# **Unit Assessment Pack (UAP) – Cover Sheet**

## **Student and Trainer/Assessor Details**

| **Student ID** |  |
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| **Student name** |  |
| **Contact number** |  |
| **Email address** |  |
| **Trainer/Assessor name** |  |

## **Course and Unit Details**

| **Course code** |  |
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| **Course name** |  |
| **Unit code** | ICTPRG503 |
| **Unit name** | Debug and monitor applications |

## **Assessment Submission Method**

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| By hand to trainer/assessor | By email to trainer/assessor | Online submission via Learning Management System (LMS) |
| By Australia Post to RTO | Any other method \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  (Please mention here) | |

**Student Declaration**

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| * I certify that the work submitted for this assessment pack is my own. I have clearly referenced any sources used in my submission. I understand that a false declaration is a form of malpractice; * I have kept a copy of this assessment pack and all relevant notes, attachments, and reference material that I used in the production of the assessment pack; * For the purposes of assessment, I give the trainer/assessor of this assessment the permission to:   + Reproduce this assessment and provide a copy to another member of staff; and   + Take steps to authenticate the assessment, including communicating a copy of this assessment to a checking service (which may retain a copy of the assessment on its database for future plagiarism checking).   Student signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Date: \_\_\_\_/\_\_\_\_\_/\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

## **Assessment Plan**

To demonstrate competence in this unit, you must be assessed as satisfactory in each of the following assessment tasks.

| **Evidence recorded** | **Evidence Type/ Method of assessment** | | | **Sufficient evidence recorded/Outcome** |
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| **Unit Assessment Task 1** | Unit Knowledge Test (UKT) | | | S / NS (First Attempt)  S / NS (Second Attempt) |
| **Unit Assessment Task 2** | Unit Project (UP) | | | S / NS (First Attempt)  S / NS (Second Attempt) |
| **Final result** | C/NYC | **Date assessed** |  | |
| **Trainer/Assessor Signature** |  | |

## **Assessment Conditions**

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| **Unit purpose/application** |

This unit describes the skills and knowledge required to debug and monitor a software application.

It applies to individuals who work as developers, testers and support engineers, using logging and tracing techniques to identify software problems and to monitor systems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

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| **What the student can expect to learn by studying this unit of competency** |

* Implement a framework for logging and error handling
* Debug and trace an application
* Monitor the application’s performance

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| **Training and assessment resources required for this unit of competency** |

The student will have access to the following:

* Learner guide
* PowerPoint presentation
* Unit Assessment Pack (UAP)
* Access to other learning materials such as textbooks

The resources required for these assessment tasks also included:

* Access to a computer, the Internet and word-processing system such as MS Word.
* Integrated Development Environment (IDE) where student has sufficient privileges to access tracing and debugging tools
* Microsoft Windows
* Event Viewer utility
* Simulated assessment environments must simulate the real-life working environment where these skills and knowledge would be performed, with all the relevant equipment and resources of that working environment.

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| **Submission instructions** |

Your trainer/assessor will confirm assessment submission details for each assessment task.

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| **Academic integrity, plagiarism and collusion** |

**Academic Integrity**

Academic Integrity is about the honest presentation of your academic work. It means acknowledging the work of others while developing your own insights, knowledge and ideas.

As a student, you are required to:

* undertake studies and research responsibly and with honesty and integrity
* ensure that academic work is in no way falsified
* seek permission to use the work of others, where required
* acknowledge the work of others appropriately
* take reasonable steps to ensure other students cannot copy or misuse your work.

**Plagiarism**

Plagiarism means to take and use another person's ideas and or manner of expressing them and to pass them off as your own by failing to give appropriate acknowledgement. This includes material sourced from the internet, RTO staff, other students, and from published and unpublished work.

Plagiarism occurs when you fail to acknowledge that the ideas or work of others are being used, which includes:

* Paraphrasing and presenting work or ideas without a reference
* Copying work either in whole or in part
* Presenting designs, codes or images as your own work
* Using phrases and passages verbatim without quotation marks or referencing the author or web page
* Reproducing lecture notes without proper acknowledgement.

**Collusion**

Collusion means unauthorised collaboration on assessable work (written, oral or practical) with other people. This occurs when a student presents group work as their own or as the work of someone else.

Collusion may be with another RTO student or with individuals or students external to the RTO. This applies to work assessed by any educational and training body in Australia or overseas.

