Pixel Dawn

CS 179n Final Project Writeup

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1 Overwiew

Pixel Dawn is a 2d side-scrolling survival game. Our team decided to utilize the unity game engine because of the accessibility of the engine and the many guides online to help us get started.

The world of Pixel Dawn is being attacked by a zombie apocalypse. The player is one of the last man standing and must defend themselves from the wave of zombies.

The player has to choose between four different characters, a cowboy, a little girl, a ninja, and an android, where each has a unique playstyle and unique abilities. From then the player must choose to play in either two different maps, a winter style map or a sci-fi style map. No matter which map and which character is chosen the objective of the game is the same, survive as long as you can.

Once the player is dropped into the map zombies will being to spawn across the map. The amount of zombies spawned across the map is limited, that is until you have killed all the zombies, then a new wave begins where each new wave comes with more zombies the player has to kill. The base of the game is to see how many waves of zombies the player can survive.

In order to fend off against the zombies the player can purchase weapons in a shop that is located in the map. In order to purchase weapons the player must collect points from killing the zombies. The player is given enough points in order to purchase a pistol right from the beginning, but weapons aren't the only way to defend yourself against the zombies.

As stated before each playable character has a unique ability to fight against the zombies. The little girls special ability is a tantrum mode where she summons weapons around herself and they begin to shoot. The android has an arm cannon that shoots a blast that pushes and kills zombies it makes contact with. The cowboy can throw grenades, but can only throw five, although after every new wave he replenishes his grenade count. And finally the ninja unsheathes her sword and slashes the air sending a powerful wind that kills the first zombie in makes contact with.

2 Tasks

- Main Menu
  - \+ Menu Options: Start and Exit
  - \+ Menu Music
  - \+ Character Selection Screen
  - \+ Stage Selection Screen
  - – High Score
    We didn't add this in because we wanted the focus of the game to be more on just shooting enemies and grinding your way to have enough points to buy guns. We still have a score counter though.
- Characters
  - \+ Possessed little girl
  - \+ Android
  - \+ Cowboy

+ Ninja girl
– Soldier
We decided to cut him out of the game simply because the sprites that we found for him was not the same art style as the other sprites that we found for the other characters. We replaced him with the cowboy character instead.
+ Movement with WASD and Space
+ Gun arm movement tracks mouse cursor, and left click to shoot gun
+ Sounds
+ Character specific abilities

- Enemies
  + Human
  + Wolves
  × Bats
  We mainly focused on walking enemies. Since flying enemies would have its own AI, we couldn't afford to invest time in a specialized enemy AI script.
  × Bear
  + Sounds (groans, yells)
  + Random enemy spawn

- World and Other
  – Base Mansion Level
  We did create a mansion level for testing purposes. However, we thought of other level design options and opted for a winter level and a sci-fi level instead because it looked more fun and interesting.
  × Climbable Ladders
  We didn't have the back side of every character's sprites. Also we had no artists in our team to draw the back of each character, so we just scrapped this mechanic out.
  + Level Music
  + In-game currency
  + Weapon shop
  + Guns (pistol, machine gun, shotgun, grenades)
  + Character UI (Inventory, lives, score)
  × Increasing of enemy difficulty as time goes on
  We didn't think much of increasing the enemy difficulty because we were satisfied with having them come in waves.
  × Power ups
  This overlapped with the character specific abilities. Since character abilities can only be used so many times, their abilities are kind of like their "power-up".
  × Health packs
  We were going to let players buy more health at the shop, but since the shop was one of the very last things we implemented before the project deadline, we couldn't put this in with the time we had.
  + Game Over screen

3 Assets

All the assets for the game came form online sources. We downloaded and used the following assets.

