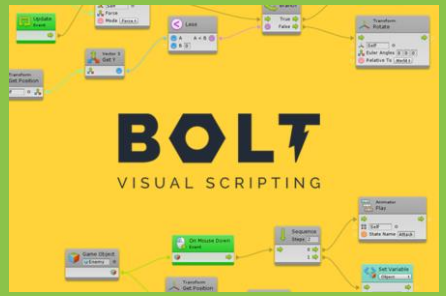
KINE 458: Virtual Interactive Worlds

Game Mechanics



Todays Objectives:

- Review
- Introduction to more advanced Bolt macros
- BoltKit_FirstPerson asset review

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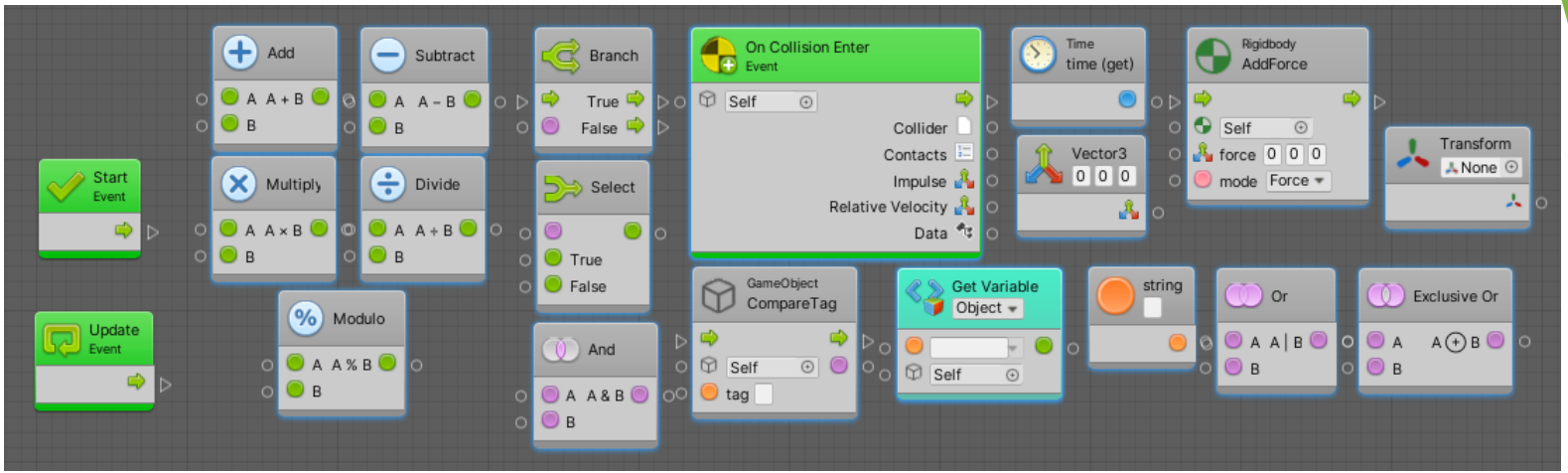
Previous Workshop Review