Collusion occurs when you work without the authorisation of the teaching staff to:

* Work with one or more people to prepare and produce work
* Allow others to copy your work or share your answer to an assessment task
* Allow someone else to write or edit your work (without rto approval)
* Write or edit work for another student
* Offer to complete work or seek payment for completing academic work for other students.

Both collusion and plagiarism can occur in group work. For examples of plagiarism, collusion and academic misconduct in group work please refer to the RTO’s policy on Academic integrity, plagiarism and collusion.

Plagiarism and collusion constitute cheating. Disciplinary action will be taken against students who engage in plagiarism and collusion as outlined in RTO’s policy.

Proven involvement in plagiarism or collusion may be recorded on students’ academic file and could lead to disciplinary action.

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| **Other Important unit specific Information** |

N/A

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| **Unit outcome** |

* This unit is not graded and the student must complete and submit all requirements for the assessment task for this cluster or unit of competency to be deemed competent.
* Students will receive a 'satisfactorily completed' (S) or 'not yet satisfactorily completed (NS) result for each individual unit assessment task (UAT).
* Final unit result will be recorded as competency achieved/competent (C) or competency not yet achieved/not yet competent (NYC).

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| **Prerequisite/s** |

Nil

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| **Co-requisite/s** |

Nil

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| **Foundation Skills** |

The Foundation Skills describe those required skills (learning, oral communication, reading, writing, numeracy, digital technology and employment skills) that are essential to performance. Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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| **Relevant Legislation** |

* Australian Human Rights Commission Act 1986
* Age Discrimination Act 2004
* Disability Discrimination Act 1992
* Racial Discrimination Act 1975
* Sex Discrimination Act 1984
* The Privacy Act 1988 (Privacy Act) and Australian Privacy Principles (APPs)
* Occupational Health and Safety Act 2004
* Work Health and Safety Act 2011

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| **Principles of assessment and rules of evidence** |

All assessment tasks will ensure that the principles of assessment and rules of evidence are adhered to.

The principles of assessment are that assessment must be valid, fair, flexible, reliable and consistent. The rules of evidence state that evidence must be sufficient, valid, current and authentic.

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| **AQF Level** |

AQF levels and the AQF levels criteria are an indication of the relative complexity and/or depth of achievement and the autonomy required to demonstrate that achievement.

All assessment tasks must ensure compliance with the requirements of AQF level and the AQF level criteria. For more information, please visit <http://www.aqf.edu.au/>

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| **Further Information** |

For further information about this unit go to <https://training.gov.au/Training/Details/ICTPRG503>

## **Additional Information**

* This information will be managed by the provisions of the Privacy Act and the Freedom of Information Act.)
* Students are required to satisfactorily complete and submit all assessment tasks that contribute to the assessment for a unit.
* Students will be provided with one more attempt to complete this Unit assessment pack (UAP) if trainer/assessor deems them not satisfactorily completed (NS) in any Unit assessment task (UAT).
* Unit Pre-Assessment Checklist (UPAC) will be reviewed by the trainer/assessor to ensure the student is ready for the assessment.
* Feedback regarding this Unit Assessment Pack (UAP) can be emailed to the [compliance](mailto:info@caqa.online) and quality assurance department/administration department in your RTO for continuously improving our assessment and student resources.

## **Feedback to student**

Feedback on students’ assessment performance is a vital element in their learning. Its purpose is to justify to students how their competency was assessed, as well as to identify and reward specific qualities in their work, to recommend aspects needing improvement, and to guide students on what steps to take.

Feedback defines for students what their trainer/assessor thinks is important for a topic or a subject. At its best, feedback should:

* Be provided for each Unit Assessment Task (UAT)
* Guide students to adapt and adjust their learning strategies
* Guide trainers/assessors to adapt and adjust teaching to accommodate students’ learning needs
* Be a pivotal feature of learning and assessment design, not an add-on ritual
* Focus on course and unit learning outcomes
* Guide students to become independent and self-reflective learners and their own critics
* Acknowledge the developmental nature of learning.

