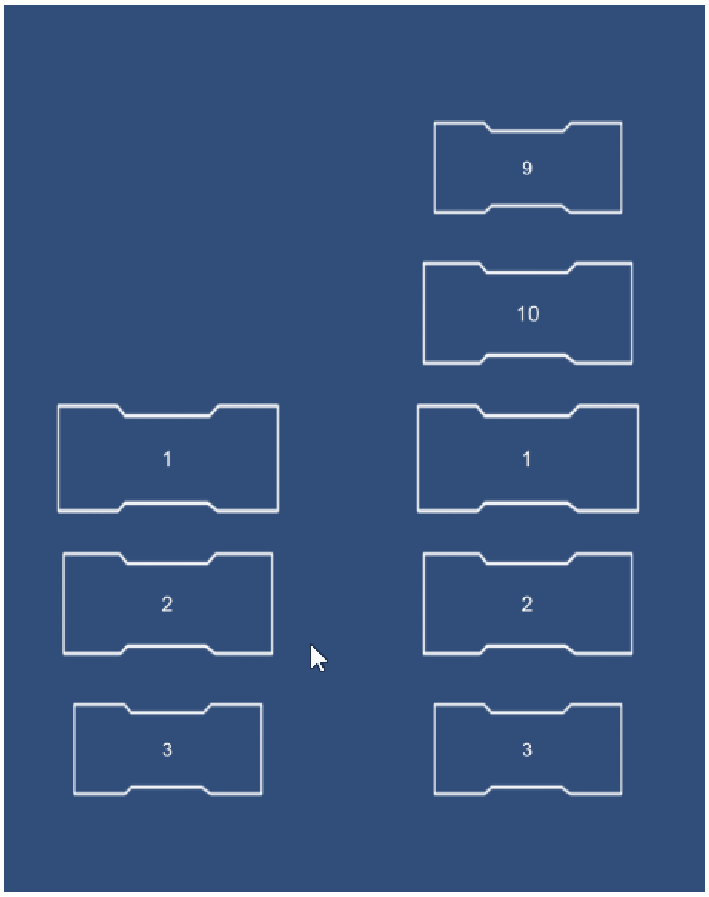
Circular Scrolling List



Features

- Use finite list boxes to display infinite list items
- Use Unity's event system to detect input events
- Use `AnimationCurve` to define the layout and the movement
- Support all three render modes of the canvas plane
- Support Unity 5+ (Tested in Unity 5.6.7f1)

List mode

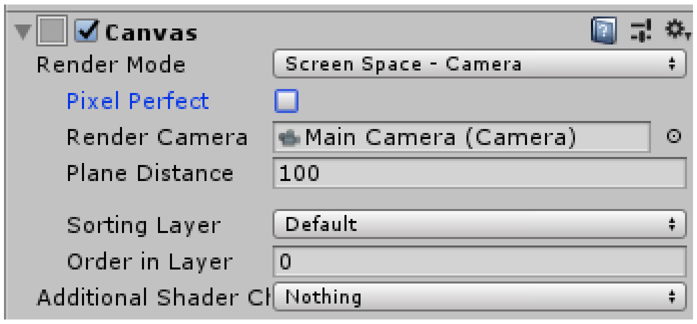
- List type: Circular or Linear mode
- Control mode: Drag, Function, or Mouse wheel
- Direction: Vertical or Horizontal

