CIS 5680: Game Design Practicum

Assignment #4: Stack O Bot Mechanic Tutorial

Part A: Importing Stack-O-Bot

Part B: Designing a New Mechanic

Part C: Creating Your Level

Due Date: Wed, Feb. 25, 2026
(please submit to Canvas by midnight)

Assignment Overview

This tutorial is meant to help you set up the Stack O Bot scene in your engine and extend the mechanics provided there through blueprint programming and level design.

Stack O Bot is a platformer game/ tutorial designed to help you learn more about the engine and working with blueprints as well as level design.

The goal of this assignment is to implement a new feature/mechanic (or extend an existing one) shown in the tutorial and then create a new playable level that demonstrates it.

In Part A, you will need to follow the instructions to import Stack O Bot and explore the base mechanics.

In Part B, you will need to design and implement a new mechanic (or extend an existing mechanic). The mechanic should be an original or a significant extension of existing creatures, and it should require its own Blueprint system or actor.

In Part C, you will implement a level designed around your new mechanic and showcases it in gameplay, providing multiple opportunities for the player to engage with it.

Stack O Bot Tutorial Website
This website has a few videos you may find useful, but they are not required to watch:
- [Stack-O-Bot | Epic Developer Community](#)

Part A - Importing Stack O Bot
1. Install version 5.6.1 of Unreal Engine, the Stack O Bot tutorial looks different in different versions of unreal so it is important to make sure you are working in 5.6
[Download Unreal Engine - Unreal Engine](#)

2. In the Epic Games Launcher navigate to the Fab page on the left side, use the search bar to look for Stack o bot
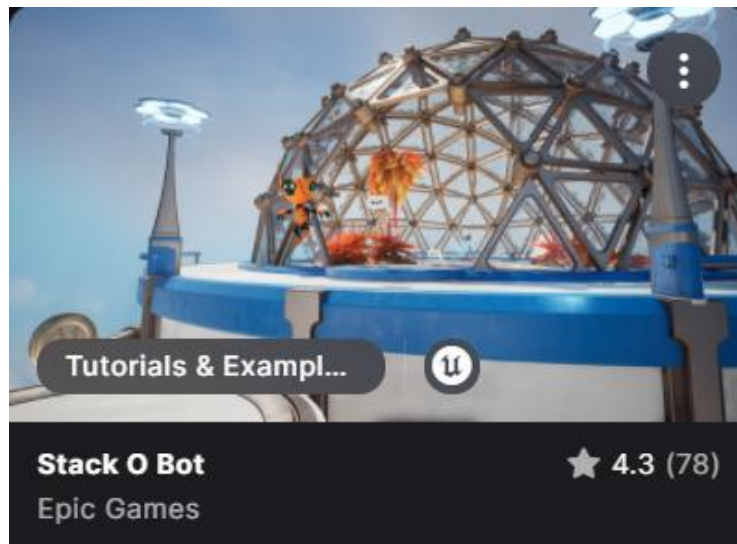
3. Click on the Create Project Option and select Create when the location directory window pops up
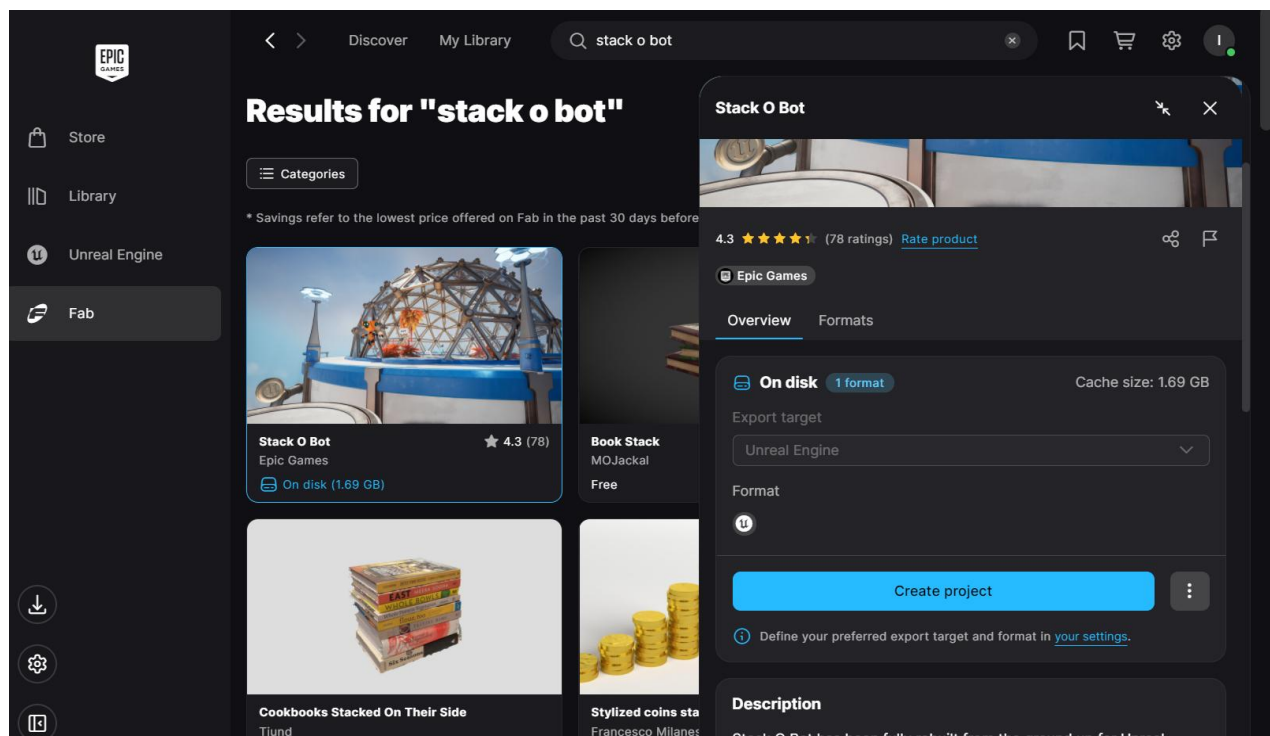
4. Launch Unreal Engine and select the Stack O Bot game

