoBehaviour, ICloneable
```

## Inheritance

[object](#) ← CoroutineBuilder

## Implements

[ICloneable](#)

## Remarks

The [CoroutineBuilder](#) class allows developers to dynamically construct coroutines by chaining various types of execution steps, such as invoking actions, waiting for seconds, or repeating steps. This class simplifies complex coroutine creation and management, making it easy to customize behavior at runtime without writing repetitive coroutine functions.

It supports conditional waits, loops, and method invocation, providing a powerful tool for creating sophisticated asynchronous behaviors.

## Properties

### IsRunning

Gets a value indicating whether the coroutine is currently running.

```
public bool IsRunning { get; }
```

Property Value

[bool](#)

## Methods

## Append(params CoroutineBuilder[])

Appends the specified coroutines to the current [CoroutineBuilder](#) instance.

```
public CoroutineBuilder Append(params CoroutineBuilder[] coroutines)
```

### Parameters

**coroutines** [CoroutineBuilder](#)[]

The coroutines to append.

### Returns

[CoroutineBuilder](#)

The current [CoroutineBuilder](#) instance.

### Exceptions

[Exception](#)

Thrown when one of the coroutines is currently running.

## Cancel()

Cancels the running coroutine.

```
public void Cancel()
```

## CancelOnDisable(bool)

Configures whether the [CoroutineBuilder](#) instance should be canceled when it gets disabled.

```
public CoroutineBuilder CancelOnDisable(bool condition = true)
```

### Parameters

## `condition` bool

True if the instance should be canceled; otherwise, false.

Returns

## [CoroutineBuilder](#)

The current [CoroutineBuilder](#) instance.

## Clone()

Creates a shallow copy of the current [CoroutineBuilder](#) instance.

```
public object Clone()
```

Returns

## object

A shallow copy of the current [CoroutineBuilder](#) instance.

## DestroyOnFinish(bool)

Configures whether the [CoroutineBuilder](#) instance should be destroyed when the coroutine finishes.

```
public CoroutineBuilder DestroyOnFinish(bool condition = true)
```

Parameters

## `condition` bool

True if the instance should be destroyed; otherwise, false.

Returns

## [CoroutineBuilder](#)

The current [CoroutineBuilder](#) instance.

## ForTimes(int)

Adds an execution step to repeat the previous steps a specified number of times during the coroutine execution.

```
public CoroutineBuilder ForTimes(int times)
```

### Parameters

**times int**

The number of times to repeat the previous steps.

### Returns

[CoroutineBuilder](#)

The current [CoroutineBuilder](#) instance.

## Invoke(Action)

Adds an execution step to invoke the specified action during the coroutine execution.

```
public CoroutineBuilder Invoke(Action action)
```

### Parameters

**action Action**

The action to be invoked.

### Returns

[CoroutineBuilder](#)

The current [CoroutineBuilder](#) instance.

## Run()

Runs the configured coroutine.

```
public void Run()
```

## WaitForEndOfFrame()

Adds an execution step to wait for the end of the current frame during the coroutine execution.

```
public CoroutineBuilder WaitForEndOfFrame()
```

Returns

[CoroutineBuilder](#)

The current [CoroutineBuilder](#) instance.

## WaitForFixedUpdate()

Adds an execution step to wait for the next fixed update during the coroutine execution.

```
public CoroutineBuilder WaitForFixedUpdate()
```

Returns

[CoroutineBuilder](#)

The current [CoroutineBuilder](#) instance.

## WaitForSeconds(float)

Adds an execution step to wait for a specified number of seconds during the coroutine execution.

```
public CoroutineBuilder WaitForSeconds(float seconds)
```

## Parameters

### `seconds float`

The number of seconds to wait.

## Returns

### [CoroutineBuilder](#)

The current [CoroutineBuilder](#) instance.

## WaitUntil(Func<bool>)

Adds an execution step to wait until the specified predicate is true during the coroutine execution.

```
public CoroutineBuilder WaitUntil(Func<bool> predicate)
```

## Parameters

### `predicate Func<bool>`

The predicate function to evaluate.

## Returns

### [CoroutineBuilder](#)

The current [CoroutineBuilder](#) instance.

## WaitWhile(Func<bool>)

Adds an execution step to wait while the specified predicate is false during the coroutine execution.

```
public CoroutineBuilder WaitWhile(Func<bool> predicate)
```

## Parameters

**predicate** [Func<bool>](#)

The predicate function to evaluate.

## Returns

[CoroutineBuilder](#)

The current [CoroutineBuilder](#) instance.

## While(Func<bool>)

Adds an execution step to wait while the specified predicate is true during the coroutine execution.

```
public CoroutineBuilder While(Func<bool> predicate)
```

## Parameters

**predicate** [Func<bool>](#)

The predicate function to evaluate.

## Returns

[CoroutineBuilder](#)

The current [CoroutineBuilder](#) instance.

# Class EnumerableExtensions

Namespace: [SODD.Core](#)

Extends [IEnumerable<T>](#) type providing utility methods.

```
public static class EnumerableExtensions
```

## Inheritance

[object](#) ← EnumerableExtensions

## Methods

### ForEach<T>(IEnumerable<T>, Action<T>)

Performs the specified action on each element of the IEnumerable<T>.

```
public static void ForEach<T>(this IEnumerable<T> source, Action<T> action)
```

#### Parameters

**source** [IEnumerable<T>](#)

The IEnumerable<T> to iterate over.

**action** [Action<T>](#)

The action to perform on each element of the IEnumerable<T>.

#### Type Parameters

**T**

The type of elements in the IEnumerable<T>.

#### Remarks

This method iterates over each element in the source IEnumerable<T> and performs the specified action on each element using the provided delegate. If the action is null, this

method does nothing and returns immediately.

## IsEmpty<T>(IEnumerable<T>)

```
public static bool IsEmpty<T>(this IEnumerable<T> source)
```

Parameters

**source** [IEnumerable<T>](#)

Returns

[bool](#)

Type Parameters

**T**

## TryFind<T>(IEnumerable<T>, Func<T, bool>, out T)

Tries to find an element in the IEnumerable<T> that matches the specified predicate.

```
public static bool TryFind<T>(this IEnumerable<T> source, Func<T, bool> predicate,  
out T output)
```

Parameters

**source** [IEnumerable<T>](#)

The IEnumerable<T> to search.

**predicate** [Func<T, bool>](#)

The predicate function used to find the element.

**output** [T](#)

When this method returns, contains the first element that matches the predicate, if found; otherwise, the default value of type T.

Returns

[bool](#)

True if an element matching the predicate is found and stored in the `output` parameter; otherwise, false if no such element is found.

Type Parameters

`T`

The type of elements in the `IEnumerable<T>`.

Remarks

This method searches the source `IEnumerable<T>` for an element that matches the specified predicate function. If a matching element is found, it is stored in the `output` parameter and the method returns true. If no matching element is found, the `output` parameter is set to the default value of type `T` and the method returns false.

## WrapAround<T>(IEnumerable<T>)

Creates an infinite loop by wrapping the source `IEnumerable<T>` around itself.

```
public static IEnumerable<T> WrapAround<T>(this IEnumerable<T> source)
```

Parameters

`source` [IEnumerable<T>](#)

The `IEnumerable<T>` to wrap around.

Returns

[IEnumerable<T>](#)

An `IEnumerable<T>` that repeatedly returns elements from the source `IEnumerable<T>` in an infinite loop.

Type Parameters

The type of elements in the `IEnumerable<T>`.

## Remarks

This method creates an infinite loop by repeatedly returning elements from the source `IEnumerable<T>`. When the end of the source sequence is reached, it wraps around and starts again from the beginning, effectively creating an infinite sequence.

# Class GameObjectExtensions

Namespace: [SODD.Core](#)

Extends GameObject type providing utility methods.

```
public static class GameObjectExtensions
```

## Inheritance

[object](#) ← GameObjectExtensions

## Methods

### Broadcast<T>(GameObject, Action<T>, Scope)

Executes the provided [Action<T>](#) on all components of type `T` found on the specified `gameObject` within the defined `scope`.

```
public static void Broadcast<T>(this GameObject gameObject, Action<T> action, Scope scope = Scope.GameObject)
```

#### Parameters

`gameObject` [GameObject](#)

The GameObject from which the components are to be retrieved and the action is to be executed on each.

`action` [Action<T>](#)

The action to execute on each retrieved component. If no components are found, the action is not executed.

`scope` [Scope](#)

The [Scope](#) defining where to search for the components. The default is [GameObject](#).

#### Type Parameters

The type of the components to retrieve and act upon.

## Examples

The following example shows the use of `Broadcast` to disable all Collider components within and including children of a GameObject:

```
public class ExampleUsage : MonoBehaviour
{
    void Start()
    {
        gameObject.Broadcast<Collider>(collider => collider.enabled =
    false, Scope.Children);
    }
}
```

## Remarks

This method facilitates the application of a single action to multiple components of the same type distributed throughout the specified scope. It is particularly useful for scenarios where a uniform operation needs to be applied to an array of components, such as enabling, disabling, or resetting component states.

## Coroutine(GameObject, bool, bool)

Creates and attaches a [CoroutineBuilder](#) to this GameObject.

```
public static CoroutineBuilder Coroutine(this GameObject gameObject, bool
destroyOnFinish = true, bool cancelOnDisable = true)
```

## Parameters

`gameObject` GameObject

The GameObject on which to create the [CoroutineBuilder](#).

`destroyOnFinish` [bool](#)

If set to true, the [CoroutineBuilder](#) will be automatically destroyed when the coroutine execution completes.

#### `cancelOnDisable bool`

If set to true, the coroutine execution will be automatically canceled if the GameObject is disabled.

Returns

#### [CoroutineBuilder](#)

A [CoroutineBuilder](#) attached to this GameObject.

Examples

```
// Create a coroutine that waits 2 seconds, then logs a message to the console
gameObject.Coroutine()
    .WaitForSeconds(2)
    .Invoke(() => Debug.Log("2 seconds have passed"))
    .Run();
```

Remarks

This method dynamically adds a new [CoroutineBuilder](#) component to the specified GameObject. It is ideal for situations where the behavior of the GameObject needs to be extended with custom asynchronous routines that can be defined on-the-fly using method chaining. The [CoroutineBuilder](#) supports various types of execution steps like delays, loops, and condition-based continuations, making it versatile for complex asynchronous behaviors.

## DirectionFrom(GameObject, GameObject)

Calculates the direction vector from the position of the specified GameObject to the position of the GameObject.

```
public static Vector3 DirectionFrom(this GameObject gameObject, GameObject other)
```

Parameters

**gameObject** GameObject

The GameObject to calculate the direction vector to.

**other** GameObject

The source GameObject whose position is the source of the direction vector.

Returns

Vector3

A Vector3 representing the direction vector from the position of the specified GameObject to the position of the GameObject.

Exceptions

[ArgumentNullException](#)

Thrown when the specified GameObject is null.

## DirectionFrom(GameObject, Transform)

Calculates the direction vector from the specified Transform to the position of the GameObject.

```
public static Vector3 DirectionFrom(this GameObject gameObject, Transform transform)
```

Parameters

**gameObject** GameObject

The GameObject to calculate the direction vector to.

**transform** Transform

The Transform whose position is the source of the direction vector.

Returns

Vector3

A Vector3 representing the direction vector from the specified Transform to the position of the GameObject.

## Exceptions

### [ArgumentNullException](#)

Thrown when the specified Transform is null.

## DirectionFrom(GameObject, Vector3)

Calculates the direction vector from the specified point to the position of the GameObject.

```
public static Vector3 DirectionFrom(this GameObject gameObject, Vector3 point)
```

## Parameters

### gameObject GameObject

The GameObject to calculate the direction vector to.

### point Vector3

The source point from which the direction vector is calculated.

## Returns

### Vector3

A Vector3 representing the direction vector from the specified point to the position of the GameObject.

## DirectionTo(GameObject, GameObject)

Calculates the direction vector from the position of the GameObject to the position of the specified GameObject.

```
public static Vector3 DirectionTo(this GameObject gameObject, GameObject other)
```

## Parameters

**gameObject** GameObject

The GameObject to calculate the direction vector from.

**other** GameObject

The target GameObject whose position is the target of the direction vector.

## Returns

Vector3

A Vector3 representing the direction vector from the position of the GameObject to the position of the specified GameObject.

## Exceptions

[ArgumentNullException](#)

Thrown when the specified GameObject is null.

## DirectionTo(GameObject, Transform)

Calculates the direction vector from the position of the GameObject to the position of the specified Transform.

```
public static Vector3 DirectionTo(this GameObject gameObject, Transform transform)
```

## Parameters

**gameObject** GameObject

The GameObject to calculate the direction vector from.

**transform** Transform

The Transform whose position is the target of the direction vector.

## Returns

## Vector3

A Vector3 representing the direction vector from the position of the GameObject to the position of the specified Transform.

## Exceptions

### [ArgumentNullException](#)

Thrown when the specified Transform is null.

## DirectionTo(GameObject, Vector3)

Calculates the direction vector from the position of the GameObject to the specified point.

```
public static Vector3 DirectionTo(this GameObject gameobject, Vector3 point)
```

## Parameters

### **gameobject** GameObject

The GameObject to calculate the direction vector from.

### **point** Vector3

The target point to which the direction vector is calculated.

## Returns

### Vector3

A Vector3 representing the direction vector from the position of the GameObject to the specified point.

## DistanceTo(GameObject, GameObject)

Calculates the distance between the position of the GameObject and the position of the specified GameObject.

```
public static float DistanceTo(this GameObject gameobject, GameObject other)
```

## Parameters

**gameObject** GameObject

The GameObject to calculate the distance to.

**other** GameObject

The target GameObject whose position is the target of the distance calculation.

## Returns

[float](#)

The distance between the position of the GameObject and the position of the specified GameObject.

## Exceptions

[ArgumentNullException](#)

Thrown when the specified GameObject is null.

## DistanceTo(GameObject, Transform)

Calculates the distance between the position of the GameObject and the position of the specified Transform.

```
public static float DistanceTo(this GameObject gameObject, Transform transform)
```

## Parameters

**gameObject** GameObject

The GameObject to calculate the distance to.

**transform** Transform

The Transform whose position is the target of the distance calculation.

## Returns

## float

The distance between the position of the GameObject and the position of the specified Transform.

## Exceptions

### ArgumentNullException

Thrown when the specified Transform is null.

## DistanceTo(GameObject, Vector3)

Calculates the distance between the position of the GameObject and the specified point.

```
public static float DistanceTo(this GameObject gameobject, Vector3 point)
```

## Parameters

### gameobject GameObject

The GameObject to calculate the distance to.

### point Vector3

The target point whose distance is calculated from the GameObject's position.

## Returns

## float

The distance between the position of the GameObject and the specified point.

## GetComponent<T>(GameObject, Scope)

Retrieves a component of type T from the specified GameObject according to the provided scope.

```
public static T GetComponent<T>(this GameObject gameobject, Scope scope  
= Scope.GameObject)
```

## Parameters

**gameObject** `GameObject`

The `GameObject` from which the component is to be retrieved.

**scope** [Scope](#)

The scope of the search for the component, which can be limited to the `GameObject`, its children, its parent, or both its parent and children. The default value is [GameObject](#).

## Returns

`T`

The component of type `T` found within the specified `scope` or `null` if no such component exists.

## Type Parameters

`T`

The type of the component to retrieve.

## Examples

```
// Retrieve a Rigidbody component only from the GameObject itself
Rigidbody rb = gameObject.GetComponent<Rigidbody>();

// Retrieve a Rigidbody component from the children
Rigidbody rbChild = gameObject.GetComponent<Rigidbody>(Scope.Children);

// Retrieve a Rigidbody component from the parent or children
Rigidbody rbFamily = gameObject.GetComponent<Rigidbody>(Scope.ParentsAndChildren);
```

This example demonstrates how `to` retrieve a `Rigidbody` component `from` a `GameObject` `with` different scopes `of` search.

## Remarks

This method allows for a flexible component search by specifying a `scope` for the search area:

- `GameObject`: Searches only on the given GameObject.
- `Children`: Searches all children of the GameObject, not including itself.
- `Parents`: Searches the parent objects of the GameObject, moving up the hierarchy.
- `ParentsAndChildren`: First searches up the parent chain, and if no component is found, searches down through the children.

## Exceptions

### [ArgumentOutOfRangeException](#)

Thrown if the `scope` is not one of the enumerated values.

## GetComponents<T>(GameObject, Scope)

Retrieves all components of type `T` from the specified GameObject according to the provided `scope`.

