Hat High-Rise

Stay-At-Home-Games
Magic-Hat Studios
2 Dimensional Game Design and Development

Revision: 0.0.0

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1) Overview

  In hats high rise, you play as a disgruntled worker that has just been fired from you everyday office job. You have to make your way from the CEO's office, all the way down to the ground floor to escape, and since you have nothing left to lose you steal the companies merchandise (hats) all along the way. Since you are stealing and running around like a mad man, there will be security guards trying to capture and many other enemies on the other floors of the building that you've never been on before.

  As you pick up different hats scattered and hidden around the map you gain special powers unique to each hat which will help you evade and defeat enemies and help you complete certain tasks. There is not a specific limit to how many hats you can carry on your head, however, Lots of hats means lots of weight which will bog you down and make it harder to evade enemy attacks, and finish jumping puzzles to continue the level. You will be able to reorder the hats so you can keep your favorite powers closer to your head for safe keeping.

  Each floor of the tower is unique, the top floor closest to the CEO is the first level a player will encounter. It will consist of many workers trying to look busy in front of the CEO with security cameras watching their every move. You will have to avoid the cameras to avoid getting swarmed by security guards, which will make the level significantly harder. On later levels the cameras will be equipped with turrets and will shoot at you if you are seen.

  In addition to turrets on later levels, there will be more jumping puzzles and shortcuts to find, getting progressively more discreet as you progress. Each level will have a unique theme with their own style of enemies. Your character will be able to run and jump, use each ability for each hat you are wearing, as well as wall jump. Some hats will have passive abilities, while some hats will provide you with another attack option. For example, a hat with bunny ears will make you jump higher, or a nurse hat will give you more health, while a wizard hat will allow you to throw fireballs out, or with a fish hat you could spit water balls. These attacks and buffs will help you get through the level faster and easier, as well as eliminate security guards and any other enemy that might come your way. If someone is looking for an extra level of difficulty though, every level will be possible to complete without wearing a hat. Since this you don't need hats, it provides the player with a safety net meaning that if they lose some hats, they will always be able to finish the game. Also it

allows the player some freedom to finish the level in their own way, there is no set in stone way to finish it.

Theme / Setting / Genre

You play as a disgruntled worker who has just been fired and is trying to take as much merchandise as you can carry before leaving the building.

Core Gameplay Mechanics Brief

- Stack hats, more hats bog you down
- Each hat has an ability related to combat or movement
- To get hats, find them in the level before the enemy does
- Each hat serves as a hit point preventing you from resetting to the start of the level

Targeted platforms / Hardware

The plan is to make this game playable from a web browser and possibly make it available on steam but we want the game to be playable for free.

Team

Consists of 3 Programmers and 2 Artists

Steve Datz
-Programmer
James Valentino
-Artist
Jaden Schneider
-Programmer
Anton Nikitin
-Programmer
Sam Clysdale
-Artist

Project Influences (Brief)

Celeste

- Video Game
- Celeste is a 2D platformer that was influential both in how it looked and played. Visually it is a pixel art game that makes a lot out of a pretty small color palette. Celeste is one of the top platformers out there as far as how good it feels to play. The player movement is really responsive, and has a few mechanics that are expanded upon in numerous ways.
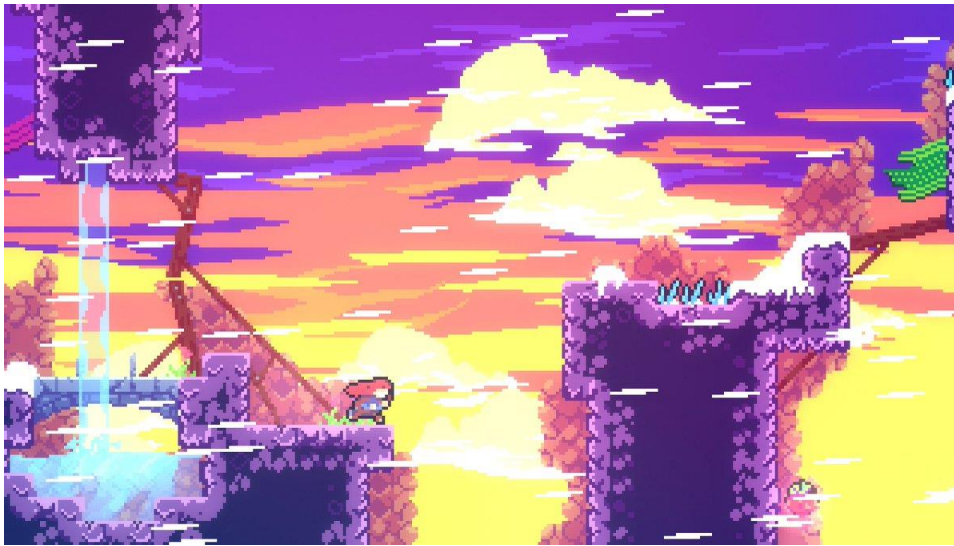
The Metroid Series

