Github Link:

Storyboard, Plan, and Reflection:

I have changed the animation I had in mind initially. It was in hopes that I would be able to improve my skills as of right now. As I was scrolling through animations on YouTube, I came across kensyouen_Y. There is a video that shows a female character breaking the fourth wall. The girl is shown interacting with Blender and its functions. Similarly, I wished to achieve this in a way with what I believed I was capable of. I also watched Legend of Pipi which took on a comedic animation style. These two were the inspiration behind this animation I had in mind.

My plan went from trying to implement running animations in the initial chasing scene to an animation about placing a character into a scene and her interacting with the environment. The environment consists of a table that she tries to lean on, however, she misses entirely and falls. She gets up and gets upset with the table, blaming it for moving despite it being an inanimate object. With this, she slams her fists into the table, only to get hurt and shake the pain away. Even angrier, she storms off the scene just to come back and kick the table.

During the first portion of the animation, it was fine. That was until the falling animation where the rotations got messed up. The animation for getting up turned out better than I expected, but still not the best. I believe that it is obvious when she got upset, but after the rotations for each bone became strange and it was hard to work with.

Importing into Unity and using Cinemachine Dolly spline was a struggle due to the Widgets that come with the Blender Character Rain model getting imported. I had issues with gitignore, which led to a lot of struggling and confusion. After a few hours, I finally got the dolly spline and camera to work.

Critical Analysis Framework:

Reference Initial Impressions
● For each of your references
● Document your initial perceptions.
○ Which animation intricacies caught your attention?

- The animation by kensyouen_y was surreal and fun to watch. It explored the functionality of blender tools in an interesting way. Watching a character break the fourth wall in animation usually seemed off or not fun as they tend to be just conversations about random things. However, this animation shows the character pressing buttons and playing around with features rather than the typical and boring way most animations of its kind approach breaking the fourth wall. You can even see her lag as the blender file is being recovered from the last session.
- I watched Legend of Pipi, an animation about a cat hero saving princesses, which took on a cute and comedic approach to animation. It was incredibly stylized and fun to

watch. It told a story in a few sentences and the visuals were amazing with the transitions and such.
- The seemingly oddly adorable animations of Untitled Goose Game were always something I enjoyed looking at. Initially, I found them amusing and ridiculously adorable. It seems that it has not changed since then as the small details and interactive elements made the world seem fun to be in.
- Hollow Knight has a darker and more mysterious atmosphere compared to the rest. I found it intriguing how the movement and animations felt and looked different. The game felt more heavy than what it looked like. Every animation is based on character structure and form, which I found satisfying to witness.
- In Another Code Recollection, the art style has a warm and welcoming atmosphere. It seems to be one of those really cute Japanese songs with a really dark meaning behind it. The art and soft animations gave off the impression that it was going to be a lighthearted and sweet experience.
- Turnip Boy Commits Tax Evasion may be one of the oddest games I have come across thus far. It's cute yet talks about committing crimes in a happy tone. I was amazed with how the pixel art was still so expressive despite the characters not having many parts they could move in animations.

○ What works and what doesn't in terms of the animation?
- For all of them, I felt that they were all unique and worked well in different ways. Their approaches were not stiff and allowed room for things to be warped. They were what made the animations look fun to watch.
- The animation of the girl breaking the fourth wall was very unique and interesting to watch as she is really expressive in her facial expressions. Her actions portrayed pure curiosity and joy when playing around with various functionalities.

○ Describe the smoothness of the animation?
- Both animations were smooth as all the character actions move fluidly from one motion to another.

○ What makes the animations interesting to you?
- The animations are interesting as they all approached it differently yet ended up looking cool in their own ways. They seemed to work well with the constraints they had and it was interesting to see it all come together.
- Pipi's personality was so vivid as he tried his best to find the lost princess. Ultimately, falling in love with the villain that executed the princess. His mannerisms showed that he kept trying to do the right thing.
- The girl from the blender animation was really expressive as she showed a lot of interest after being made alive in the animation. The animation gave her a lot of life and personality within a short amount of time.