```
public static T[] GetComponents<T>(this GameObject gameObject, Scope scope
= Scope.GameObject)
```

## Parameters

### `gameObject` [GameObject](#)

The GameObject from which the components are to be retrieved.

### `scope` [Scope](#)

The scope of the search for the components, which can be limited to the GameObject, its children, its parent, or both its parent and children. The default is [GameObject](#).

## Returns

### `T[]`

An array of components of type `T` found within the specified `scope`.

## Type Parameters

### `T`

The type of the components to retrieve.

## Examples

```
// Retrieve all Rigidbody components only from the GameObject itself
Rigidbody[] rigidbodies = gameObject.GetComponents<Rigidbody>();

// Retrieve all Rigidbody components from the children
Rigidbody[] childRigidbodies = gameObject.GetComponents<Rigidbody>(Scope.Children);

// Retrieve all unique Rigidbody components from both the parent and children
Rigidbody[] familyRigidbodies = gameObject.GetComponents<Rigidbody>
(Scope.ParentsAndChildren);
```

This example demonstrates how to retrieve Rigidbody components from a GameObject with different scopes of search.

## Remarks

This method expands the capabilities of the standard `GameObject.GetComponent<T>` method by allowing the search for components to be scoped more broadly than just the current `GameObject`. Depending on the `scope` parameter, components can be retrieved from:

- The `GameObject` itself ([GameObject](#)).
- All direct and indirect children of the `GameObject` ([Children](#)).
- The parent and all higher ancestors of the `GameObject` ([Parents](#)).
- Both the parent hierarchy and the children hierarchy ([ParentsAndChildren](#)), ensuring a unique set of components by removing duplicates.

This method is particularly useful for complex `GameObject` hierarchies where a single `GameObject` may interact with multiple related components spread across different levels of the hierarchy.

## Exceptions

### [ArgumentOutOfRangeException](#)

Thrown if the `scope` is not one of the enumerated values.

## IsInLayerMask(GameObject, LayerMask)

Determines whether the GameObject is part of the specified LayerMask.

```
public static bool IsInLayerMask(this GameObject gameObject, LayerMask layerMask)
```

## Parameters

**gameObject** `GameObject`

The GameObject to test.

**layerMask** `LayerMask`

The LayerMask to check against.

## Returns

[bool](#)

`true` if the `gameObject`'s layer is included in the `layerMask`; otherwise, `false`.

## Examples

This example demonstrates how to check if a GameObject named "Player" is in a LayerMask defined for enemies:

```
GameObject player = GameObject.Find("Player");
LayerMask enemyLayerMask = LayerMask.GetMask("Enemy");

bool isPlayerInEnemyLayer = player.IsInLayerMask(enemyLayerMask);

if (isPlayerInEnemyLayer)
{
    Debug.Log("Player is in the Enemy Layer.");
}
else
{
    Debug.Log("Player is not in the Enemy Layer.");
}
```

## Remarks

This method checks if the layer to which the `gameObject` belongs is included in the specified `layerMask`. It uses bitwise operations to compare the `gameObject`'s layer with the

layerMask.

## Send<T>(GameObject, Action<T>, Scope)

Executes the provided [Action<T>](#) on the first **T** component found on the specified **gameObject** within the defined **scope**.

```
public static void Send<T>(this GameObject gameObject, Action<T> action, Scope scope = Scope.GameObject)
```

### Parameters

**gameObject** [GameObject](#)

The [GameObject](#) from which the component is to be retrieved and the action is to be executed.

**action** [Action<T>](#)

The action to execute on the retrieved component. If the component is not found, the action is not executed.

**scope** [Scope](#)

The [Scope](#) defining where to search for the component. The default scope is [GameObject](#).

### Type Parameters

**T**

The type of the component to retrieve and act upon.

### Examples

The following example shows the use of **Send** to apply damage to a damageable component upon projectile impact:

```
public class Projectile : MonoBehaviour
{
    public float damage;
    public LayerMask targetLayers;
    public Event<Vector3> onProjectileImpact;
```

```
private void OnCollisionEnter(Collision other)
{
    if (other.gameObject.IsInLayerMask(targetLayers))
    {
        other.gameObject.Send<IDamageable>(damageable =>
damageable.ReceiveDamage(damage));
        onProjectileImpact.Invoke(transform.position);
        Destroy(gameObject);
    }
}
```

This example shows how the `Send` method is used within the `Projectile` class to find and interact with an `IDamageable` component on a collision object, applying damage and triggering an event upon impact.

## Remarks

This method offers a robust and more efficient alternative to Unity's `SendMessage`, which relies on string method names and lacks type safety. By directly invoking a delegate on the component, `Send` avoids the overhead and errors associated with string-based method invocation.

This method attempts to find a component of type `T` on the `gameObject` according to the specified `scope`. If the component is found, the provided `action` is executed with the component as its argument. If no such component is found, or if `action` is null, no action is executed.

This method is useful for applying operations to components when the exact presence of the component is not guaranteed, or when the operation should only be applied conditionally based on the presence of the component.

## TryGetComponent<T>(GameObject, out T, Scope)

W Tries to retrieve a component of type `T` from the specified `gameObject` according to the provided `scope`, and outputs the result.

```
public static bool TryGetComponent<T>(this GameObject gameObject, out T component,
Scope scope = Scope.GameObject)
```

## Parameters

**gameObject** [GameObject](#)

The [GameObject](#) from which to retrieve the component.

**component** [T](#)

When this method returns, contains the component of type [T](#) if found, otherwise null. This parameter is passed uninitialized.

**scope** [Scope](#)

The [Scope](#) within which to search for the component. The default is [GameObject](#).

## Returns

[bool](#)

[true](#) if a component of type [T](#) is found; otherwise, [false](#).

## Type Parameters

[T](#)

The type of the component to retrieve.

## Examples

The following example demonstrates how to use the [TryGetComponent<T>\(GameObject, out T, Scope\)](#) method to attempt to retrieve a component of type [MeshRenderer](#) from a game object.

```
MeshRenderer renderer;

if (gameObject.TryGetComponent<MeshRenderer>(out renderer))
{
    Console.WriteLine("Component found!");
}
else
{
    Console.WriteLine("Component not found.");
}
```

## Remarks

This method extends GameObject and utilizes GameObject.GetComponent<T> to attempt to retrieve a component of the specified type T. If the component exists within the given scope on the GameObject, it is assigned to the output parameter 'component', and the method returns true. If no such component is found, the method returns false.

## VectorFrom(GameObject, GameObject)

Calculates the direction vector from the position of the specified GameObject to the position of the GameObject.

```
public static Vector3 VectorFrom(this GameObject gameobject, GameObject other)
```

## Parameters

**gameObject** GameObject

The GameObject to calculate the direction vector to.

**other** GameObject

The source GameObject whose position is the source of the direction vector.

## Returns

Vector3

A Vector3 representing the direction vector from the position of the specified GameObject to the position of the GameObject.

## Remarks

This method calculates the direction vector from the position of the specified GameObject to the position of the GameObject. It uses the position of the specified GameObject as the starting point and the GameObject's current position as the target. The resulting direction vector points from the position of the specified GameObject towards the position of the GameObject.

## Exceptions

## [ArgumentNullException](#)

Thrown when the specified GameObject is null.

# VectorFrom(GameObject, Transform)

Calculates the direction vector from the specified Transform to the position of the GameObject.

```
public static Vector3 VectorFrom(this GameObject gameObject, Transform transform)
```

## Parameters

**gameObject** GameObject

The GameObject to calculate the direction vector to.

**transform** Transform

The Transform whose position is the source of the direction vector.

## Returns

Vector3

A Vector3 representing the direction vector from the specified Transform to the position of the GameObject.

## Remarks

This method calculates the direction vector from the specified Transform to the position of the GameObject. It uses the Transform's position as the starting point and the GameObject's current position as the target. The resulting direction vector points from the specified Transform towards the position of the GameObject.

## Exceptions

### [ArgumentNullException](#)

Thrown when the specified Transform is null.

## VectorFrom(GameObject, Vector3)

Calculates the direction vector from the specified point to the position of the GameObject.

```
public static Vector3 VectorFrom(this GameObject gameobject, Vector3 point)
```

### Parameters

**gameObject** GameObject

The GameObject to calculate the direction vector to.

**point** Vector3

The source point from which the direction vector is calculated.

### Returns

Vector3

A Vector3 representing the direction vector from the specified point to the position of the GameObject.

### Remarks

This method calculates the direction vector from the specified point to the position of the GameObject. It uses the specified point as the starting point and the GameObject's current position as the target. The resulting direction vector points from the specified point towards the position of the GameObject.

## VectorTo(GameObject, GameObject)

Calculates the direction vector from the position of the GameObject to the position of the specified GameObject.

```
public static Vector3 VectorTo(this GameObject gameobject, GameObject other)
```

### Parameters

**gameObject** GameObject

The GameObject to calculate the direction vector from.

**other** GameObject

The target GameObject whose position is the target of the direction vector.

Returns

Vector3

A Vector3 representing the direction vector from the position of the GameObject to the position of the specified GameObject.

Remarks

This method calculates the direction vector from the position of the GameObject to the position of the specified GameObject. It uses the GameObject's current position as the starting point and the position of the specified GameObject as the target. The resulting direction vector points from the GameObject towards the position of the specified GameObject.

Exceptions

[ArgumentNullException](#)

Thrown when the specified GameObject is null.

## VectorTo(GameObject, Transform)

Calculates the direction vector from the GameObject's position to the position of the specified Transform.

```
public static Vector3 VectorTo(this GameObject gameobject, Transform transform)
```

Parameters

**gameObject** GameObject

The GameObject to calculate the vector from.

**transform** Transform

The Transform whose position is the target of the direction vector.

## Returns

Vector3

A Vector3 representing the direction vector from the GameObject's position to the position of the specified Transform.

## Remarks

This method calculates the direction vector from the GameObject's position to the position of the specified Transform. It uses the GameObject's current position as the starting point and the position of the specified Transform as the target. The resulting direction vector points from the GameObject towards the position of the specified Transform.

## Exceptions

### [ArgumentNullException](#)

Thrown when the specified Transform is null.

## VectorTo(GameObject, Vector3)

Calculates the direction vector from the GameObject's position to the specified point.

```
public static Vector3 VectorTo(this GameObject gameobject, Vector3 point)
```

## Parameters

**gameobject** GameObject

The GameObject to calculate the vector from.

**point** Vector3

The target point to which the direction vector is calculated.

## Returns

Vector3

A Vector3 representing the direction vector from the GameObject's position to the specified point.

## Remarks

This method calculates the direction vector from the GameObject's position to the specified point. It uses the GameObject's current position as the starting point and the specified point as the target. The resulting direction vector points from the GameObject towards the specified point.

# Class LifecycleEvents

Namespace: [SODD.Core](#)

Invokes Unity events corresponding to the lifecycle events of a Unity MonoBehaviour.

```
public class LifecycleEvents : MonoBehaviour
```

## Inheritance

[object](#) ← LifecycleEvents

## Remarks

The [LifecycleEvents](#) class is used to hook into the lifecycle events of a Unity MonoBehaviour. It provides Unity events for Awake, Start, OnEnable, OnDisable, and OnDestroy, allowing for flexible event-driven programming within the Unity Editor.

# Class Logger

Namespace: [SODD.Core](#)

Provides utility functions for logging in the Unity Editor.

```
public static class Logger
```

## Inheritance

[object](#) ← Logger

## Methods

### LogAsset(Object, string)

Logs a message associated with a specific Unity asset in the console, including a clickable link to the asset in the editor.

```
public static void LogAsset(Object asset, string message)
```

#### Parameters

**asset** Object

The asset related to the message.

**message** string

The message to log.

#### Examples

Example of logging an asset-related message:

```
// Assuming 'exampleAsset' is a Unity asset, such as a ScriptableObject  
Logger.LogAsset(exampleAsset, "This is a test message for logging purposes.");
```

This will output a log message in the Unity console with a clickable link to 'exampleAsset'.

## Remarks

This method enhances debugging and logging in the Unity Editor by providing a direct link to the asset involved, making it easier to identify and access assets directly from the console log. Only available in the Unity Editor.

# Class NavMeshAgentExtensions

Namespace: [SODD.Core](#)

Extends NavMeshAgent type providing utility methods.

```
public static class NavMeshAgentExtensions
```

## Inheritance

[object](#) ← NavMeshAgentExtensions

## Methods

### CanReachDestination(NavMeshAgent)

Checks if the NavMeshAgent can reach its destination.

```
public static bool CanReachDestination(this NavMeshAgent agent)
```

#### Parameters

**agent** NavMeshAgent

The NavMeshAgent instance to check.

#### Returns

[bool](#)

True if the agent can reach its destination without any obstacles or path errors; otherwise, false if the agent's path is incomplete or blocked.

#### Remarks

This method checks the path status of the NavMeshAgent to determine if it can reach its destination. If the path is complete and there are no obstacles or path errors, the agent can reach its destination.

# HasReachedDestination(NavMeshAgent)

Checks if the NavMeshAgent has reached its destination.

```
public static bool HasReachedDestination(this NavMeshAgent agent)
```

## Parameters

**agent** NavMeshAgent

The NavMeshAgent instance to check.

## Returns

[bool](#)

True if the agent has reached its destination or is very close to it; otherwise, false if the agent is still moving towards the destination.

## Remarks

This method checks if the NavMeshAgent has reached its destination or is very close to it. It takes into account any pending path calculations, stopping distance, and current velocity.

# Class PassiveScriptableObject

Namespace: [SODD.Core](#)

Represents a passive ScriptableObject that ensures it is loaded into memory during runtime.

```
public abstract class PassiveScriptableObject : ScriptableObject
```

## Inheritance

[object](#) ← PassiveScriptableObject

## Derived

[InputActionHandler<T>](#), [ControlSchemeHandler](#), [InputActionIconProvider](#),  
[InputIconRepository](#), [VariableRepository](#)

## Examples

Definition of a custom passive ScriptableObject:

```
[CreateAssetMenu(menuName = "My ScriptableObjects/Custom Passive SO", fileName  
= nameof(CustomPassiveSO))]  
public class CustomPassiveSO : PassiveScriptableObject  
{  
    // Custom implementation details  
}
```

## Remarks

The [PassiveScriptableObject](#) class is designed for ScriptableObjects that do not populate a scene but need to provide functionality passively as assets loaded into memory. It includes a mechanism to ensure these ScriptableObjects are referenced and loaded into memory during runtime.

Each instance of a [PassiveScriptableObject](#) includes a toggle option in the Inspector, which is enabled by default, indicating whether the specific instance should be loaded into memory. This class is part of the SODD Framework's approach to managing ScriptableObject-based systems that interact with features such as Input Action Handlers or Control Scheme Handlers.

The SODD Framework provides a menu option that scans the project files for [Passive ScriptableObject](#) instances with the enabled toggle option. It then creates a GameObject with a Component that contains a list of all the collected [PassiveScriptableObject](#) instances, ensuring they are loaded into memory during runtime.

## Fields

### reference

Indicates whether this instance should be loaded into memory.

```
public bool reference
```

### Field Value

[bool](#)

### Remarks

This toggle option, enabled by default, determines if the specific instance of the [Passive ScriptableObject](#) should be included in the memory loading process.

# Class PassiveScriptableObjectLoader

Namespace: [SODD.Core](#)

Automatically generated component that ensures Passive ScriptableObjects are loaded into memory.

```
public sealed class PassiveScriptableObjectLoader : MonoBehaviour
```

## Inheritance

[object](#) ← PassiveScriptableObjectLoader

## Examples

Usage example of PassiveScriptableObjectLoader:

```
// This class is automatically generated by the SODD Framework.  
// Manual creation or modification is not required.
```

## Remarks

The [PassiveScriptableObjectLoader](#) class is designed to be automatically generated by the SODD Framework and added to scenes to reference passive ScriptableObjects, ensuring they are kept loaded into memory during runtime.

This component maintains a list of [PassiveScriptableObject](#) instances that are required to be loaded. It is attached to a GameObject that is added to all scenes included in the final build, providing a centralized reference to all passive ScriptableObjects, ensuring they are instantiated and available when needed.

## Fields

### passiveScriptableObjects

List of passive ScriptableObjects to be loaded into memory.

```
public List<PassiveScriptableObject> passiveScriptableObjects
```

## Field Value

[List<PassiveScriptableObject>](#)

## Remarks

This list is populated by the SODD Framework during the build process. Each entry corresponds to a [PassiveScriptableObject](#) that is flagged to be loaded into memory.

# Class PersistentScriptableObject

Namespace: [SODD.Core](#)

Represents a ScriptableObject that can be persisted across game sessions.

