Assessment Coversheet
AT01 Studio Project

Qualification details			
Training Package Code and Title:	**ICT - Information and Communications Technology (Release 7.0)**		
Qualification National Code and Title:	ICT40120 Certificate IV in Information Technology (Gaming Development)	**State code:**	BFF9

Assessment Title	**AT01 Studio Project**		
Unit National Code & Title	ICTGAM423 Apply artificial intelligence in game development (Release 1) ICTGAM430 Design interactive media (Release 1)		
Date Due	**Session 9**	**Date Received**	20-06-2022

Student Name	Xihao Chen	**Student ID**	30053752
Student Declaration	I declare that the evidence submitted is my own work: Xihao C.		

Assessor Name				
Assessment Decision	☐ Satisfactory		☐ Not Yet Satisfactory	
Assessor Signature			**Date**	
Is student eligible for reassessment (Re-sit)?	☐ No	☐ Yes	**Reassessment Date:**	

Feedback to student
Via Blackboard (LMS) – Please check [Grade] section.
Feedback from student
Via Blackboard (LMS) – Please use [Comment] section during submission.

Student signature		**Date**	

Assessment Instructions

TO THE ASSESSOR

Type of Assessment	*Project*
Duration of Assessment	*9 sessions (session 1 – session 9)*
Location of Assessment	*Classroom (computer lab), at home*
Conditions	*Skills in this unit must be demonstrated in a workplace or simulated environment where the conditions are typical of those in a working environment in this industry.* *This includes access to:* • *the internet* • *research tools* • *required hardware, software and its component* • *path-finding libraries* • *game development testing tools* • *development tools to implement AI strategies* • *game design specifications and documentation* • *required hardware and software and peripheral devices* • *human-computer hardware interface devices* • *a range of event-handling systems* • *application libraries* • *widgets* • *graphical user interface software and libraries* • *games engine* • *a range of browsers and digital devices* • *client requirements documentation* • *file storage* *Learners are required to complete the required tasks and submit the required evidence electronically via Blackboard.*
Elements and Criteria	As detailed in the assessment plan. You are required to make sure that all students meet the elements, performance criteria and foundation skill items as outlined in the provided checklist.

TO THE STUDENT

Purpose of Assessment	You are required to show you can: *ICTGAM423 - Apply artificial intelligence in game development* • Conduct research on AI strategies • Design, implement and test AI game strategy • Evaluate game and confirm with required personnel *ICTGAM430 - Design interactive media* • Identify and research human-computer hardware interface devices, event-handling systems and graphical user interface (GUI) widget sets • Design a simple media software device • Build and implement a simple media software device You are required to meet the elements, performance criteria and foundation skill items as outlined.
Allowable Materials	Blackboard (Topic by topic) will include the following: Weekly Readings, Class notes, and Weekly Activities. Internet resources must be recorded as references for the assessment.
Required Resources	*Computer with:* • *Internet Access* • *Word processing software* • *Access to Learning Management System (LMS)* • *Unity (college version)* • *Version control software (GitHub, SourceTree)*
Reasonable Adjustment	In some circumstances, adjustments to assessments may be made for you. If you require support for literacy and numeracy issues; support for hearing, sight or mobility issues; change to assessment times/venues; use of special or adaptive technology; considerations relating to age, gender and cultural beliefs; format of assessment materials; or presence of a scribe you need to inform your lecturer.
Assessment Submission	*All activities must be attempted.* *Use of research tools and peers in formulating answers are acceptable – but work submitted must be your own work and must not be plagiarised.* *Final files and documentation are to be uploaded to the appropriate area in the Blackboard course created for this unit.* *If you are marked as NYS (Not Yet Satisfactory) on your first attempt, you will be provided with another opportunity to re-attempt the assessment.*
Project contents	This project consists of the following tasks: • Plan the production of an AI NPC with path-finding for a video game • Plan the implementation of a custom UI widget • Plan the implementation of selected human-computer interaction devices • Prototype, test, and amend an AI NPC with path-finding • Prototype, test, and amend a custom UI widget and HCI integration • Produce a gold-master build of a game that includes an AI NPC with path-finding and a custom UI widget with HCI integration

Production Diary Documentation Guidance\Requirements:

Throughout the assessment task you are required to research, gather ideas, evaluate techniques, plan production, gather inspiration, up skill, reflect on your performance and undertake professional conversations.