Demo video

How to Use

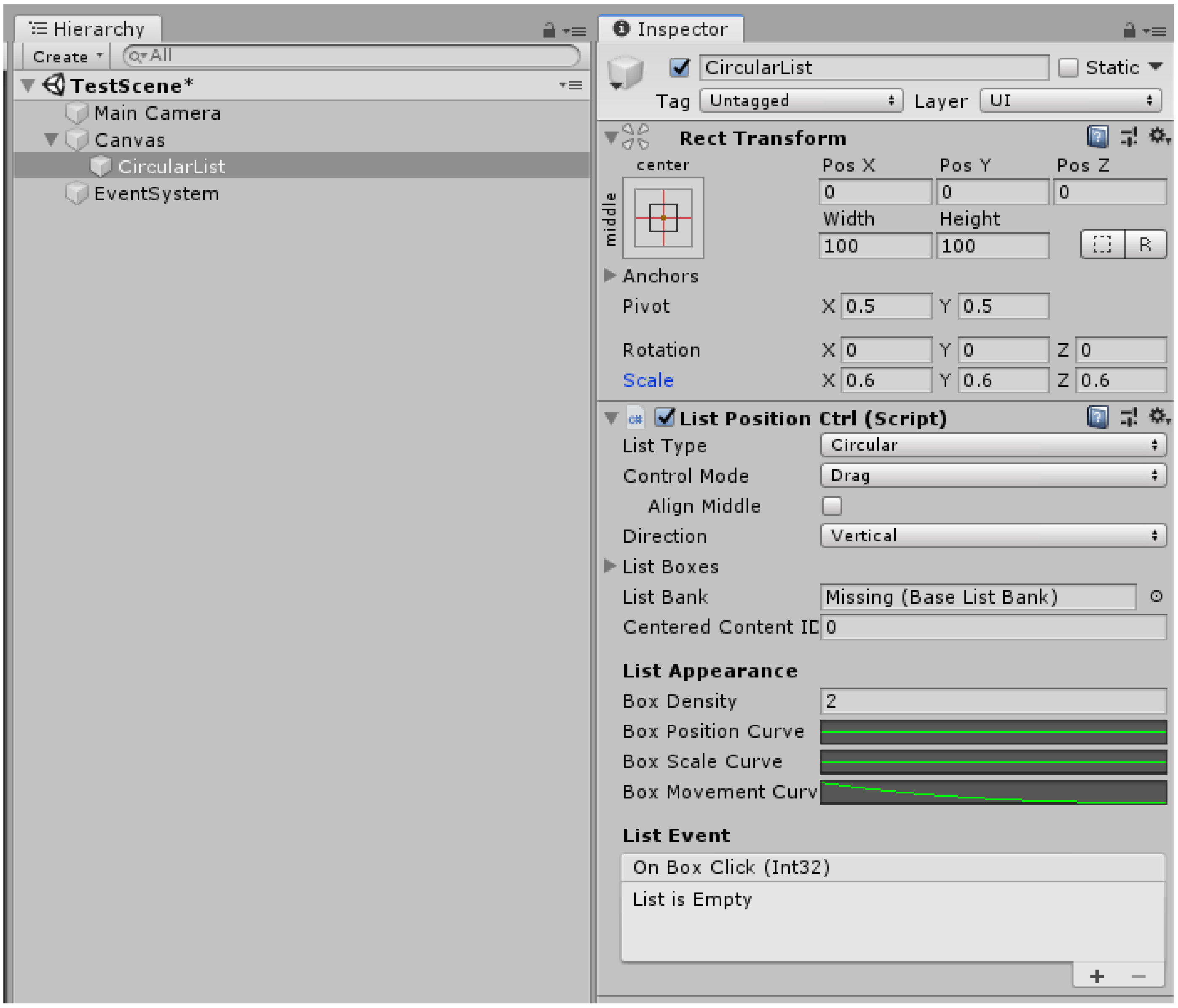
Set up the List

1. Add a Canvas plane to the scene. Set the render mode to "Screen Space - Camera" (for example), and assign the "Main Camera" to the "Render Camera".



Canvas
Render Mode: Screen Space - Camera
Pixel Perfect: ☐
Render Camera: Main Camera (Camera)
Plane Distance: 100
Sorting Layer: Default
Order in Layer: 0
Additional Shader Cl: Nothing

2. Create an empty gameobject as the child of the canvas plane, rename it to `CircularList` (or another name you like), set the scale to 0.6, and attach the script `ListPositionCtrl.cs` to it.



Hierarchy
TestScene*
Main Camera
Canvas
CircularList
EventSystem

Inspector
CircularList ☐ Static
Tag: Untagged   Layer: UI

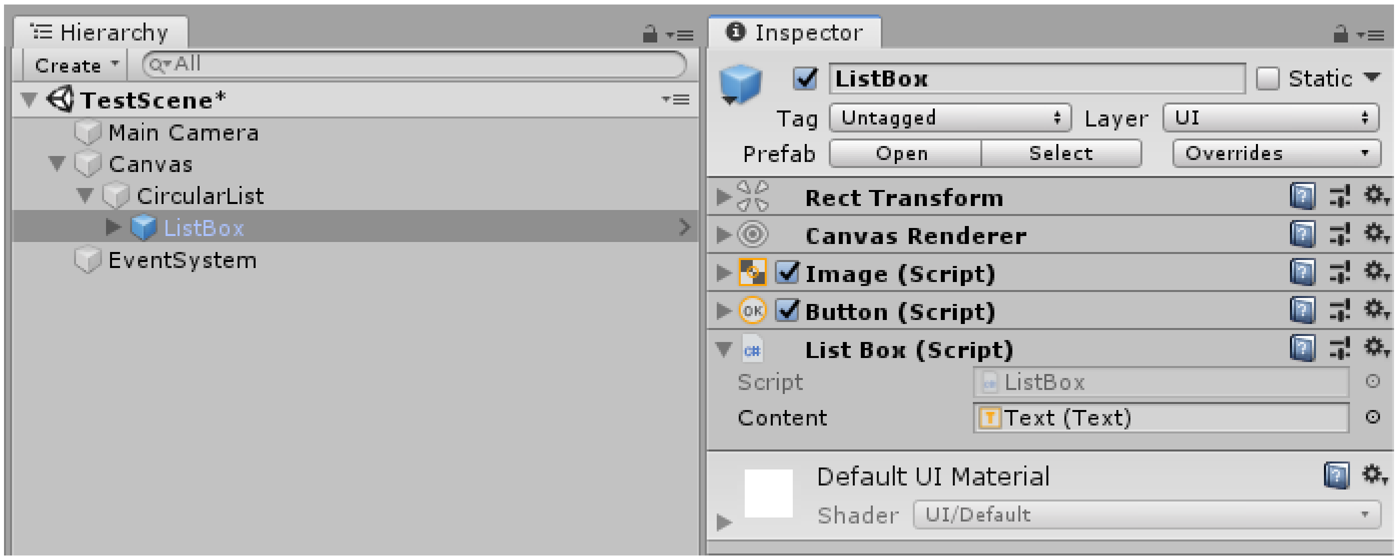
Rect Transform
center / middle
Pos X: 0   Pos Y: 0   Pos Z: 0
Width: 100   Height: 100
Anchors
Pivot: X 0.5 Y 0.5
Rotation: X 0 Y 0 Z 0
Scale: X 0.6 Y 0.6 Z 0.6