```
public abstract class PersistentScriptableObject : ScriptableObject
```

## Inheritance

[object](#) ← PersistentScriptableObject

## Derived

[Variable<T>](#)

## Examples

Definition of a custom persistent ScriptableObject:

```
[CreateAssetMenu(menuName = "My ScriptableObjects/Custom Persistent SO", fileName = nameof(CustomPersistentSO))]
public class CustomPersistentSO : PersistentScriptableObject
{
    // Custom implementation details
}
```

## Remarks

The [PersistentScriptableObject](#) class is designed to enable persistent storage and retrieval of Scriptable Variables within the SODD Framework. It serves as the base class for variables that need to be saved and loaded across game sessions, such as player settings and game states.

Each instance of a [PersistentScriptableObject](#) includes a toggle option in the Inspector, which indicates whether the specific variable should be persisted. This toggle option facilitates the management of variables in the Variable Repository, ensuring that only those marked for persistence are saved and loaded.

## Fields

# **persist**

Indicates whether this variable should be persisted across game sessions.

```
public bool persist
```

## Field Value

[bool](#)

## Remarks

This toggle option determines if the specific instance of the [PersistentScriptableObject](#) should be included in the persistence process managed by the Variable Repository.

# Class PrimitiveTypeExtensions

Namespace: [SODD.Core](#)

Extends primitive types providing utility methods.

```
public static class PrimitiveTypeExtensions
```

## Inheritance

[object](#) ← PrimitiveTypeExtensions

## Methods

### ToBool(int)

Converts an integer value to a boolean representation.

```
public static bool ToBool(this int value)
```

#### Parameters

**value** [int](#)

The integer value to convert.

#### Returns

[bool](#)

True if the input integer value is non-zero; otherwise, false if the input integer value is 0.

#### Remarks

This method converts an integer value to its corresponding boolean representation: true if the input integer value is non-zero, and false if the input integer value is 0. It is a convenient way to interpret integer values as boolean conditions in certain scenarios.

# ToInt(bool)

Converts a boolean value to an integer representation.

```
public static intToInt(this bool value)
```

## Parameters

[value](#) [bool](#)

The boolean value to convert.

## Returns

[int](#)

The integer representation of the boolean value: 1 if the input value is true, and 0 if the input value is false.

## Remarks

This method converts a boolean value to its corresponding integer representation: 1 for true and 0 for false. It is a convenient way to obtain an integer value when dealing with boolean conditions in certain scenarios.

# Enum Scope

Namespace: [SODD.Core](#)

Specifies the scope of search for components in a [GameObject](#).

```
public enum Scope
```

## Fields

**Children = 1**

Search for the component on all children of the provided GameObject.

**GameObject = 0**

Search for the component only on the provided GameObject.

**Parents = 2**

Search for the component on the parent of the provided GameObject.

**ParentsAndChildren = 3**

Search for the component on the parent and all children of the provided GameObject.

# Enum ToStringStrategy

Namespace: [SODD.Core](#)

```
public enum ToStringStrategy
```

## Fields

Capitalized = 0

Lowercase = 1

Uppercase = 2

# Class TransformExtensions

Namespace: [SODD.Core](#)

Extends Transform type providing utility methods.

```
public static class TransformExtensions
```

## Inheritance

[object](#) ← TransformExtensions

## Methods

### DirectionFrom(Transform, GameObject)

Calculates the direction vector from the specified GameObject's position to the current transform's position.

```
public static Vector3 DirectionFrom(this Transform transform, GameObject gameobject)
```

#### Parameters

**transform** Transform

The current transform.

**gameObject** GameObject

The GameObject.

#### Returns

Vector3

The direction vector from the specified GameObject's position to the current transform's position.

## DirectionFrom(Transform, Transform)

Calculates the direction vector from the specified transform's position to the current transform's position.

```
public static Vector3 DirectionFrom(this Transform transform, Transform other)
```

### Parameters

**transform** Transform

The current transform.

**other** Transform

The other transform.

### Returns

Vector3

The direction vector from the specified transform's position to the current transform's position.

## DirectionFrom(Transform, Vector3)

Calculates the direction vector from the specified point to the current transform's position.

```
public static Vector3 DirectionFrom(this Transform transform, Vector3 point)
```

### Parameters

**transform** Transform

The current transform.

**point** Vector3

The starting point.

### Returns

Vector3

The direction vector from the specified point to the current transform's position.

## DirectionTo(Transform, GameObject)

Calculates the direction vector from the current transform's position to a GameObject's position.

```
public static Vector3 DirectionTo(this Transform transform, GameObject gameObject)
```

### Parameters

**transform** Transform

The current transform.

**gameObject** GameObject

The GameObject.

### Returns

Vector3

The direction vector from the current transform's position to the GameObject's position.

## DirectionTo(Transform, Transform)

Calculates the direction vector from the current transform's position to another transform's position.

```
public static Vector3 DirectionTo(this Transform transform, Transform other)
```

### Parameters

**transform** Transform

The current transform.

## other Transform

The other transform.

Returns

Vector3

The direction vector from the current transform's position to the other transform's position.

## DirectionTo(Transform, Vector3)

Calculates the direction vector from the current transform's position to the specified point.

```
public static Vector3 DirectionTo(this Transform transform, Vector3 point)
```

Parameters

**transform** Transform

The current transform.

**point** Vector3

The target point.

Returns

Vector3

The direction vector from the current transform's position to the target point.

## DistanceTo(Transform, GameObject)

Calculates the distance between the current transform's position and a GameObject's position.

```
public static float DistanceTo(this Transform transform, GameObject gameobject)
```

## Parameters

**transform** Transform

The current transform.

**gameObject** GameObject

The GameObject.

## Returns

[float](#)

The distance between the current transform's position and the GameObject's position.

## DistanceTo(Transform, Transform)

Calculates the distance between the current transform's position and another transform's position.

```
public static float DistanceTo(this Transform transform, Transform other)
```

## Parameters

**transform** Transform

The current transform.

**other** Transform

The other transform.

## Returns

[float](#)

The distance between the current transform's position and the other transform's position.

## DistanceTo(Transform, Vector3)

Calculates the distance between the current transform's position and the specified point.

```
public static float DistanceTo(this Transform transform, Vector3 point)
```

## Parameters

**transform** Transform

The current transform.

**point** Vector3

The target point.

## Returns

float

The distance between the current transform's position and the target point.

## VectorFrom(Transform, GameObject)

Calculates the vector from the specified GameObject's position to the current transform's position.

```
public static Vector3 VectorFrom(this Transform transform, GameObject gameobject)
```

## Parameters

**transform** Transform

The current transform.

**gameobject** GameObject

The GameObject.

## Returns

Vector3

The vector from the specified GameObject's position to the current transform's position.

## VectorFrom(Transform, Transform)

Calculates the vector from the specified transform's position to the current transform's position.

```
public static Vector3 VectorFrom(this Transform transform, Transform other)
```

### Parameters

**transform** Transform

The current transform.

**other** Transform

The other transform.

### Returns

Vector3

The vector from the specified transform's position to the current transform's position.

## VectorFrom(Transform, Vector3)

Calculates the vector from the specified point to the current transform's position.

```
public static Vector3 VectorFrom(this Transform transform, Vector3 point)
```

### Parameters

**transform** Transform

The current transform.

**point** Vector3

The starting point.

Returns

Vector3

The vector from the specified point to the current transform's position.

## VectorTo(Transform, GameObject)

Calculates the vector from the current transform's position to a GameObject's position.

```
public static Vector3 VectorTo(this Transform transform, GameObject gameobject)
```

Parameters

**transform** Transform

The current transform.

**gameobject** GameObject

The GameObject.

Returns

Vector3

The vector from the current transform's position to the GameObject's position.

## VectorTo(Transform, Transform)

Calculates the vector from the current transform's position to another transform's position.

```
public static Vector3 VectorTo(this Transform transform, Transform other)
```

Parameters

**transform** Transform

The current transform.

## other Transform

The other transform.

Returns

Vector3

The vector from the current transform's position to the other transform's position.

## VectorTo(Transform, Vector3)

Calculates the vector from the current transform's position to the specified point.

```
public static Vector3 VectorTo(this Transform transform, Vector3 point)
```

Parameters

**transform** Transform

The current transform.

**point** Vector3

The target point.

Returns

Vector3

The vector from the current transform's position to the target point.

# Class Vector2Extensions

Namespace: [SODD.Core](#)

Extends Vector2 type providing utility methods.

```
public static class Vector2Extensions
```

## Inheritance

[object](#) ← Vector2Extensions

## Methods

### DirectionFrom(Vector2, Vector2)

Calculates the direction vector from the specified point to the current Vector2.

```
public static Vector2 DirectionFrom(this Vector2 vector2, Vector2 point)
```

#### Parameters

**vector2** Vector2

The current Vector2.

**point** Vector2

The starting point.

#### Returns

Vector2

The direction vector from the specified point to the current Vector2.

### DirectionTo(Vector2, Vector2)

Calculates the direction vector from the current Vector2 to the specified point.

```
public static Vector2 DirectionTo(this Vector2 vector2, Vector2 point)
```

## Parameters

**vector2** Vector2

The current Vector2.

**point** Vector2

The target point.

## Returns

Vector2

The direction vector from the current Vector2 to the target point.

## DistanceTo(Vector2, Vector2)

Calculates the distance between the current Vector2 and the specified point.

```
public static float DistanceTo(this Vector2 vector2, Vector2 point)
```

## Parameters

**vector2** Vector2

The current Vector2.

**point** Vector2

The target point.

## Returns

float

The distance between the current Vector2 and the target point.

## Rotate(Vector2, float, Vector2)

Rotates the current Vector2 by the specified angle around the specified axis.

```
public static Vector2 Rotate(this Vector2 vector, float angle, Vector2 axis)
```

### Parameters

**vector** Vector2

The current Vector2.

**angle** [float](#)

The angle to rotate by.

**axis** Vector2

The axis to rotate around.

### Returns

Vector2

The rotated Vector2.

## VectorFrom(Vector2, Vector2)

Calculates the vector from the specified point to the current Vector2.

```
public static Vector2 VectorFrom(this Vector2 vector2, Vector2 point)
```

### Parameters

**vector2** Vector2

The current Vector2.

**point** Vector2

The starting point.

Returns

Vector2

The vector from the specified point to the current Vector2.

## VectorTo(Vector2, Vector2)

Calculates the vector from the current Vector2 to the specified point.

```
public static Vector2 VectorTo(this Vector2 vector2, Vector2 point)
```

Parameters

**vector2** Vector2

The current Vector2.

**point** Vector2

The target point.

Returns

Vector2

The vector from the current Vector2 to the target point.

# Class Vector3Extensions

Namespace: [SODD.Core](#)

Extends Vector3 type providing utility methods.

```
public static class Vector3Extensions
```

## Inheritance

[object](#) ← Vector3Extensions

## Methods

### DirectionFrom(Vector3, Vector3)

Calculates the direction vector from the specified point to the current Vector3.

```
public static Vector3 DirectionFrom(this Vector3 vector3, Vector3 point)
```

#### Parameters

**vector3** Vector3

The current Vector3.

**point** Vector3

The starting point.

#### Returns

Vector3

The direction vector from the specified point to the current Vector3.

### DirectionTo(Vector3, Vector3)

Calculates the direction vector from the current Vector3 to the specified point.

```
public static Vector3 DirectionTo(this Vector3 vector3, Vector3 point)
```

## Parameters

**vector3** Vector3

The current Vector3.

**point** Vector3

The target point.

## Returns

Vector3

The direction vector from the current Vector3 to the target point.

## DistanceTo(Vector3, Vector3)

Calculates the distance between the current Vector3 and the specified point.

```
public static float DistanceTo(this Vector3 vector3, Vector3 point)
```

## Parameters

**vector3** Vector3

The current Vector3.

**point** Vector3

The target point.

## Returns

float

The distance between the current Vector3 and the target point.

## Rotate(Vector3, float, Vector3)

Rotates the current Vector3 by the specified angle around the specified axis.

```
public static Vector3 Rotate(this Vector3 vector, float angle, Vector3 axis)
```

### Parameters

**vector** Vector3

The current Vector3.

**angle** [float](#)

The angle to rotate by.

**axis** Vector3

The axis to rotate around.

### Returns

Vector3

The rotated Vector3.

## VectorFrom(Vector3, Vector3)

Calculates the vector from the specified point to the current Vector3.

```
public static Vector3 VectorFrom(this Vector3 vector3, Vector3 point)
```

### Parameters

**vector3** Vector3

The current Vector3.

**point** Vector3

The starting point.

Returns

Vector3

The vector from the specified point to the current Vector3.

## VectorTo(Vector3, Vector3)

Calculates the vector from the current Vector3 to the specified point.

```
public static Vector3 VectorTo(this Vector3 vector3, Vector3 point)
```

Parameters

**vector3** Vector3

The current Vector3.

**point** Vector3

The target point.

Returns

Vector3

The vector from the current Vector3 to the target point.

# Struct Void

Namespace: [SODD.Core](#)

Represents a type that signifies the absence of any value.

```
[Serializable]  
public struct Void
```

## Inherited Members

[ValueType.Equals\(object\)](#) , [ValueType.GetHashCode\(\)](#) , [ValueType.ToString\(\)](#)

## Remarks

The [Void](#) type is used as a placeholder type parameter in events where no other data is needed. This allows for the use of generic event handling mechanisms without needing to specify a meaningful type. It is primarily used in the VoidEvent to represent an event that is triggered without any accompanying data.

## Fields

### Instance

Provides a singleton instance of the Void type, used to represent an empty value.

```
public static readonly Void Instance
```

### Field Value

[Void](#)

# Namespace SODD.Data

## Classes

### [SerializableDictionary<TK, TV>](#)

A dictionary that supports Unity serialization.

## Structs

### [Range<T>](#)

Represents a range of comparable values.

# Struct Range<T>

Namespace: [SODD.Data](#)

Represents a range of comparable values.

```
[Serializable]  
public struct Range<T> where T : IComparable<T>
```

## Type Parameters

T

The type of the values, which must implement [IComparable<T>](#).

## Inherited Members

[ValueType.Equals\(object\)](#) , [ValueType.GetHashCode\(\)](#) , [ValueType.ToString\(\)](#)

## Examples

Example usage of the [Range<T>](#) struct:

```
Range<int> intRange = new Range<int>(0, 10);  
bool isInRange = intRange.IsInRange(5); // Returns true
```

## Remarks

The [Range<T>](#) struct is used to define a range with minimum and maximum bounds. It provides functionality to check if a given value is within this range. This struct can be used with any type that implements [IComparable<T>](#).

## Constructors

### Range(T, T)

Initializes a new instance of the [Range<T>](#) struct with specified minimum and maximum values.

```
public Range(T min, T max)
```

## Parameters

### min T

The minimum value of the range.

### max T

The maximum value of the range.

## Fields

### max

The maximum value of the range.

```
public T max
```

### Field Value

T

### min

The minimum value of the range.

```
public T min
```

### Field Value

T

## Methods

### IsInRange(T)

Determines whether a specified value is within the range.

```
public bool IsInRange(T value)
```

## Parameters

**value** **T**

The value to check.

## Returns

[bool](#)

**true** if the value is within the range; otherwise, **false**.

# Class SerializableDictionary<TK, TV>

Namespace: [SODD.Data](#)

A dictionary that supports Unity serialization.