5. Explore the scene, and try out some of the mechanics available to you!

Part B - Designing a New Mechanic

Choose one mechanic to extend or create. Your mechanic should be:

- Clearly different from the base Stack O Bot abilities
- Be complex enough to require either new Blueprint system or actor (not just a minor variable change) or be significantly different from the base blueprints
- Required to complete your level
- Demonstrated multiple times in gameplay
- Requires some decision making/strategy from the player

Examples Mechanics:
Below are acceptable examples (you may also propose your own). If you have a new mechanic in mind and are unsure if it fits, feel free to post it in the Piazza for approval.

1. Movement & Traversal:
   a. Sliding / Wall-grab surfaces - Allow the bot to slide down or grab walls
   b. Grappling hook or tether - Swing between anchor points for dynamic traversal
   c. Magnetic surfaces - Special walls/ceilings the bot can walk on
2. Combat & Interaction:
   a. Projectile shooting - Give the bot a blaster with different ammo types that bounce off surfaces
   b. Enemy variety - Flying enemies, shielded robots, patrol bots with different behaviors
   c. Destructible environment - Blocks that break when attacked or jumped on
   d. Pushable/pullable objects - Boxes or switches that affect the level layout
   e. Trap system - Environmental hazards that react to the player or enemies
   f. Switchable environment hazards - Activate/deactivate lasters, spikes or moving platforms with triggers
3. Progression & Abilities:
   a. Morphing abilities - Bot changes size, shape, or movement style
   b. Key/door systems - Colored keys that unlock corresponding areas
4. Level Design Features:
   a. Gravity switches - Flip or rotate the gravity direction
   b. Puzzle elements - Pressure plates, timed switches
   c. Dynamic terrain - Platforms that change shape, crumble or deform over time

