Foundation Databinding (v4.0) 3/8/2015

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Databinding is a mechanism to 'connect' your UI widgets (buttons, input, text, lists) to 'view scripts'. This strategy is necessary for the Model-View-ViewModel architecture that is very popular in the C# world. In MVVM Your views's properties, fields and methods are 'observed' by the UI elements and any changes to your view's are communicated to the UI elements so they may update worry free.

- Supports inheritance, interfaces, structs and using DLLs
- Bind to monobehaviours and plain CLR objects (wont have change notification)
- Foundation.Databinding.Model is a dll, so you can place your game model in a class library
- Bind to methods, fields, properties or coroutines
- Uses IObservableModel interface instead of IPropertyNotifyChange. IObservableModel includes the changed value along side the changed property name as to prevent an additional reflection call.

Platforms

Desktop, Webplayer, Android, iOS, Windows Store

Dependencies

- FullSerializer Json Library
- Foundation.Tasks Async Library
- Foundation.Localization Translation Library
- Localization may be omitted by using the NoLocalization compilation directive
- Foundation.Injector Is mentioned in the comments. It is not needed but I personally use it so that I dont need to reference my components in the editor.

Model Logic

It is recommended that you inherit your monobehaviours from ObservableBehaviour and your clr objects from ObservableObject. These classes implement the IObservableModel interface for you and include a number of helper methods for quickly publishing changes to your views.

Example Model

Here is an example model with a single observable property. when the property changes the view (or any other listener) will receive the change event and have an opportunity to update itself.

```
public class MyModel : ObservableObject {

        private int _myProperty;
        public int MyProperty
        {
            get { return _myProperty; }
            set
            {
                // Prevent Stack Overflow in two way binding scenarios
                if (_myProperty == value)
                    return;

                _myProperty = value;

                // Notify Listeners
                NotifyProperty("MyProperty", value);
            }
        }
}
```

Models vs ViewModels

Extending from ObservableBehaviour requires that you make an instance of your view in the scene (since it is an MonoBehaviour). This has the advantage of letting you set properties in your scene view.

Extending from ObservableScriptableObject requires that you make an instance in your editor (since it is an ScriptableObject). This has the advantage of letting you set properties in your editor.

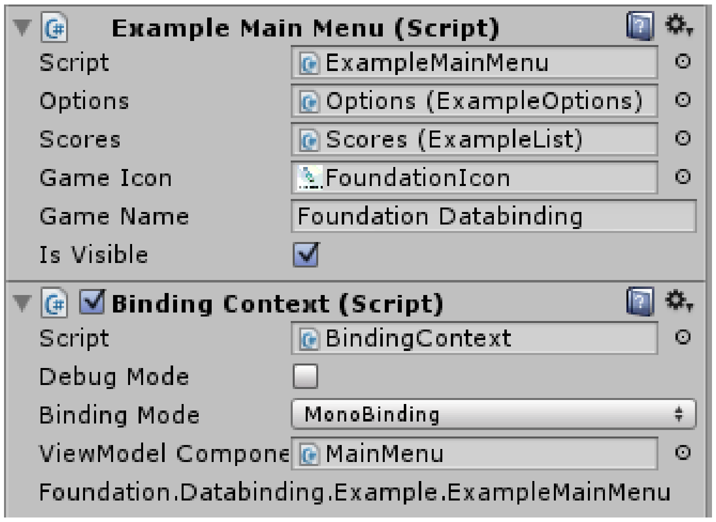
Extending from ObservableObject is my personal choice for most data objects (high scores, profiles, ect). It is a light weight CLR object which does not depend on the UnityEngine.

View Logic

Once you have your model defined and a mockup of your view using Unity's uGUI UI framework it is time to connect the two.

Binding Context

The binding context is responsible for gluing your model to your view elements. Once set child binders will update with a listing of properties to bind to.



Example Main Menu (Script)
Script: ExampleMainMenu
Options: Options (ExampleOptions)
Scores: Scores (ExampleList)
Game Icon: FoundationIcon
Game Name: Foundation Databinding
Is Visible: ✓

Binding Context (Script)
Script: BindingContext
Debug Mode: ☐
Binding Mode: MonoBinding
ViewModel Compone: MainMenu
Foundation.Databinding.Example.ExampleMainMenu

This script sits at the root of your UI and operates in one of three modes.