```
[Serializable]
public class SerializableDictionary<TK, TV> : Dictionary<TK, TV>, IDictionary<TK, TV>, ICollection<KeyValuePair<TK, TV>>, IReadOnlyDictionary<TK, TV>, IReadOnlyCollection<KeyValuePair<TK, TV>>, IEnumerable<KeyValuePair<TK, TV>>, IDictionary, ICollection, IEnumerable, IDeserializationCallback, ISerializable, ISerializationCallbackReceiver
```

## Type Parameters

**TK**

The type of the keys in the dictionary.

**TV**

The type of the values in the dictionary.

## Inheritance

[object](#) ← [Dictionary](#)<TK, TV> ← [SerializableDictionary](#)<TK, TV>

## Implements

[IDictionary](#)<TK, TV>, [ICollection](#)<[KeyValuePair](#)<TK, TV>>, [IReadOnlyDictionary](#)<TK, TV>, [IReadOnlyCollection](#)<[KeyValuePair](#)<TK, TV>>, [IEnumerable](#)<[KeyValuePair](#)<TK, TV>>, [IDictionary](#), [ICollection](#), [IEnumerable](#), [IDeserializationCallback](#), [ISerializable](#), [ISerializationCallbackReceiver](#)

## Inherited Members

[Dictionary](#)<TK, TV>.Add(TK, TV) , [Dictionary](#)<TK, TV>.Clear() ,  
[Dictionary](#)<TK, TV>.ContainsKey(TK) , [Dictionary](#)<TK, TV>.ContainsValue(TV) ,  
[Dictionary](#)<TK, TV>.EnsureCapacity(int) , [Dictionary](#)<TK, TV>.GetEnumerator() ,  
[Dictionary](#)<TK, TV>.OnDeserialization(object) , [Dictionary](#)<TK, TV>.Remove(TK) ,  
[Dictionary](#)<TK, TV>.Remove(TK, out TV) , [Dictionary](#)<TK, TV>.TrimExcess() ,  
[Dictionary](#)<TK, TV>.TrimExcess(int) , [Dictionary](#)<TK, TV>.TryAdd(TK, TV) ,  
[Dictionary](#)<TK, TV>.TryGetValue(TK, out TV) , [Dictionary](#)<TK, TV>.Comparer ,

[Dictionary<TK, TV>.Count](#) , [Dictionary<TK, TV>.this\[TK\]](#) , [Dictionary<TK, TV>.Keys](#) ,  
[Dictionary<TK, TV>.Values](#)

## Extension Methods

[EnumerableExtensions.ForEach<T>\(IEnumerable<T>, Action<T>\)](#) ,  
[EnumerableExtensions.IsEmpty<T>\(IEnumerable<T>\)](#) ,  
[EnumerableExtensions.TryFind<T>\(IEnumerable<T>, Func<T, bool>, out T\)](#) ,  
[EnumerableExtensions.WrapAround<T>\(IEnumerable<T>\)](#).

## Examples

Example usage of the [SerializableDictionary<TK, TV>](#) class:

```
[Serializable]
public class MySerializableDictionary : SerializableDictionary<string, int> {}

public class MyComponent : MonoBehaviour
{
    [SerializeField]
    private MySerializableDictionary myDictionary;
}
```

## Remarks

The [SerializableDictionary<TK, TV>](#) class extends [Dictionary<TKey, TValue>](#) and implements ISerializationCallbackReceiver to support Unity's serialization system. It allows dictionaries to be serialized and deserialized within Unity, making them usable in the Inspector.

## Methods

### OnAfterDeserialize()

Invoked after the dictionary is deserialized.

```
public void OnAfterDeserialize()
```

### OnBeforeSerialize()

Invoked before the dictionary is serialized.

```
public void OnBeforeSerialize()
```

# Namespace SODD.Events

## Classes

### [BoolEvent](#)

Represents a scriptable event that carries a boolean payload.

### [Event<T>](#)

Provides a generic base class for scriptable event implementations, enabling events to be defined with specific data types as payloads.

### [FloatEvent](#)

Represents a scriptable event that carries a float payload.

### [GameObjectEvent](#)

Represents a scriptable event that carries a GameObject payload.

### [GenericEvent<T>](#)

Represents a generic event that can be listened to and invoked.

### [IntEvent](#)

Represents a scriptable event that carries an integer payload.

### [StringEvent](#)

Represents a scriptable event that carries a string payload.

### [Vector2Event](#)

Represents a scriptable event that carries a Vector2 payload.

### [Vector3Event](#)

Represents a scriptable event that carries a Vector3 payload.

### [VoidEvent](#)

Represents a scriptable event that carries no payload.

## Interfaces

### [IEvent<T>](#)

Defines a generic interface for events that can have listeners added or removed, and be invoked with a payload of type `T`.

### [IListenableEvent<T>](#)

Defines a generic interface for events with payloads of type `T` that can have listeners added or removed.

# Class BoolEvent

Namespace: [SODD.Events](#)

Represents a scriptable event that carries a boolean payload.

```
public sealed class BoolEvent : Event<bool>, IEvent<bool>, IListenerableEvent<bool>
```

## Inheritance

[object](#) ← [Event<bool>](#) ← BoolEvent

## Implements

[IEvent<bool>](#), [IListenerableEvent<bool>](#)

## Inherited Members

[Event<bool>.AddListener\(Action<bool>\)](#) , [Event<bool>.RemoveListener\(Action<bool>\)](#) ,  
[Event<bool>.Invoke\(bool\)](#)

## Examples

Below is an example demonstrating how to use a [BoolEvent](#) in a script to handle player actions like crouching:

```
public class BoolEventExample : MonoBehaviour
{
    public BoolEvent onCrouch; // Assign the event through the Unity Editor.

    private void OnEnable()
    {
        onCrouch.AddListener(OnCrouch);
    }

    private void OnDisable()
    {
        onCrouch.RemoveListener(OnCrouch);
    }

    private void OnCrouch(bool isCrouching)
    {
        if (isCrouching)
        {
            // Set movement speed to crouching speed
        }
    }
}
```

```
        }
    else
    {
        // Set movement speed to normal speed
    }
}
```

This example illustrates how the `onCrouch` event can be triggered by various game mechanisms such as player input or specific gameplay triggers like a tutorial session. Importantly, the script is indifferent regarding who triggers the event, focusing solely on responding to the event itself.

## Remarks

This class extends the generic `Event<T>` class, specifying `bool` as the type parameter. It is used to create events that need to communicate a boolean value, such as toggling a state, confirming a condition, or triggering binary decisions.

Use cases might include signaling game state changes, user interactions that have two states (like on/off switches), or as a response to certain player actions in a game.

This class can be instantiated as a `ScriptableObject` asset directly from the Unity Editor.

# Class Event<T>

Namespace: [SODD.Events](#)

Provides a generic base class for scriptable event implementations, enabling events to be defined with specific data types as payloads.

```
public abstract class Event<T> : ScriptableObject, IEvent<T>, IListenerableEvent<T>
```

## Type Parameters

T

The type of the event payload.

### Inheritance

[Object](#) ← Event<T>

### Implements

[IEvent<T>](#), [IListenerableEvent<T>](#)

### Derived

[BoolEvent](#), [FloatEvent](#), [GameObjectEvent](#), [IntEvent](#), [StringEvent](#), [Vector2Event](#),  
[Vector3Event](#), [VoidEvent](#)

## Examples

Definition of a string event implementation:

```
[CreateAssetMenu(menuName = "My Events/String Event", fileName  
= nameof(StringEvent))]  
public class StringEvent : Event<string> {}
```

## Remarks

This abstract class serves as the base of the ScriptableObject-based event system provided by the SODD Framework. It allows developers to create custom events that are reusable, and loosely coupled, enhancing the modularity and flexibility of game architecture.

It implements the [IEvent<T>](#) interface, which includes methods to add or remove listeners, and to invoke the event. This class can be extended to define events with any valid Unity

type as a payload, such as `int`, `string`, `GameObject`, etc.

The methods [AddListener\(Action<T>\)](#), [RemoveListener\(Action<T>\)](#), and [Invoke\(T\)](#) provided by this class should suffice for basic event handling scenarios. Developers can override these methods in derived classes to tailor event behavior to specific needs.

To create custom scriptable events, inherit from this class and specify the payload type `T`.

## Fields

### GenericEvent

```
protected readonly GenericEvent<T> GenericEvent
```

## Field Value

[GenericEvent<T>](#)

## Methods

### AddListener(Action<T>)

Subscribes a listener to the event, allowing it to be notified when the event is invoked.

```
public void AddListener(Action<T> listener)
```

## Parameters

`listener Action<T>`

The listener to add. It is a method that matches the signature of the [Action<T>](#) delegate, accepting a single parameter of type `T`.

### Invoke(T)

Triggers the event, notifying all subscribed listeners and passing the specified payload to them.

```
public void Invoke(T payload)
```

## Parameters

**payload T**

The payload to pass to the listeners.

## RemoveListener(Action<T>)

Unsubscribes a previously added listener from the event, preventing it from being notified when the event is invoked.

```
public void RemoveListener(Action<T> listener)
```

## Parameters

**listener Action<T>**

The listener to remove. It must be the same instance that was previously added with [AddListener\(Action<T>\)](#).

# Class FloatEvent

Namespace: [SODD.Events](#)

Represents a scriptable event that carries a float payload.

```
public sealed class FloatEvent : Event<float>, IEvent<float>,
IListenableEvent<float>
```

## Inheritance

[object](#) ← [Event<float>](#) ← [FloatEvent](#)

## Implements

[IEvent<float>](#), [IListenableEvent<float>](#)

## Inherited Members

[Event<float>.AddListener\(Action<float>\)](#) , [Event<float>.RemoveListener\(Action<float>\)](#) ,  
[Event<float>.Invoke\(float\)](#)

## Examples

Below is an example demonstrating how to define and use a [FloatEvent](#) to manage game completion percentage:

```
public class GamePercentageManager : MonoBehaviour
{
    public FloatEvent onCompletionIncreased; // Assign this through the
    Unity Editor.

    private float _completionPercentage = 0f;

    private void OnEnable()
    {
        onCompletionIncreased.AddListener(OnCompletionIncreased);
    }

    private void OnDisable()
    {
        onCompletionIncreased.RemoveListener(OnCompletionIncreased);
    }

    private void OnCompletionIncreased(float percentage)
```

```
{  
    _completionPercentage += percentage;  
    Debug.Log("Completion percentage increased to: " + _completionPercentage  
+ "%");  
}  
}
```

This example shows how `onCompletionIncreased` can be used to incrementally update the game's completion percentage as players progress through levels or achieve specific milestones. The event system ensures that the game logic related to tracking completion is decoupled from the actions that trigger progress.

## Remarks

This class extends the generic [Event<T>](#) class, specifying `float` as the type parameter. It is commonly used to handle numerical data that requires precision beyond integers, such as percentages, time durations, distances, or health values.

Typical use cases include adjusting player speed, modifying game timers, changing health bars, or any scenario where a change in a floating-point value needs to be communicated across different game components.

This class can be created as a ScriptableObject asset directly from the Unity Editor.

# Class GameObjectEvent

Namespace: [SODD.Events](#)

Represents a scriptable event that carries a GameObject payload.

```
public sealed class GameObjectEvent : Event<GameObject>, IEvent<GameObject>,  
IListenableEvent<GameObject>
```

## Inheritance

[object](#) ← [Event](#)<GameObject> ← GameObjectEvent

## Implements

[IEvent](#)<GameObject>, [IListenableEvent](#)<GameObject>

## Inherited Members

[Event<GameObject>.AddListener\(Action<GameObject>\)](#) ,  
[Event<GameObject>.RemoveListener\(Action<GameObject>\)](#) ,  
[Event<GameObject>.Invoke\(GameObject\)](#).

## Examples

Below is an example demonstrating how to define and use a [GameObjectEvent](#) to manage an inventory system in a game:

```
public class InventoryManager : MonoBehaviour  
{  
    public GameObjectEvent onAddInventoryItem; // Assign this through the  
    // Unity Editor.  
    public GameObjectEvent onRemoveInventoryItem; // Assign this through the  
    // Unity Editor.  
  
    private List<GameObject> _inventory = new();  
  
    private void OnEnable()  
    {  
        onAddInventoryItem.AddListener(OnAddInventoryItem);  
        onRemoveInventoryItem.AddListener(OnRemoveInventoryItem);  
    }  
  
    private void OnDisable()  
    {
```

```
        onAddInventoryItem.RemoveListener(OnAddInventoryItem);
        onRemoveInventoryItem.RemoveListener(OnRemoveInventoryItem);
    }

    private void OnAddInventoryItem(GameObject item)
    {
        _inventory.Add(item);
    }

    private void OnRemoveInventoryItem(GameObject item)
    {
        _inventory.Remove(item);
    }
}
```

This example illustrates how the `onAddInventoryItem` and `onRemoveInventoryItem` events can be used to manage the items in the player's inventory, enabling the `InventoryManager` to react to changes without directly interacting with the game objects that trigger these changes.

## Remarks

This class extends the generic [Event<T>](#) class, specifying `GameObject` as the type parameter. It is designed to handle events that involve `GameObjects`, such as spawning, transformations, or inventory management.

Typical use cases include adding or removing items from an inventory, activating or deactivating game objects, or any scenario where `GameObjects` are manipulated dynamically during gameplay.

This class can be created as a `ScriptableObject` asset directly from the Unity Editor.

# Class GenericEvent<T>

Namespace: [SODD.Events](#)

Represents a generic event that can be listened to and invoked.

```
public sealed class GenericEvent<T> : IEvent<T>, IListenableEvent<T>
```

## Type Parameters

T

The type of the event payload.

## Inheritance

[object](#) ← GenericEvent<T>

## Implements

[IEvent<T>](#), [IListenableEvent<T>](#)

## Methods

### AddListener(Action<T>)

Adds a listener to the event.

```
public void AddListener(Action<T> listener)
```

## Parameters

listener [Action<T>](#)

The listener to add.

## Remarks

This method adds a listener to the event. The listener will be triggered whenever the event is invoked.

## Invoke(T)

Invokes the event and notifies all registered listeners with the specified payload.

```
public void Invoke(T payload)
```

### Parameters

**payload T**

The payload to pass to the listeners.

## RemoveListener(Action<T>)

Removes the specified listener from the event.

```
public void RemoveListener(Action<T> listener)
```

### Parameters

**listener Action<T>**

The listener to be removed.

# Interface IEvent<T>

Namespace: [SODD.Events](#)

Defines a generic interface for events that can have listeners added or removed, and be invoked with a payload of type T.

```
public interface IEvent<T> : IListenableEvent<T>
```

## Type Parameters

T

The type of the event payload. This type parameter specifies the data type that listeners will receive when the event is invoked.

## Inherited Members

[IListenableEvent<T>.AddListener\(Action<T>\)](#) ,  
[IListenableEvent<T>.RemoveListener\(Action<T>\)](#)

## Examples

Example of defining a new event and subscribing a listener:

```
// Define a new event with a string payload
public class MyStringEvent : IEvent<string> {
    private event Action<string> listeners;

    public void AddListener(Action<string> listener) => listeners += listener;

    public void RemoveListener(Action<string> listener) => listeners -= listener;

    public void Invoke(string payload) => listeners?.Invoke(payload);
}

// Create an instance of the event
MyStringEvent myEvent = new MyStringEvent();

// Define a listener method
void MyEventListener(string message) {
    Debug.Log(message);
}
```

```
// Subscribe the listener to the event  
myEvent.AddListener(MyEventListener);  
  
// Invoke the event  
myEvent.Invoke("Hello, World!");
```

This example will print "Hello, World!" to the console.

## Remarks

The [IEvent<T>](#) interface serves as the foundation of the loosely coupled event system based on ScriptableObjects provided by the SODD Framework, from which all scriptable events implement.

Listeners can subscribe to the event using [AddListener\(Action<T>\)](#) and unsubscribe using [RemoveListener\(Action<T>\)](#). The event can be triggered using the [Invoke\(T\)](#) method, which notifies all subscribed listeners, passing the specified payload to them.

Usage of this interface promotes a pattern where components can react to specific game events, enhancing modularity and flexibility of the game's architecture.

## Methods

### Invoke(T)

Triggers the event, notifying all subscribed listeners and passing the specified payload to them.

```
void Invoke(T payload)
```

## Parameters

### payload T

The payload to pass to the listeners.

# Interface `IListenableEvent<T>`

Namespace: [SODD.Events](#)

Defines a generic interface for events with payloads of type `T` that can have listeners added or removed.

```
public interface IListenableEvent<out T>
```

## Type Parameters

`T`

The type of the event payload. This type parameter specifies the data type that listeners will receive when the event is invoked.

## Examples

Implementing [`IListenableEvent<T>`](#) for a custom event system:

```
public class HealthChangedEvent : IListenableEvent<int>
{
    private event Action<int> _onHealthChanged;

    public void AddListener(Action<int> listener)
    {
        _onHealthChanged += listener;
    }

    public void RemoveListener(Action<int> listener)
    {
        _onHealthChanged -= listener;
    }

    private void Invoke(int newHealth)
    {
        _onHealthChanged?.Invoke(newHealth);
    }
}
```

In this example, `HealthChangedEvent` uses an internal event delegate to manage subscribing and unsubscribing of listeners, and provides a private method `Invoke` to invoke all

subscribed listeners with the current health value.

## Remarks

The [IListenableEvent<T>](#) interface serves as the foundation for scriptable events and scriptable variables.

Listeners can subscribe to the event using [AddListener\(Action<T>\)](#) and unsubscribe using [RemoveListener\(Action<T>\)](#). When the event is internally triggered, it notifies all subscribed listeners, passing the specified payload to them.

## Methods

### AddListener(Action<T>)

Subscribes a listener to the event, allowing it to be notified when the event is invoked.

```
void AddListener(Action<out T> listener)
```

#### Parameters

##### `listener Action<T>`

The listener to add. It is a method that matches the signature of the [Action<T>](#) delegate, accepting a single parameter of type `T`.

### RemoveListener(Action<T>)

Unsubscribes a previously added listener from the event, preventing it from being notified when the event is invoked.