Previous Demo Examples:
- Ghost Mechanic by Sirui Z.
- Traversable Pipe by Eli Asimow
- Color Absorption by Amy Liu
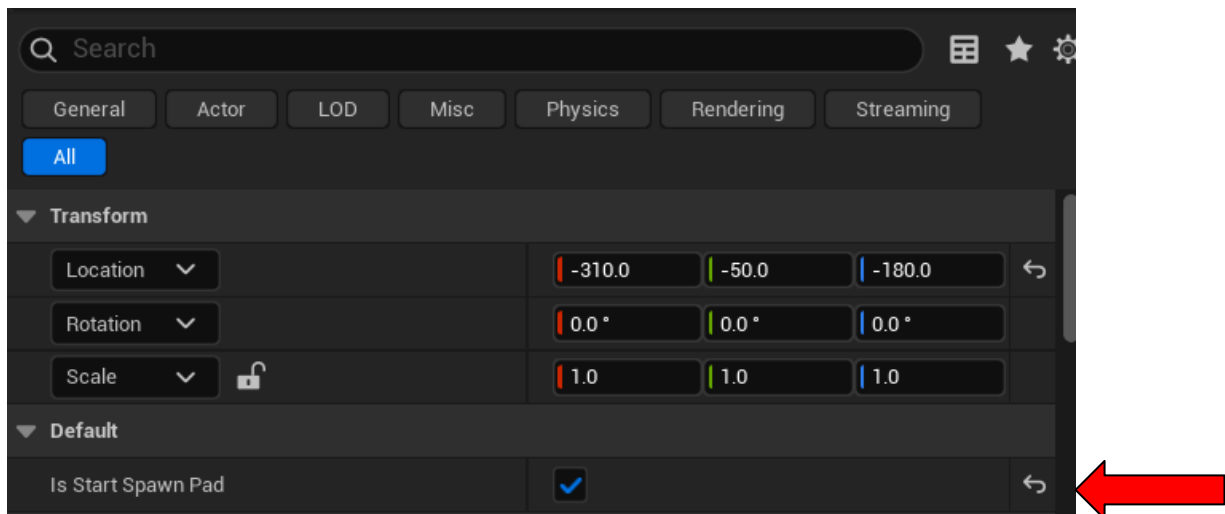- Liquid Transformation by Siyang Li

Part C - Level Design

Once your mechanic works, build a level around it.