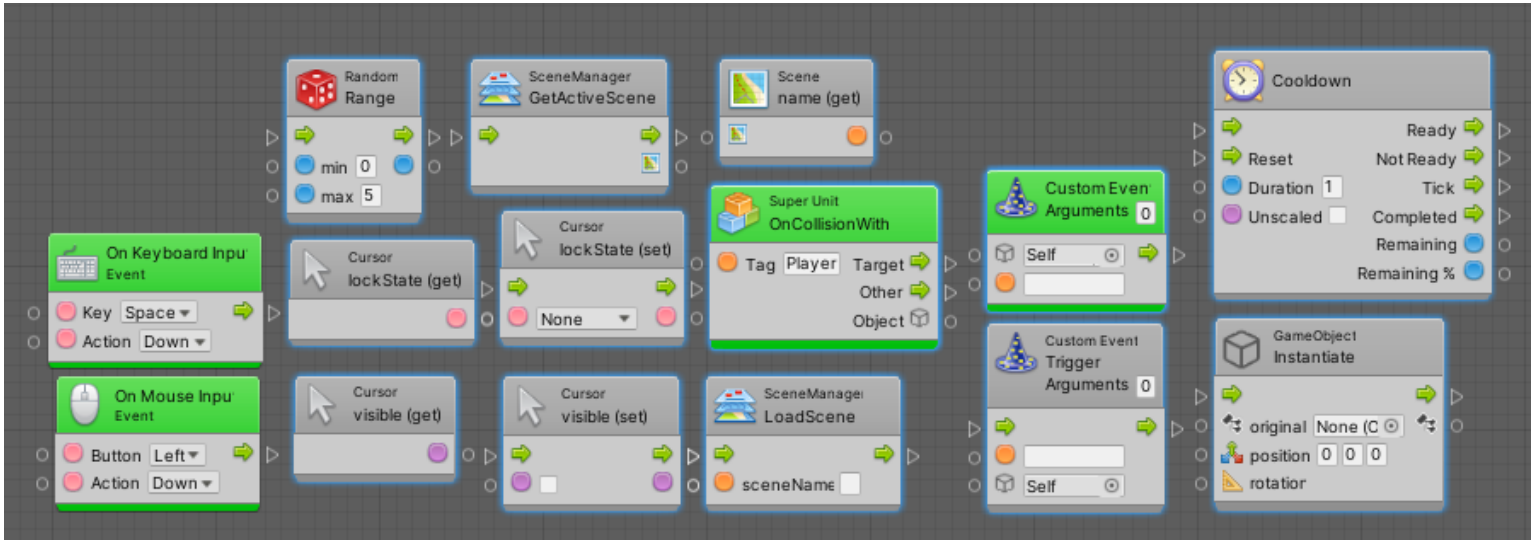
- **Start**: Outputs flow when the object initially loads. (Before the first frame)
- **Update**: Outputs flow when the frame is updated. (NOT every second)
- **Add**, **Sub**, **Mult**, **Div**, **Mod**: Performs mathematical operations.
- **AND**, **OR**, **XOR**: Performs logical operations.
- **Branch**: Outputs flow in True or False branch based on supplied logical argument.
- **Select**: Selects the variable in the True or False input based on supplied logical argument.
- **On Collision Enter**: Outputs flow when the owner of this flow graph collides with another object.
- **Time**: Provides the current time since the scene was launched.
- **Get Variable**: Pull in a variable from the current game object to the flow graph. (Referenced by var name)
- **Vector 3**: A 3-Dimensional vector that stores x, y, and z values. (Used for Position and Orientation)
- **Compare Tag**: See if an incoming game object has a particular tag.
- **Transform**: x3 3D Vectors representing Position, Orientation, and Scale.



New Basic Modules

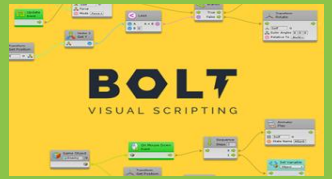
- At this point you've seen how to perform the following:
- Manipulate the positions of objects.
- Background math and logic for data generation and dynamic flow execution.
- Collision checking for dynamic flow execution.
- How to work with 3D vectors
- The Game Object -> Component relationship.

In the following examples we will focus on user input, scene changes, dynamically loading and deleting objects, custom flow execution rules, random inputs, and cooldowns.



New Basic Modules

- **Random Range:** Generate a random number between min and max.
- **On Keyboard Input:** Dynamically produce flow based on when the assigned key performs the assigned action.
- **On Mouse Input:** Dynamically produce flow based on when the assigned mouse button performs the assigned action.
- **Cursor Lock State Get/Set:** View/Change the lock state of the cursor.
- **Cursor Visible Get/Set:** View/Change the visibility of the cursor.
- **Set Active Scene:** Create a flow graph scene variable based on the active scene.
- **Scene Name Get:** Extract the scene name from a scene variable.
- **Load Scene:** Load a unity scene in the project based on the provided name.
- **On Collision With:** Similar to On Collision but accepts a Tag variable as an argument and uses it to filter flow execution.
- **Custom Event:** Dynamically produces flow based on when a Custom Event Trigger is fired under the same key.
- **Custom Event Trigger:** Sends out a signal on a certain key that will execute flow on any waiting Custom Event modules listening on that key.
- **Cooldown:** Pause flow execution for a number of seconds. (Has several output metrics)
- **Instantiate:** Creates a new game object with a position and orientation.