```
void RemoveListener(Action<out T> listener)
```

#### Parameters

##### `listener Action<T>`

The listener to remove. It must be the same instance that was previously added with [AddListener\(Action<T>\)](#).

# Class IntEvent

Namespace: [SODD.Events](#)

Represents a scriptable event that carries an integer payload.

```
public sealed class IntEvent : Event<int>, IEvent<int>, IListenableEvent<int>
```

## Inheritance

[object](#) ← [Event<int>](#) ← IntEvent

## Implements

[IEvent<int>](#), [IListenableEvent<int>](#)

## Inherited Members

[Event<int>.AddListener\(Action<int>\)](#) , [Event<int>.RemoveListener\(Action<int>\)](#) ,  
[Event<int>.Invoke\(int\)](#)

## Examples

Below is an example demonstrating how to define and use an [IntEvent](#) to track changes in a game score:

```
public class ScoreManager : MonoBehaviour
{
    public IntEvent onUpdateScore; // Assign this through the Unity Editor.

    private int _score;

    private void OnEnable()
    {
        onScoreChanged.AddListener(onUpdateScore);
    }

    private void OnDisable()
    {
        onScoreChanged.RemoveListener(onUpdateScore);
    }

    private void onUpdateScore(int increment)
    {
        _score += increment;
    }
}
```

```
    }  
}
```

This example shows a score manager that tracks and updates the player's score based on increments received through an event. Multiple components in the game, such as enemies when slain or coins when collected, can trigger this event to notify the need to increase the score without directly referencing the score manager.

## Remarks

This class extends the generic [Event<T>](#) class, specifying `int` as the type parameter. It is commonly used to communicate numeric values, such as scores, health points, or other quantifiable game mechanics.

Typical use cases include signaling changes in player scores, enemy health, or counting game items. This class enables events to be triggered with integer data, facilitating interaction between different components of the game without tight coupling.

This class can be instantiated as a ScriptableObject asset directly from the Unity Editor.

# Class StringEvent

Namespace: [SODD.Events](#)

Represents a scriptable event that carries a string payload.

```
public sealed class StringEvent : Event<string>, IEvent<string>,
IListenableEvent<string>
```

## Inheritance

[object](#) ← [Event<string>](#) ← StringEvent

## Implements

[IEvent<string>](#), [IListenableEvent<string>](#)

## Inherited Members

[Event<string>.AddListener\(Action<string>\)](#) ,  
[Event<string>.RemoveListener\(Action<string>\)](#) , [Event<string>.Invoke\(string\)](#)

## Examples

Below is an example demonstrating how to define and use a [StringEvent](#) for displaying messages in a game's UI:

```
public class UIManager : MonoBehaviour
{
    public StringEvent onDisplayMessage; // Assign this through the Unity Editor.
    public UnityEngine.UI.Text messageText; // Assign this UI text element in the
    Unity Editor.

    private void OnEnable()
    {
        onDisplayMessage.AddListener(DisplayMessage);
    }

    private void OnDisable()
    {
        onDisplayMessage.RemoveListener(DisplayMessage);
    }

    private void DisplayMessage(string message)
    {
```

```
        messageText.text = message;  
    }  
}
```

This example shows how the `onDisplayMessage` event can be used to update a UI text element whenever a new message needs to be displayed. This approach decouples the UI update logic from the rest of the game logic, enhancing modularity and maintainability.

## Remarks

This class extends the generic `Event<T>` class, specifying `string` as the type parameter. It is particularly useful for handling textual data within the game, such as user input, notifications, or dynamic text updates.

Typical use cases include sending messages between systems, updating UI text elements, or logging debug information.

This class can be created as a `ScriptableObject` asset directly from the Unity Editor.

# Class Vector2Event

Namespace: [SODD.Events](#)

Represents a scriptable event that carries a Vector2 payload.

```
public sealed class Vector2Event : Event<Vector2>, IEvent<Vector2>,
IListenableEvent<Vector2>
```

## Inheritance

[object](#) ← [Event](#)<Vector2> ← Vector2Event

## Implements

[IEvent](#)<Vector2>, [IListenableEvent](#)<Vector2>

## Inherited Members

[Event<Vector2>.AddListener\(Action<Vector2>\)](#) ,  
[Event<Vector2>.RemoveListener\(Action<Vector2>\)](#) , [Event<Vector2>.Invoke\(Vector2\)](#)

## Examples

Below is an example demonstrating how to use a [Vector2Event](#) for capturing and handling 2D player input in a game:

```
using UnityEngine;
using SODD.Events;

public class PlayerController : MonoBehaviour
{
    public Vector2Event onPlayerMove; // Assign this through the Unity Editor.

    private Vector2 _direction;

    private void OnEnable()
    {
        onPlayerMove.AddListener(OnPlayerMove);
    }

    private void OnDisable()
    {
        onPlayerMove.RemoveListener(OnPlayerMove);
    }
}
```

```
private void FixedUpdate()
{
    // Move player based on _direction
}

private void OnPlayerMove(Vector2 direction)
{
    _direction = direction;
}
}
```

This example shows how the `onPlayerMove` event can be used to read and respond to 2D movement inputs from the player. This method decouples input gathering from movement logic, allowing for more modular and easily maintainable code.

## Remarks

This class extends the generic `Event<T>` class, specifying `Vector2` as the type parameter. It is particularly useful for scenarios involving 2D vectors, such as player movement, touch inputs, or any other two-dimensional data transmission.

Typical use cases include capturing player directional inputs, tracking touch gestures, or sending coordinates for game elements to react to.

This class can be created as a `ScriptableObject` asset directly from the Unity Editor.

# Class Vector3Event

Namespace: [SODD.Events](#)

Represents a scriptable event that carries a Vector3 payload.

```
public sealed class Vector3Event : Event<Vector3>, IEvent<Vector3>,
IListenableEvent<Vector3>
```

## Inheritance

[object](#) ← [Event](#)<Vector3> ← Vector3Event

## Implements

[IEvent](#)<Vector3>, [IListenableEvent](#)<Vector3>

## Inherited Members

[Event<Vector3>.AddListener\(Action<Vector3>\)](#) ,  
[Event<Vector3>.RemoveListener\(Action<Vector3>\)](#) , [Event<Vector3>.Invoke\(Vector3\)](#)

## Examples

Below is an example demonstrating how to define and use a [Vector3Event](#) to manage particle spawning at specific 3D coordinates:

```
public class ParticleSpawner : MonoBehaviour
{
    public Vector3Event onSpawnParticles; // Assign this through the Unity Editor.
    public ParticleSystem particleSystem; // Assign your Particle System through the
    Unity Editor.

    private void OnEnable()
    {
        onSpawnParticles.AddListener(SpawnParticles);
    }

    private void OnDisable()
    {
        onSpawnParticles.RemoveListener(SpawnParticles);
    }

    private void SpawnParticles(Vector3 position)
    {
```

```
        particleSystem.transform.position = position;
        particleSystem.Emit(10); // Emit 10 particles at the given location
    }
}
```

This example shows how the `onSpawnParticles` event can be used to spawn particles at specific 3D coordinates received through the event, allowing for dynamic effects that are decoupled from the logic that triggers these effects.

## Remarks

This class extends the generic [Event<T>](#) class, specifying `Vector3` as the type parameter. It is ideal for scenarios involving three-dimensional vectors, such as spatial coordinates for moving objects, spawning items, or effects in 3D space.

Typical use cases include determining spawn locations for characters or objects, tracking movement paths, or coordinating complex particle effects in response to game actions.

This class can be created as a `ScriptableObject` asset directly from the Unity Editor.

# Class VoidEvent

Namespace: [SODD.Events](#)

Represents a scriptable event that carries no payload.

```
public sealed class VoidEvent : Event<Void>, IEvent<Void>, IListenableEvent<Void>
```

## Inheritance

[object](#) ← [Event<Void>](#) ← VoidEvent

## Implements

[IEvent<Void>](#), [IListenableEvent<Void>](#)

## Inherited Members

[Event<Void>.AddListener\(Action<Void>\)](#) , [Event<Void>.RemoveListener\(Action<Void>\)](#) ,  
[Event<Void>.Invoke\(Void\)](#)

## Examples

Below is an example demonstrating how to define and use a [VoidEvent](#) to trigger a level reset in a game:

```
public class LevelManager : MonoBehaviour
{
    public VoidEvent onLevelReset; // Assign this through the Unity Editor.

    private void OnEnable()
    {
        onLevelReset.AddListener(ResetLevel);
    }

    private void OnDisable()
    {
        onLevelReset.RemoveListener(ResetLevel);
    }

    private void ResetLevel()
    {
        // Add logic here to reset the level
    }
}
```

This example shows how the `onLevelReset` event can be used to initiate a level reset without needing to pass any specific data. This ensures that the action to reset can be easily triggered from multiple parts of the game without any dependencies on the event sender.

## Remarks

This class extends the generic `Event<T>` class, specifying `Void` as the type parameter. It is ideal for situations where the occurrence of the event is important, but no data needs to be communicated.

This class can be created as a `ScriptableObject` asset directly from the Unity Editor.

## Methods

### Invoke()

```
public void Invoke()
```

# Namespace SODD.Input

## Classes

### [ControlSchemeHandler](#)

Manages control schemes and handles switching between them based on input device events.

### [InputActionIconProvider](#)

Provides input action icons based on the current control scheme.

# Class ControlSchemeHandler

Namespace: [SODD.Input](#)

Manages control schemes and handles switching between them based on input device events.

```
public class ControlSchemeHandler : PassiveScriptableObject
```

## Inheritance

[object](#) ← [PassiveScriptableObject](#) ← ControlSchemeHandler

## Inherited Members

[PassiveScriptableObject.reference](#)

## Remarks

The [ControlSchemeHandler](#) class is responsible for managing control schemes within a Unity project. It listens to input system events and switches control schemes based on the active input device. This class extends [PassiveScriptableObject](#) to ensure it is loaded into memory during runtime.

When an input event is detected from a new device, the control scheme associated with that device is activated. The class invokes an event to notify other systems of the control scheme change and updates a variable to reflect the current control scheme.

# Class InputActionIconProvider

Namespace: [SODD.Input](#)

Provides input action icons based on the current control scheme.

```
public class InputActionIconProvider : PassiveScriptableObject
```

## Inheritance

[object](#) ← [PassiveScriptableObject](#) ← InputActionIconProvider

## Inherited Members

[PassiveScriptableObject.reference](#)

## Remarks

The [InputActionIconProvider](#) class is responsible for providing icons representing input actions based on the current control scheme. It listens for changes in the control scheme and updates the displayed icon accordingly. This class extends [PassiveScriptableObject](#) to ensure it is loaded into memory during runtime.

This class uses an [InputIconRepository](#) to fetch the appropriate icons for different input actions and control schemes. The icons are then applied to a target TMP\_SpriteAsset for display.

# Namespace SODD.Input.ActionHandlers

## Classes

### [BoolInputHandler](#)

A ScriptableObject that handles input actions passing boolean data.

### [FloatInputHandler](#)

A ScriptableObject that handles input actions passing float data.

### [InputHandler<T>](#)

Provides a base class for handling input actions and converting them into scriptable events.

### [Vector2InputHandler](#)

A ScriptableObject that handles input actions producing Vector2 values.

### [Vector3InputHandler](#)

Handles input actions that provide Vector3 data.

### [VoidInputHandler](#)

A ScriptableObject that handles input actions that do not pass data.

# Class BoolInputActionHandler

Namespace: [SODD.Input.ActionHandlers](#)

A ScriptableObject that handles input actions passing boolean data.

```
public sealed class BoolInputActionHandler : InputActionHandler<bool>
```

## Inheritance

[object](#) ← [PassiveScriptableObject](#) ← [InputActionHandler<bool>](#) ← [BoolInputActionHandler](#)

## Inherited Members

[PassiveScriptableObject.reference](#)

## Remarks

The [BoolInputActionHandler](#) is designed to process boolean input actions, providing a structured and reusable way to react to button press or toggle events within Unity's Input System. This concrete implementation of [InputActionHandler<T>](#) offers specific overrides for the action started, performed, and canceled events, translating input action data to boolean values.

## Methods

### OnActionCanceled(CallbackContext)

Called when the input action is canceled.

```
protected override void OnActionCanceled(InputAction.CallbackContext context)
```

#### Parameters

**context** CallbackContext

Context of the input action callback.

### OnActionPerformed(CallbackContext)

Called when the input action is performed.

```
protected override void OnActionPerformed(InputAction.CallbackContext context)
```

## Parameters

**context** CallbackContext

Context of the input action callback.

## OnActionStarted(CallbackContext)

Called when the input action starts.

```
protected override void OnActionStarted(InputAction.CallbackContext context)
```

## Parameters

**context** CallbackContext

Context of the input action callback.

# Class FloatInputActionHandler

Namespace: [SODD.Input.ActionHandlers](#)

A ScriptableObject that handles input actions passing float data.

```
public sealed class FloatInputActionHandler : InputActionHandler<float>
```

## Inheritance

[object](#) ← [PassiveScriptableObject](#) ← [InputActionHandler<float>](#) ← [FloatInputActionHandler](#)

## Inherited Members

[PassiveScriptableObject.reference](#)

## Remarks

The [FloatInputActionHandler](#) specializes in processing input actions that output float data, such as analog stick movement, trigger pressure, or any other input mechanism that generates a continuous range of values rather than discrete on/off signals.

This handler is ideal for scenarios where the precise value of an input, within a defined range, influences the game's behavior. Examples include adjusting the speed of a character's movement based on analog stick deflection or modulating audio volume.

# Class InputActionHandler<T>

Namespace: [SODD.Input.ActionHandlers](#)

Provides a base class for handling input actions and converting them into scriptable events.

```
public abstract class InputActionHandler<T> : PassiveScriptableObject where T : struct
```

## Type Parameters

T

The data type of the input value, defined by the input action being handled.

## Inheritance

[object](#) ← [PassiveScriptableObject](#) ← InputActionHandler<T>

## Derived

[BoolInputActionHandler](#), [FloatInputActionHandler](#), [Vector2InputActionHandler](#),  
[Vector3InputActionHandler](#), [VoidInputActionHandler](#)

## Inherited Members

[PassiveScriptableObject.reference](#)

## Examples

Below is an example of how to create a concrete implementation of [InputActionHandler<T>](#) for handling Vector2 input actions, commonly used for 2D movement:

```
[CreateAssetMenu(menuName = "InputHandlers/Vector2InputActionHandler")]
public class Vector2InputActionHandler : InputActionHandler<Vector2>
{
    // Override methods if needed for custom behavior upon input events.
}
```

In the Unity Editor, create an instance of this ScriptableObject and assign the input action reference along with any event subscribers to handle the input action events.

## Remarks

This abstract class serves as the foundation for all input action handler implementations within the SODD Framework. It allows for the decoupling of input handling logic from game objects and components by translating the events provided by Unity's Input System into the SODD Framework's scriptable event system.

This class listens to three phases of an input action—started, performed, and canceled—and invokes the corresponding scriptable events.

To create custom input action handlers inherit from this class and specifying the appropriate type for `T` based on your input action's expected output. Then, assign input action references and connect event listeners to handle specific input events.

## Fields

### inputActionReference

Reference to the `InputAction` to be handled.

```
protected InputActionReference inputActionReference
```

### Field Value

`InputActionReference`

### onActionCanceled

Event triggered when the input action is canceled.

```
protected Event<T> onActionCanceled
```

### Field Value

`Event<T>`

### onActionPerformed

Event triggered when the input action is performed.

```
protected Event<T> onActionPerformed
```

## Field Value

[Event<T>](#)

## onActionStarted

Event triggered when the input action starts.

```
protected Event<T> onActionStarted
```

## Field Value

[Event<T>](#)

## targetVariable

```
protected Variable<T> targetVariable
```

## Field Value

[Variable<T>](#)

## Methods

### OnActionCanceled(CallbackContext)

Called when the input action is canceled.

```
protected virtual void OnActionCanceled(InputAction.CallbackContext context)
```

## Parameters

`context` CallbackContext

Context of the input action callback.

## OnActionPerformed(CallbackContext)

Called when the input action is performed.

```
protected virtual void OnActionPerformed(InputAction.CallbackContext context)
```

### Parameters

**context** CallbackContext

Context of the input action callback.

## OnActionStarted(CallbackContext)

Called when the input action starts.

```
protected virtual void OnActionStarted(InputAction.CallbackContext context)
```

### Parameters

**context** CallbackContext

Context of the input action callback.

## See Also

[Event<T>](#)

# Class Vector2InputActionHandler

Namespace: [SODD.Input.ActionHandlers](#)

A ScriptableObject that handles input actions producing Vector2 values.

