CITS3003
Part 2 Project Report

Testing: Mac OSX

Functionality
After resolving the issues highlighted below, the model is functional and animated inside the scene viewer. All features are working correctly.

Implementation / Issues
After choosing a desired figure, I followed a number of video guides to assist in the initial modelling process. The scene editor was set up to allow for animation by following the 'addingAnimation.txt' guide provided in the project outline.

Meshing
I drew out the outline of the shape in 2D first, then extruded to approximately half the width I wanted the figure. I then mirrored the shape along the X-Axis to get the full width. To make the figure look less blocky, I primarily dragged vertexes and faces around until things looked right.

Rigging
I started by adding a shoulder, leg, and lower leg chain to one of the legs. I then created a separate foot bone and placed it beneath the chain. Parenting the chain to the foot bone allowed for me to adjust the position of the leg individually from a single pivot point.

Adding an inverse kinematics modifier to the last bone in the leg chain allowed me to lock rotation on certain axis' so that the legs can only move in the correct direction.

I then duplicated the bone structure from the first leg and copied it over to each of the other three legs.

Weight Painting
The automatic weights generated from parenting the bone structure to the mesh were fairly accurate, however, some minor adjustments needed to be made around the body before animating.

Animation
Animating took a few attempts to get right - however, after finding an image online demonstrating the walk cycle of a dog, it was made much easier.

Exporting
As suggested in the project outline, I exported the initial model into the scene editor before going ahead with any animating. It took some adjusting before it looked right, however, I made note of the location, rotation, and scale which I would use later when exporting the final animation.

After finishing, the final figure was exported and implemented into the scene editor with no issues.

Addition to the scene editor

After adding the required code from addingAnimation.txt a method was devised to measure the progress of an animation in frames (POSE_TIME). Each aiScene object contains an array of animations and each animation contains the two attributes mDuration and mTicksPerSecond. These can be used to determine the length of the animation in milliseconds. For each scene object we store these attributes as well as the time in milliseconds since the animation began. The progress of the animation (in milliseconds) can then be determined by taking the modulus of the time since the animation begun and the duration. This is time value is then multiplied by ticksPerSecond to get the current frame. I'd originally multiplied it by the frames per second of the window which resulted in the animation running quickly then pausing while it waited for the next cycle

Issues

Realistic design

Learning how to use the various tools and features of Blender while maintain a realistic design proved challenging at times. Luckily, choosing a fairly simple figure meant that more attention could be placed on functionality rather than wasting hours correcting movement issues.

Keeping file backups

The 'Ctrl-Z' shortcut only goes back a few steps in Blender. I soon realized it would be necessary to keep constant file backups throughout the design process, which I could fall back on if anything went wrong.

Apply scale after animation has been added

Scaling the figure after already adding the animation didn't seem to work in Blender. After some searching online with no success, I decided that it was probably best to re-animate the figure after scaling.

Awkward vertex shapes

The starting shapes largely determine how hard or easy it will be to model the figure later on. I had some difficulty initially when shaping the dog due to awkward vertex shapes, however, after applying a number of loop cuts and subdivisions, it was made much easier.

Individual effort

The creation of the animated dog and implementation into the scene editor was done by myself. After following the 'addingAnimation.txt' instructions, I worked on getting the objects to move in the scene by determining the pose time of each animation. This was very rewarding once it all came together.

Reflection

This section of the project incorporated a larger emphasis on design rather than programming, which I found to be a nice change from what we had been working on before. The numerous video guides and tutorials online also made this section much less daunting than what it seemed at first. Overall, this section ended up being a great learning process, especially after seeing the final product animated inside the scene editor.