

GA502 - Level Design II – Session 02

Blueprints Introduction

- Visual Scripting
- Prefab Objects
- Nodes and Wires
- Sequential flow
- Blueprint vs C++

Level Blueprint

- Global per level.
- Good for level events, scorekeeping, etc.
- Context menu:
 - Aware of level objects.
 - create node by right click.
 - create node by dragging pin.
- Comments
- Level Blueprint example:
 - Toggle light with trigger volume with delay.

Class Blueprint

- Actors all the way down.
- Clone-able
- Good for scripted objects, player controllers, environment pieces, NPCs and everything else.
- Parent class / Inheritance
- Creating Blueprints:
 - Asset Tray > Right Click
 - Convert to Blueprint
 - Toolbar
- Adding & Composing Components
 - Blueprint Viewport
 - Asset Tray
 - Component menu
 - From level editor
- Graph
 - Context menu:
 - Aware of components.
 - Component reference
 - Get / Set
 - Input
 - Enable / Disable Nodes
 - Keyboard Events
 - Mouse Input

- Comments
- Cloning
 - Graph Instance Selection
- Class Blueprint Example:
 - Toggle light with trigger volume.

Construction Scripts

- Helper for class blueprints.
- Only run in editor.
- Construction script event runs when anything is updated.
- Promote to variable.
 - Exposes in details panel.
 - Custom tooltips.
- Construction script example:
 - Set light color and viability.

Variables

- Basic Types
 - Immutable once referenced
 - Color coded
 - Properties
 - Math
 - Logic
 - Casting
- Structs
 - Collections of data.
 - “Break” into variables.
- Object / Class variables
 - Stores reference
 - Object = Already exists in level
 - Class = Doesn't exist in level
 - Get player reference.
- Get & Set
 - Set requires execution.
 - Getting component variables.
 - Example: Dynamic material instance.
 - Construction script > Get material from mesh > Create Dynamic Material Instance > Promote DMI output to variable > Set mesh material.
 - Apply random color to DMI variable.
- Enum
 - List of named values.
 - Indexed by int or name.
 - Do not store data.

- Good as tags, modes, log levels, etc.
- Content browser > New > Misc > Enumeration
- Arrays
 - List of variables.
 - Homogeneous
 - Dynamic
 - Index (0 based)
 - Array functions:
 - Call Function > Utilities > Array
 - Dynamic type
 - Pure (green) / Impure (blue)
 - Foreach functions.

Flow Control

<https://docs.unrealengine.com/latest/INT/Engine/Blueprints/UserGuide/FlowControl/index.html>

- Branch
- Switch
- Loops
 - Repeating code
 - ForLoop
 - Loop body vs Completed execution
 - ForLoopWithBreak
 - ForEachLoop
 - WhileLoop
 - Example: Procedural Level Design
- Gate
- Sequence
- Do Once & Do N

Events

<https://docs.unrealengine.com/latest/INT/Engine/Blueprints/UserGuide/Events/index.html>

- Global events
 - Begin Play
 - End Play
 - Tick
 - DeltaTime
- Actor Events
 - Overlap
 - Damage
 - Cursor
- Custom Events
 - Inputs / Outputs
 - Input consumption

Timelines

<https://docs.unrealengine.com/latest/INT/Engine/Blueprints/UserGuide/Timelines/>

- Create Timelines
 - Right click > Add Timeline
- Timeline Variables
 - Variable is reference to timeline
 - Can query properties from reference
- Timeline Editor
 - Add tracks
 - float
 - vector
 - event
 - color
 - curves
 - must be selected in the content browser
 - Add keys