List Position Ctrl (Script)
List Type: Circular
Control Mode: Drag
Align Middle: ☐
Direction: Vertical
List Boxes
List Bank: Missing (Base List Bank)
Centered Content ID: 0

List Appearance
Box Density: 2
Box Position Curve
Box Scale Curve
Box Movement Curv

List Event
On Box Click (Int32)
List is Empty

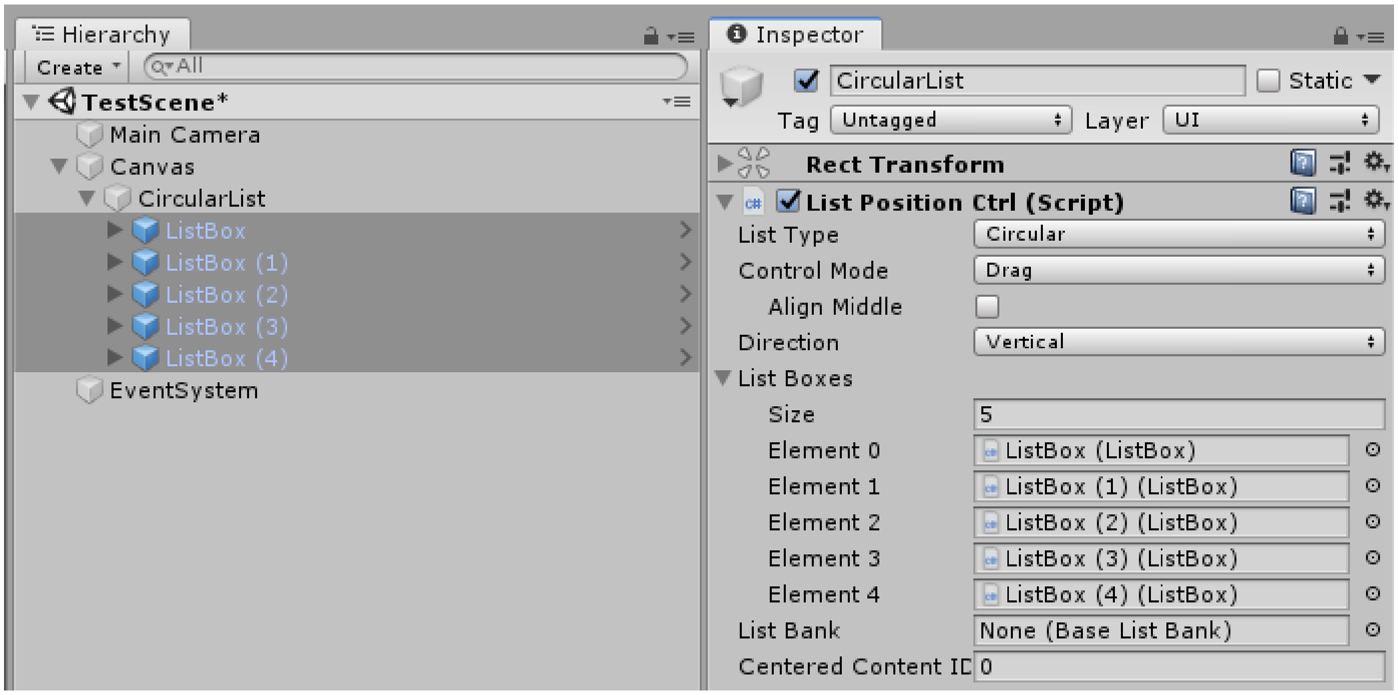
3. Create a Button gameobject as the child of the `CircularList` , rename it to `ListBox` , change the sprite and the font size if needed.
4. Attach the script `ListBox.cs` to it, assign the gameobject "Text" of the Button to the "Content" of the `ListBox.cs` , and then create a prefab of it .



```
Hierarchy
TestScene*
  Main Camera
  Canvas
    CircularList
      ListBox
  EventSystem
```

```
Inspector
ListBox                      Static
Tag  Untagged      Layer  UI
Prefab  Open  Select  Overrides
Rect Transform
Canvas Renderer
Image (Script)
Button (Script)
List Box (Script)
  Script      ListBox
  Content     Text (Text)
Default UI Material
  Shader  UI/Default
```