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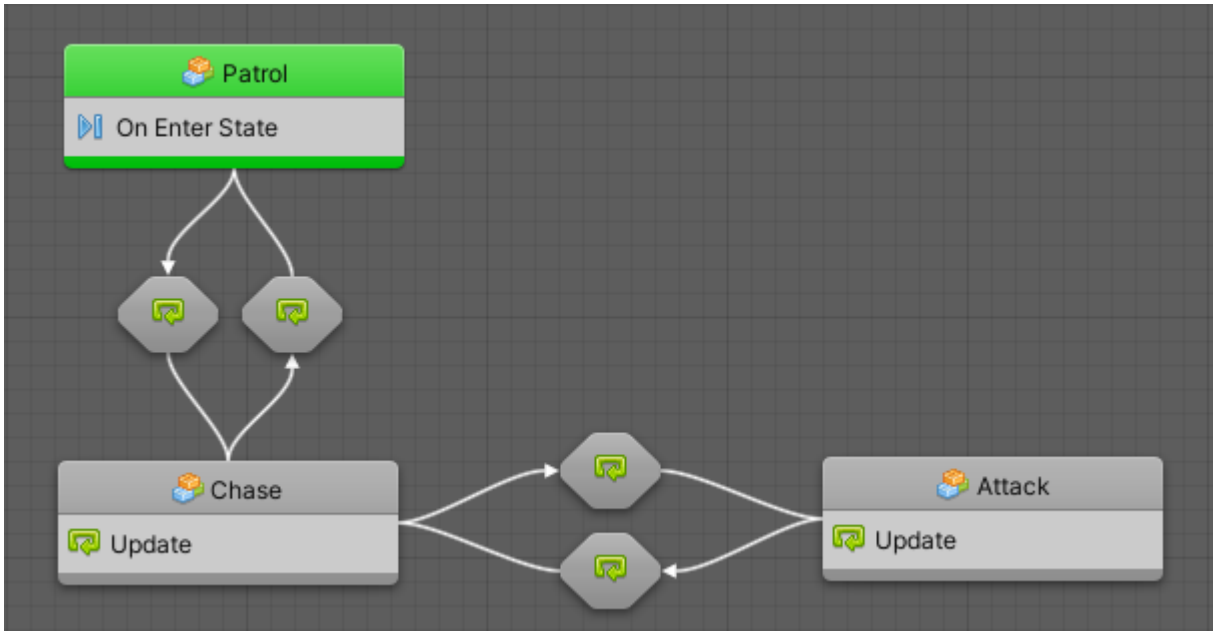
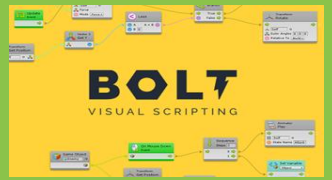
New Advanced Modules

- **Nav Mesh Agent:** https://docs.unity3d.com/ScriptReference/AI.NavMeshAgent.html
  You can use this module to create paths that a mobile NPC can walk.

- **State Macros:** Alternate type of flow graphs called State Graphs. State Graphs contain multiple flow graphs where some are referred to as States and others are referred to as Transitions. States define behaviors run at different portions of the state graph execution. Transitions define boundary rules that determine when to move from one state to another.





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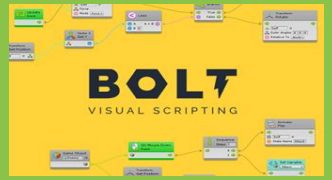
Section Two: Live Demo

Questions?



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