*If students have not received proper feedback, they must speak to compliance and quality assurance department/administration department in the RTO/person responsible for looking after the quality and compliance services of the RTO.*

*For more information, please refer to RTO Student Handbook.*

# **Unit Pre-Assessment Checklist (UPAC)**

# **UAT 1 – Unit Knowledge Test (UKT)**

## **Purpose of the checklist**

The pre-assessment checklist helps students determine if they are ready for assessment. The trainer/assessor must review the checklist with the student before the student attempts the assessment task. If any items of the checklist are incomplete or not clear to the student, the trainer/assessor must provide relevant information to the student to ensure they understand the requirements of the assessment task. The student must ensure they are ready for the assessment task before undertaking it.

**Section 1: Information for Students**

* Please make sure you have completed the necessary prior learning before attempting this assessment.
* Please make sure your trainer/assessor clearly explained the assessment process and tasks to be completed.
* Please make sure you understand what evidence is required to be collected and how.
* Please make sure you know your rights and the Complaints and Appeal process.
* Please make sure you discuss any special needs or reasonable adjustments to be considered during the assessment (refer to the Reasonable Adjustments Strategy Matrix and negotiate these with your trainer/assessor).
* Please make sure that you have access to a computer and the internet (if you prefer to type the answers).
* Please ensure that you have all the required resources needed to complete this Unit Assessment Task (UAT).
* Due date of this assessment task is according to your timetable.
* In exceptional (compelling and compassionate) circumstances, an extension to submit an assessment can be granted by the trainer/assessor.
* Evidence of the compelling and compassionate circumstances must be provided together with your request for an extension to submit your assessment work.
* Request for an extension to submit your assessment work must be made before the due date of this assessment task.

## **Section 2: Reasonable adjustments**

* Students with carer responsibilities, cultural or religious obligations, English as an additional language, disability etc. can request for reasonable adjustments.
* Please note, academic standards of the unit/course will not be lowered to accommodate the needs of any student, but there is a requirement to be flexible about the way in which it is delivered or assessed.
* The Disability Standards for Education requires institutions to take reasonable steps to enable the student with a disability to participate in education on the same basis as a student without a disability.
* Trainer/Assessor must complete the section below “Reasonable Adjustment Strategies Matrix” to ensure the explanation and correct strategy have been recorded and implemented.
* Trainer/Assessor must notify the administration/compliance and quality assurance department for any reasonable adjustments made.
* All evidence and supplementary documentation must be submitted with the assessment pack to the administration/compliance and quality assurance department.

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| **Reasonable Adjustment Strategies Matrix (Trainer/Assessor to complete)** | | |
| **Category** | **Possible Issue** | **Reasonable Adjustment Strategy**  **(select as applicable)** |
| 🞎 LLN | 🞎 Speaking  🞎 Reading  🞎 Writing  🞎 Confidence | 🞎 Verbal assessment  🞎 Presentations  🞎 Demonstration of a skill  🞎 Use of diagrams  🞎 Use of supporting documents such as wordlists |
| 🞎 Non-English Speaking Background | 🞎 Speaking  🞎 Reading  🞎 Writing  🞎 Cultural background  🞎 Confidence | 🞎 Discuss with the student and supervisor (if applicable) whether language, literacy and numeracy are likely to impact on the assessment process  🞎 Use methods that do not require a higher level of language or literacy than is required to perform the job role  🞎 Use short sentences that do not contain large amounts of information  🞎 Clarify information by rephrasing, confirm understanding  🞎 Read any printed information to the student  🞎 Use graphics, pictures and colour coding instead of, or to support, text  🞎 Offer to write down, or have someone else write, oral responses given by the student  🞎 Ensure that the time available to complete the assessment, while meeting enterprise requirements, takes account of the student’s needs |
| 🞎 Indigenous | 🞎 Knowledge and understanding  🞎 Flexibility  🞎 Services  🞎 Inappropriate training and assessment | 🞎 Culturally appropriate training  🞎 Explore understanding of concepts and practical application through oral assessment  🞎 Flexible delivery  🞎 Using group rather than individual assessments  🞎 Assessment through completion of practical tasks in the field after demonstration of skills and knowledge. |
| 🞎 Age | 🞎 Educational background  🞎 Limited study skills | 🞎 Make sure font size is not too small  🞎 Trainer/Assessor should refer to the student’s experience  🞎 Ensure that the time available to complete the assessment takes account of the student’s needs  🞎 Provision of information or course materials in accessible format.  🞎 Changes in teaching practices, e.g. wearing an FM microphone to enable a student to hear lectures  🞎 Supply of specialised equipment or services, e.g. a note-taker for a student who cannot write  🞎 Changes in lecture schedules and arrangements, e.g. relocating classes to an accessible venue  🞎 Changes to course design, e.g. substituting an assessment task  🞎 Modifications to physical environment, e.g. installing lever taps, building ramps, installing a lift |
| 🞎 Educational background | 🞎 Reading  🞎 Writing  🞎 Numeracy  🞎 Limited study skills and/or learning strategies | 🞎 Discuss with the Student previous learning experience  🞎 Ensure learning and assessment methods meet the student’s individual need |
| 🞎 Disability | 🞎 Speaking  🞎 Reading  🞎 Writing  🞎 Numeracy  🞎 Limited study skills and/or learning strategies | 🞎 Identify the issues  🞎 Create a climate of support  🞎 Ensure access to support that the student has agreed to  🞎 Appropriately structure the assessment  🞎 Provide information or course materials in accessible format, e.g. a textbook in braille  🞎 Changes in teaching practices, e.g. wearing an FM microphone to enable a student to hear lectures  🞎 Supply of specialised equipment or services, e.g. a note- taker for a student who cannot write  🞎 Changes in lecture schedules and arrangements, e.g. relocating classes to an accessible venue  🞎 Changes to course design, e.g. substituting an assessment task  🞎 Modifications to physical environment, e.g. installing lever taps, building ramps, installing a lift |
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| **Explanation of reasonable adjustments strategy used (If required)** |
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# **Unit Assessment Task (UAT)**

