ASSIGNMENT BRIEF

Module Code	COM6013M	**Module Tutor**	David Gundry		
Module Title	Artificial Intelligence for Games				
Level	6	**Credit Value of Module**	20		
Assessment Task	Problem Questions				
Word Count	No limit				
Assessment No	1	**of**	1	**Weighting**	100%
Type of Submission	Git repository link				
Method of Submission	Moodle submission point				
Publication Date	28 February 2022				
Due Date	30 May 2022				
Expected Feedback Date	20 June 2022				

Learning Outcomes

1. Discuss and implement software development techniques to support the creation of AI behaviour in games

2. Understand and utilise a variety of graph and path planning techniques

3. Combine AI techniques to create more advanced game AI

4. Critically evaluate the level of intelligence in currently deployed game.

Assignment Description

See attached

Additional Information

Assessment Regulations
• Your attention is drawn to the University policy on cheating and plagiarism. Penalties will be applied where a student is found guilty of academic misconduct, including termination of programme (Policy link). • You are required to keep to the word limit set for an assessment and to note that you may be subject to penalty if you exceed that limit. (Policy link). You are required to provide an accurate word count on the cover sheet for each piece of work you submit. • For late or non-submission of work by the published deadline or an approved extended deadline, a mark of 0NS will be recorded. Where a re-assessment opportunity exists, a student will normally be permitted only one attempt to be re-assessed for a capped mark. (Policy link). • An extension to the published deadline may be granted to an individual student if they meet the eligibility criteria of the Exceptional Circumstances policy.

General Writing guidelines

Summary Feedback			
First Marker:		**Date:**	
First marker feedback			
Second Marker:		**Date**:	
Second marker feedback (if applicable)			
	Provisional mark:		

Please note that grades remain unconfirmed until they have been considered at a Subject Assessment Panel (SAP), and recommended by the SAP to the University Board of Examiners for Progress and Award. Confirmed marks will be made available via eVision, after the Board of Examiners meeting.

AI for Games: Individual Project

Submission Date: 12:00 noon, Mon 30th May 2022

Rubric

In this assessment you will develop a game containing an AI system and write a report about its development. You must submit the assessment individually and all submitted work must be your own.

The following are examples to suggest the sort of AI systems that might be developed:

- An AI to control an agent or multiple agents in a game world
- An AI controlled player for a game
- A procedural content generation system to generate content for a game
- An AI director to manage gameplay
- A combination of multiple such systems

While you must develop a game, the focus of the marking will be on the AI that it contains. This means that, for example, the graphics will have no effect on your mark unless, say, you generate them using Procedural Content Generation. Similarly the quality of game design and gameplay will affect your mark only to the extent they relate to the AI system developed.

You will submit a git repository containing the following things.

- A report describing your game and AI system and its development.
- A playable version of the game and AI system
- Source code for the AI system developed along with all configuration files and documentation required to build it.

This assessment is worth 100% of the overall mark for the module.

Deliverables:

The following three items are the deliverables for this assessment:

1. An Assessment Report of up to 15 pages of A4
2. Source code, configuration files, and build documentation
3. A playable build of the game that includes your AI system

Assessment Report

This assessment is largely judged on the basis of a report on the AI that was developed, with other deliverables supporting and providing context for this report. The maximum length for this report is 15 pages, including screenshots, graphs, UML diagrams, etc.

The report that you deliver will contain the following:

- An introduction, which gives an overview of a game and AI system
- An implementation report that outlines how the game and AI system was built.

- A discussion of the approach that was taken, including a judgement regarding the success of the approach taken, a discussion of its limitations, and suggestions for alternative approaches.

Playable build

An executable file, or a URL to a playable build of the game containing the your AI system should be included with this assessment, in order to contextualize and evidence the issues discussed in the assessment report.

If the game is distributed as an executable file, this file must be included in the git repository for the project.

If the game is playable in-browser, this may be hosted on a personal web-page, for example using GitHub pages, or on a game portal, such as itch.io. A URL to this must be supplied in the git repository for the project.