● Animation Principles

○ What animation principles can you identify that are important to the chosen animation and why?

- A lot of motion in the animation were in arcs. Pathing and running followed arcs to create an interesting animation.
- Anticipation was integrated smoothly into the animations as many clips are slowed in and slowed out to create exaggeration and help viewers anticipate the next movement each character would do.
- Timing and exaggeration seemed to go hand in hand. These two were with each other to emphasize important and key aspects of the gameplay, story, or simply to give hints.

Static vs. Dynamic Components
● Identify and list all dynamic and static elements.
○ Categorize them as static (non-moving) or dynamic (animated).

● For Static components:
- All of the games had:
    - Game title
    - Menu buttons
    - Panels
    - Colours
    - Scroll bar
    - Buttons and their icons
    - Static environment assets
- The Legend of Pipi and kensyouen_y's animations both included:
    - Static imagery
    - Animated characters
        - These are dynamic and expressed a lot of personality and life.

○ What is its use?
- These components are to help create a theme and visual unity with the game players are about to play.
- They help to give players a taste of the game world without playing it at the moment.
- They are also used to help create a sense of interest from viewers and players alike.

○ What purpose does it serve?
- It helps let players get a hint of what to expect or what is next.
- It helps to create an aesthetically pleasing main menu.
- It creates interest and sets an atmosphere in stone for the mood.

● For Dynamic components:
- All of these had:
    - Interactable assets
    - Animations
    - shaders

○ Describe its animation: is it a simple transformation, morphing, keyframe, etc?

- UI animations seemed to be subtle for the most part of the games. When characters fall, receive damage, deal damage, or simply just interact with the game world, the HUD may have some changes or animations in response to it. These are usually either shaders and transformations done through scripting.
- Characters may have their movement keyframed for the most part. Some characters may have some morphing but they were hardly noticeable in the animations. They were also what made them look good.

○ Is the component a 2D or 3D asset? Does this factor into its motion?
- 3D motion in the games seemed smoother and 2D motion seemed more blocky. They both have their own charms and help with stylistic animations one way or another.

○ When does it move? What causes it to move? How fast does it move?
- 3D assets move based on rigs and bone movement. These can be keyframed and moved along timelines easier than 2D assets. This is because 2D animations are usually done frame by frame, but they can be really fast motions and may work better in some instances better than in 3D.

○ Document the different states of the component (i.e. on/off, enabled/disabled, highlighted, not-highlighted)
● For characters:
○ From movement alone, try to determine how many bones (approx) are used in the character? I.e. face/hands/feet, are they simple or complex movements, what indicates more than a single bone or not?
- For facial expressions and rigs, there may be at least 20 bones to create the 52 shape keys necessary for animation. I believe that there are more, approximately 40 facial rig bones for kensyouen_y's animation specifically. I assume so as the rig and animations were very expressive.
- For the torso alone, there may be around 10 bones for the shoulders, neck, and spine.
- Hands and feet typically have around 5-10 bones each for normal position and motion.
- The more detailed the animation motion tends to mean that there are more than one single bone. The more folds and movement potential in the rig may most likely mean that there are more than just one single bone.