## **Assessment Task 1 - Unit Knowledge Test (UKT)**

**Assessment type:**

* Written Questions

**Assessment task description:**

* This is the first (1) unit assessment task you have to successfully complete to be deemed competent in this unit of competency.
* The Unit Knowledge Test is comprised of thirteen (13) written questions
* You must respond to all questions and submit them to your Trainer/Assessor.
* You must answer all questions to the required level, e.g. provide the number of points, to be deemed satisfactory in this task
* You will receive your feedback within two weeks - you will be notified by your Trainer/Assessor when results are available.

**Applicable conditions:**

* All knowledge tests are untimed and are conducted as open book tests (this means you are able to refer to your textbook during the test).
* You must read and respond to all questions.
* You may handwrite/use computers to answer the questions.
* You must complete the task independently.
* No marks or grades are allocated for this assessment task. The outcome of the task will be Satisfactory or Not Satisfactory.
* As you complete this assessment task you are predominately demonstrating your written skills and knowledge to your trainer/assessor.
* The trainer/assessor may ask you relevant questions on this assessment task to ensure that this is your own work.

**Resubmissions and reattempts:**

* Where a student’s answers are deemed not satisfactory after the first attempt, a resubmission attempt will be allowed.
* You must speak to your Trainer/Assessor if you have any difficulty in completing this task and require reasonable adjustments (e.g. can be given as an oral assessment)
* For more information, please refer to your RTO Student Handbook.

**Location:**

* This assessment task may be completed in a learning management system (i.e. Moodle) or independent learning environment.
* Your trainer/assessor will provide you further information regarding the location for completing this assessment task.

**Instructions for answering written questions:**

* Complete a written assessment consisting of a series of questions.
* You will be required to correctly answer all the questions.
* Do not start answering questions without understanding what is required from you. Read the questions carefully and critically analyse them for a few seconds, this will help you to identify what is really needed.
* Your answers must demonstrate an understanding and application of relevant concepts, critical thinking, and good writing skills.
* Be concise to the point and write answers according to the given word-limit to each question and do not provide irrelevant information. Be careful, quantity is not quality.
* Be careful to use non-discriminatory language. The language used should not devalue, demean, or exclude individuals or groups on the basis of attributes such as gender, disability, culture, race, religion, sexual preference or age. Gender inclusive language should be used.
* When you quote, paraphrase, summarise or copy information from the sources you are using to write your answers/research your work, you must always acknowledge the source.

**How your trainer/assessor will assess your work?**

* This assessment task requires the student to answer all the questions.
* Answers must demonstrate the student’s understanding and knowledge of the unit.
* If all assessment tasks are deemed Satisfactory (S), then the unit outcome is Competent (C).
* If at least one of the assessment task is deemed Not Satisfactory (NS), then the unit outcome is Not Yet Competent (NYC).
* Once all assessment tasks allocated to this Unit of Competency have been undertaken, trainer/assessor will complete an Assessment plan to record the unit outcome. The outcome will be either Competent (C) or Not Yet Competent (NYC).
* The “Assessment Plan” is available with the Unit Assessment Pack (UAP) – Cover Sheet.