- CUTE GIRL - FREE SPRITE
  - Folder: `Little-girl`
  - URL: `https://www.gameart2d.com/freebies.html`
  - License: CC0 1.0 Universal
  - License URL: `https://www.gameart2d.com/license.html`
  - Attribution: Game Art 2D
  - Modifications: Modification to the sprites for Idle, running, and jumping animations.
- THE ROBOT - FREE SPRITE
  - Folder: `Android`
  - URL: `https://www.gameart2d.com/freebies.html`
  - License: CC0 1.0 Universal
  - License URL: `https://www.gameart2d.com/license.html`
  - Attribution: Game Art 2D
  - Modifications: Modification to the sprites for Idle, running, and jumping animations.
- NINJA GIRL - FREE SPRITE
  - Folder: `Ninja`
  - URL: `https://www.gameart2d.com/freebies.html`
  - License: CC0 1.0 Universal
  - License URL: `https://www.gameart2d.com/license.html`
  - Attribution: Game Art 2D
  - Modifications: Modification to the sprites for Idle, running, and jumping animations.
- TEMPLE RUN - FREE SPRITE
  - Folder: `Cow-boy`
  - URL: `https://www.gameart2d.com/freebies.html`
  - License: CC0 1.0 Universal
  - License URL: `https://www.gameart2d.com/license.html`
  - Attribution: Game Art 2D
  - Modifications: Modification to the sprites for Idle, running, and jumping animations.
- FREE WINTER PLATFORMER GAME TILESET
  - Folder: `Winter-map`
  - URL: `https://www.gameart2d.com/freebies.html`
  - License: CC0 1.0 Universal
  - License URL: `https://www.gameart2d.com/license.html`
  - Attribution: Game Art 2D

  - Modifications: no modification.

- FREE SCI-FI PLATFORMER TILESET
  - Folder: `Sci-fi map`
  - URL: `https://www.gameart2d.com/freebies.html`
  - License: CC0 1.0 Universal
  - License URL: `https://www.gameart2d.com/license.html`
  - Attribution: Game Art 2D
  - Modifications: no modification.

- FREE GRAVEYARD PLATFORMER TILESET
  - Folder: `Graveyard map`
  - URL: `https://www.gameart2d.com/freebies.html`
  - License: CC0 1.0 Universal
  - License URL: `https://www.gameart2d.com/license.html`
  - Attribution: Game Art 2D
  - Modifications: no modification.

- THE ZOMBIES - FREE SPRITES
  - Folder: `Enemies`
  - URL: `https://www.gameart2d.com/freebies.html`
  - License: CC0 1.0 Universal
  - License URL: `https://www.gameart2d.com/license.html`
  - Attribution: Game Art 2D
  - Modifications: no modification.

- Hell Hound Sprite Animation
  - File: `Hell-Hound-Files.zip`
  - URL: `https://ansimuz.itch.io/hell-hound-sprite-animation`
  - License: Creative Commons Attribution v4.0 International
  - License URL: `https://itch.io/game-assets/assets-cc4-by`
  - Attribution: ansimuz
  - Modifications: no modification.

- Gun Construction Kit
  - File: `FreeArt_GunConstructionKit_v03_show.svg`
  - URL: `https://opengameart.org/content/gun-construction-kit`
  - License: CC0 1.0 Universal
  - License URL: `https://opengameart.org/content/gun-construction-kit`
  - Attribution: SpriteAttack
  - Modifications: no modification.

- 8-bit sound effects
  - File: `The Essential Retro Video Game Sound Effects Collection [512 sounds].zip`
  - URL: `https://opengameart.org/content/512-sound-effects-8-bit-style`
  - License: CC0 1.0 Universal
  - License URL: `https://opengameart.org/content/512-sound-effects-8-bit-style`
  - Attribution: SubspaceAudio
  - Modifications: no modification.
- Danger Storm - Sci-fi map music
  - File: `Danger Storm.mp3`
  - URL: `https://incompetech.com/music/royalty-free/music.html`
  - License: Creative Commons: By Attribution 3.0
  - License URL: `hhttps://incompetech.com/music/royalty-free/licenses/`
  - Attribution: Kevin MacLeod
  - Modifications: no modification.
- Nouvelle Noel- Winter map music
  - File: `Nouvelle Noel.mp3`
  - URL: `https://incompetech.com/music/royalty-free/music.html`
  - License: Creative Commons: By Attribution 3.0
  - License URL: `hhttps://incompetech.com/music/royalty-free/licenses/`
  - Attribution: Kevin MacLeod
  - Modifications: no modification.
- Andreas Theme- Main menu music
  - File: `Andreas Theme.mp3`
  - URL: `https://incompetech.com/music/royalty-free/music.html`
  - License: Creative Commons: By Attribution 3.0
  - License URL: `hhttps://incompetech.com/music/royalty-free/licenses/`
  - Attribution: Kevin MacLeod
  - Modifications: no modification.
- A* Pathfinding Project Free
  - File: `PathfindingProject_Free_WebsiteDownload_4_1_16_7f164ebc.zip`
  - URL: `https://arongranberg.com/astar/download`
  - License: Asset Store Terms of Service and EULA
  - License URL: `https://unity3d.com/legal/as_terms`
  - Attribution: Aron Granberg
  - Modifications: no modification.

