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| **Qualification details** | | | |
| **Training Package code and title:** | ICT Information and Communications Technology | | |
| **National Qualification Code & Title:** | **ICT40915 Certificate IV in Digital and Interactive Games** | **State code:** | **AWE5** |

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| **Student Name** |  | | | | |
| **Student Declaration** | I declare that the evidence submitted is my own work:  ………………………………………….. | | | | |
| **Assessor Name** | Joshua Ferguson under supervision of Brian Blasgund. | | | | |
| **Date Due** | 24/03/2020 (Week 8) | **Date Due** |  | | |
| **Unit of Competency** | | | | | |
| **National Code & Title** | **ICTPRG301 – Apply introductory programming techniques** | | | **State code:** | AUV54 |
| **National Code & Title** | **ICTPRG413 – Use a library or pre-existing components** | | | **State code:** | AUV59 |
| **Assessment Tool** | **Assessment 3 – Group Game Project** | | | | |
| **Demonstration Tasks** | **Objective:** Learners will consolidate their understanding of introductory programming skills by applying them to the development of a video game within a group. Learners will develop and consolidate the skills required in order to write code in response to program and design specifications, generate dynamic components to achieve the required functionality of the program, develop and maintain documentation in order to record program testing results, ensure all components are integrated into the project in order to achieve the required functionality, and compile builds of the program for the purpose of testing and publishing the final version of the project.  **For submission:**  **Include this cover sheet in your submission document. Include references to all sources of information and resources used at the end of this assessment sheet.**  *Must include references to all information and resources. If your work is not referenced it will be considered as PLAGIARISM.* | | | | |
| **Resource Requirements** | A USB drive to save/backup work on.  A pen, pencil and a notepad for note taking.  Access to the appropriate BlackBoard shell.  Project production documentation such as Hack n Plan (Game design project management software), the GDD (Game Design Document) and team correspondence. | | | | |
| **Skills being assessed** | **Performance Evidence**  Evidence of the ability to:   * Apply programming language syntax, sequence, selection and iteration control structures to the development of an application, or game. * Produce an application, or game, that is designed and built from the program specifications. * Confirm that the created application, or game, meets the original program specifications, and obtain user sign-off for the completed program. * Identify, evaluate, and select the appropriate components that may be re-used. * Modify and integrate the re-used components into a project. * Document the selection and evaluation processes. * Test the functionality of the re-used components.   **Knowledge Evidence**  To complete the unit requirements safely and effectively, the individual must:   * Identify and describe common games programming languages, their syntax, and command structure. * Describe the development of small-sized applications or games. * Define and prepare the contract s specifications. * Outline, and apply, current industry development and design methodologies. * Describe domain modelling. * Recognise and apply generic specification. * Define the content and structure of libraries. * Select and apply the techniques for metrics collection. * Recognise patterns, frameworks and idioms. * Identify and apply repository tools. | | | | |

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| **INSTRUCTIONS** | | |
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| **TO THE ASSESSOR** | | |
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| **Type of Assessment** | | Portfolio Project |
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| **Duration of Assessment** | | Within the course time limitations |
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| **Location of Assessment** | | Classroom, online and home |
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| **Conditions** | | Students are assessed individually whilst completing a digital game project, students work in production teams.  Their game project provides context for assessment, if their individual games do not cover the performance criteria then individual portfolio items may be used as evidence.  It is recommended that the game project is used as often as possible.  Please check the plagiarism policy available via the South Metro TAFE website. <http://www.southmetrotafe.wa.edu.au/currentstudents/forms>  Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:   * The requirement documents. * The site documents. * Software development tools currently used in industry, such as a compiler. * An independent development environment (IDE). * The software development environment. * A reuse library. * The technical requirements. |
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| **ICTPRG301 – Apply introductory programming techniques** | | |
| **Elements and Criteria** | ***1.******Apply language syntax and layout***   * 1. *Apply basic language syntax rules*   2. *Use language data types, operators, and expressions to create a clear and concise code*   3. *Apply the variables and variable scope*   4. *Use the library functions in a program*   5. *Use commenting to create a clear meaning to the code*   ***2.******Apply control structures***   * 1. *Apply the language syntax for sequence, selection and iteration constructs*   2. *Use logical operators to create expressions for use in selection and iteration constructs*   ***3. Code using standard algorithms***   * 1. *Develop algorithms that use the sequence, selection and iteration constructs*   2. *Create and use arrays*   3. *Code the standard sequential access algorithms, for reading and writing text files, including end-of-file detection loops*   4. *Apply string manipulation*   ***4.******Test the code***   * 1. *Use debugging techniques to trace code execution and examine the variable contents to detect, and correct, errors*   2. *Create and conduct simple tests, to confirm that the code meets the design specification*   3. *Document the tests performed and results achieved*   ***5.******Create an application or game***   * 1. *Design an algorithm in response to basic program specifications*   2. *Develop the application or game to meet the program specification*   3. *Test and confirm that the application, or game, meets the initial specifications* | |