5. Duplicate the gameobject `ListBox` or create gameobjects from the prefab as many times as you want (4 times here, for exmaple), and assign them to the "List Boxes" of the script `ListPositionCtrl.cs` .



```
Hierarchy
TestScene*
  Main Camera
  Canvas
    CircularList
      ListBox
      ListBox (1)
      ListBox (2)
      ListBox (3)
      ListBox (4)
  EventSystem
```

```
Inspector
CircularList                 Static
Tag  Untagged      Layer  UI
Rect Transform
List Position Ctrl (Script)
  List Type            Circular
  Control Mode         Drag
    Align Middle       [ ]
  Direction            Vertical
  List Boxes
    Size               5
    Element 0          ListBox (ListBox)
    Element 1          ListBox (1) (ListBox)
    Element 2          ListBox (2) (ListBox)
    Element 3          ListBox (3) (ListBox)
    Element 4          ListBox (4) (ListBox)
  List Bank            None (Base List Bank)
  Centered Content ID  0
```

Create `ListBank`

1. Create a new script named `MyListBox.cs` and launch the editor.
2. Inherit the abstract class `BaseListBank` (The class `BaseListBank` inherits the `MonoBehaviour` , therefore, you could initialize list contents in `Start()` and attach the script to a gameobject).
3. There are two functions which must be implemented:

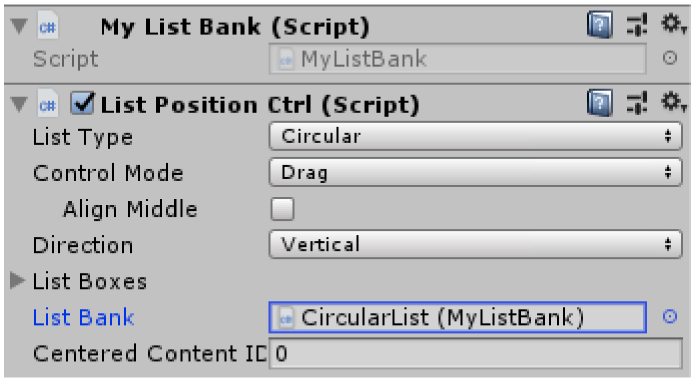
- `public string GetListContent(int index)` : Get the string representation of the specified content.
- `public int GetListLength()` : Get the number of the list contents.

```
// The example of the simplest ListBank
public class MyListBank: BaseListBank
{
    private int[] _contents = {
        1, 2, 3, 4, 5, 6, 7, 8, 9, 10
    };

    public override string GetListContent(int index)
    {
        return _contents[index].ToString();
    }

    public override int GetListLength()
    {
        return _contents.Length;
    }
}
```

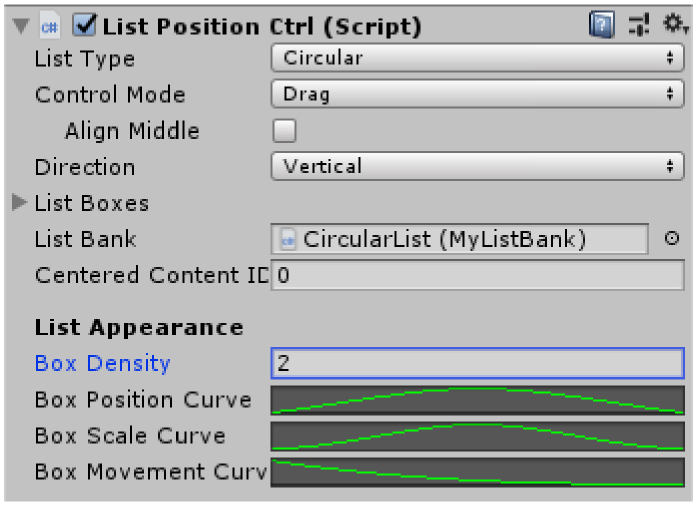
4. Attach the script `MyListBank.cs` to the gameobject `CircularList` (or another gameobject), and assign the gameobject to the "List Bank" of the script `ListPositionCtrl.cs` .