- Video Games
- Different ability unlocks throughout the game is a major focus for both Hat High Rise and the Metroid series. We would also like to add some "Metroidvania" level design, where different sections of the level would only be accessible when a player has a specific ability.

Project Description Brief

You will play as a disgruntled worker in the Capco Tower who has just been fired. As revenge and retribution you try to steal as many hats as you can from the company. Each hat gives you a new unique power that will help you escape and defeat the tower security systems.

Project Description Full

For this project our goal is to create a 2d platformer, in which you explore the levels to find hats which give you powers to help you progress even more. We wanted to make sure that each level is able to be completed without picking up any items though, in order to keep player agency and to ensure that a player never gets stuck on one part or has to go back and search for a specific hat to move on. We suspect that that would ruin someone's gameplay and would make them want to stop playing. Instead, we are going to design the levels to be a bit harder so that a player will want to pick up hats to gain the

abilities and make this game easier in that way. This incentivizes picking up hats and urges a player to explore all parts of a level.

The narrative of the story is not our main focus, however we would like to give the player a clear motive and reason for running around stealing hats and beating up the security. The character you play has been working for CapCo for an extended period of time as a plain office worker. After he is fired from his job he realizes that he has given this company his life and they have given him nothing in return. In retaliation he goes on a fury, blinded with rage he steals hats justifying it as compensation for all the years of his life lost to CapCo. Since you are running amuck and causing all sorts of chaos the security is called and they try and subdue you. Since you have only been on the one level your entire career, but there is many floors to the building, The character also explores many different floors, stealing more hats from each level.

The levels in Hats High Rise will have a floor and ceiling with occasional drops into oblivion that will kill your character and respawn you at the beginning of the level with the same hats you had on when you started. Security cameras will be mounted on the ceiling and if you are caught by one, many enemies will emerge and you will have to escape or take them down. As there are many floors and we don't mind the tower seeming like it would be impossible to exist in reality, There will be many unique and interesting themes that we will explore for each level. The first will be a plain office, since that is where the character works every day. The second will be a Japanese style level where there will be samurai enemy's and you will be able to pick up a samurai helmet and many other hats.

Hats serve as hit points for the player. Upon taking damage the player will drop a hat. If the player has no hats they will drop a random amount of coins and reset to the start of the level. The player will be able to store all their collected hats at the end of the level, these stored hats will count towards the players overall score. While it is possible for the player to lose the hat during gameplay due to a low ceiling, the hat will always be available to them at the beginning of each level.

The initial goal was for there to be a variety of enemies that a player will have to overcome on any given level. These enemies would be correlated to that levels theme. Enemies will mainly spawn from a security camera system that detects the player. Due to scope we only were able to implement one enemy type and one level theme.