```
public sealed class Vector2InputActionHandler : InputActionHandler<Vector2>
```

## Inheritance

[object](#) ← [PassiveScriptableObject](#) ← [InputActionHandler](#)<Vector2> ←  
Vector2InputActionHandler

## Inherited Members

[PassiveScriptableObject.reference](#)

## Remarks

The [Vector2InputActionHandler](#) is optimized for input actions where the output is a two-dimensional vector, such as directional inputs from a joystick or touchpad. Typical use cases include controlling character movement, camera panning, or any scenario requiring directional input.

# Class Vector3InputActionHandler

Namespace: [SODD.Input.ActionHandlers](#)

Handles input actions that provide Vector3 data.

```
public sealed class Vector3InputActionHandler : InputActionHandler<Vector3>
```

## Inheritance

[object](#) ← [PassiveScriptableObject](#) ← [InputActionHandler](#)<Vector3> ←  
Vector3InputActionHandler

## Inherited Members

[PassiveScriptableObject.reference](#)

## Remarks

This class extends [InputActionHandler<T>](#) to specifically handle input actions that output Vector3 data, such as 3D spatial movements or directional inputs. It is ideal for applications requiring precise control over 3D space, such as camera controls, character movement, or object manipulation. Subscribers can listen to the events raised by this handler to react to the start, performance, or cancellation of the input action with Vector3 data.

# Class VoidInputActionHandler

Namespace: [SODD.Input.ActionHandlers](#)

A ScriptableObject that handles input actions that do not pass data.

```
public sealed class VoidInputActionHandler : InputActionHandler<Void>
```

## Inheritance

[object](#) ← [PassiveScriptableObject](#) ← [InputActionHandler<Void>](#) ← [VoidInputActionHandler](#)

## Inherited Members

[PassiveScriptableObject.reference](#)

## Remarks

The [VoidInputActionHandler](#) is designed for input actions where the action itself is significant, but the action's data is not. This is common in scenarios such as button presses where the timing and occurrence of the action are important, but the action does not carry additional data (e.g., a jump or confirm button press).

This handler triggers events for the started, performed, and canceled phases of an input action, using a [Void](#) type as payload to signify the absence of specific data. This approach maintains consistency with the [InputActionHandler](#) system while accommodating actions that do not require data.

## Methods

### OnActionCanceled(CallbackContext)

Called when the input action is canceled.

```
protected override void OnActionCanceled(InputAction.CallbackContext context)
```

## Parameters

**context** CallbackContext

Context of the input action callback.

## OnActionPerformed(CallbackContext)

Called when the input action is performed.

```
protected override void OnActionPerformed(InputAction.CallbackContext context)
```

### Parameters

**context** CallbackContext

Context of the input action callback.

## OnActionStarted(CallbackContext)

Called when the input action starts.

```
protected override void OnActionStarted(InputAction.CallbackContext context)
```

### Parameters

**context** CallbackContext

Context of the input action callback.

# Namespace SODD.Listeners

## Classes

### [BoolEventListener](#)

Represents an event listener for boolean events.

### [EventListener<T>](#)

Represents an abstract component that listens for events of a specific type `T` and triggers UnityEvents in response.

### [FloatEventListener](#)

Represents an event listener for float events.

### [GameObjectEventListener](#)

Represents an event listener for GameObject events.

### [IntEventListener](#)

Represents an event listener for integer events.

### [StringEventListener](#)

Represents an event listener for string events.

### [Vector2EventListener](#)

Represents an event listener for Vector2 events.

### [Vector3EventListener](#)

Represents an event listener for Vector3 events.

### [VoidEventListener](#)

Represents an event listener for void events.

## Interfaces

### [IEventListener<T>](#)

Represents a listener for an event of type `T`.

# Class BoolEventListener

Namespace: [SODD.Listeners](#)

Represents an event listener for boolean events.

```
public class BoolEventListener : EventListener<bool>, IEventListener<bool>
```

## Inheritance

[object](#) ← [Event Listener<bool>](#) ← [BoolEventListener](#)

## Implements

[IEventListener<bool>](#)

## Inherited Members

[Event Listener<bool>.targetEvent](#) , [Event Listener<bool>.onEventInvoked](#) ,  
[Event Listener<bool>.StartListening\(IEvent<bool>\)](#) ,  
[Event Listener<bool>.StopListening\(IEvent<bool>\)](#) ,  
[Event Listener<bool>.OnEventInvoked\(bool\)](#).

# Class EventListener<T>

Namespace: [SODD.Listeners](#)

Represents an abstract component that listens for events of a specific type **T** and triggers UnityEvents in response.

```
public abstract class EventListener<T> : MonoBehaviour, IEventListener<T>
```

## Type Parameters

**T**

The type of the event payload.

## Inheritance

[object](#) ← EventListener<T>

## Implements

[IEventListener<T>](#)

## Derived

[BoolEventLister](#), [FloatEventLister](#), [GameObjectEventLister](#), [IntEventLister](#),  
[StringEventLister](#), [Vector2EventLister](#), [Vector3EventLister](#), [VoidEventLister](#)

## Examples

A StringEvent Listener implementation would look like this:

```
public class StringEventLister : EventListener<string> {}
```

## Remarks

This abstract class provides a foundation for creating scriptable event listeners. It implements the [IEventListener<T>](#) interface and inherits the MonoBehaviour class, simplifying the process of subscribing to and unsubscribing from events based on the MonoBehaviour's lifecycle, ensuring that listeners are only active when the MonoBehaviour is enabled.

To create a custom event listener, inherit from this class and specify the payload type **T**, it can be any valid Unity type (e.g., int, string, GameObject, etc.). In the Unity Editor, attach

your new custom event listener component to a GameObject, assign the specific scriptable event to listen to and configure the response through the exposed UnityEvent [onEventInvoked](#).

## Fields

### onEventInvoked

```
protected UnityEvent<T> onEventInvoked
```

#### Field Value

UnityEvent<T>

### targetEvent

```
protected Event<T> targetEvent
```

#### Field Value

Event<T>

## Methods

### OnEventInvoked(T)

Called when the event is invoked, triggering the assigned UnityEvent.

```
public void OnEventInvoked(T payload)
```

#### Parameters

**payload** T

The payload passed to the event.

## StartListening(IEvent<T>)

Subscribes to the target event.

```
public void StartListening(IEvent<T> @event)
```

### Parameters

event [IEvent<T>](#)

The event to start listening to.

## StopListening(IEvent<T>)

Unsubscribes from the target event.

```
public void StopListening(IEvent<T> @event)
```

### Parameters

event [IEvent<T>](#)

The event to stop listening to.

## See Also

[IEventListener<T>](#)

[Event<T>](#)

[IEvent<T>](#)

# Class FloatEventListener

Namespace: [SODD.Listeners](#)

Represents an event listener for float events.

```
public class FloatEventListener : EventListener<float>, IEventListener<float>
```

## Inheritance

[object](#) ← [EventListener<float>](#) ← [FloatEventListener](#)

## Implements

[IEventListener<float>](#)

## Inherited Members

[EventListener<float>.targetEvent](#) , [EventListener<float>.onEventInvoked](#) ,  
[EventListener<float>.StartListening\(IEvent<float>\)](#) ,  
[EventListener<float>.StopListening\(IEvent<float>\)](#) ,  
[EventListener<float>.OnEventInvoked\(float\)](#)

# Class GameObjectEventListener

Namespace: [SODD.Listeners](#)

Represents an event listener for GameObject events.

```
public class GameObjectEventListener : EventListener<GameObject>,  
IEventListener<GameObject>
```

## Inheritance

[object](#) ← [Event Listener](#)<GameObject> ← GameObjectEventListener

## Implements

[IEventListener](#)<GameObject>

## Inherited Members

[Event Listener<GameObject>.targetEvent](#) , [Event Listener<GameObject>.onEventInvoked](#) ,  
[Event Listener<GameObject>.StartListening\(IEvent<GameObject>\)](#) ,  
[Event Listener<GameObject>.StopListening\(IEvent<GameObject>\)](#) ,  
[Event Listener<GameObject>.OnEventInvoked\(GameObject\)](#)

# Interface IEventListener<T>

Namespace: [SODD.Listeners](#)

Represents a listener for an event of type T.

```
public interface IEventListener<T>
```

## Type Parameters

T

The type of the event payload.

## Methods

### OnEventInvoked(T)

Defines a method that is called when an event is invoked.

```
void OnEventInvoked(T payload)
```

## Parameters

payload T

The payload passed to the event.

### StartListening(IEvent<T>)

Starts listening to the specified event by adding the supplied event listener.

```
void StartListening(IEvent<T> @event)
```

## Parameters

event [IEvent<T>](#)

The event to listen to.

## Remarks

This method adds the [OnEventInvoked\(T\)](#) method as a listener to the specified event, which will be invoked whenever the event is triggered.

## StopListening(IEvent<T>)

Stops listening to an event.

```
void StopListening(IEvent<T> @event)
```

## Parameters

event [IEvent<T>](#)

The event to stop listening to.

# Class IntEventListener

Namespace: [SODD.Listeners](#)

Represents an event listener for integer events.

```
public class IntEventListener : EventListener<int>, IEventListener<int>
```

## Inheritance

[object](#) ← [Event Listener<int>](#) ← [IntEventListener](#)

## Implements

[IEventListener<int>](#)

## Inherited Members

[Event Listener<int>.targetEvent](#) , [Event Listener<int>.onEventInvoked](#) ,  
[Event Listener<int>.StartListening\(IEvent<int>\)](#) ,  
[Event Listener<int>.StopListening\(IEvent<int>\)](#) , [Event Listener<int>.OnEventInvoked\(int\)](#)

# Class StringEventListener

Namespace: [SODD.Listeners](#)

Represents an event listener for string events.

```
public class StringEventListener : EventListener<string>, IEventListener<string>
```

## Inheritance

[object](#) ← [EventListener<string>](#) ← [StringEventListener](#)

## Implements

[IEventListener<string>](#)

## Inherited Members

[EventListener<string>.targetEvent](#) , [EventListener<string>.onEventInvoked](#) ,  
[EventListener<string>.StartListening\(IEvent<string>\)](#) ,  
[EventListener<string>.StopListening\(IEvent<string>\)](#) ,  
[EventListener<string>.OnEventInvoked\(string\)](#)

# Class Vector2EventListener

Namespace: [SODD.Listeners](#)

Represents an event listener for Vector2 events.

```
public class Vector2EventListener : EventListener<Vector2>, IEventListener<Vector2>
```

## Inheritance

[object](#) ← [EventListener](#)<Vector2> ← Vector2EventListener

## Implements

[IEventListener](#)<Vector2>

## Inherited Members

[EventListener<Vector2>.targetEvent](#) , [EventListener<Vector2>.onEventInvoked](#) ,  
[EventListener<Vector2>.StartListening\(IEvent<Vector2>\)](#) ,  
[EventListener<Vector2>.StopListening\(IEvent<Vector2>\)](#) ,  
[EventListener<Vector2>.OnEventInvoked\(Vector2\)](#).

# Class Vector3EventListener

Namespace: [SODD.Listeners](#)

Represents an event listener for Vector3 events.

```
public class Vector3EventListener : EventListener<Vector3>, IEventListener<Vector3>
```

## Inheritance

[object](#) ← [EventListener](#)<Vector3> ← Vector3EventListener

## Implements

[IEventListener](#)<Vector3>

## Inherited Members

[EventListener<Vector3>.targetEvent](#) , [EventListener<Vector3>.onEventInvoked](#) ,  
[EventListener<Vector3>.StartListening\(IEvent<Vector3>\)](#) ,  
[EventListener<Vector3>.StopListening\(IEvent<Vector3>\)](#) ,  
[EventListener<Vector3>.OnEventInvoked\(Vector3\)](#).

# Class VoidEventListener

Namespace: [SODD.Listeners](#)

Represents an event listener for void events.

```
public class VoidEventListener : EventListener<Void>, IEventListener<Void>
```

## Inheritance

[object](#) ← [Event Listener<Void>](#) ← [VoidEventListener](#)

## Implements

[IEventListener<Void>](#)

## Inherited Members

[Event Listener<Void>.targetEvent](#) , [Event Listener<Void>.onEventInvoked](#) ,  
[Event Listener<Void>.StartListening\(IEvent<Void>\)](#) ,  
[Event Listener<Void>.StopListening\(IEvent<Void>\)](#) ,  
[Event Listener<Void>.OnEventInvoked\(Void\)](#).

# Namespace SODD.Observers

## Classes

### [BoolVariableObserver](#)

Represents a component that observes changes in a [BoolVariable](#)'s value and triggers UnityEvents in response.

### [FloatVariableObserver](#)

Represents a component that observes changes in a [FloatVariable](#)'s value and triggers UnityEvents in response.

### [IntVariableObserver](#)

Represents a component that observes changes in a [IntVariable](#)'s value and triggers UnityEvents in response.

### [StringVariableObserver](#)

Represents a component that observes changes in a [StringVariable](#)'s value and triggers UnityEvents in response.

### [VariableObserver<T>](#)

Represents an abstract component that observes changes in a [Variable<T>](#) of a specific type [T](#) and triggers UnityEvents in response.

### [Vector2VariableObserver](#)

Represents a component that observes changes in a [Vector2Variable](#)'s value and triggers UnityEvents in response.

### [Vector3VariableObserver](#)

Represents a component that observes changes in a [Vector3Variable](#)'s value and triggers UnityEvents in response.

# Class BoolVariableObserver

Namespace: [SODD.Observers](#)

Represents a component that observes changes in a [BoolVariable](#)'s value and triggers UnityEvents in response.

```
public class BoolVariableObserver : VariableObserver<bool>
```

## Inheritance

[object](#) ← [VariableObserver<bool>](#) ← BoolVariableObserver

## Remarks

This class extends [VariableObserver<T>](#) by adding functionality to convert the boolean value to a string in different formats (lowercase, uppercase, or capitalized) and trigger an event when the string value changes. This feature can be useful for UI elements where boolean states need to be displayed textually.

## Methods

### OnVariableValueChanged(bool)

Called when the variable's value changes.

```
protected override void OnVariableValueChanged(bool value)
```

## Parameters

**value** [bool](#)

The new value of the variable.

# Class FloatVariableObserver

Namespace: [SODD.Observers](#)

Represents a component that observes changes in a [FloatVariable](#)'s value and triggers UnityEvents in response.

```
public class FloatVariableObserver : VariableObserver<float>
```

## Inheritance

[object](#) ← [VariableObserver<float>](#) ← [FloatVariableObserver](#)

## Methods

### OnVariableValueChanged(float)

Called when the variable's value changes.

```
protected override void OnVariableValueChanged(float value)
```

## Parameters

**value** [float](#)

The new value of the variable.

# Class IntVariableObserver

Namespace: [SODD.Observers](#)

Represents a component that observes changes in a [IntVariable](#)'s value and triggers UnityEvents in response.

```
public class IntVariableObserver : VariableObserver<int>
```

## Inheritance

[object](#) ← [VariableObserver<int>](#) ← [IntVariableObserver](#)

## Fields

### onValueChangedAsString

```
[CollapsibleAttribute]  
public UnityEvent<string> onValueChangedAsString
```

## Field Value

UnityEvent<[string](#)>

## Methods

### OnVariableValueChanged(int)

Called when the variable's value changes.

```
protected override void OnVariableValueChanged(int value)
```

## Parameters

`value int`

The new value of the variable.

# Class StringVariableObserver

Namespace: [SODD.Observers](#)

Represents a component that observes changes in a [StringVariable](#)'s value and triggers UnityEvents in response.

```
public class StringVariableObserver : VariableObserver<string>
```

## Inheritance

[object](#) ← [VariableObserver<string>](#) ← StringVariableObserver

## Inherited Members

[VariableObserver<string>.OnVariableValueChanged\(string\)](#)

## Remarks

This class inherits from the [VariableObserver<T>](#) where **T** is a string. It provides a ready-to-use observer component that can be attached to any GameObject to monitor changes in string variables. This observer does not implement additional logic; it utilizes the functionality provided by its base class to link string variable changes directly to Unity events.

# Class VariableObserver<T>

Namespace: [SODD.Observers](#)

Represents an abstract component that observes changes in a [Variable<T>](#) of a specific type **T** and triggers UnityEvents in response.