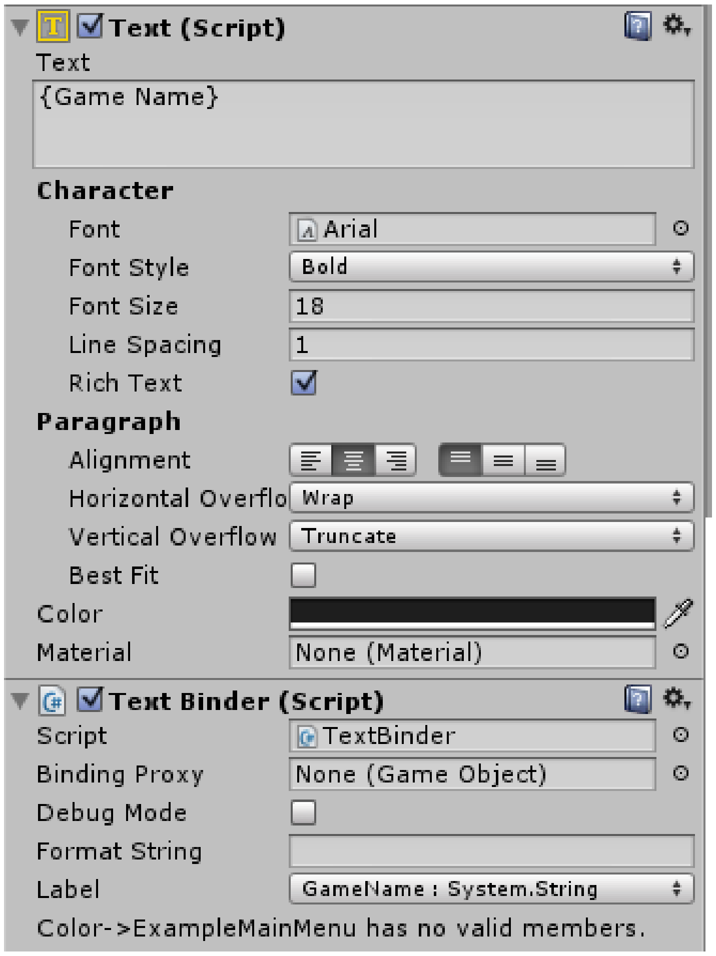
```
 - MonoBinding
 Viewmodel is a monobehaviour (or observable behavior). Drag and drop the behavior
 into the editor field to bind to it.

 - MockBinding
 Viewmodel is a late bound. Use this option when you would like to set the datatype
 for child binders while not actually setting the model instance. Example uses
 include list controls where you may know the type of the list item but the actual
 item instance is set at run time.

 - Property Binding (Hierarchy Binding)
 This allows you to index into a model within another model. For instance MyModel.MyUser.M
 where MyModel is the parent viewmodel, MyUser is a child model and MyName is a property o
 the child most model.
```

Binders

Binders sit underneath a binding context and next to their associated ui element. When the binding context is set the binders will update with a listing of valid properties and methods from the model.

There are a number of binders including InputFieldBinder, ButtonBinder, ListBinder and ImageBinders. I believe I have most major controls. If you need a custom binder inherit from BinderBase. If you feel that I have neglected a non specialized binder, let me know and I will make it.

Using a binder is straight forward. Just drag and drop the script onto the control that it will bind to. For instance if you want databinding on an Input Field include the Input Field binder as well.



Text (Script) ✓

Text
{Game Name}

Character
Font: Arial
Font Style: Bold
Font Size: 18
Line Spacing: 1
Rich Text: ✓

Paragraph
Alignment
Horizontal Overflo: Wrap
Vertical Overflow: Truncate
Best Fit: ☐
Color: ■
Material: None (Material)

Text Binder (Script) ✓

Script: TextBinder
Binding Proxy: None (Game Object)
Debug Mode: ☐
Format String:
Label: GameName : System.String

Color->ExampleMainMenu has no valid members.

AudioManager

I have included a AudioManager in this library. The AudioManager extends Unity's audio system with audio layers. This will allow the players to fine tune audio volume by layer (music, sound, ect).

- **Audio2DListener** : Attach to the main camera(s). Used to spawn audio sources for UI elements.
- **Audio2DSource** : for global (ui) sounds. Use just like the AudioSource.

- **AudioRegulator** : Attach to AudioSources to regulate audio volume by layers (music, ui, ect)
- **AudioManager** : A Clr manager for mediating changes to layer volumes.