The hats that the player can pick up come in a great variety of abilities. Some hats will give the player a jump boost, allowing them to more easily complete certain jumping puzzles and find more secrets in each level, while other hats will give the player a speed boost allowing them to quickly escape danger. Some hats will give the player combat abilities. An example of this is the hat styled after a security hat which gives the player a baton as a melee weapon. Another hat that will be implemented is a Robin Hood styled hat that will grant the player the ability to shoot a bow and arrow to give them long range capabilities. The fact that there is many different hat abilities, and that the player can wear many hats at once, allows for a lot of player agency as the player will play with different hat combinations in order to find which one they like the best and which one is the best for completing each level.

2) Gameplay

Hats High Rise is a 2D Platformer in which you collect hats that grant you a variety of abilities to help you defeat enemies and

Uniqueness

Hat High-Rise uses the mechanic of powerups in platformers in a unique way that has a large influence on gameplay

- Wearing a number of hats at once offer you the power of all those hats at once. As a tradeoff, your tower of hats make you a larger target to enemies, and can be cumbersome on your movement.
- The mechanic of these hats accumulating physical height to the player itself can be taken into account in how the character interacts with the world. A taller stack of hats is not just a penalty

Progression

The Game is segmented into linear stages similarly to other 2D platformers (Mario, Celeste, etc.). The character can pick up hats along the way to use to progress, but the amount of hats the character has on at once does not steadily increase as the game progresses. The amount of hats the player has varies throughout the game. The player can choose to completely forego wearing hats for an extra challenge, but most players would be discouraged to do so.

Gameplay Mechanics

Jumping/Platforming:

There will be jumping puzzles and such to maneuver around and keep the level interesting and exciting even when you are not fighting enemies. All of these will be possible to do without hats in order to make sure a player doesn't get stuck at a certain part. Some hats will enhance your speed or jump height which makes these parkour parts much easier.

Melee/Ranged Combat:

The base character has no offensive abilities, but is the quickest since there are no hats to weigh him down. The player will be able to pick up hats which will give them specific attacks. For example, the first hat we have implemented is styled after a security guards hat and gives you a baton that

you can hit enemies with. There will also be a Robin Hood style hat that gives the player the ability to shoot a bow and arrow to give them long range capabilities.

Collecting and Wearing Hats

- Hat High-Rise offers a variety of hats that can be found and worn by the character throughout the stages of the game. Hats can be acquired in a variety of ways, and offer abilities ranging from combative to passive. Wearing multiple hats at once offers those abilities to stack, but wearing a large number of hats at once makes you more physically unwieldy to move throughout the level, and a larger target to enemies. The amount of hats/choice of hats worn by the player is usually a playstyle choice in what feels the most fun to them. Hats can be taken off your stack using the environment.
- How the hats are implemented will be really emblematic of the scale of the game.

Stealth/Puzzles:

- There will be security cameras on the ceiling which if you are seen by one, will release several security guards into the room. In later levels there will be turrets as well and they will shoot at you if you're seen. In order to help you maneuver around and be quick and sneaky, smooth responsive character movement will allow the player to avoid detection and enemies.
- A practical concern for this implementation is a lack of time to design intricate enough puzzles.

Scoring:

- There will be a set number of coins and hats distributed between levels. The players score will be incremented and saved upon competition of a level based on how many collectables they finished the level with. A coin is worth 1 point, and a hat is worth 10. It is possible for the player to lose their current hats and coins during a level.

3) Narrative: Setting, Characters & Story

Setting / World

The narrative is contained within the CapCo tower. We know that CapCo is a global leader in the manufacturing and distribution of a large variety of hats. Each floor of the tower serves a different purpose in the hat creating process. From floors that are greenhouses to grow some type of plant based hat, to an ironwork floor where hats are cast and molded from molten metal. The dangers existing on each floor allude to some corporate malpractice CapCo is involved in or Worker safety violations going unreported.

Design Constraints

The setting of the game mirrors its main mechanic. Towering hats while climbing a tower. If someone sees a tower, the top is a natural an end goal. However, there is one issue. Hat high rise is restricted by the semester we have to work on in. At this point I doubt we will have time to fully make 3 quality levels, And Most towers aren't only 3 stories tall. A possible solution could be that one level is multiple floors, each floor is a part of a level, a bit how sonic levels are separated into 3 Acts. Each being thematically the same but build on different aesthetics and game mechanics.

