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| Student Name |  | Student Number | |  |
| Unit Code/s & Name/s | ICTPRG501 Apply advanced object-oriented language skills  ICTPRG502 Manage a project using software management tools  ICTPRG503 Debug and monitor applications  ICTWEB502 Create dynamic web pages | | | |
| Assessment Name | Programming Assignment | Assessment Task No. | | AT1 |
| Assessment Due Date | 30/11/2018 | Date submitted | |  |
| Assessor Name |  | | | |
| **Student Declaration:** I declare that this assessment is my own work. Any ideas and comments made by other people have been acknowledged as references. I understand that if this statement is found to be false, it will be regarded as misconduct and will be subject to disciplinary action as outlined in the TAFE Queensland Student Rules. I understand that by emailing or submitting this assessment electronically, I agree to this Declaration in lieu of a written signature. | | | | |
| Student Signature |  | | Date |  |

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| **Instructions to Student** | **Learning Support**  Additional support is available to help you achieve your learning goals. Speak to your teacher or a Learning Skills Centre team member if you feel that you may benefit from some extra support. The Institute provides extra support through the Disability Support Unit and the Learning Skills Centre.  RPL (Recognition of Prior Learning) is available for this unit. Speak to your teacher/assessor to check if you qualify for RPL.  **Conditions of Assessment**  You will need to complete the learning and undertake all assessments satisfactorily to be deemed competent. You are responsible for complying with all assessment item instructions; submission and collection requirements; undertaking assessment tasks honestly and retaining a copy of all assessment items.  You must submit assessment items by the **due date**, unless an extension has been granted by your teacher. Failure to submit assessment items by the due date will result in a “did not submit” being recorded and depending on your circumstances, you may be granted one final resubmission. |
|  | To be judged competent in this assessment item the student is required to demonstrate competence in all indicators shown in the marking guide.  **The Classroom as a Simulated Work Environment**  Students must be aware and take responsibility for the problems of working in a shared IT environment. Problems such as noise levels, production flow, interruptions and time variances are common to workplaces. In the simulated environment provided in the classroom these problems can take the form of:   * Other students who continually ask questions or talk aloud while thinking * Fire drills, projector not working, printers running out of paper or toner cartridge * Miscalculating how much work you can do in one day, missing classes and so on.   Some things are unavoidable and you must devise strategies to overcome them, for example, we cannot stop students from asking questions or entering at exiting the class. Other things are unpredictable (e.g. fire drills). You need to be aware and plan and organise your work allowing some extra time for unavoidable and unpredicted events.  **Assessment Criteria:**  To achieve a satisfactory result, your assessor will be looking for your ability to demonstrate key skills/tasks/knowledge to an acceptable industry standard.  Refer to the marking criteria document for a detailed list of items.  **Number of Attempts:**  You will receive up to two (2) attempts at this assessment task. Should your 1st attempt be unsatisfactory (U), your teacher will provide feedback and discuss the relevant sections / questions with you and will arrange a due date for the submission of your 2nd attempt. If your 2nd submission is unsatisfactory (U), or you fail to submit a 2nd attempt, you will receive an overall unsatisfactory result for this assessment task. Only one re-assessment attempt may be granted for each assessment task, with the exception of Apprentices or Trainees who are permitted an additional supplementary assessment. **For more information, refer to the Student Rules.** |

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| **Submission details** (if relevant) | Submit your assessment to the allocated dropbox in **Connect** or to the allocated network folder.  Your teacher will provide all the details for the submission system or network.  Your assignment must be saved with your surname\_student number\_unit/cluster\_AssessmentNumber. For example:  **surname\_1234567890\_ICTPRG501\_1**  For re-submissions, an “R” must be added to the file name. For example:  **surname\_1234567890\_ ICTPRG501\_1\_R**   * The Marking Criteria Sheet must be signed and submitted with your work. |
| **Instructions to Assessor** | To be judged competent in this assessment item the student is required to demonstrate competence in all indicators shown in the marking guide.  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 programming and software development industry, and include access to:   * Database management systems * Computers on the network * Integrated Development Environment (IDE) * Program specifications |
| **Note to Student** | An overview of all Assessment Tasks relevant to this unit is located in the Unit Study Guide. |

# Instructions to Students

## Assessment 1: Software Programming

In this assessment, you are required to participate in the development of an object-oriented desktop application with a graphical user interface, and a web application based on the PharmaCare Software Requirements Specifications (SRS):

* Select a minimum of two use cases from those actioned by the Doctor and create a Windows application with relevant database component access. Write / Modify / Cancel prescription are a good set of uses cases to complete for this application.
* Select a minimum of two use cases from those actioned by the Pharmacist or Nurse and create a web application with relevant database component access.

You are required to show clear evidence of due process – appropriate planning, gathering requirements, design, development, testing of the Windows and web application, and reporting to your project manager on the completion of the project.

