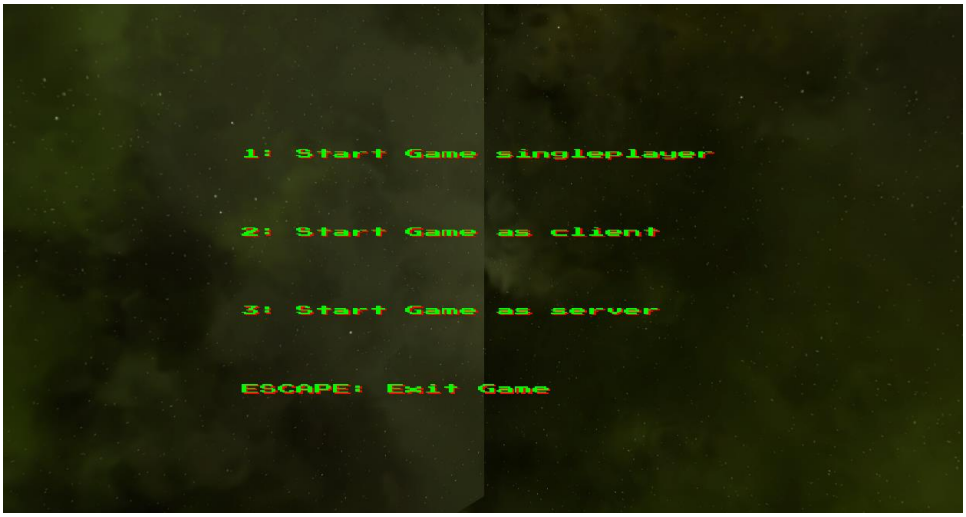
CSC8502-Matthew Law c0034428

Video:

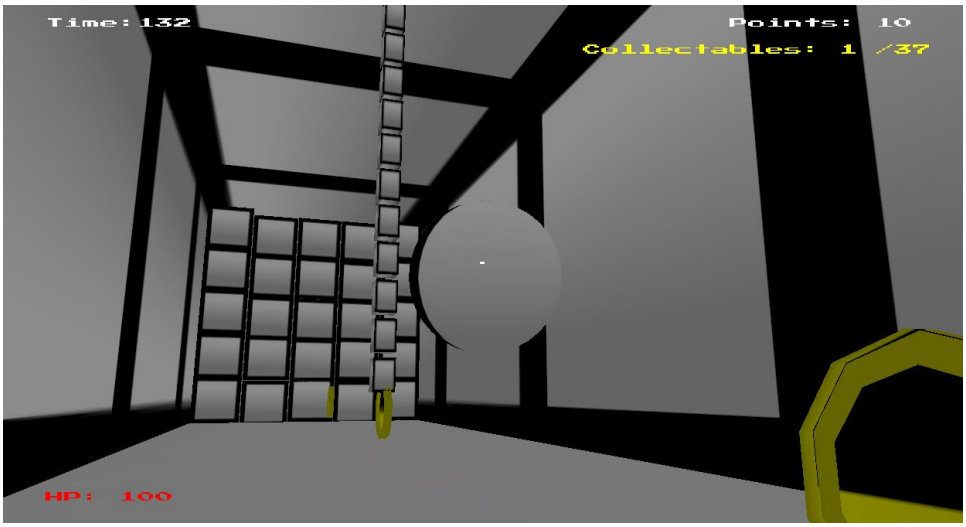
[CSC8503: The Average Heist of the Golden Goose - YouTube]

Screenshots:

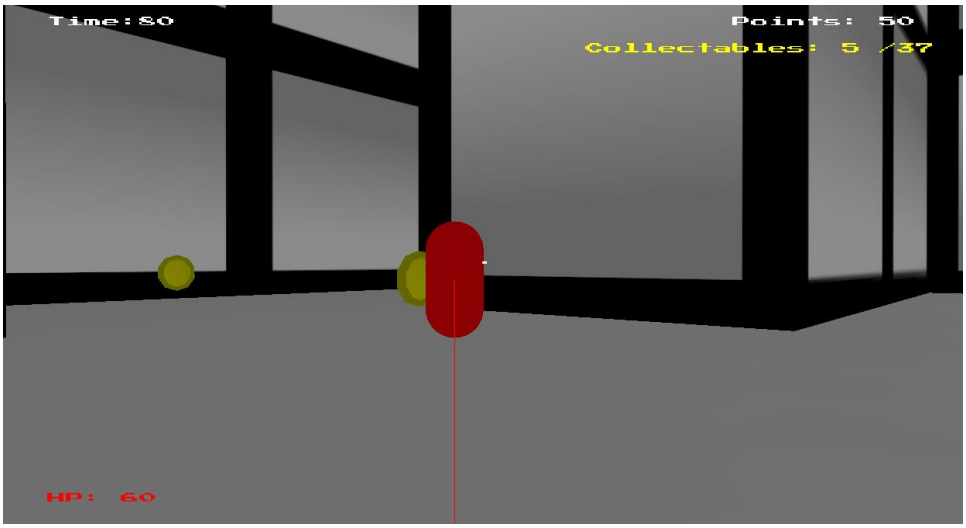
Main Menu:



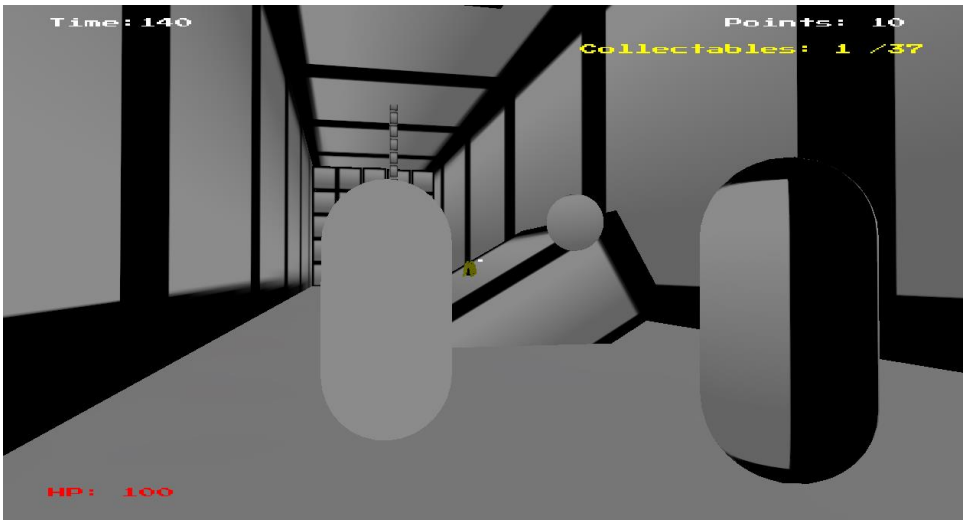
Objects can be picked up:



An Enemy that shoots the player:



Multiple clients in the same game:



Keybinds:

- WASD-movement
- Space-Jump
- Mouse-Camera
- Left click- throw object (while holding one)
- Right Click – grapple hook
- E- pick up object

Features implemented:

Physics

-Collisions for Sphere-Sphere , Sphere-AABB, Sphere-OBB, AABB-AABB, Capsule-Sphere, Capsule-AABB

-Ray collisions for all types.

-Physics materials with changeable coefficient of restitution, vertical damping and horizontal damping.

-Collision layers so objects can ignore collisions with each other.

-Raycast collision layers.

-Quad tree broad phase for faster processing.

-Static and dynamic objects, where collisions between static objects are not considered.

-Sleeping and awake objects, where collisions between sleeping objects are ignored, and static objects are also ignored.

-A grappling hook that uses raycasts to allow the player to grapple towards static objects, and pull dynamic objects towards them.

-Trigger volumes used for a jump pad, and used to allow the player to pick up and throw objects when the trigger is over a dynamic object.

AI

-A state machine enemy that will patrol between points, run towards the player if it can see them, shoot the player if it is close enough, pathfind to get to the player if it cannot see them, and then return to patrolling if the player hides for long enough.

-Pathfinding that can be executed multiple times by the enemy to navigate the world.

-A simple behaviour tree powered enemy that stays near the treasure and provides resistance when it detects that the player is trying to steal the treasure, until it eventually gives up.

-Both of these enemies work in single player and in multiplayer, where they are controlled by the server in multiplayer.

-Pushdown automata used for the main menu, including the ability to pause the game in singleplayer.

Networking

-The game can be started as a client or a server.

-When the player joins a server, the server sends a message to all players and the correct number of player objects are added.

-Player inputs are sent to the server and processed.

-The server executes all physics, and the results are sent to the clients.

-Game information such as player health and points are sent from the server to the clients when events occur that change those values.

Other

-Simple component system for easily adding functionality to game objects. This is not a full Entity Component System but for the purposes of the coursework it is sufficient.

Basic game info

In the game, you need to locate the golden goose and bring it back to the starting point, while keeping an eye on the timer and the patrolling enemy! This involves a few physics puzzles and using a grappling hook. Pickups are scattered around the world which the player can collect and it adds to their score.

The game is multiplayer up to four players, though not all game functionality works in multiplayer.