Characters

- Hat guy (working name)
    - Player character. Short fully white humanoid character. Distinguished from his Tuft of hair on top of head that will usually be covered by tower of hats collected by the player.
    - Cog in the CapCo working machine. Works in the office at a dead-end day job.
- CapCo CEO
    - Fires the Hat Guy, works at the top floor of Hat tower.
    - Would be a nice final boss if we can get around to it. The player can take revenge against the CEO
- Security Guards
    - Will attack and try to subdue the player

Story Brief

You are an office worker in the CapCo tower that is tired of getting stepped on and looked down on by the higher ups. After you get fired you take retribution and run around the building stealing hats and kicking ass.

Design Constraints

The mechanics of Hat High rise came in first. So finding a story that can cover and justify all these mechanics is a little bit of a challenge. Thankfully the general theme of the story is light enough that we don't need to have lore for every inch of this world. In other words we can get away with a little bit of narrative dissonance because we have already established that wearing 10 hats at once can give you superpowers. However, Some issues still exist. Why is the hat guy's place of work so dangerous? Justifying the enemies and challenge in this particular setting needs to be addressed in some way. Each obstacle and enemy will need to make sense in the level.

Story Detailed

The player character is just another worker in the CapCO Tower. After getting called up to the top floor just to get fired, the player character decides to take action and get retribution for all their hard work by stealing as many hats as possible. As a result, all the towers security systems are targeting the player, thankfully stolen hats give new powerups to help escape the tower with the merchandise.

4) Visual Design

The game will be made in pixel art. It supports a more lighthearted game, and is very easy to create and implement pixel assets. The game will be bright and appealing to look at without being overwhelming. Each stage should have its own unique color palette and visual theme. Putting effort into character animation is a must in able to telegraph the movement and condition well.

Visual Aesthetic Goals

Everything as described in the header. The visuals of the game do as much heavy lifting in making a game fun as the mechanics. Every game mechanic MUST be telegraphed to the character in an appealing and noticeable way. This spans from character animation to color palette to the UI

Influences

Celeste
- Great pixel art
- Telegraphs game mechanics masterfully. Great stage design
- Bright and colorful palette, yet is balanced and controlled
- Pixel art style doesn't use many which dark outlines, which I like
- Punchy animation that makes movement feel even better

Hollow Knight
- Elegant and simple UI
- Telegraphs mechanics very well Especially with sound
- Simple and great animation
- Dark color palette, but brings out the bright and saturated colors when it needs to

Fez
- Mixes pixel art with 3D
- Contains a hat
- Bright Color palette, also explores different styles across different stages

Art Style Guide / Art Bible

Character Guidelines

Main character:

- All player animations or bases for other humanoid characters will use this character as a base
- Character is 32 pixels tall and 18 pixels wide. In the Stage they are 2 tiles tall and a bit over 1 tile wide.
- As of right now, the character has no Hard outline because it contrasts with the background. This works for now but we can later add an outline if character visibility ever becomes an issue
- Hats will be 20 pixels or 2 wider than the character's head at the hat's bottom
- The Hats will always be 12 pixels tall: they extend 8 pixels above the characters head, and overlap 4 pixels onto the head.
- The overlap rule also applies to sequential hats in the stack.
- The hat tower will begin to sway following inertia as it grows in size, this won't be hand animated but done using code.
- The aim is to make the hats raise the character's hitbox height by 8 pixels with each hat accumulated (half a tile)
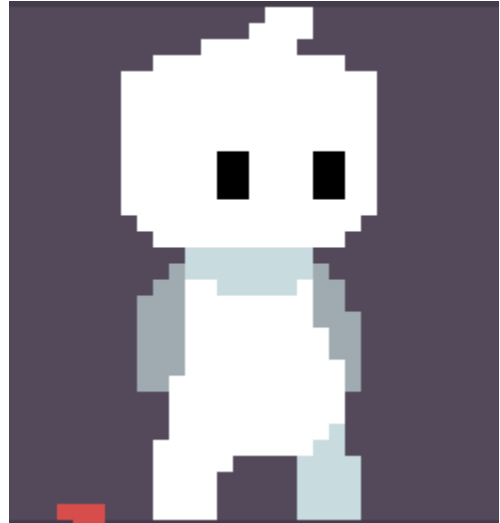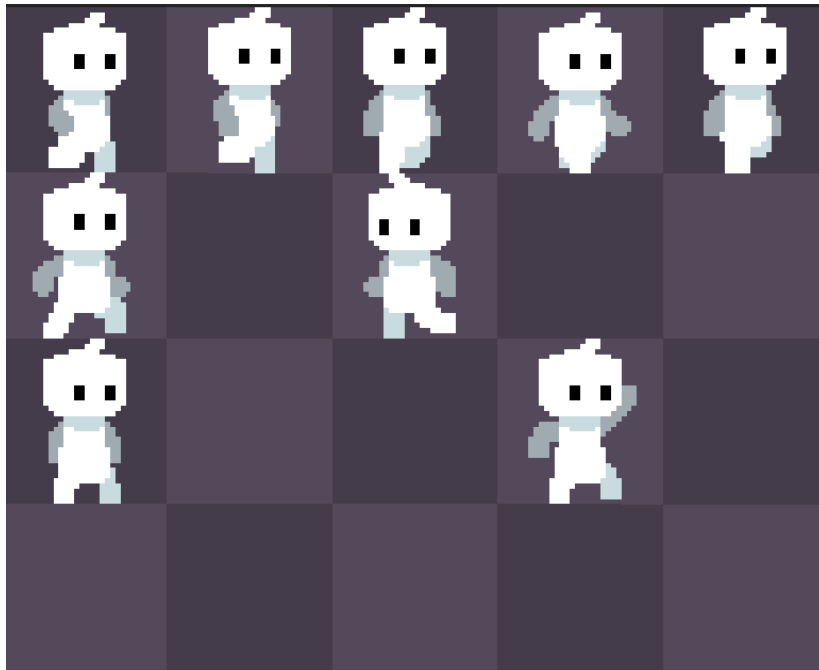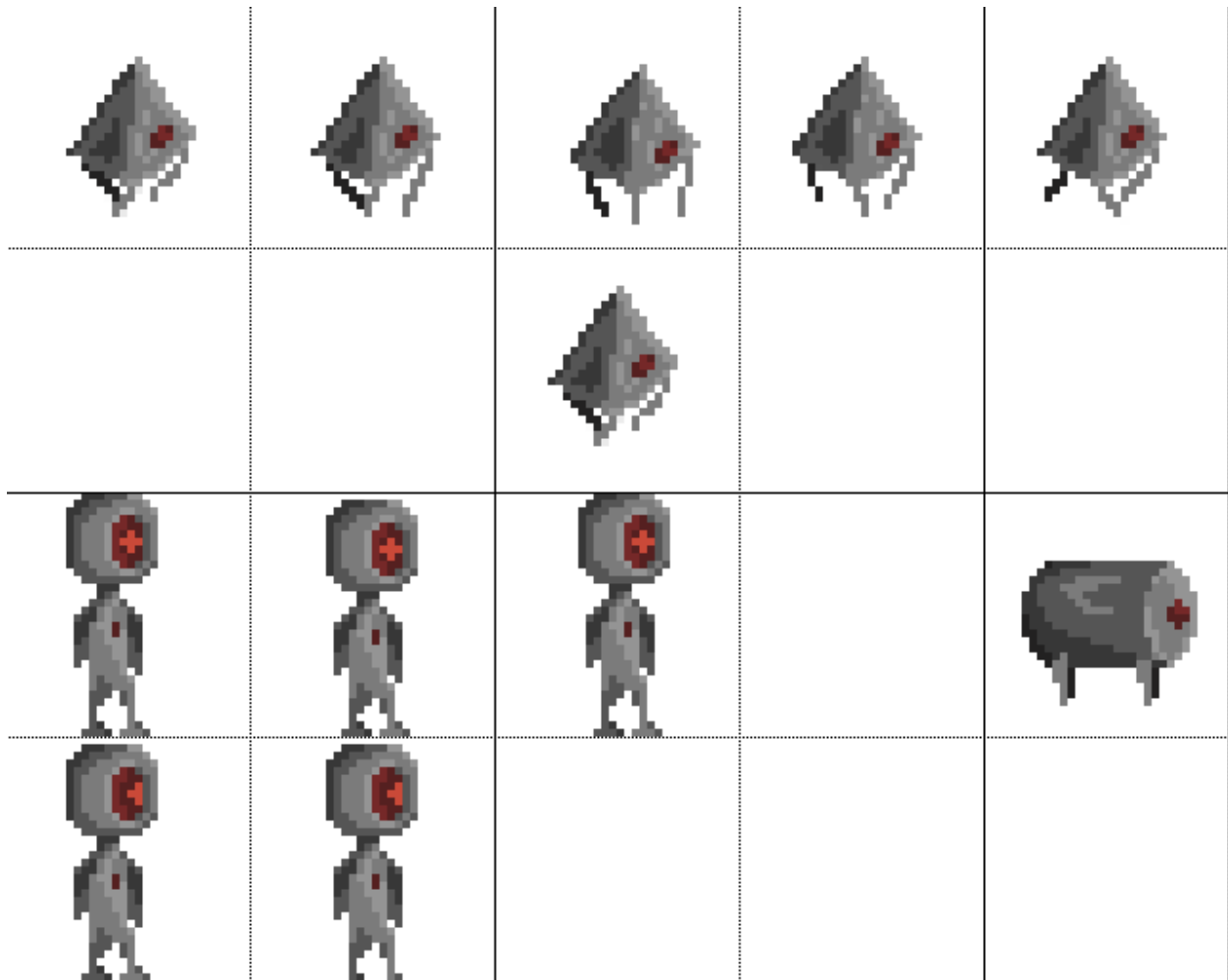
Environment Guidelines