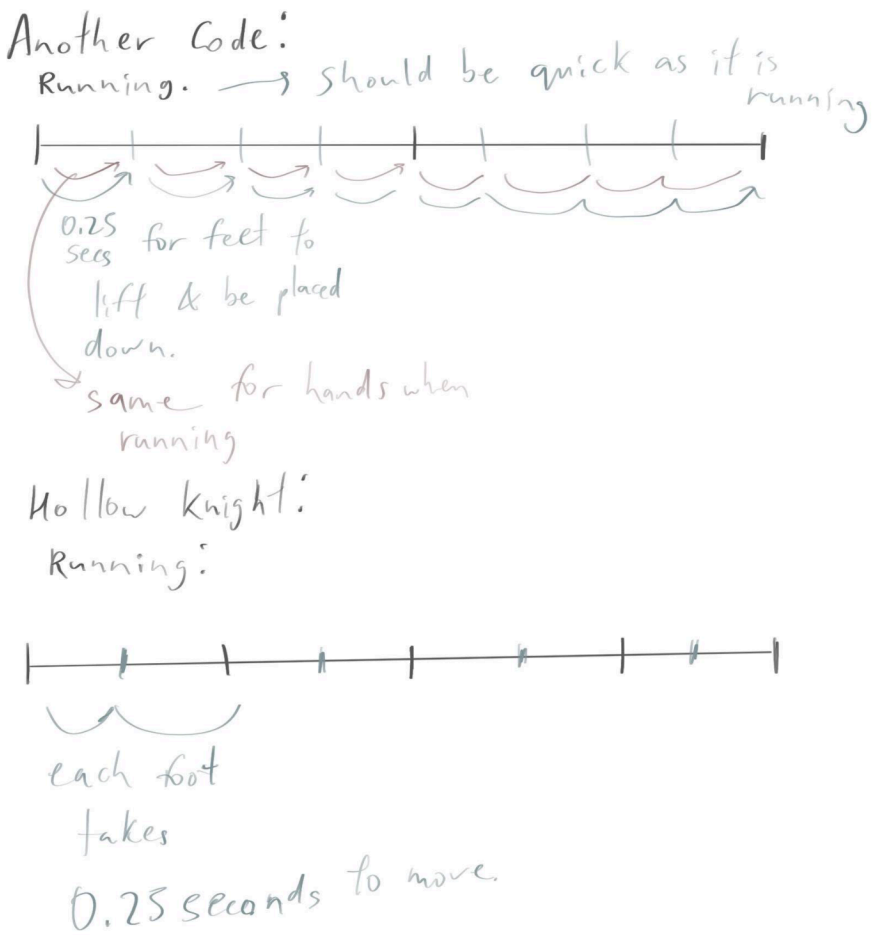
○ Analyze limb positioning:
■ How do the character's feet adhere to uneven terrain?
- They seem to snap to the terrain surface or rotate based on it like how human feet kind of do.

■ Does the character reach out and interact with objects convincingly?
- Yes
- All the animations seemed convincing and characters seemed to have a lot of personality when interacting with objects as well.

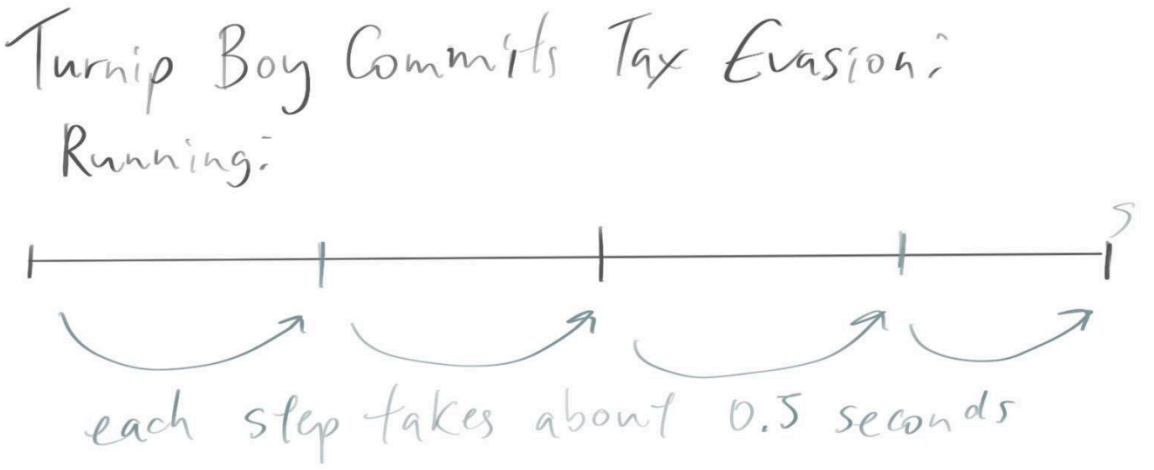
○ Document the naturalness and fluidity of limb movements and posture adjustments.