This game must be able to run on the computers in CC/115, if necessary using a browser specified in the your README.md file. If this is not the case, marks may be deducted from the project.

Source Code

The complete uncompiled source code of the AI System should be included in the git repository in order to contextualize and evidence the content discussed in the assessment report.

This should include any configuration files and documentation necessary to build the project. Specifically expected are:

- A `README.md` file in the root of the repository giving instructions on how to build your code, as well as any instructions required for configuring or running the built game to demonstrate your AI system. If the game is playable at a URL, this URL should be included here.
- A `LICENSE.md` file in the root of the repository giving a license or copyright statement for your code.

If this is not included in the assessment submission, marks may be deducted from the project.

Part 1: Assessment Report

The Group Assessment Report will consist of:

- Introduction (worth 20% of the total mark)
- Implementation Report (worth 40% of the total mark)
- Discussion (worth 40% of the total mark)

Part 1.1: Introduction

You will introduce both the game and the AI that you have develop for this game.

You must describe:

- The game that you have designed an AI system for
- The intended behaviour of your AI System
- What artificial intelligence techniques you selected to use in order to build an AI system for this game

- Why you selected these specific techniques, in terms of both desired behaviour, feasibility of implementation within the time available, and the runtime requirements of the system

Marking Criteria:

- Clear explanation of the game that was selected (25%)
- Clear description of the intended behaviour of the AI system (25%)
- Clear explanation of the techniques selected for use in developing the AI system for this game (25%)
- Justifiable description of why these techniques were selected (25%)

Part 1.2: Implementation Report

You will describe the practicalities of the implementation work that you did in order to build the game and AI system.

You must describe:

- The architecture of the game and AI system that you developed, the specific algorithms used, and the source code that implements this architecture, e.g. with reference to applicable classes and class diagrams
- The design decisions that you made during the development of the game and AI system that had a significant impact on the process of development or the final product, and a justification for why you made those decisions
- The technology that was used to implement this AI system, including a description of any software development frameworks or libraries that were used during development

Marking Criteria:

- Clear description of the AI system architecture using the terminology taught during the course (30%)
- Clear justification of major design decisions taken during the development of the AI system with reference to the desired behaviour, game experience, feasibility of implementation, and runtime requirements of the system (30%)
- Clear evidence of significant and complex artificial intelligence coding and development work (40%)

Part 1.3: Discussion

You will describe both how successful the implementation work described in the previous section was, and outline alternative approaches which may be more fruitful in solving the same problem, or other further work.

You must describe:

- The overall success of the approach in terms of the desired and observed behaviour and/or its effect on the game experience.
- The overall success of the approach in terms of feasibility of implementation within the time available

- The overall success of the approach in terms of the runtime requirements of the system, such as memory usage and computing time.
- What the limitations of the approach that was taken were.
- Suggestions for alternative approaches for achieving the desired behaviour that are more feasible, less time-consuming, or require less resources at runtime.

Marking Criteria:

1. Clear understanding how the selected techniques and the implementation effected the behaviour of the system and a judgment of how successful this is at achieving the desired behaviour and/or desired game experience 50%)
2. Clear understanding of how the approach taken influenced the feasibility of implementation and the runtime requirements of the system (25%)
3. Clear understanding of alternative approaches that could be taken to solving the same problem and discussion of the pros and cons of these techniques (25%)

Part 2: Playable Build (Potential Mark Adjustment)

Your submission should include a playable game with your AI system included. This may be an executable file or a URL to a version playable in browser.

Any reasonable requirements for running and configuring the game should be described in the your README.md file.

This game is important in evidencing the work that was described in Part 1. If the game is not submitted – or cannot be run with reasonable effort – then your mark will be adjusted. It is your responsibility to ensure that the game can be run for assessment.

Part 3: Source Code (Potential Mark Adjustment)

You should submit the full source code for your AI along with all other source code, libraries and/or configuration files required to build the submitted playable build. This should be included in the Git repository that is submitted. Instructions for building the project should be included in the submitted Git repository.

This code is important in evidencing the work that was described in Part 1. If the source code is not submitted then your mark will be adjusted.