```
public abstract class VariableObserver<T> : MonoBehaviour
```

## Type Parameters

**T**

The type of the variable being observed.

## Inheritance

[Object](#) ← VariableObserver<T>

## Derived

[BoolVariableObserver](#), [FloatVariableObserver](#), [IntVariableObserver](#), [StringVariableObserver](#),  
[Vector2VariableObserver](#), [Vector3VariableObserver](#)

## Examples

An implementation example for an IntVariable observer might look like this:

```
public class IntVariableObserver : VariableObserver<int>
{
}
```

## Remarks

This abstract class provides a foundation for creating scriptable variable observers. It simplifies the process of subscribing to and unsubscribing from variable changes, ensuring that observers are only active when the MonoBehaviour is enabled.

To create a custom variable observer, inherit from this class and specify the variable type **T**, which can be any valid Unity type (e.g., int, string, GameObject, etc.). In the Unity Editor, attach your new custom variable observer component to a GameObject, assign the specific scriptable variable to observe, and configure the response through the exposed UnityEvent [onValueChanged](#).

# Methods

## OnVariableValueChanged(T)

Called when the variable's value changes.

```
protected virtual void OnVariableValueChanged(T value)
```

### Parameters

**value** T

The new value of the variable.

### See Also

[Variable<T>](#)

# Class Vector2VariableObserver

Namespace: [SODD.Observers](#)

Represents a component that observes changes in a [Vector2Variable](#)'s value and triggers UnityEvents in response.

```
public class Vector2VariableObserver : VariableObserver<Vector2>
```

## Inheritance

[object](#) ← [VariableObserver](#)<Vector2> ← Vector2VariableObserver

## Fields

### onValueChangedAsString

```
[CollapsibleAttribute]  
public UnityEvent<string> onValueChangedAsString
```

## Field Value

UnityEvent<[string](#)>

## Methods

### OnVariableValueChanged(Vector2)

Called when the variable's value changes.

```
protected override void OnVariableValueChanged(Vector2 value)
```

## Parameters

**value** Vector2

The new value of the variable.

# Class Vector3VariableObserver

Namespace: [SODD.Observers](#)

Represents a component that observes changes in a [Vector3Variable](#)'s value and triggers UnityEvents in response.

```
public class Vector3VariableObserver : VariableObserver<Vector3>
```

## Inheritance

[object](#) ← [VariableObserver](#)<Vector3> ← Vector3VariableObserver

## Fields

### onValueChangedAsString

```
[CollapsibleAttribute]  
public UnityEvent<string> onValueChangedAsString
```

## Field Value

UnityEvent<[string](#)>

## Methods

### OnVariableValueChanged(Vector3)

Called when the variable's value changes.

```
protected override void OnVariableValueChanged(Vector3 value)
```

## Parameters

**value** Vector3

The new value of the variable.

# Namespace SODD.Repositories

## Classes

### [BinaryFileRepository<T>](#)

Provides a concrete implementation of [FileRepository<T>](#) that manages data through binary serialization.

### [FileRepository<T>](#)

Provides a base implementation of  [IRepository<T>](#) for file-based data storage.

### [InputIconRepository](#)

Provides a repository for input action icons, mapping input actions to their respective icons.

### [JsonFileRepository<T>](#)

Provides a concrete implementation of [FileRepository<T>](#) that manages data through JSON serialization.

### [VariableRepository](#)

Manages a repository of variables, allowing for their persistent storage and retrieval using binary serialization.

## Interfaces

### [IRepository<T>](#)

Defines a generic repository interface for managing persistent data.

# Class BinaryFileRepository<T>

Namespace: [SODD.Repositories](#)

Provides a concrete implementation of [FileRepository<T>](#) that manages data through binary serialization.

```
public class BinaryFileRepository<T> : FileRepository<T>, IRepository<T>
```

## Type Parameters

T

The type of data managed by the repository.

## Inheritance

[object](#) ← [FileRepository<T>](#) ← [BinaryFileRepository<T>](#)

## Implements

[IRepository<T>](#)

## Inherited Members

[FileRepository<T>.filename](#) , [FileRepository<T>.Filename](#)

## Remarks

This class implements the saving, loading, and deleting of data using the [BinaryFormatter](#), which serializes and deserializes an object, or an entire graph of connected objects, in binary format. It is suitable for storing data such as game states, configurations, or user data in a compact, binary format that is not human-readable, enhancing both security and storage efficiency.

## Constructors

### BinaryFileRepository()

Initializes a new instance of the [BinaryFileRepository<T>](#) class.

```
public BinaryFileRepository()
```

# BinaryFileRepository(string)

Initializes a new instance of the [BinaryFileRepository<T>](#) class with the specified filename.

```
public BinaryFileRepository(string filename)
```

## Parameters

filename [string](#)

The filename to use for storing the binary data. Cannot be null.

## Methods

### Delete()

Deletes the binary file where the data is stored.

```
public override void Delete()
```

## Remarks

This method deletes the file specified by [Filename](#) from Application.persistentDataPath.

### Exists()

Determines whether the repository exists.

```
public override bool Exists()
```

## Returns

[bool](#)

[true](#) if the repository exists; otherwise, [false](#).

### Load()

Loads the entity from a binary file.

```
public override T Load()
```

Returns

T

The loaded entity of type T.

Remarks

This method deserializes the data from a binary file specified by [Filename](#) into an object of type T.

## Save(T)

Saves the specified entity to a binary file.

```
public override void Save(T t)
```

Parameters

t T

The entity to save. The entity must be serializable.

Remarks

This method serializes the object of type T using [BinaryFormatter](#) and writes it to a file specified by [Filename](#). The data path used is Application.persistentDataPath.

# Class FileRepository<T>

Namespace: [SODD.Repositories](#)

Provides a base implementation of  [IRepository<T>](#) for file-based data storage.

```
public abstract class FileRepository<T> : IRepository<T>
```

## Type Parameters

T

The type of data managed by the repository.

### Inheritance

[object](#) ← FileRepository<T>

### Implements

[IRepository<T>](#)

### Derived

[BinaryFileRepository<T>](#), [JsonFileRepository<T>](#)

## Remarks

This abstract class lays the foundation for creating file-based repositories that can save, load, and delete data of type T. Implementations require a filename for the underlying storage mechanism.

## Constructors

### FileRepository()

Initializes a new instance of the [FileRepository<T>](#) class without specifying a filename. The filename must be set before performing I/O operations.

```
protected FileRepository()
```

# FileRepository(string)

Initializes a new instance of the [FileRepository<T>](#) class with the specified filename.

```
protected FileRepository(string filename)
```

## Parameters

### filename string

The filename to use for data storage. Cannot be null.

## Fields

### filename

The filename used for storing data.

```
protected string filename
```

## Field Value

### string

## Properties

### Filename

Gets or sets the filename used for data storage.

```
public virtual string Filename { get; set; }
```

## Property Value

### string

# Methods

## Delete()

Deletes the entity of type `T` from the repository.

```
public abstract void Delete()
```

## Exists()

Determines whether the repository exists.

```
public abstract bool Exists()
```

Returns

[bool](#)

`true` if the repository exists; otherwise, `false`.

## Load()

Loads the entity of type `T` from the repository.

```
public abstract T Load()
```

Returns

`T`

The loaded entity of type `T`.

## Save(`T`)

Saves the specified entity of type `T` to the repository.

```
public abstract void Save(T t)
```

## Parameters

t T

The entity to save.

# Interface IRepository<T>

Namespace: [SODD.Repositories](#)

Defines a generic repository interface for managing persistent data.

```
public interface IRepository<T>
```

## Type Parameters

T

The type of data the repository manages.

## Remarks

This interface provides a framework for implementing CRUD (Create, Read, Update, Delete) operations on data of type T. Implementations should encapsulate the specifics of data storage, retrieval, and deletion.

## Methods

### Delete()

Deletes the entity of type T from the repository.

```
void Delete()
```

### Exists()

Determines whether the repository exists.

```
bool Exists()
```

## Returns

[bool](#)

`true` if the repository exists; otherwise, `false`.

## Load()

Loads the entity of type `T` from the repository.

```
T Load()
```

Returns

`T`

The loaded entity of type `T`.

## Save(`T`)

Saves the specified entity of type `T` to the repository.

```
void Save(T t)
```

Parameters

`t` `T`

The entity to save.

# Class InputIconRepository

Namespace: [SODD.Repositories](#)

Provides a repository for input action icons, mapping input actions to their respective icons.

```
public class InputIconRepository : PassiveScriptableObject
```

## Inheritance

[object](#) ← [PassiveScriptableObject](#) ← InputIconRepository

## Inherited Members

[PassiveScriptableObject.reference](#)

## Remarks

The [InputIconRepository](#) class manages a dictionary of input actions and their corresponding icons. It allows for retrieving the appropriate icon based on an input action path, facilitating the display of correct icons in the UI depending on the active control scheme.

This class extends [PassiveScriptableObject](#) to ensure it is loaded into memory during runtime and can be accessed by other systems that require input action icons.

## Methods

### GetIcon(string)

Retrieves the icon associated with a given input action path.

```
public Sprite GetIcon(string path)
```

#### Parameters

**path** [string](#)

The path of the input action.

#### Returns

## Sprite

The associated icon if found; otherwise, the default icon.

## Remarks

This method searches the icon map for an icon associated with the specified input action path. If no matching icon is found, the default icon is returned.

# Class JsonFileRepository<T>

Namespace: [SODD.Repositories](#)

Provides a concrete implementation of [FileRepository<T>](#) that manages data through JSON serialization.

```
public class JsonFileRepository<T> : FileRepository<T>, IRepository<T>
```

## Type Parameters

T

The type of data managed by the repository.

### Inheritance

[object](#) ← [FileRepository<T>](#) ← [JsonFileRepository<T>](#)

### Implements

[IRepository<T>](#)

### Inherited Members

[FileRepository<T>.filename](#) , [FileRepository<T>.Filename](#)

## Remarks

This class implements the saving, loading, and deleting of data using JSON serialization, leveraging JsonUtility for serialization and deserialization. It is ideal for storing data such as game settings, player progress, or other configuration data in a human-readable format, making it easier to edit manually if necessary.

## Constructors

### JsonFileRepository()

Initializes a new instance of the [JsonFileRepository<T>](#) class.

```
public JsonFileRepository()
```

# JsonFileRepository(string)

Initializes a new instance of the [JsonFileRepository<T>](#) class with the specified filename.

```
public JsonFileRepository(string filename)
```

## Parameters

filename [string](#)

The filename to use for storing the JSON data. Cannot be null.

## Methods

### Delete()

Deletes the JSON file where the data is stored.

```
public override void Delete()
```

## Remarks

This method deletes the file specified by [Filename](#) from Application.persistentDataPath.

### Exists()

Determines whether the repository exists.

```
public override bool Exists()
```

## Returns

[bool](#)

[true](#) if the repository exists; otherwise, [false](#).

### Load()

Loads the entity from a JSON file.

```
public override T Load()
```

Returns

T

The loaded entity of type T.

Remarks

This method deserializes the data from a JSON file specified by [Filename](#) into an object of type T using JsonUtility.

## Save(T)

Saves the specified entity to a JSON file.

```
public override void Save(T t)
```

Parameters

t T

The entity to save.

Remarks

This method serializes the object of type T using JsonUtility and writes it to a file specified by [Filename](#). The data path used is Application.persistentDataPath.

# Class VariableRepository

Namespace: [SODD.Repositories](#)

Manages a repository of variables, allowing for their persistent storage and retrieval using binary serialization.

```
public class VariableRepository : PassiveScriptableObject
```

## Inheritance

[object](#) ← [PassiveScriptableObject](#) ← VariableRepository

## Inherited Members

[PassiveScriptableObject.reference](#)

## Remarks

This ScriptableObject serves as a repository for various game variables, such as settings or player data, and leverages binary serialization for efficient, non-human-readable storage. The repository can be configured to automatically load variables when enabled and save them when disabled.

A custom editor script adds functionality to log variable data when saving or loading, and provides buttons for manual save and load operations, aiding in testing and debugging.

The repository works with variables that extend [PersistentScriptableObject](#), which includes a toggle to indicate whether the variable should be persisted. This toggle allows for automatic management of variables in the repository, simplifying the process of maintaining persistent state across game sessions.

## Methods

### Delete()

Deletes the binary file where the variables are stored.

```
public void Delete()
```

## Load()

Loads the state of variables from a binary file.

```
public void Load()
```

## Save()

Saves the current state of variables to a binary file.

```
public void Save()
```

# Namespace SODD.UI

## Classes

### [OptionSelector](#)

A selectable UI component that allows the user to cycle through a list of options.

# Class OptionSelector

Namespace: [SODD.UI](#)

A selectable UI component that allows the user to cycle through a list of options.

```
public class OptionSelector : Selectable
```

## Inheritance

[object](#) ← OptionSelector

## Examples

Example usage of the [OptionSelector](#) class:

```
[SerializeField]
private OptionSelector optionSelector;

void Start()
{
    optionSelector.SetOptions(new List<string> { "Option 1", "Option 2", "Option 3" });
    optionSelector.onOptionSelected.AddListener(OnOptionSelected);
}

private void OnOptionSelected(int index)
{
    Debug.Log("Selected option index: " + index);
}
```

## Remarks

The [OptionSelector](#) class extends Selectable and provides functionality for navigating through a list of string options. It supports both horizontal and vertical navigation and invokes an event when an option is selected.

## Properties

### Value

Gets or sets the current index of the selected option.

```
public int Value { get; set; }
```

Property Value

[int](#)

## Methods

### AddOption(string)

Adds an option to the list of options.

```
public void AddOption(string option)
```

Parameters

[option](#) [string](#)

The option to add.

Exceptions

[ArgumentNullException](#)

Thrown if [option](#) is null.

### AddOptions(List<string>)

Adds a list of options to the existing options.

```
public void AddOptions(List<string> optionsList)
```

Parameters

[optionsList](#) [List<string>](#)

The list of options to add.

## Exceptions

### [ArgumentNullException](#)

Thrown if `optionsList` is null.

## OnMove(AxisEventData)

Handles navigation events for the option selector.

```
public override void OnMove(AxisEventData eventData)
```

## Parameters

### `eventData` AxisEventData

The event data.

## SelectNext()

Selects the next option in the list.

```
public void SelectNext()
```

## SelectPrevious()

Selects the previous option in the list.

```
public void SelectPrevious()
```

## SetOptions(List<string>)

Sets the list of options to select from.

```
public void SetOptions(List<string> optionsList)
```

## Parameters

**optionsList** [List<string>](#)

The list of options.

## Exceptions

[ArgumentNullException](#)

Thrown if **optionsList** is null.

## SetValueWithoutNotify(int)

Sets the value without invoking the option selected event.

```
public void SetValueWithoutNotify(int value)
```

## Parameters

**value** [int](#)

The index of the option to select.

## Exceptions

[ArgumentOutOfRangeException](#)

Thrown if **value** is out of range.

# Namespace SODD.Variables

## Classes

### [BoolVariable](#)

A ScriptableObject representing a boolean variable.

### [FloatVariable](#)

A ScriptableObject representing a floating-point number variable.

### [GameObjectVariable](#)

A ScriptableObject representing a GameObject variable.

### [IntVariable](#)

A ScriptableObject representing an integer variable.

### [LayerMaskVariable](#)

A ScriptableObject representing a LayerMask variable.

### [StringVariable](#)

A ScriptableObject representing a string variable.

### [ValueReference<T>](#)

Represents a reference holder for values of type `T`.

### [Variable<T>](#)

Represents an abstract variable of type `T`.

### [Vector2Variable](#)

A ScriptableObject representing a Vector2 variable.

### [Vector3Variable](#)

A ScriptableObject representing a Vector3 variable.

## Interfaces

### [IVariable](#)

Represents a generic variable interface for type-agnostic variable usage.

### [IVariable<T>](#)

Represents a generic variable interface with a specific type.

# Class BoolVariable

Namespace: [SODD.Variables](#)

A ScriptableObject representing a boolean variable.

```
public class BoolVariable : Variable<bool>, IVariable, IVariable<bool>,  
IListenableEvent<bool>
```

## Inheritance

[object](#) ← [PersistentScriptableObject](#) ← [Variable<bool>](#) ← [BoolVariable](#)

## Implements

[IVariable](#), [IVariable<bool>](#), [IListenableEvent<bool>](#)

## Inherited Members

[Variable<bool>.value](#) , [Variable<bool>.readOnly](#) , [Variable<bool>.OnValueChanged](#) ,  
[Variable<bool>.Id](#) , [Variable<bool>.Value](#) , [Variable<bool>.HandleValueChange\(\)](#) ,  
[Variable<bool>.AddListener\(Action<bool>\)](#) ,  
[Variable<bool>.RemoveListener\(Action<bool>\)](#) , [PersistentScriptableObject.persist](#)

## Remarks

The BoolVariable class is a specialized implementation of the Variable class for boolean (true/false) values. It facilitates the creation and management of a boolean value that can be shared across different components and scripts within a Unity project, allowing for a centralized approach to handling binary states.

This class can be used to create boolean variables directly in the Unity Editor. These variables are ideal for toggling states, managing conditions, or controlling binary features such as switches or flags in game mechanics.

The boolean value can be marked as read-only to prevent runtime modifications. Additionally, the class emits an event whenever the value changes, providing the capability to react dynamically to state changes.

# Class FloatVariable

Namespace: [SODD.Variables](#)

A ScriptableObject representing a floating-point number variable.