**Purpose of the assessment task:**

* The purpose of this assessment task is to assess the students’ knowledge required for the debugging and monitoring an application, and for the basic principles of programming and development tools.

## **Assessment Task 1 - Unit Knowledge Test (UKT)**

**Instructions:**

* This is an individual assessment.

The purpose of this assessment task is to assess the students’ knowledge required for the debugging and monitoring an application, and for the basic principles of programming and development tools.

* To make full and satisfactory responses you should consult a range of learning resources, other information such as handouts and textbooks, learners’ resources and slides.
* All questions must be answered in order to gain competency for this assessment.
* You may attach a separate sheet if required.
* You must include the following particulars in the footer section of each page of the attached sheets:
  + Student ID or Student Name
  + Unit ID or Unit Code
  + Course ID or Course Code
  + Trainer and assessor name
  + Page numbers
* You must staple the loose sheets together along with the cover page.
* You must attach the loose sheets chronologically as per the page numbers.
* Correction fluid and tape are not permitted. Please do any corrections by striking through the incorrect words with one or two lines and rewriting the correct words.

Resources required to complete the assessment task:

* Learner guide
* PowerPoint presentation
* Unit Assessment Pack (UAP)
* Access to other learning materials such as textbooks
* Access to a computer, the Internet and word-processing system such as MS Word.

1. Provide examples of common logging frameworks, logging and tracing tools, and profiling tools used within Visual Studio for a C# application. Write your response in 100-150 words.

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| ***Visual Studio provides a variety of profiling tools to help you diagnose different kinds of performance issues depending on your app type. The profiling tools that you can access during a debugging session are available in the Diagnostic Tools window. The Diagnostic Tools window appears automatically unless you have turned it off. To bring up the window, click Debug / Windows / Show Diagnostic Tools. With the window open, you can select tools for which you want to collect data. While you are debugging, you can use the Diagnostic Tools window to analyze CPU and memory usage, and you can view events that show performance-related information.***  ***Logging and tracing are really two names for the same technique. The simple technique has been used since the early days of computers. It simply involves instrumenting an application to write output to be consumed later.***  ***The low-level APIs may not be the right choice for your logging needs. You may want to consider a logging framework. The ILogger interface has been used to create a common logging interface where the loggers can be inserted through dependency injection. For instance, to allow you to make the best choice for your application .NET offers support for a selection of built-in and third-party frameworks:***  ***Reference:*** Docs.microsoft.com. 2020. *Logging And Tracing - .NET Core*. [online] Available at: <https://docs.microsoft.com/en-us/dotnet/core/diagnostics/logging-tracing> [Accessed 12 November 2020]. |

1. Summarise the function of each of the following. Write your response in 50-100 words for each.
2. Profiling tool
3. Logging tool
4. Tracing tool

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| 1. ***Profiling tool***   ***A profiling tool is important for performing analysis of the source and target data structures for data integration, whether the transformation will be performed in a batch or real-time environment. It is possible to perform profiling using just the utilities of the source data environment, but specialized profiling tools make the analysis process much more efficient, especially on large volumes of data. Some data-profiling tools can actually infer the relationships between data based on the actual data contents of the various data structures. Basic metadata tools can infer relationships between the data based on the names of the fields or attributes in the data structures.***  ***Reference:*** Sciencedirect.com. 2020. *Profiling Tool - An Overview | Sciencedirect Topics*. [online] Available at: <https://www.sciencedirect.com/topics/computer-science/profiling-tool> [Accessed 12 November 2020]. |
| 1. ***Logging tool***   ***The purpose of logging is to track error reporting and related data in a centralized way. Logging should be used in big applications and it can be put to use in smaller apps, especially if they provide a crucial function. The term logging can refer both to the practice of event logging or to the actual log files that result.***  ***Log files can show any discrete event within an application or system, such as a failure, and error, or a state transformation. When something inevitably goes wrong, such transformations in state help indicate which change actually caused an error.*** |
| 1. ***Tracing tool***   ***Where logging provides an overview to a discrete, event-triggered log, tracing encompasses a much wider, continuous view of an application. The goal of tracing is to following a program’s flow and data progression. As such, there is a lot more information at play; tracing can be a lot noisier of an activity than logging – and that’s intentional. In many instances, tracing represents a single user’s journey through an entire app stack. Its purpose isn’t reactive, but instead focused on optimization. By tracing through a stack, developers can identify bottlenecks and focus on improving performance.***  ***When a problem does occur, tracing allows you to see how you got there: which function, the function’s duration, parameters passed, and how deep into the function the user could get. A common tracing tool is the Profiling API in .NET.***  ***Reference:*** BMC Blogs. 2020. *Tracing Vs Logging Vs Monitoring: What’S The Difference?*. [online] Available at: <https://www.bmc.com/blogs/monitoring-logging-tracing/> [Accessed 12 November 2020]. |