- The tiles that make up the environment are made up of 16x16 pixels.
- A tile set should have multiple variants of common used tiles in order to create variety.
- Each level should have its own theme, These themes for each level should be narratively consistent within itself, but can be completely different from another level.
- Remember that all these levels exist indoors, if you choose a theme that is outdoors make sure to add a motif that still makes it exist within the tower (i.e. Large windows in BG if theme is something outdoors)
- Levels should have their own unique palette based off of one or 2 main colors. (i.e. a jungle is mostly green with red/purple accents)

- The main tile sheet for a level should include more than 1 type of ground (example would be a sewer level contains both brick floor and a pipe floor)
- Levels should be constructed with both steps and slopes. Slopes add more shape to each level and can be potentially be used in puzzles
- Slopes would be restricted to 2 tiles horizontally to move up 1 tile vertically (22.5 degree angle) make top and bottom half of slope in tile sheet

Example of a Tile Palette made by James and implemented into an environment. NOTE: these tiles are 32x32 where we will be using 16x16.

LAYERS IN THE ENVIRONMENT
- (back) Parallax layers (1-3) *the farthest parallax layer will be size of whole screen
- Background wall layer
- Background decor layer
- Foreground layer (player and collision objects)
- Foreground decor layer
- (front) Close parallax space

- Not every level will use background or foreground parallax, but should be planned out beforehand.
- A background parallax should exist in levels WHEN necessary. Usually consists of 1+ pixel image that repeats and moves in pseudo perspective to the player. Layers of parallax lose detail as they move back in space and are taller than closer layers.
- The background (parallax or not) should initially be created with the same palette as the foreground. It will be darkened and desaturated at the end to keep consistency in the hue and contrast

Pallet and Texture Guidelines
- The color palette should be leashed but not fully constrained. Having the access to the full color spectrum makes things less consistent and more muddy.
- As we start to create assets we will settle on a single 64 color palette to work with.
- Limit the use of hard black borders on characters and objects. Let the color/value contrast set the character apart from its environment.
- Texture should be done with large clusters of color instead of more noisy pixel by pixel value.