My List Bank (Script)
Script: MyListBank

List Position Ctrl (Script)
List Type: Circular
Control Mode: Drag
Align Middle: ☐
Direction: Vertical
List Boxes
List Bank: CircularList (MyListBank)
Centered Content ID: 0

Configure the List Mode and Appearance



List Position Ctrl (Script)

List Type	Circular
Control Mode	Drag
Align Middle	☐
Direction	Vertical
List Boxes	
List Bank	CircularList (MyListBank)
Centered Content I	0

List Appearance

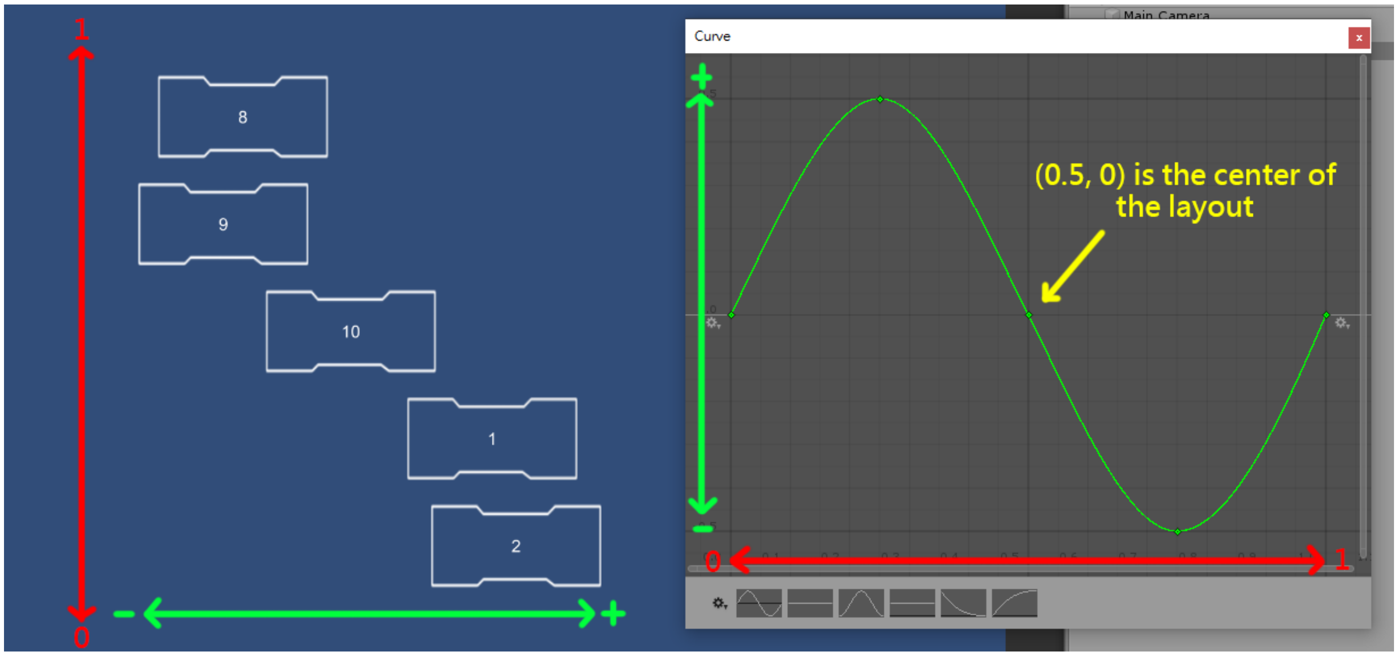
Box Density	2
Box Position Curve	
Box Scale Curve	
Box Movement Curv	

Basic Configuration

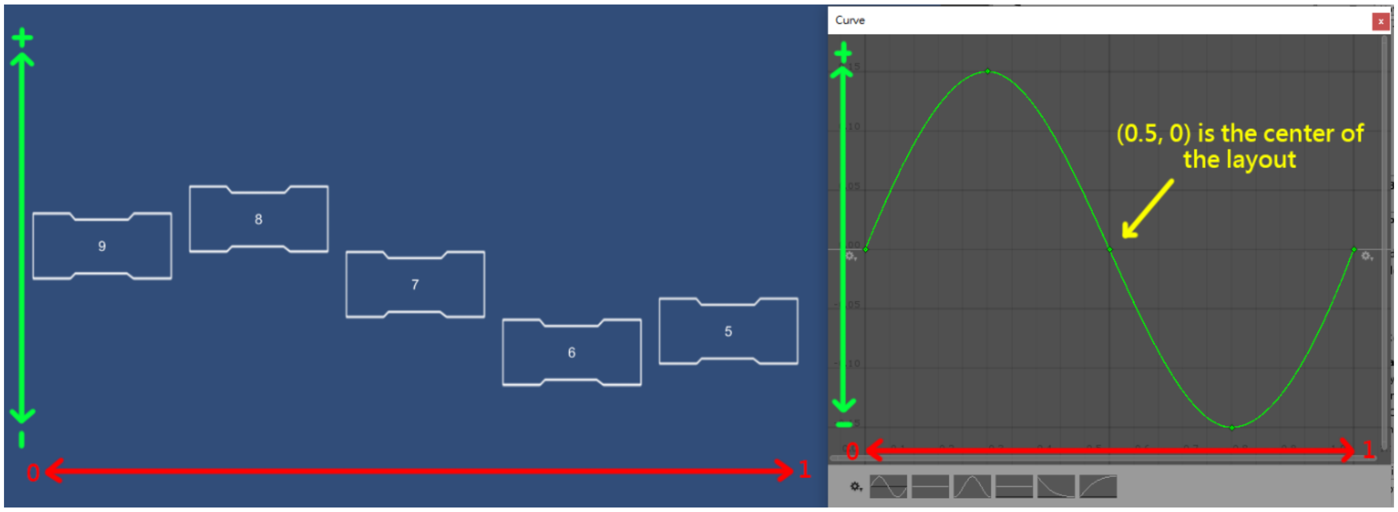
- List Type: Circular or Linear
- Control Mode: Drag, Function, or Mouse Wheel
    - Align Middle: Whether to align a box at the center of the list when the list stop moving. Only available in Drag mode.
    - If the Function mode is selected, move the list by invoking `ListPositionCtrl.MoveOneUnitUp()` and `ListPositionCtrl.MoveOneUnitDown()` . For example, you could assign these two functions to buttons to control the list.
- Direction: Vertical or Horizontal
- Centered Content ID: The initial content ID for the centered (or focused) box