The production diary could include, but is not limited to, a journal featuring screenshots, written records of conversations, textual explanations and reviews, before and after images, links, videos, or other types of media.

There is an expectation that all visual and audible content has supporting written documentation to provide a clear overview of the intent.

Your final diary must clearly show that you have evidence to support the outlined requirements in each part below. The diary needs to be one overall complete item that contains all requirements other than asset development files.

Scenario

You are applying for the role of a game developer at a local media studio called 'Immersive Studios'. After making it through the first round of successful applicants and conducting an over the phone interview, you have been provided with a Unity project and a list of specifications that you must successfully integrate. The specifications include an AI NPC using the depth-first search path-finding algorithm, a custom UI widget, and cross-device inputs.

Criteria

Download the provided project file called "AT01_UnityProject" from the "Assessment" section of BlackBoard. You will need to use version 2020.3.13f1 or a more recent version of the Unity engine to open the project.

In implementing the AI NPC you will need to use the depth-first search (DFS) algorithm in order to integrate the required path-finding. You may not use any native or third party AI path-finding tools or features for this project.

You will need to implement appropriate input functionality relating to the player controls. This functionality will need to be cross-device compatible with the keyboard as well as a gamepad controller of your choice.

You must also implement a custom UI widget in the games heads-up display (HUD) that showcases when an input has been interacted with. The UI widget will also need to be cross-device compatible with the keyboard, the mouse buttons, and the gamepad controller you have selected for integration. In the implementation of the custom UI widget, you will need to use appropriate event-handling call-backs in order to execute suitable functionality when an interaction is captured from an input device.

You will be required to manipulate and modify the existing scripts provided with the project files. All new and modified code must be appropriately commented to demonstrate your understanding of the defined functionality. You will need to make use of appropriate naming conventions – with all variable names applying lower camel case, and all class and method names applying upper camel case.

The final version of the project will need to be constructed for both the Windows and Web GL platforms. The web version of the project must be tested across multiple web browsers.

For a complete overview of the project specifications, refer to the game brief associated with this assessment – "AT01 - Game Brief".

Section 1 – Pre-Production

PART 1 - ICTGAM423

1. Before implementing the required NPC, you have been asked to demonstrate an understanding of relevant artificial intelligence related information, as confirmation that you possess the required knowledge. Conduct research relating to the DFS algorithm and document a brief analysis of how it can be applied to different video game environments and genres. In your analysis discuss the standards for using the DFS algorithm in the video game development industry, as well as how the algorithm can influence the design and development of a video game. You will also need to define the following terms as they relate to the algorithm – **path-finding**, **tree**, **parent**, and **child**. Document your analysis in your production diary.
2. Once you have recorded your research relating to AI and the DFS algorithm in video games you will need to discuss your findings with the studio to ensure your research is in line with the intended specifications. Organise your research findings then update the studio manager with the relevant information by presenting them with your research. Discuss your ideas and analysis of the required AI strategy, and confirm that they satisfy the specifications for the AI of the project.
3. The next step in pre-production for the NPC is to begin designing a feasible AI solution for implementation in the project. Based on your research select suitable AI strategies that are technically feasible for implementation, and provide creative solutions to any identified design issues. Use the selected ideas to design the required NPC by generating a range of goals, actions, and other relevant factors. Document the design of your AI NPC in your production diary and supplement it by generating a behaviour chart that demonstrates the relationship between the goals and actions of the NPC. Customise the design of your AI strategy as required to ensure that the specifications of the project have been appropriately fulfilled.
4. It is important to consider the other production-related implications of implementing the AI NPC to demonstrate your understanding of its impact in the bigger picture of the whole production. Reflect on your designed AI strategy and document an assessment of the associated production implications in your production diary. While you are reflecting on the design of the NPC, consider how technically feasible the implementation of the AI strategy is and how suitable the design will be in relation to potential players. You will also need to consider its potential impact on a theoretical production budget and timeline by estimating a potential and duration for the production of the NPC.

PART 2 - ICTGAM430

1. Before you can implement the required controller devices and associated gameplay functions, you need to identify the human-computer interaction devices that will be integrated in the project. In your production diary identify the relevant controller devices that need to be integrated into the project and describe the game controls that must be defined in their implementation. Make sure to clearly identify and describe the specific type of gamepad controller that you have selected for implementation in the project, and outline the intended control scheme associated with the selected device.