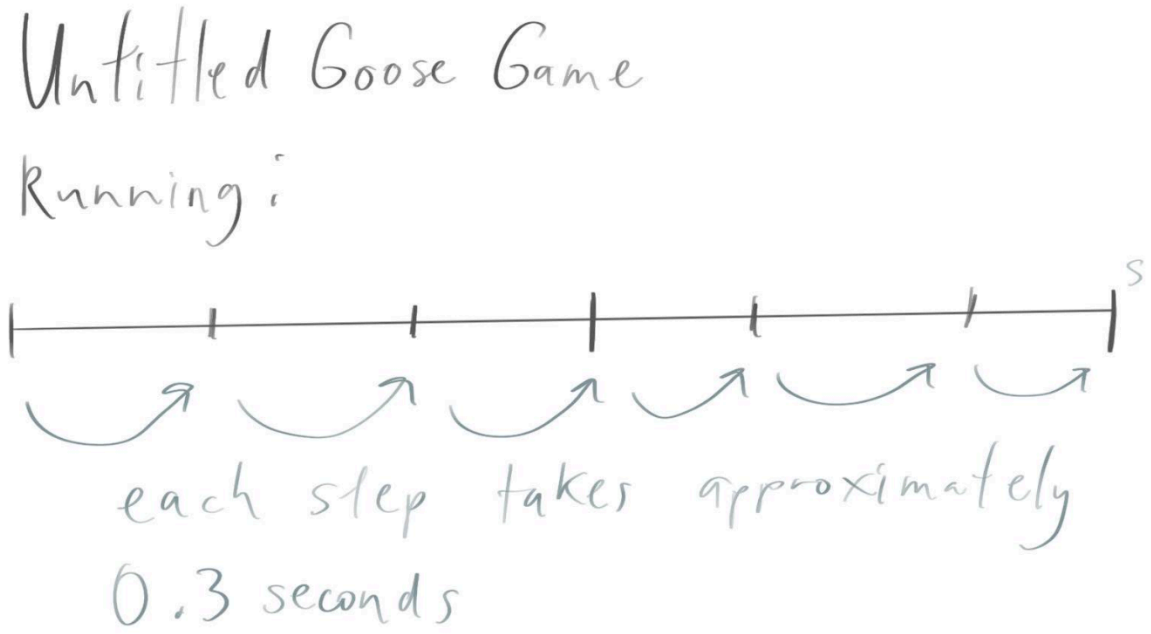
Animation Timing
● Showcase, explain, and justify your timing charts for your references

For the animation timing charts, I timed the running animations for the reference games and



they are as follows:

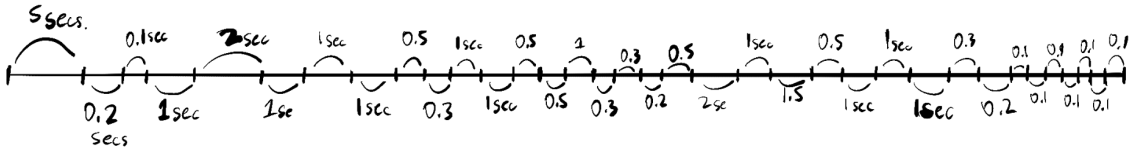




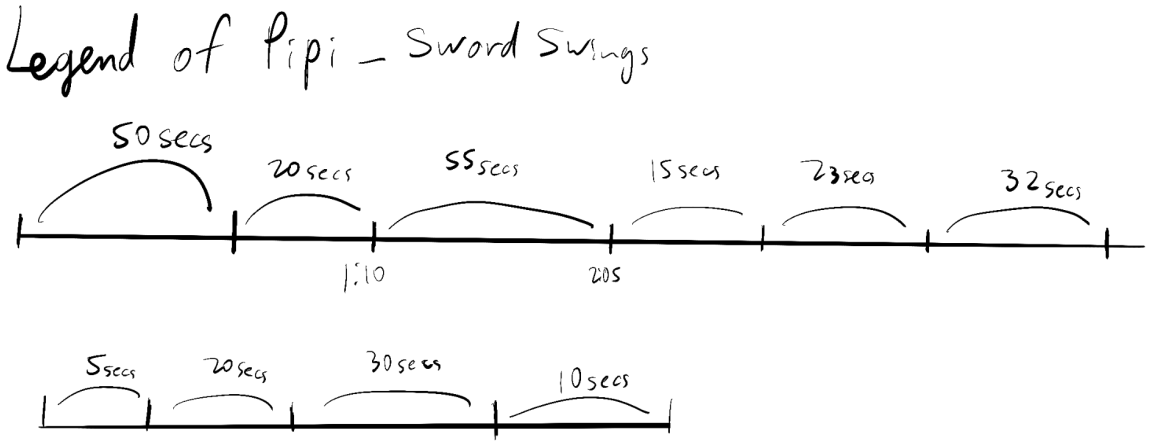
These running animations timings seem to be different yet also similar. They were all greater than or equal to ¼ of a second or up to ½ a second based on the art style and genre.

For the kensyouen_y animation, I made note of her hand gestures over time. This is shown in the following image:

Kensyouen_y's Animation_Handmotion



For the Legend of Pipi, I tracked his sword swings in the animation. It is shown in the below image:



Core Animation Concepts

● What animation techniques are utilized? (e.g., steering, LERP, morphing, paths, splines) and what evidence supports your claim?

- There are many instances of steering and splines working hand in hand. Characters turn to face specific ways and take different paths all the time. Cameras seem to follow a spline or move along one based on them being in the same position most times despite players doing things differently each time.
- Splines and paths may have been used for the animations to flow smoothly without needing to lerp in a linear fashion.

● What can you infer about the underlying math?

- There may be set values in the code for the math.
- Splines are constantly being calculated and used for movement

Usability & Engagement

● How do the animations contribute to the overall experience?
    - Animations breathe life into characters and fictional worlds. It makes the characters and scenes seem more real and engaging altogether.
    - People tend to pay attention to motion and animations are a result of this tendency (it is just what I think).

● Do the animations enhance player engagement, or do they distract?
    - When done correctly, they can enhance player engagement. When overdone or done at wrong occasions, they can be distracting. This is usually my problem with games that require reaction times to be near perfect.

Technical Considerations

● Observe how the character transitions between different animations.
● Describe the smoothness, speed, and naturalness of these transitions.
● How does the game handle interrupting animations or blending multiple animation sources?
    - They may have animation masks to mask over some parts of the animation while hiding the other part based on player input.

● Are there discernible layers of animations being blended
○ (e.g., a character running and reloading a weapon simultaneously)?
    - This may be an animation mask being put to use.

● Document the transitions with control
○ i.e. when you tell the character to move forward or reverse or change direction, do they abruptly change animations or is there a smooth transition?
○ What are the advantages and disadvantages to the chosen method?
    - For some games they make sense, such as Hollow Knight and Turnip Boy. However it does not make sense for games that are more tied to reality like Another Code Recollection and Untitled Goose Game.
    - The advantages: they can help give a sense of customization/stylization and/or realistic motion
    - The disadvantages: they can also break realistic motion and stylization.

References and Acknowledgements:

- The character used in the animations for both Blender and Unity for Stage2 is Rain v3 from Blender Studio. This included using the rigs and textures.
- Cinemachine was used for the spline camera motion in order to animate the smooth camera pathing for the Unity Video.
- References are as follows: kensyouen_y, turnip boy commits tax evasion, hollow knight, legend of pipi, untitled goose game, and another code.