List Appearance

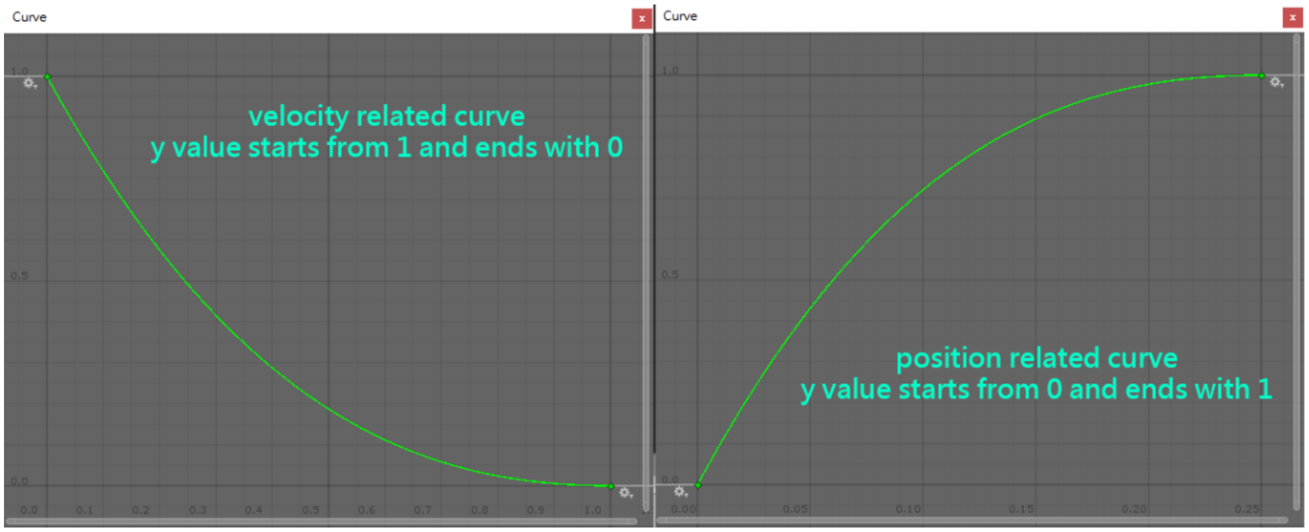
- Box Density: The gap between boxes. The larger, the closer.
- Box Position Curve: The curve specifying the box position. The x axis is the major position of the box, which is mapped to [0, 1] (from the smallest value to the largest value). The y axis is the factor of the passive position.
  For example, in the vertical mode, the major position is the y position and the passive position is the x position:



It is intuitive in the horizontal mode:

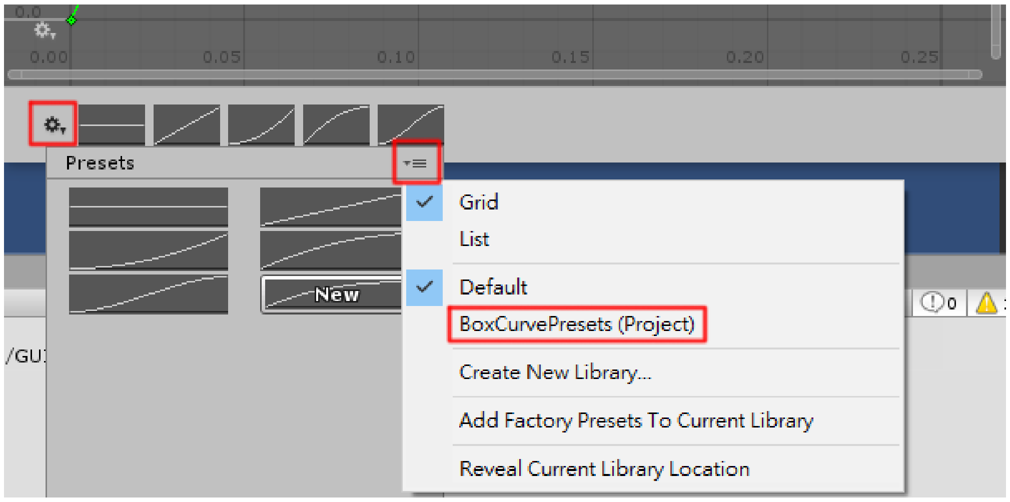


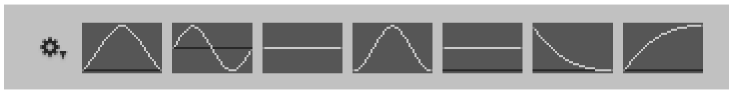
- Box Scale Curve: Similar to the Box Position Curve, but the y axis defines the scale value of the box at that major position.
- Box Movement Curve: The curve specifying movement of the box. The x axis is the movement duration in seconds, which starts from 0. The value of y axis is depended on the mode:
    - In the Drag mode, it is the factor relative to the releasing velocity;
    - In the Function or Mouse Wheel mode, it is the factor relative to the target position.


Curve
velocity related curve
y value starts from 1 and ends with 0
Curve
position related curve
y value starts from 0 and ends with 1

Curve Presets

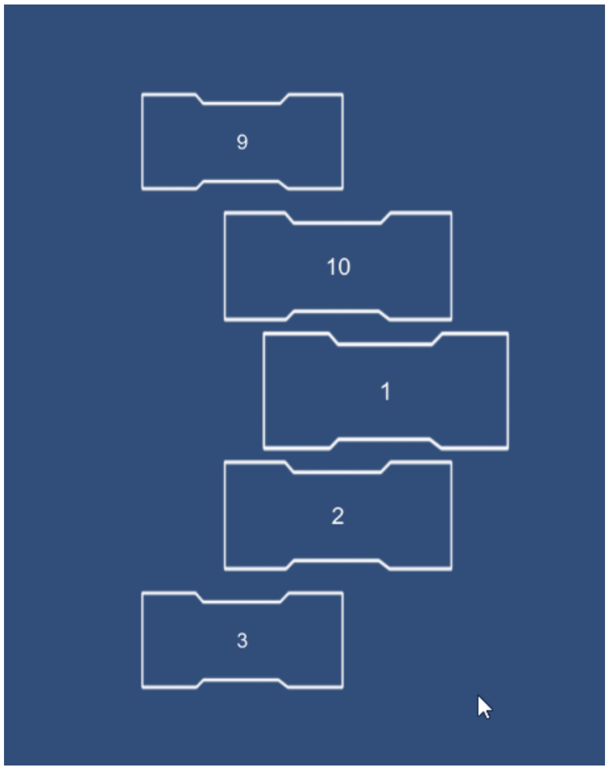
The project provides curve presets. Open the curve editing panel and select the `BoxCurvePresets` to use them.


Presets
New
Grid
List
Default
BoxCurvePresets (Project)
Create New Library...
Add Factory Presets To Current Library
Reveal Current Library Location



The first three curves are position curves, the 4th and 5th one are scale curves, the 6th one is a velocity related curve, and the last one is a position related curve.

After configuration, the set up of the list is done! Click Play button of the scene to check the list. You could adjust the position and the size of the list by setting the position and the scale of the gameobject `CircularList` .



Get the ID of the Selected Content

There are two ways to get ID of the selected content.

1. Create callback function
2. Get the centered content ID

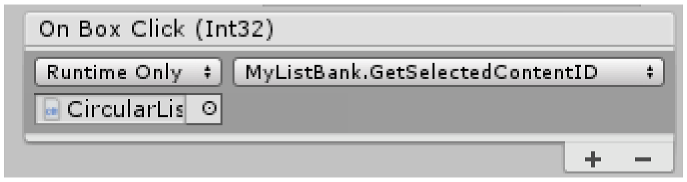
Create Callback Function

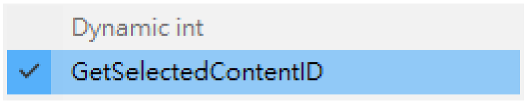
When a box is clicked, the `ListPositionCtrl` will launch the event `OnBoxClick` (actually launch from the `Button.onClick` event). The callback function (or the listener) for the event must have 1 parameter for receiving the ID of the selected content.

For example, add a function `GetSelectedContentID` as the callback function to the class `MyListBank`.