2. It's important to ensure that you have appropriately planned the technical implementation of the planned device functionality. Review the software libraries and the GUI libraries that are compatible with the Unity game engine. In your production diary identify and describe at least one (1) potential industry-standard method for implementing the required device functionality using event-systems. You must also identify and describe how at least two (2) compatible GUI libraries may be used in Unity to implement the required UI widget. Once you have documented the required information, meet with the studio manager for assistance in selecting the most suitable GUI library for production and to discuss the ramifications of the selected library.
3. In order to produce a UI widget that is well-designed for use in a video game heads-up display HUD, it's a good idea to analyse a range of relevant widget designs that have been implemented in existing video games. In your production diary identify a selection of at least two (2) examples of UI widgets from the HUDs of existing video games that perform similar functionality to the widget you are required to design. Describe the functionality of each example, and how each example has been used within the HUD of the video game they are from.
4. To appropriately plan the design of the required UI widget, generate a paper prototype or functional digital wireframe after you have identified the task requirements. Your paper or digital prototype must be accompanied by a clear description of the requirements for the UI widget, as well as the planned methods for handling relevant hardware input events in the game. Once you are satisfied with your prototype you must meet with the studio manager to confirm that your custom UI widget design is suitable for use in the HUD for the game.

Section 2 – Production

PART 1 - ICTGAM423

1. Implement the required AI NPC strategy in the game as according to your planned design and integration. Implement the DFS algorithm as the path-finding solution for the AI NPC, and test the implementation of the AI to ensure it meets the project requirements. You will need to perform appropriate test cases for the AI and generate a testing log document to record the results. The testing log should document the details of the case being tested, the expected results of each test case, and the actual results of each test case. For any test cases that return an unsuccessful result you will need to implement appropriate amendments to your implementation of the AI, before re-testing the test case to confirm that the amendments were successful.

PART 2 - ICTGAM430

1. Create an application that accesses and uses human-computer interaction technology, by developing the planned custom UI widget as according to the task requirements and appropriately integrating it into the project. The custom UI control you produce will need to integrate all of the required elements as specified by the prototype of the widget. You will need to demonstrate successful use of event-handling call-backs to ensure that the implementation of the widget showcases relevant events that are captured from the defined HCI devices.
2. After you have successfully integrated the required UI widget and HCI device functionality into the project, it is critical that you conduct appropriate testing to confirm the functionality is stable across relevant devices and platforms. Construct a build of the project that is compatible with Windows, and a build of the game that is compatible with web browsers. To confirm that the game is functional across the

required platforms and devices, perform appropriate testing for the implementation of the UI widget using the required HCI devices and for the execution of the game across the required platforms. Document the results of all test cases performed in your testing log, and implement appropriate amendments for any test cases that return an unsuccessful result before re-testing the relevant test cases.

Section 3 – Gold-master

1. After implementing the required AI, UI, and HCI functionality it is important to review the game and confirm that all integrated functionality adheres to the intended design of the project. Review the design of the game, the UI widget you integrated, and the AI strategies that you implemented by playing through the game. As you play through the project conduct the relevant final checks to confirm that the game functionality effectively realises the original design of the project, and that the specifications of the game design brief have been fulfilled. In your production diary include a checklist of the final checks that you conduct in order to identify any project requirements that have not yet been realised. You will also need to record a brief evaluation of your implementation of the AI to identify and describe its strengths and weaknesses.
2. Once you have implemented and performed the final checks for all of the functionality you have implemented, you will need to seek feedback from the studio manager to determine whether any additional modifications need to be integrated. Meet with the studio manager to discuss and seek feedback regarding the state of the project. In consultation with the studio manager confirm that there are no additional project requirements to be fulfilled, or modifications to be implemented for the design of the game. Any further required modifications should be documented in your production diary for reference. After the discussion with the studio manager, incorporate the required amendments and create a new version of the gold-master build.
3. The final step is to save the relevant project files and store them so that they are accessible by relevant members of the studio. Export the final gold master into a directory that you should then compress before uploading to a remote repository for the project, along with the project files. Write an email to the studio manager that includes a publicly accessible link to the remote repository, and send it before the required deadline to confirm their final sign-off on the project. Include screenshots of the relevant email(s) in your production diary.