**Task 1**

**You will be required to complete the following tasks:**

1. **Select and report on at least three (3) current software project management tools** that you will or would be utilising. Justify your choices and describe the benefits of each one. Your selections need to cover the following software development management areas: Project Management, Source Code Control, and Collaboration Management.
2. **Determine and report the methodology** you will or would be utilising for the development project, as well as the process to follow for source code control to avoid source code conflicts.
3. Prepare a **project plan** for your project that matches your SRS and development methodology. Verify timelines and costings using mathematical estimates separate to that derived by and from your project management software. Document these verifications separately in your closing report to your manager.
4. **Demonstrate the use of your selected Project Management, Source Code Control and Collaboration software** as you proceed with your development project. **Work with at least one other member of your class group or an associate in demonstrating your project collaboration, and your source code and version control management.** Demonstrate an ability to select the appropriate management software features, media and format for interacting with other team members, for identifying and resolving issues, and for leading the management of your project in the most effective and appropriate manner possible.
5. Provide a detailed review (in a management report or a detailed email to your manager or client) of the **project results, the issues identified and approaches used** in managing the issues and the project as a whole, and **adjustments** to the project plan.
6. Provide a list of **references** of all your information sources plus web links for all products used.

**Task 2**

1. Based on the given SRS and your interpretation of the SRS, prepare a Technical Report for your Project Manager to include the following:

* An explanation of the mechanism you would use that enables inter-process communication in your web application.
* An explanation of what is an Interface in object-oriented programming and how would you use it to apply multiple inheritances.

1. Based on the scenario above and your interpretation of the program specifications, build and test the windows application in Java making use of the following:

* Write code that follows the coding standards and naming conventions and ensure to include comment-blocks for user-defined methods.
* GUI components such as web forms, buttons, labels, data grids, etc.
* Create Help Files using GUI components and include them in the appropriate web forms or pages.

1. Based on the scenario above and your interpretation of the program specifications, build and test the web application in PHP with the following features:

* You must create a functioning form that is integrated with their MySQL database. The form must have an aesthetically pleasing interface created using HTML that is styled using CSS. It must be validated using JavaScript (client-side) and use PHP (server-side), such that the incoming data is sanitised. The web page must include a footer with the student’s name and year of creation.
* Upon completion of your page, you must perform web standards validation, testing and debugging to ensure your website functions appropriately in at least three (3) popular web browsers.

1. Based on the scenario above and your interpretation of the SRS, build and test a server application (web service) to implement remote procedure call (RPC) based on multiple inheritances in Java making use of the following:

* Write codes that follow the coding standards and naming conventions and ensure to include comment-block for user-defined methods.
* Operation Contracts to handle the following database operations:
  + - Create new record
    - Update existing record
    - Delete existing record
    - Retrieve multiple records
* Data Contract to allow transfer of data between client and the server.

1. Demonstrate your advanced programming skills by developing a stand-alone application following the coding standards and naming conventions incorporating the following features to this project:

* Drag and drop
* 2-D graphics

1. To ensure all syntax and logic errors are identified and the debugging process, outcomes and corrections comply with program specification:

* Use the debugging tools including trace and watches to create a log of syntax and logic errors
* Outline the solutions applied
* Include this in your report under the section “Defect Logs”.
* Include screenshots and steps of using these tools under the section “Debugging Tools in Action”.

1. Create and prepare test data to confirm code meets design specifications.
2. Perform testing using the prepared test data and document the test results and compare against program specifications and gathered project requirements. Have at least one of your peers to test the program and

* document the test results
* analyse results, and…
* prepare a test summary report.

1. Include a section in your report titled: “Documentation Maintenance” to indicate how you will maintain the program documentation. Include in this section your approaches to managing document version control, and naming conventions
2. Present your development project, including technical report, to your Project Manager for sign-off.

**Task 3**

1. Based on your interpretation of the SRS, prepare a report to your Project Manager outlining the following: (*available to your chosen programming language or integrated development environment (IDE))*

* Lists of logging frameworks and a description of each
* Lists of debugging tools and a description of each
* Lists of profiling tools and description of each

1. Choose and use one of the logging frameworks you have listed above and create a custom event log for your software development project.
2. Analyse the event log and identify the potential solutions to the captured error or bug and include this in your report under the section “Event Logs Analysis”.
3. Choose and use one the debugging tools you have listed above and include in your report the screenshots and steps of using these tools under the section “Debugging Tools in Action”.
4. In your software development project, include the following code for debugging: Print, Assert, and Stop and provide the code snippet in your report under the section “Debugging Tools in Action”.
5. Choose and use one of the profiling tools you have listed above and include in your report the screenshot of using this tool under the section “Profiling”. *(In relation to your application look to verify the parts of the system that consume the most resources, such as random access memory (RAM), central processing unit (CPU) and time.)*
6. Analyse the profiling results and identify the potential solutions to the identified issues and include this in your report under the section “Profiling”.