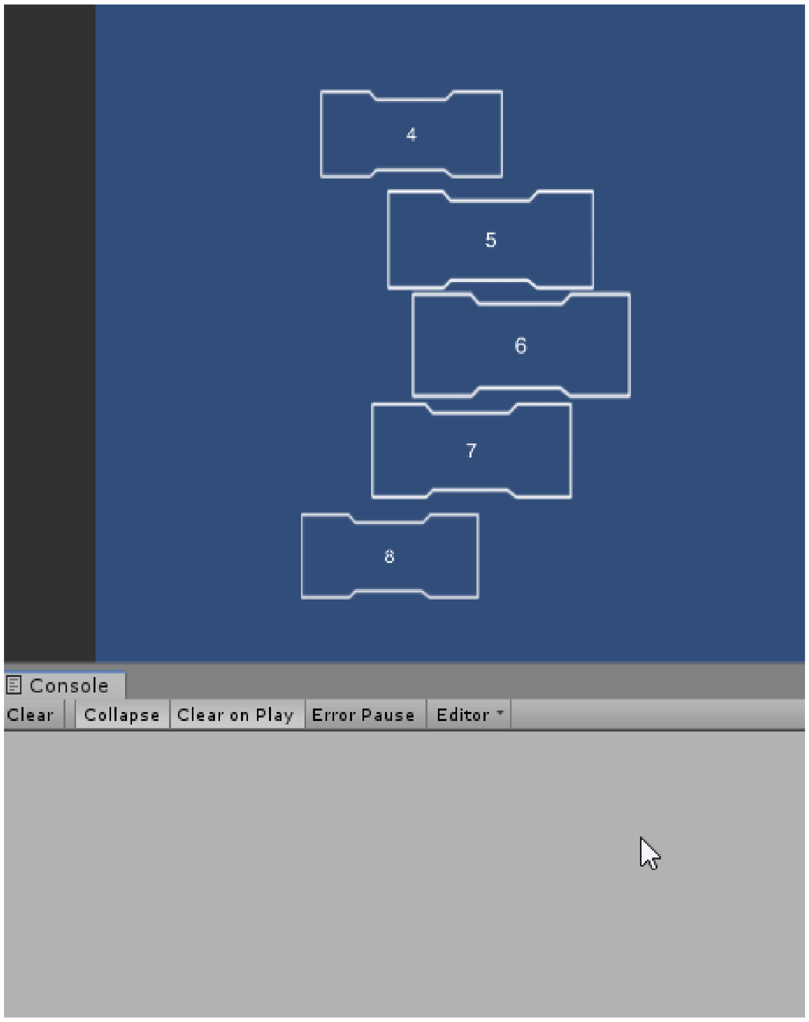
```
public void GetSelectedContentID(int contentID)
{
    Debug.Log("Selected content ID: " + contentID.ToString() +
        ", Content: " + GetListContent(contentID));
}
```

Then, add it to the "On Box Click (Int 32)" of the script `ListPositionCtrl.cs` in the inspector. (Note that select the function in the "dynamic int" section)


On Box Click (Int32)
Runtime Only
MyListBank.GetSelectedContentID
CircularLis



It will be like:



Get the Centered Content ID

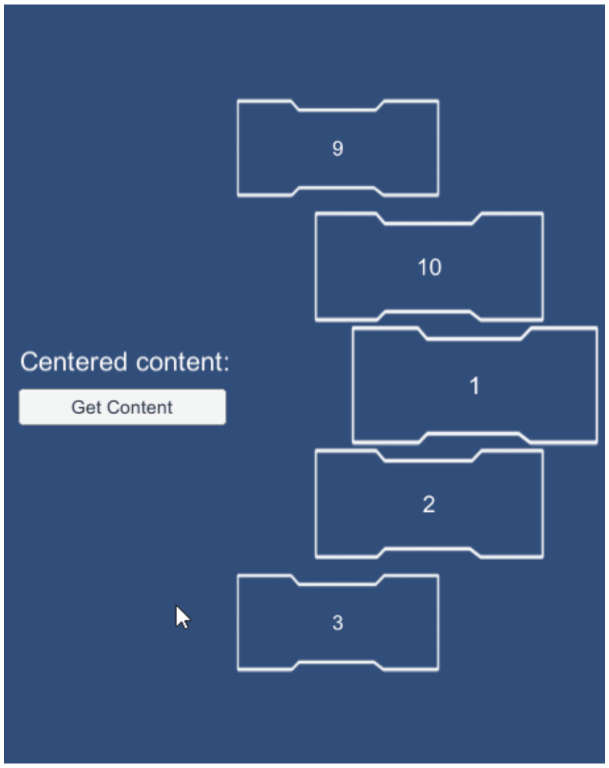
The other way is to invoke the function `ListPositionCtrl.GetCenteredContentID()` which will find the list box closest to the center and return the content ID of it.

For example, create a function which will update the content of the centered box to the Text, and use a Button to invoke it.

```
public class MyApplication: MonoBehaviour
{
    public ListPositionCtrl list;
    public Text displayText;

    public void DisplayCenteredContent()
    {
        int contentID = list.GetCenteredContentID();
        string centeredContent = list.listBank.GetListContent(contentID);
        displayText.text = "Centered content: " + centeredContent;
    }
}
```

It will be like:


9
10
Centered content:
Get Content
1
2
3