1. Create a new level in your project

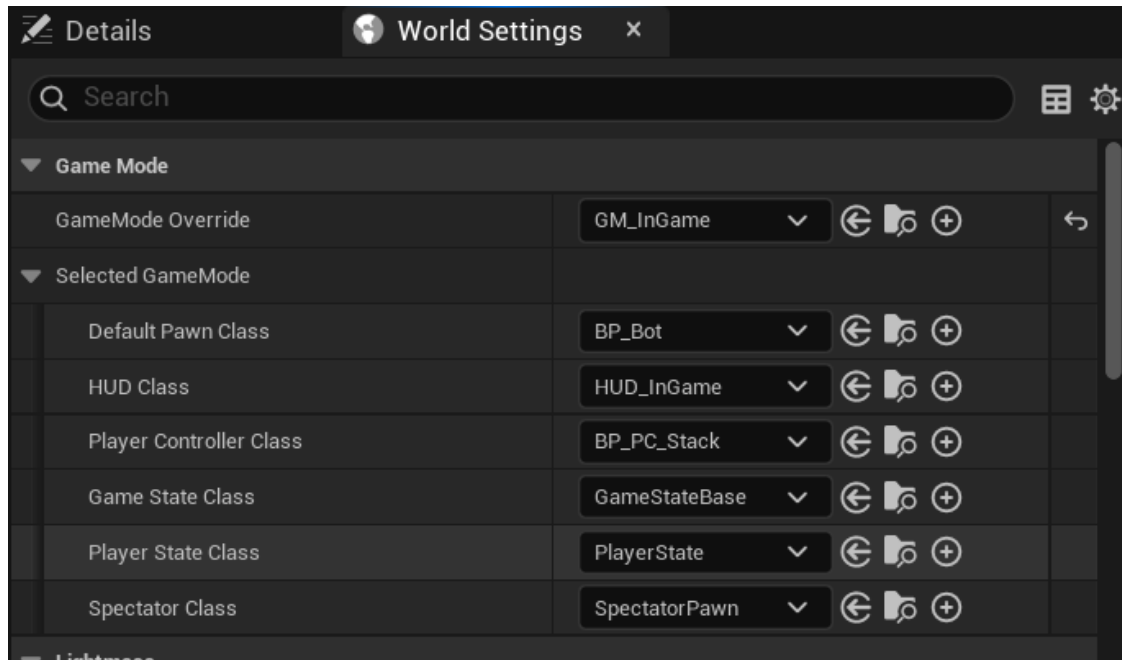2. Add Stack o bot spawner pad into your scene (found in the GameElements folder)
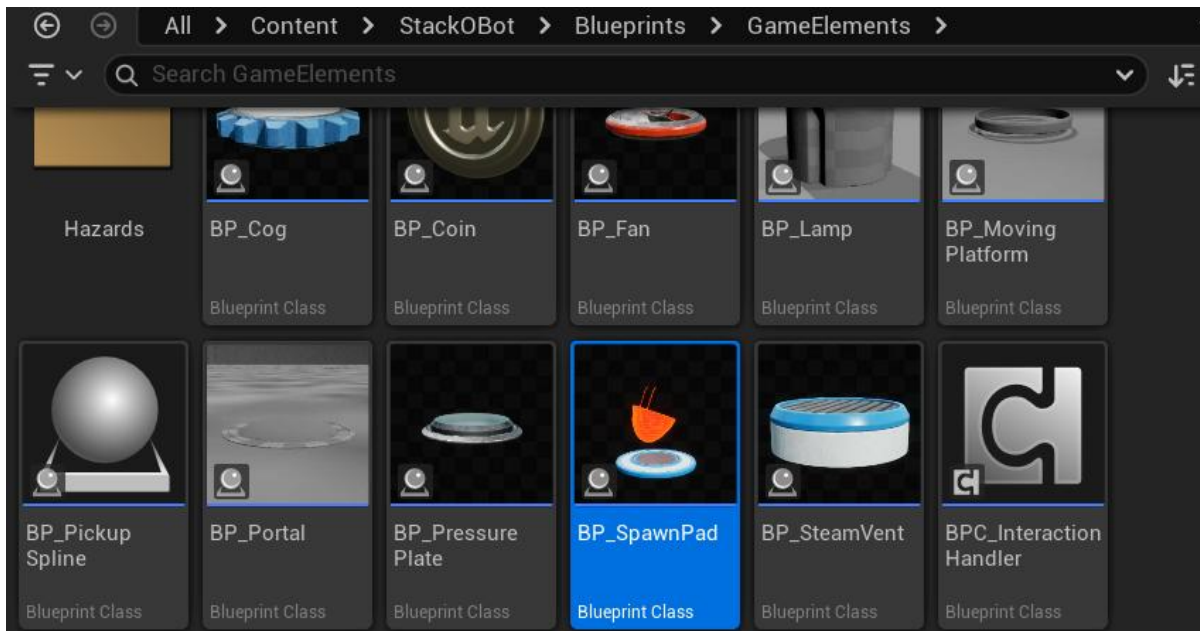
3. On yourBP_SpawnPad make sure **Is Start Spawn Pad** is checked in the details panel

4. Open your world settings from the Window menu: Window > World Settings

Change your world settings to match the following

5. Have fun designing your level!

Level Requirements:
Your level must include:
- A start area
- A clear end goal (victory pad, collectible, or exit) that requires use of your mechanic to reach
- At least 1-3 minutes of playtime when demonstrated
- At least 2-3 opportunities for the mechanic to be used

Deliverables
When you submit the assignment, make sure you provide a written description documenting your new mechanic in a NewMechanic.doc file and submit this with your updated Unreal project code, game executable, and an associated gameplay video demo to the associated CIS5680 Canvas folder by the due date.