4 Discussion

One of the biggest issues we had while building our game was the merge conflicts with the scenes and prefabs. This made the first few weeks of progress to be slower than it should of been; it wasn't until we communicated more about the merge conflicts and how we should each work in separate scenes that we started to speed up our progress. We didn't realize how important communication was until we got deeper into the game and each of our separate tasks began to intertwine. However, when we began communicating on a nearly daily basis on Discord, we were able to easily coordinate our work and ask each questions about what each of us learned while working on our part.

We managed our time based on our proposal milestones. While we were able to reach our milestones for the first few weeks, we realized that our milestones didn't account for the time we would have to spend on midterms. Thus, during midterm week, we made very little progress, and had to catch up during the next few weeks. Additionally, we didn't realize that some features definitely required multiple weeks to finish. For example, gun interactions with the characters and special abilities took nearly 3 weeks to fully implement. That was the main reason why we had the characters only have one ability. It took so long to implement one feature of the character that the plan for the rest of the abilities (like the little girl's dog) would not be able to be done in time. Also, we didn't realize how connected each of our objects were from the beginning. Near the final weeks of the project, we had to go through many of our scripts to make sure they could work if we were to implement a feature using that object. For example, we had to adjust the gun scripts in order to have multiple guns and an inventory system.

We definitely were able to speed up our progress on the game the longer we spent using Unity. It took most of us the first two weeks to fully understand Unity's tools and how to use them, like the inspector and the hierarchy. The commits made during the first few weeks are minuscule compared to the changes we made during the last couple of weeks. We also didn't realize how the game was going to be combined until near the end, so many of our final changes are made to make sure everything functions together, like the main menu music carrying over into multiple scenes. Perhaps if we had planned our project's structure out a lot more in the beginning then we could of avoided this issue, but our lack of experience with Unity in the beginning prevented that.

If we were to do this project again, the main two things we would do differently are figure out a solution of the scene-merge-breaking, and create our own assets. As said before, we found a solution to our merge issues, but it's very tedious. It wasn't until we did more research into how other people online deal with git and Unity scenes that we found ways to avoid it. Secondly, our original idea was to make a game that had an 8-bit art style, hence the name Pixel Dawn. However, none of us have artistic talent, and it would of taken one of us multiple weeks to make just somewhat acceptable sprites and animations. We would trying having one person dedicated to artwork, while the other four work on the game logic. It would make our game more personalized and closer to our vision, but thankfully we found sprites from a single artist that could fit into our 2D zombie game.

A few of the things that we learned throughout this project was good game design, how difficult it was to truly make a good game, and how small features can take an enormous amount of time. We realized late on that we should of tried to make each game object as independent as possible, instead of adding more features to the same script and attaching it to every object. Also, though we had somewhat low expectations for our game, we didn't realize how much thought goes into the gameplay. Making the game "fun" required us to test are game and judge for ourselves if it was, and then make changes accordingly. Lastly, we underestimated the time needed and difficulty of making simple or small features, like character movement or making an arm point at the mouse's position. It made us respect the small features game developers have in their games, since some may have taken weeks to implement correctly.

Overall, this journey in creating a game using a game engine that we knew nothing about was a very rewarding and good learning experience. We learned a lot about how to work as individuals and as a team. Although we had some times where everybody was unmotivated and had some disagreements, we learned to accept our differences and remember that we are working as a team on the same game. We also learned what it's like to work in a large group of 5 and to go from milestone to milestone. Since most of us have only ever worked in teams of 2 or 3 and had generally less milestones for projects, this experience was brand

new and eye-opening. It was rewarding because it gave us an insight into what it's like to work in the video game industry, or just the tech industry in general.