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| **ICTPRG413 – Use a library or pre-existing components** | |
| **Elements and Criteria** | ***1.******Identify potential re-use units***   * 1. *Analyse the project design and functionality, to identify re-use components*   2. *Source re-use components with the desired functionality*   ***2.******Evaluate re-use components for suitability in parent project***   * 1. *Evaluate the re-use component, or libraries, for suitability for use within the parent software project*   2. *Compare the functionality of each potential re-use component to the functionality required by the parent project*   3. *Evaluate the cost of implementing the re-use component*   4. *Consider the technical impact on the parent project design*   5. *Consider re-use component vendor licensing issues*   6. *Finalise the selection of re-use components*   7. *Document selection, evaluation and decision processes, as part of the parent project design documentation*   ***3. Incorporate the re-use components***   * 1. *Configure the development environment to include re-use components during the build process*   2. *Construct test programs or use provided example programs, to become familiar with re-use components, in preparation for incorporation into the parent project*   3. *Add re-use components to the parent project incrementally*   4. *Resolve re-use component dependencies*   5. *Assemble and test the parent project, with a focus on the functionality provided by the re-use components* |

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| **Assessment 3 – Group Game Project** |
| You should be a part of a project group, which are assigned in the classroom. Groups are to consist of no more than 5 members. Within your groups you are to brainstorm game pitches and decide upon one which you will work on as a group for the duration of this course.  Once a team of up to five members has been assigned and a game pitch has been decided, this will give you context for all assessments within this course unless clearly stated otherwise. Each group member is to provide the required evidence of individual work being completed for each assessment. |

**TO THE STUDENT**

*Part One – Programming in C#*

Part one of the assessment requires learners to provide evidence of their knowledge, understanding, and application of introductory C# syntax, patterns and techniques. Learners will need to write, test, and debug code and scripts in response to the design and program specifications, and achieve the required functionality of the project. This evidence is to be provided through components, scripts and code that has been generated by each individual learner.

The scripts generated by the learner need to provide evidence of the application of the following programming knowledge, practices, and skills. Learners need to ***apply basic C# syntax*** in their code, including ***data types, operators, expressions, arrays, and lists***. The appropriate ***application of variables and variable scope*** also needs to be demonstrated in all scripts generated by the learner.

Learners also need to ensure that they apply appropriate programming practices to the generated code and scripts. These practices include using appropriate ***camel casing*** and ***naming*** ***conventions*** for scripts and identifiers, ***commenting all scripts*** and ***each ‘block’ of code*** appropriately, and ***using pre-defined library functions*** to create scripts and mechanics. The scripts learners generate in response to the program design specifications must also ***demonstrate the development of algorithms*** that use logical operators to apply ***sequence, selection, and iteration programming patterns***. Learners also need to generate code that incorporates a ***standard sequential access algorithm*** for ***reading from*** and ***writing to text files***, as well as ***manipulating string values***.

Lastly, learners need to demonstrate the use of appropriate ***debugging techniques*** and ***methods*** in order to ***trace code execution***, ***examine the contents of variables***, and then ***detect*** ***and*** ***correct errors in the code***. ***Tests*** will need to be ***designed, performed, and documented*** in order to ***diagnose*** and ***correct*** ***logical errors*** and ensure mechanical functionality ***according to the design and program specifications***.