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5) Audio Design

The music for the game will be made in FL Studio. Main idea is to follow the emotions of the environment of the level. Level music is mostly done using Serum, 3x Oscillator and DUNE 2 plugins. VST plugins are used to improve the sound of instruments. Reverb, compression and delay is mostly used to give the music a desired atmosphere. Drums for the music are mostly taken from drum packs. Sometimes drums can be generated using FL Studio stock plugins.

Audio Aesthetic Goals

- Influence a player to win the game with music
- Convey the atmosphere of a level through music
- Achieve sound effects that would make a player believe in what happens in the game
- Dark, creepy music in dark stages
- Bright, happy music in bright stages
- Mix the music so that it does not overlay with sound effects
- Master the music to prevent loud sounds

Influences

My Friend Pedro:
-Fast music
-"beat" type of music
-Intense music during boss fights

Magicka:
-SFX sounds
-Projectile sound (fireballs, lasers)

Brawlhalla:
-SFX sounds
-Punch sounds
-Jumping and running sound effects

Terraria:
-SFX sounds
-Main Menu music
-Overall idea of a pixel art based 2D game music

Audio Style Guide

The main goal of the music is to follow the idea of a stage/level. Emotions of the music will also depend on the stage. For example, in dark stages, the music is going to be dark as well matching the idea of the level. On the other hand, in the type of stage where it is bright, the music is going to be happy and bring positive emotions.

Sometimes during the level the music will become more intense to notify the player that he has to make quick decisions. Moreover, before the boss fight the music should also make a player understand that something to going to happen soon. Along with that, after a fight with a boss or with NPCs is over, the music will become more slow and relaxing to let a player know that he finished and objective or that the fight is over.

6) User Experience Design

UX Values & goals

The player controls will be responsive and simple to use. The UI will be minimalistic and easy to understand.

Controls

Primary player input will use keyboard and mouse:
A,D – Move side to side
Space – Jump
Left click – Attack
Left shift - Sprint

Secondary player input using keyboard and mouse:
Left, Right – Move side to side
Z – Jump
X – Attack
Left shift – Sprint

Secondary player input using a controller:
Left joystick / d-pad – move side to side
A button – jump
X button – attack
Left Bumper – Sprint

Information Design / HUD

Current powerups available will be showed on the hat stack on top of the player character's head
A pause menu to restart a level or return to the main menu

World Interaction
- Pick up hats
    - The player adds a hat to their stack

- The player simply walks into the hat, and it is automatically added

- Attack
  - Deal damage to NPCs, and maybe even props in the level
  - Left click / X

- Moving Platforms
  - Player can ride on certain platforms to move to other areas of a level
  - Player must be standing on top of the platform

- Wall Jumping
  - Player can jump onto and off of walls for additional height
  - Move in the direction of the wall and press the jump button

Menus & User Controlled Settings

Pause Menu- Resume game, restart level, options, and quit.
Settings:
Music volume
SFX volume

7) Software Design

Unity Engine and Entity Component System, use of Scriptable Objects for data saving and fast enumeration of asset creation. C# for scripting.

Architecture and Subsystems

Implementation patterns inspired by MVC and SOLID.

