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| **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 |

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| **Assessment Title** | **AT04 Knowledge Questions (Part 1)** | | |
| **Unit National Code & Title** | ICTGAM423 Apply artificial intelligence in game development (Release 1) | | |
| ICTGAM427 Use 3-D software interface and toolsets (Release 1) | | |
| ICTGAM430 Design interactive media (Release 1) | | |
| **Date Due** | **Session 17** | **Date Received** |  |

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| **Student Name** | Richard Pountney | **Student ID** | 30007736 |
| **Student Declaration** | I declare that the evidence submitted is my own work:  RBP  ………………………………………….. | | |

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

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| **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** |  |

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| **Assessment Instructions** |

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| **TO THE ASSESSOR** | |
| Type of Assessment | *Written Questions* |
| Duration of Assessment | *5 sessions (session 13 – session 17)* |
| 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*   *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. |

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| **TO THE STUDENT** | |
| Purpose of Assessment | You are required to show your understanding of:  *ICTGAM423 - Apply artificial intelligence in game development*   * basic path-finding algorithms implications on game development * major AI terms used in the game industry * the development process of creating AI strategies in non-player characters (NPCs) in a game * applying object-oriented programming practices * overall architecture of a game engine * game development testing processes * industry standards applicable to game development   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)* |
| 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:   * Answer all of the questions for each section |

**Instructions**

To the best of your ability, answer each of the following questions in full. Ensure that you have attempted to answer all questions before submitting.

**Part 1 – ICTGAM423**

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| **Question 1 – Describe the order of each node in the first complete paths from Lectra City to New Vegas returned using the depth-first search, breadth-first search, and Dijkstra’s path-finding algorithms.** | | | | | | |
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| **DFS:** | | | Lectra City, City 17, Dunwall, Rapture, Racoon City, New Vegas | | | |
| **BFS:** | | | Lectra City, City 17, Stilwater, Racoon City, New Vegas | | | |
| **Dijkstra’s:** | | | Lectra City, Los Santos, Stilwater, Racoon City, New Vegas | | | |
| **Question 2 – Provide definitions for the following terminology as it relates to artificial-intelligence in game development.** | | | | | | |
| ***Agent*** | | | | | AI entity that is controlled separately from normal | |
| ***NPC*** | | | | | Non-Player Character. Characters that are not directly connected. | |
| ***Navigation Mesh*** | | | | | A walkable area for an AI. | |
| ***Path-finding*** | | | | | To plan a path in an environment (Navigation) | |
| ***Decision-making*** | | | | | To see what actions can be done, figure out how to do the actions, and execute the decided action. | |
| **Question 3 – Identify three (3) different development patterns that can be used to control the decision-making of an AI NPC in a video game.** | | | | | | |
| ***1*** | | Finite-state machine | | | | |
| ***2*** | | Goal Oriented Action Planning | | | | |
| ***3*** | | Behavior Trees | | | | |
| **Question 4 – Describe how the following object-oriented programming principles are applied in practice.** | | | | | | |
| ***Abstraction*** | | | | Hides all data of an object except the most relative. | | |
| ***Encapsulation*** | | | | It restricts variable access for objects from users. | | |
| ***Inheritance*** | | | | The program/class inherits attributes & methods from another class. | | |
| ***Polymorphism*** | | | | An adaptable program and/or code. | | |
| **Question 5 – Describe the role of each of the following game engine components in relation to the overall architecture of a game engine.** | | | | | | |
| ***Rendering engine*** | | | | | | Drawing graphics  Culling objects  Calculating lighting |
| ***Physics engine*** | | | | | | Realistic physics & forces  Collision events |
| ***Audio engine*** | | | | | | Loading, unloading, & playing audio clips  Spatial (3d) sound & other effects |
| ***Artificial intelligence engine*** | | | | | | Agents  Pathfinding |
| **Question 6 – Briefly describe each of the following testing processes as they apply to game development.** | | | | | | |
| ***Functionality testing*** | | | | | | Seeing if the program and/or function works correctly. |
| ***Compatibility testing*** | | | | | | Platform testing, so testing if it works on the desired platform & not just in an IDE (Integrated Development Environment) |
| ***Play testing*** | | | | | | Checking if the game actually works through playing. |
| **Question 7 – Identify and describe at least two (2) industry-standards that apply to the development of AI in video games.** | | | | | | |
| ***1*** | Pathfinding, so the AI/NPC can move/navigate. | | | | | |
| ***2*** | Decision-Making, so the AI can make decisions in the game. | | | | | |