CS 437 Final Game
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For my final game I chose to program my game in Godot. I chose this language as I have no experience with it and wanted to learn and expand my knowledge with it. After much research with the language from Mr. Harris and online documents I was able to work on my 2D game. As this is a 2D game we use sprites for all our in game characters. However before talking about the sprites, I want to discuss the scenes for the game. Our main game takes place on an island filled with the creatures. This is where the player will spend most of the time playing the game. However we have 2 additional scenes which include the interior for a blacksmith and a healer. This is where the player can upgrade their weapon or choose to heal themselves with the materials gathered from their journey. From the main scene the character is introduced to their first NPC, which explains to them about the island and current situation, as well as informing them about the blacksmith and healer. From there the character is free to explore. The scenes use many elements from godot such as sprites, both static and non statics, background to load the textures, kinematic 2D for the enemy types, and even tilemap to give the world more of a layout. As I was very unfamiliar with godot I tried to use these features to the best of abilities to make a nicer looking game for the player. From the scene the player will notice things like bushes, trees, and leaves. The player is able to interact with leaves and trees, if the player hits the tree it will award them with some random wood that can be used to upgrade their weapon. Whereas if the player fights the enemies they will be given fur, which is used to upgrade their health. The player is followed by a camera allowing the world to feel larger and more immersive. For our player character we are using a 2D sprite. Our character uses the sprite sheets to allow them to be animated. For our animation we mainly use an animation player with some animated sprites. We mainly prefer animation players as it allows more freedom and gives us more options. The player is controlled via W, A, S, D or the arrow keys. Depending on the key the player will move the given directions. However to make the game feel smoother we assign an animation to each of these keys. For example if the player will press A, the sprite sheet will cycle through animations of players walking right giving the feel of immersion. This is true for all directions. Each direction has its own separate animation. We do the same technique for attack. If the player chooses to attack we first figure out which way they are facing by checking their last input. According to the direction facing we can show the player the animation. We choose rather than always attacking in one direction as that feels very unnatural and doesn't make the game flow well. So we took the extra time to allow the player to have more control for their character. As that is the movement for our character we will need movement for our enemies as well. Using the same sprites we were able to give them animations depending on the way they are facing as well. As well as to check if the enemy dies and to play the animation according to their death. Now one of the most important parts of the game was to set up proper collisions. We wanted to make sure the sprites were in contact before taking or receiving damage. We were able to calculate the distance between two sprites and have the enemy player advance towards the player. Using collision boxes we can test if the boxes overlap, if they do we can assume the enemy does damage to the player. Whereas for the player we set up a custom hitbox that follows their sword. This allows the attack to feel much more precise and accurate. Since this collision follows each frame we can get a better hitbox on

the enemy allowing the combat to feel much smoother. Setting up a collision was very important as we had to make sure each damage taken or dealt was fair and didnt feel unearned. I was also able to set up collisions for things like the trees around the map. This allows the player to walk around and mine trees for materials they can earn to use later to upgrade their weapon. Our player runs on states, for example depending on their state they are allowed to perform different actions, our player has the move state, attack state, or idle. If the player is standing still they will be in idle, however if the player attacks, they will be in the attack state, meaning the attack animation will play. The game is able to switch between these states depending on the player, as the player our enemies uses these states as well. As it would be unfair for the player to keep getting swarmed, I chose to set up my states as idle, patrol, attack. The enemy will start off in the idle state and will patrol around the map. This allows the world to feel more alive. The enemy will move to random positions in hope to find the player on patrol. If the player is detected using collison boxes to check if the player should be seen, the enemy changes states to attack, meaning the enemy will run to the player and attempt to hit and kill them. If the enemy loses sight of the player they will return to their patrol or idle state. This keeps the game flowing and feels fair. We use sensing to check if the enemy should see the player, if they do they can attack them however if the player is not in the enemies view they will be ignored. I also included a blacksmith and healer for the player to interact with and upgrade their items with. The player is able to interact with them and get some backstory and use their materials with them. Doing so allows them to change scenes to be inside the homes of the blacksmith and healer.

Using godot was really fun and interesting, due to experience in coding and unreal 5 the logic was easy to understand. However, learning each new item and nodes was very fun and interesting. I was able to see how powerful godot can get but simple they keep. Some advantages of godot I found was how easy it to use and pick up. As well as the build in help was very helpful as I can learn about each command and function right in the program. However for disadvantages I noticed that it was difficult to switch between multiple tasks and as scripting would often get confused with what you are working on. I also noticed sometimes I would get weird bugs that would go away if I just restarted the game again which seemed odd.

I really enjoyed this game and it was really interesting to see what and how much goes just to render many of the text and sprites we see on the screen. I really liked the game engine assignment as it showed me that properly setting up code can really give you multiple different possibilities and ways to alter and create what you want. As I add previous experience in unreal engine 5 it was very cool to see what was going on under the hood. Using godot was also really nice as it was a tool I really enjoyed and would want to explore further and increase my knowledge in.

Controls:
W, A, S, D / Arrow Key for Movement
W: UP
A: Right
S: Left
D: Down

Enter: Interact with NPC
1 / F: Purchase Upgrade

Mouse 1 / Left Click: Attack