Custom Project Plan

Mikkel Aguilar, 103613812 || COS30002 – AI for Games

Introduction:

This document specifies what I will implement in my Distinction/High Distinction level project. It shows how my project covers the different areas of the learning outcome and the approach I will take to execute them to create a functioning game.

My Project Description:

The main genre I will be tackling in my project idea is tower defence, and a game the displays the use of AI techniques on both the towers and enemies. When I was younger, I spent many hours on the 'Bloons Tower Defence' series and always had wondered what it would take to create such a game, hence why this idea was the first to catch my attention.

There are three main techniques I learnt this semester that I want to include in this project, these include path planning, predictive shooting, and hierarchical state machines. I plan to use paths for enemies and use searches (A* or breadth first search) to have enemies choose the ideal path in a dynamic environment. For predictive shooting, I aim to have towers that can use the enemy's current path and speed to shoot bullets that will hit the enemies at an intersection point. Finally, using state machines, I wish to create towers that change between states, say for example a shotgun state to a rifle state depending on the position of enemies.

Python's PyGame library will most likely be used rather than the Pyglet library as I am more comfortable and accustomed to using it. Other libraries that may be used is the 'Math' library, 'Itertools' library and the 'Random' library.

What I Will Document:

- Game design document indicating specifics in code concepts
- Sketch of a sample UI
- UML diagram to show how classes work with each other
- Bitbucket commit history
- Release notes

What I Will Present at the Interview:

- I will present the method I used to find the ideal path an enemy should take
- I will present the different states a single tower can have
- I will show how enemies react to a changing environment
- I will demonstrate the predictive bullets and how they find their target and shoot accurately
- I will demonstrate core features of the game such as tower placement and progressive levels

Conclusion:

Using Pythons PyGame module, I will create a tower defence game that incorporates AI elements to enemy agents and tower agents in a fully functional game.