```
public class FloatVariable : Variable<float>, IVariable, IVariable<float>,
    ISelectableEvent<float>
```

## Inheritance

[object](#) ← [PersistentScriptableObject](#) ← [Variable<float>](#) ← [FloatVariable](#)

## Implements

[IVariable](#), [IVariable<float>](#), [ISelectableEvent<float>](#)

## Inherited Members

[Variable<float>.value](#) , [Variable<float>.readOnly](#) , [Variable<float>.OnValueChanged](#) ,  
[Variable<float>.Id](#) , [Variable<float>.Value](#) , [Variable<float>.HandleValueChange\(\)](#) ,  
[Variable<float>.AddListener\(Action<float>\)](#) ,  
[Variable<float>.RemoveListener\(Action<float>\)](#) , [PersistentScriptableObject.persist](#)

## Remarks

The `FloatVariable` class is a specialized implementation of the `Variable` class for float values. It is designed to hold a floating-point number that can be shared across different components and scripts in a Unity project, allowing for centralized management of float data.

This class can be used to create float variables directly in the Unity Editor. These variables can be utilized for a range of purposes such as tracking dynamic numerical values like health points, speed, percentages, or any other measurements that require floating-point precision.

The float value can be set as read-only to prevent changes at runtime, maintaining data integrity. The class also emits an event whenever the value changes, enabling other scripts to respond dynamically to these changes.

# Class GameObjectVariable

Namespace: [SODD.Variables](#)

A ScriptableObject representing a GameObject variable.

```
public class GameObjectVariable : Variable<GameObject>, IVariable,  
IVariable<GameObject>, IListenerableEvent<GameObject>
```

## Inheritance

[object](#) ← [PersistentScriptableObject](#) ← [Variable](#)<GameObject> ← [GameObjectVariable](#)

## Implements

[IVariable](#), [IVariable](#)<GameObject>, [IListenerableEvent](#)<GameObject>

## Inherited Members

[Variable<GameObject>.value](#) , [Variable<GameObject>.readOnly](#) ,  
[Variable<GameObject>.OnValueChanged](#) , [Variable<GameObject>.Id](#) ,  
[Variable<GameObject>.Value](#) , [Variable<GameObject>.HandleValueChange\(\)](#) ,  
[Variable<GameObject>.AddListener\(Action<GameObject>\)](#) ,  
[Variable<GameObject>.RemoveListener\(Action<GameObject>\)](#) ,  
[PersistentScriptableObject.persist](#)

## Remarks

The GameObjectVariable class is a specialized implementation of the Variable class for GameObject values. It is designed to hold a GameObject value that can be shared across different components and scripts in a Unity project, allowing for centralized management of GameObject data.

This class can be used to create GameObject variables directly in the Unity Editor. These variables can be utilized for a range of purposes such as storing references to key GameObjects, controlling object behavior, or any other interactions that may need to be dynamically changed or referenced during gameplay.

The GameObject value can be set as read-only to prevent changes at runtime, ensuring the consistency of object interactions. The class also emits an event whenever the value changes, enabling other scripts to react dynamically to GameObject updates.

# Interface IVariable

Namespace: [SODD.Variables](#)

Represents a generic variable interface for type-agnostic variable usage.

```
public interface IVariable
```

## Remarks

This interface allows for handling variables whose type might not be known at compile time or when it is necessary to operate on variables in a type-agnostic manner. It can be used in scenarios where variables are managed dynamically, such as in systems that load or save settings where the types can vary.

## Properties

### Id

```
string Id { get; }
```

### Property Value

[string](#)

### Value

Gets or sets the value of the variable.

```
object Value { get; set; }
```

### Property Value

[object](#)

The value of the variable, stored as an object.

# Interface IVariable<T>

Namespace: [SODD.Variables](#)

Represents a generic variable interface with a specific type.

```
public interface IVariable<T>
```

## Type Parameters

T

The type of the variable's value.

## Remarks

This interface defines a generic variable with a specific type, allowing for the creation of type-safe variables. It's used to encapsulate data that can be exposed and manipulated within the Unity Editor and through scripts.

## Properties

### Id

```
string Id { get; }
```

### Property Value

[string](#)

### Value

Gets or sets the value of the variable.

```
T Value { get; set; }
```

## Property Value

T

The value of the variable, of type T.

# Class IntVariable

Namespace: [SODD.Variables](#)

A ScriptableObject representing an integer variable.

```
public class IntVariable : Variable<int>, IVariable, IVariable<int>,
IListenableEvent<int>
```

## Inheritance

[object](#) ← [PersistentScriptableObject](#) ← [Variable<int>](#) ← [IntVariable](#)

## Implements

[IVariable](#), [IVariable<int>](#), [IListenableEvent<int>](#)

## Inherited Members

[Variable<int>.value](#) , [Variable<int>.readOnly](#) , [Variable<int>.OnValueChanged](#) ,  
[Variable<int>.Id](#) , [Variable<int>.Value](#) , [Variable<int>.HandleValueChange\(\)](#) ,  
[Variable<int>.AddListener\(Action<int>\)](#) , [Variable<int>.RemoveListener\(Action<int>\)](#) ,  
[PersistentScriptableObject.persist](#)

## Remarks

The IntVariable class is a specialized implementation of the Variable class for integer values. It is designed to hold an integer value that can be shared across different components and scripts in a Unity project, allowing for centralized management of integer data.

This class can be used to create integer variables directly in the Unity Editor. These variables can be used for various purposes such as keeping track of scores, counts, or other numerical game-related data that require integer representation.

The integer value can be set as read-only to prevent changes at runtime, ensuring data integrity. The class also emits an event whenever the value changes, allowing other scripts to react to these changes.

# Class LayerMaskVariable

Namespace: [SODD.Variables](#)

A ScriptableObject representing a LayerMask variable.

```
public class LayerMaskVariable : Variable<LayerMask>, IVariable,
IVariable<LayerMask>, IListenableEvent<LayerMask>
```

## Inheritance

[object](#) ← [PersistentScriptableObject](#) ← [Variable](#)<LayerMask> ← LayerMaskVariable

## Implements

[IVariable](#), [IVariable](#)<LayerMask>, [IListenableEvent](#)<LayerMask>

## Inherited Members

[Variable<LayerMask>.value](#) , [Variable<LayerMask>.readOnly](#) ,  
[Variable<LayerMask>.OnValueChanged](#) , [Variable<LayerMask>.Id](#) ,  
[Variable<LayerMask>.Value](#) , [Variable<LayerMask>.HandleValueChange\(\)](#) ,  
[Variable<LayerMask>.AddListener\(Action<LayerMask>\)](#) ,  
[Variable<LayerMask>.RemoveListener\(Action<LayerMask>\)](#) ,  
[PersistentScriptableObject.persist](#)

## Remarks

The LayerMaskVariable class is a specialized implementation of the Variable class for LayerMask values. It is designed to hold a LayerMask value that can be shared across different components and scripts in a Unity project, allowing for centralized management of LayerMask data.

This class can be used to create LayerMask variables directly in the Unity Editor. These variables can be utilized for a range of purposes such as setting certain layers to interact or not interact with others, managing collision detection, or any other game rules that may need to be dynamically changed or referenced during gameplay.

The LayerMask value can be set as read-only to prevent changes at runtime, ensuring the consistency of layer rules. The class also emits an event whenever the value changes, enabling other scripts to react dynamically to LayerMask updates.

# Class StringVariable

Namespace: [SODD.Variables](#)

A ScriptableObject representing a string variable.

```
public class StringVariable : Variable<string>, IVariable,
    IVariable<string>, IListenableEvent<string>
```

## Inheritance

[Object](#) ← [PersistentScriptableObject](#) ← [Variable<string>](#) ← [StringVariable](#)

## Implements

[IVariable](#), [IVariable<string>](#), [IListenableEvent<string>](#)

## Inherited Members

[Variable<string>.value](#) , [Variable<string>.readOnly](#) , [Variable<string>.OnValueChanged](#) ,  
[Variable<string>.Id](#) , [Variable<string>.Value](#) , [Variable<string>.HandleValueChange\(\)](#) ,  
[Variable<string>.AddListener\(Action<string>\)](#) ,  
[Variable<string>.RemoveListener\(Action<string>\)](#) , [PersistentScriptableObject.persist](#)

## Remarks

The StringVariable class is a specialized implementation of the Variable class for string values. It is designed to hold a string value that can be shared across different components and scripts in a Unity project, allowing for centralized management of string data.

This class can be used to create string variables directly in the Unity Editor. These variables can be utilized for a range of purposes such as storing text for UI elements, dialogue, descriptions, or any other textual content that may need to be dynamically changed or referenced during gameplay.

The string value can be set as read-only to prevent changes at runtime, ensuring the integrity of the textual content. The class also emits an event whenever the value changes, enabling other scripts to react dynamically to text updates.

# Class ValueReference<T>

Namespace: [SODD.Variables](#)

Represents a reference holder for values of type **T**.

```
[Serializable]
public class ValueReference<T> : IVariable<T>, IListenableEvent<T>
```

## Type Parameters

**T**

The type of the data held by this reference.

## Inheritance

[object](#) ← ValueReference<T>

## Implements

[IVariable](#)<T>, [IListenableEvent](#)<T>

## Examples

Example of using ValueReference to switch between a local and shared value:

```
public class Player : MonoBehaviour
{
    public ValueReference<int> maxHealth;

    void Start()
    {
        Debug.Log("Max Health: " + maxHealth.Value);
    }
}
```

In this example, the `maxHealth` can be configured in the Unity Editor to use either a local field value or a reference to a shared `Variable<int>` asset. This allows for easy adjustments in gameplay mechanics without needing to touch the source code.

## Remarks

This class provides a flexible mechanism to reference values either directly as serialized fields, or indirectly through a reference to a [Variable<T>](#) asset. This allows developers to switch between inner instance-specific values and shared variable values without modifying the code that uses said values.

## Properties

### Id

```
public string Id { get; }
```

### Property Value

[string](#).

### Value

Gets or sets the value of the reference, choosing between a local field and an external variable based on configuration.

```
public T Value { get; set; }
```

### Property Value

T

## Methods

### AddListener(Action<T>)

Registers an action to be called when the referenced value changes.

```
public void AddListener(Action<T> listener)
```

### Parameters

`listener` `Action<T>`

The action to invoke when the value changes.

## RemoveListener(`Action<T>`)

Unregisters an action previously added to listen for value changes.

```
public void RemoveListener(Action<T> listener)
```

### Parameters

`listener` `Action<T>`

The action to remove.

# Class Variable<T>

Namespace: [SODD.Variables](#)

Represents an abstract variable of type T.

```
public abstract class Variable<T> : PersistentScriptableObject, IVariable,  
IVariable<T>, IListenableEvent<T>
```

## Type Parameters

T

The type of the variable.

## Inheritance

[object](#) ← [PersistentScriptableObject](#) ← Variable<T>

## Implements

[IVariable](#), [IVariable<T>](#), [IListenableEvent<T>](#)

## Derived

[BoolVariable](#), [FloatVariable](#), [GameObjectVariable](#), [IntVariable](#), [LayerMaskVariable](#),  
[StringVariable](#), [Vector2Variable](#), [Vector3Variable](#)

## Inherited Members

[PersistentScriptableObject.persist](#)

## Examples

Example of an IntVariable implementation:

```
[CreateAssetMenu(menuName = "My Variables/Int Variable", fileName  
= nameof(StringVariable))]  
public class IntVariable : Variable<int> {}
```

## Remarks

This abstract class serves as the base for all scriptable variable implementations. It implements the [IVariable<T>](#) interface allowing the creation of data containers that can be easily manipulated within the Unity Editor and referenced across different scripts, making it

useful for a wide range of applications, such as game settings, runtime configurations, or shared data across different game components.

The value of the variable can be marked as read-only to prevent modification at runtime. Additionally, the class implements the [IListenableEvent<T>](#) interface, which allows listeners to be added and notified when the value of the variable changes.

To create custom scriptable variable, inherit from this class and specify the payload type [T](#), it can be any valid Unity type (e.g., int, string, GameObject, etc.).

## Fields

### OnValueChanged

An event that is triggered whenever the value of the variable changes.

```
protected readonly IEvent<T> OnValueChanged
```

### Field Value

[IEvent<T>](#)

### readOnly

```
protected bool readOnly
```

### Field Value

[bool](#)

### value

```
[OnValueChangedAttribute]  
protected T value
```

### Field Value

# Properties

## Id

Gets the variable's unique identifier.

```
public string Id { get; }
```

## Property Value

[string](#)

## Value

Gets or sets the value of the variable.

```
public T Value { get; set; }
```

## Property Value

T

The current value of the variable.

# Methods

## AddListener(Action<T>)

Registers an action to be called when the variable's value changes.

```
public void AddListener(Action<T> listener)
```

## Parameters

`listener` `Action<T>`

The action to invoke when the value changes.

## HandleValueChange()

Invokes the `OnValueChanged` event and can log the change if debugging is enabled.

```
protected void HandleValueChange()
```

## RemoveListener(`Action<T>`)

Unregisters an action previously added to listen for value changes.

```
public void RemoveListener(Action<T> listener)
```

## Parameters

`listener` `Action<T>`

The action to remove.

# Class Vector2Variable

Namespace: [SODD.Variables](#)

A ScriptableObject representing a Vector2 variable.

```
public class Vector2Variable : Variable<Vector2>, IVariable,  
IVariable<Vector2>, IListenableEvent<Vector2>
```

## Inheritance

[object](#) ← [PersistentScriptableObject](#) ← [Variable](#)<Vector2> ← [Vector2Variable](#)

## Implements

[IVariable](#), [IVariable](#)<Vector2>, [IListenableEvent](#)<Vector2>

## Inherited Members

[Variable<Vector2>.value](#) , [Variable<Vector2>.readOnly](#) ,  
[Variable<Vector2>.OnValueChanged](#) , [Variable<Vector2>.Id](#) , [Variable<Vector2>.Value](#) ,  
[Variable<Vector2>.HandleValueChange\(\)](#) ,  
[Variable<Vector2>.AddListener\(Action<Vector2>\)](#) ,  
[Variable<Vector2>.RemoveListener\(Action<Vector2>\)](#) , [PersistentScriptableObject.persist](#)

## Remarks

The Vector2Variable class is a specialized implementation of the Variable class for Vector2 values. It is designed to hold a two-dimensional vector that can be shared across different components and scripts in a Unity project, allowing for centralized management of Vector2 data.

This class can be used to create Vector2 variables directly in the Unity Editor. These variables can be utilized for various purposes, such as tracking positions, velocities, or other 2D vector-related data within your game or application.

The Vector2 value can be set as read-only to prevent changes at runtime, ensuring the integrity of the data. The class also emits an event whenever the value changes, enabling other scripts to react dynamically to Vector2 data updates.

# Class Vector3Variable

Namespace: [SODD.Variables](#)

A ScriptableObject representing a Vector3 variable.

```
public class Vector3Variable : Variable<Vector3>, IVariable,  
IVariable<Vector3>, IListenableEvent<Vector3>
```

## Inheritance

[object](#) ← [PersistentScriptableObject](#) ← [Variable](#)<Vector3> ← [Vector3Variable](#)

## Implements

[IVariable](#), [IVariable](#)<Vector3>, [IListenableEvent](#)<Vector3>

## Inherited Members

[Variable<Vector3>.value](#) , [Variable<Vector3>.readOnly](#) ,  
[Variable<Vector3>.OnValueChanged](#) , [Variable<Vector3>.Id](#) , [Variable<Vector3>.Value](#) ,  
[Variable<Vector3>.HandleValueChange\(\)](#) ,  
[Variable<Vector3>.AddListener\(Action<Vector3>\)](#) ,  
[Variable<Vector3>.RemoveListener\(Action<Vector3>\)](#) , [PersistentScriptableObject.persist](#)

## Remarks

The Vector3Variable class is a specialized implementation of the Variable class for Vector3 values. It is designed to hold a three-dimensional vector that can be shared across different components and scripts in a Unity project, allowing for centralized management of Vector3 data.

This class can be used to create Vector3 variables directly in the Unity Editor. These variables can be utilized for various purposes, such as tracking positions, velocities, directions, or other 3D vector-related data within your game or application.

The Vector3 value can be set as read-only to prevent changes at runtime, ensuring the integrity of the data. The class also emits an event whenever the value changes, enabling other scripts to react dynamically to Vector3 data updates.