Each character in the game will loosely follow an MVC pattern through base inheritance. For example the security guard and the security camera have different input scripts that both derive from the base class AIINPUT. Likewise they do the same for their own CHARACTERVIEW and CHARACTERCONTROLLER classes. These AI Inputs are also mini state machines that implement and house

their own derived versions of Idle, Move, Attack, and Jump States. The initial overhead of setting up this system is justified by the fact that it will make it easier to add more and more characters with unique/shared behavior. This was necessary since our enemy designs were not fleshed out .
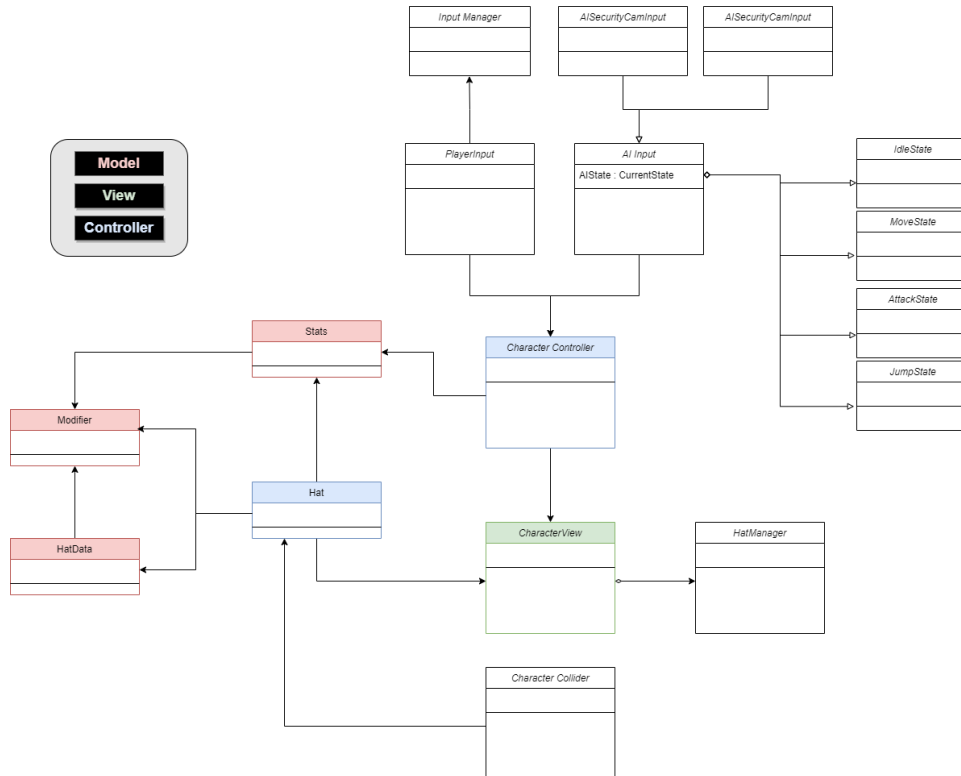
Game State

The players progress is updated in-between the two different scene types. Scoring scene and Level scene. The Scoring scene will add and save the players score to the PlayerPrefs. Upon entering a new Level scene the players state is reset. The GameOver scene will present the player with their final overall score.

Player Character & Controls

Animation : 2D SpriteSheet Animations through Unity's Mecanim System.
Input : WASD, SPACEBAR and Mouse for UI and attacks

IDLE-->MOVE
IDLE-->ATTACK
IDLE-->JUMP

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MOVE-->IDLE
MOVE-->ATTACK
MOVE-->JUMP
ATTACK-->IDLE
ATTACK-->JUMP
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Environment Content & Loading

The game world is split up into multiple scenes each representing a different level. All levels have a start and end point. Upon reaching the end point of one level, the player will load into a scoring scene which updates and displays their overall progress before loading the next level. Upon finishing the last level the player will instead load into a game over screen that will display session results and a congratulations. A simple fade transition has been introduced between levels since the camera is a child of the player prefab which is destroyed in between scenes.

Other Key Subsystems

The hat stack system was a unique challenge we faced due to not using any type of 2D bone system. Instead the hat stack animates with the player via a clever use of pixel tracing. We have a script that tracks the first true black pixel of the characters eyes . The hat stack keeps track of and follows this offset between frames, thus animating the hats to bob and move with the player.