*Part Two – Generating Program & Design Documentation*

Part two of the assessment requires learners to provide evidence of their knowledge and understanding of creating and maintaining the appropriate programming and design project documentation. Learners will need to generate development documentation in order to record the design, development, and testing of the projects mechanics and functionality. The required evidence is to be provided through the appropriate documentation that has been developed and maintained by each learner individually. The documentation required as evidence for this part of the assessment includes testing & debugging documentation, a Component Design & Integration Plan, domain models for the required components and systems for the project, and any other relevant project design documentation.

A ***Component Design & Integration Plan*** is to be prepared by learners. The plan is to ***outline an analysis*** and ***evaluation*** of the project to ***determine the required programming systems*** and ***components***. Learners are to ***document*** their ***process for analysing, evaluating, sourcing, and selecting*** the components to be implemented into the project. As a part of this process, learners are also to ***generate a domain model*** for ***each*** of the required systems for the project. Learners must ensure that they ***consider the impact*** and ***technicalities*** of the potential components on the ***development software*** being used and ***the project*** as a whole, and ***compare the functionality*** of each component ***to the functionality required by the project***. Before finalising the selection of the components to be used in the project, learners are also required to ***consider*** and ***address*** the ***cost of implementing*** the components, as well as any possible ***vendor licensing issues***.

Throughout the development of the project, learners are to ***test*** and ***debug scripts, code***, and ***components*** in order to ***minimise the amount of bugs*** and ***errors***, ***resolve dependency issues***, and ensure the project ***meets the program specifications***. In order to perform the testing of the project learners will need to ***design*** and ***generate*** ***template documents***, and then ***record the expectations*** and ***actual results*** of the test once performed. Templates will have to be ***generated for each of the different types*** of tests to be performed throughout development including various ***functionality*** & ***compatibility tests***, as well as ***user trials/play testing***. The overall goal of all testing performed is to ***confirm that the code and design*** of the project ***meets the initial design specifications***.

*Part Three –Compiling The Project*

Part three of the assessment requires learners to provide evidence of their ability to create builds of the project for testing, project confirmation, and publication. Learners will need to create builds of the project throughout the development cycle to ensure that components, scripts, and code work as required, to demonstrate the technical functionality and specifications of components generated for the project, to ensure that the project adheres to & maintains the design and program specifications initially outlined, and to publish and distribute as the ‘gold master’ or first official release of the game.

While the components required by the project are being constructed, learners will need to ***construct test builds*** to ensure that ***components function as required once built***. This is important as the way the application runs inside an engine’s editor will often fail to reflect exactly how the application will run once compiled. These component test builds are to be ***constructed independently***, and stored in a way that ***clearly indicates*** the ***component*** and the ***version being tested***. Once a component has been completed and has been successfully integrated into the project, learners will need to ***construct*** a ***technical demonstration*** or ‘***tech demo’*** build. The tech demos of each component need to ***focus on the functionality offered*** by that specific component. This can be achieved by building small ***demonstration scenes*** with a ***focus*** on the ***components functionality*** ***within the project***. ***Test builds*** of the project will also need to be constructed in the ***same manner as the component test builds*** as well. This is to ***ensure*** that the ***components function*** ***as intended and required***, when implemented appropriately into the project.

Lastly, when all of the required assets, scripts, and components have been integrated as required into the project, a ***final build*** or ‘***gold master***’ that is ***ready for public distribution*** must be compiled. This build will be the first official public release of the game, and as such it is important that the ***necessary tests are performed*** to ***ensure the project meets the initial design*** and ***program specifications*** prior to being published.

**Assessment Submission Guidelines**

When submitting the assessment to BlackBoard, please put all files relevant to each individual part of the assessment in their own folder.

Zip the root folder to compress the overall size of your submission, and ensure you submit your files to the appropriate assessment link.

Resources

*List all the research and references you used to complete this assessment below.*

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| **Assessment Decision** | Satisfactory | Not Yet Satisfactory | |
| **Assessor Signature** |  | **Date** |  |
| **Feedback to student** | | | |
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| **Feedback from student** | | | |
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| **Student signature** |  | **Date** |  |