# CS 4ZP6A: Proof of Concept Plan
# Cat-and-Mouse Game

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# 1 Introduction

This Proof of Concept Plan will outline the major structural components (or modules) which will be integrated together to create the final Product.

Specifically, the challenges and risks inherent in the development of these modules within the deliverance of the Product will be also be discussed, with a view to demonstrating that these can be overcome.

# 2 Demonstration Plan

For the Proof of Concept Demonstration, the Development Team will present an executable form of the Product, which should be runnable within the desktop environment of the Microsoft Windows operating system and be displayable to an audience through a display device (e.g. such as a projector).

In particular, the following points should be included and successfully demonstrated:

## 2.1 Basic Movement and Camera Controls

### 2.1.1 The User should be able to move their character freely and interact with the virtual environment (the so-called "Map") on a basic level.

This entails:

1. The ability to move characters in the X, Y and Z axes, to the extent which is allowed by the terrain, the laws of physics and other physical constraints as defined in the environment.

2. All objects within the environment (including the characters) will be treated as Rigid Bodies, and be subjected to the laws of physics as defined for such objects by the Unity Engine.

3. The camera will be placed and be able to be moved around to display the environment (such as objects and other players, utilising varying perspectives and modes of operation.
   *For example: Located in a fixed position behind the user.*

## 2.2 Basic Multiplayer Capabilities

### 2.2.1 The User should be able to connect to a shared game instance of up to a maximum of 4 other users through a networked connection, and see and interact in real-time within a common environment.

This entails:

1. The ability to create and/or join an existing multiplayer session over the network which is hosted on a server.

2. The ability to see the user and sessional details (such as IP address, in-game ID, etc) of all players who are connected to the current multiplayer session.

3. The ability to join a Room to interact with all the players within the session in a common environment ("map")

4. The ability to exit a map while still remaining connected to a session.

5. The ability to exit the current multiplayer session.

## 2.3 Basic User Interface

### 2.3.1 The User should be able to start a new instance of, customise options for and end an instance of a game.

This entails:

1. A **Main Menu** which should allow users to start a new game, adjust various in-game options and exit the game.

2. An **Option Menu** which should allow Users to set various game settings. Specifically, players should be able to:

   - Adjust the level of graphical fidelity to fit their personal preferences and particular hardware profile.
   - Toggle the input and levels of in-game audio (e.g. such as background music or SFX).

3. A **New Game Menu** which should allow users to start a new game, either by creating a new multiplayer session or connecting to an existing session.

4. A **Multiplayer Hub** which should allow users to:

   - See the users which are within the current session.
   - Enter a *Ready* state to begin a new match within the session.
   - When all users are in the *Ready* state, begin a new Match (by loading of the map, etc).

## 2.4 Demonstration Map

### 2.4.1 The User should be able to interact within a map environment.

This entails:

1. A ground environment which will direct and limit the movements of a character, as appropriate.

2. Several map objects (such as trees) which a character may interact with physically (such as by bumping into them)

3. A statically-generated maze with basic materials (such as *concrete, rock, stone. etc.*

4. A static sky box.

# 3 Conclusion

The successful demonstration of the key structural components which will make up the Product, as outlined in this Proof of Concept Plan, should:

- **Inform** the Customer (as well as other interested Parties) to a reasonable degree of the mitigation of risks, and thus, overall feasibility of this project going forward.

- **Allow** for all Parties to provide suggestions and amendments to the Project earlier on in the development process.