1. Explain the basic principle of client-server networks including the hardware components used, and how they communicate with one another. Write your response in 150-200 words.

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| ***Client-server is a relationship in which one program (the client) requests a service or resource from another program (the server). At the turn of the last century, the label client-server was used to distinguish distributed computing by personal computers (PCs) from the monolithic, centralized computing model used by mainframes.***  ***Today, computer transactions in which the server fulfills a request made by a client are very common and the client-server model has become one of the central ideas of network computing. In this context, the client establishes a connection to the server over a local area network (LAN) or wide-area network (WAN), such as the Internet. Once the server has fulfilled the client's request, the connection is terminated. Because multiple client programs share the services of the same server program, a special server called a daemon may be activated just to await client requests.***  ***In the early days of the internet, the majority of network traffic was between remote clients requesting web content and the data center servers that provided the content. This traffic pattern is referred to as north-south traffic. Today, with the maturity of virtualization and cloud computing, network traffic is more likely to be server-to-server, a pattern known as east-west traffic. This, in turn, has changed administrator focus from a centralized security model designed to protect the network perimeter to a decentralized security model that focuses more on controlling individual user access to services and data, and auditing their behavior to ensure compliance with policies and regulations.***  ***Reference:*** SearchNetworking. 2020. *What Is The Client-Server Model? - Definition From Whatis.Com*. [online] Available at: <https://searchnetworking.techtarget.com/definition/client-server> [Accessed 12 November 2020]. |

1. Explain what a database management system is, and some of its basic principles. Write your answer in 50-100 words.

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| ***The purpose of a DBMS is to store and transform data into information to support making decisions. It organizes your files to give you more control over your data.***  ***The basic principles of DBMS are listed below:***   * ***Data Definition: Formatting by categorizing data into specific slot. Making it easier to search, retrieve and update data. Computer data is information processed or stored by a computer. This information may be in the form of text documents, images, audio clips, software programs, or other types of data.*** * ***Data Dictionary: Data Dictionary is a set of information describing the contents, format, and structure of a database and the relationship between its elements, used to control access to and manipulation of the database. Data dictionary means grouping similar data together. The data dictionary contains records about other objects in the database, such as data ownership, data relationships to other objects, and other data. The data dictionary is a crucial component of any relational database. Ironically, because of its importance, it is invisible to most database users.*** * ***Data Manipulation Language: A data manipulation language (DML) is a computer programming language used for adding (inserting), deleting, and modifying (updating) data in a database. You can also use this to update, edit and delete data. This is also called Structured Query Language (SQL).***   ***Reference:*** Romulus Gales. 2020. *Describe The Basic Principles Of Database Management Systems*. [online] Available at: <https://romulusgales.wordpress.com/lesson-10-ictprg504-knowledge-evidence/describe-the-basic-principles-of-database-management-systems/> [Accessed 12 November 2020]. |

1. Summarise what the four main principles of an object-oriented programming language are. Write your answer in 50-150 words.

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| ***There are 4 major principles that make an language Object Oriented. These are Encapsulation, Data Abstraction, Polymorphism and Inheritance. These are also called as four pillars of Object Oriented Programming.***   1. ***Encapsulation: Encapsulation is the mechanism of hiding of data implementation by restricting access to public methods. Instance variables are kept private and accessor methods are made public to achieve this.*** 2. ***Abstraction: Abstract means a concept or an Idea which is not associated with any particular instance. Using abstract class/Interface we express the intent of the class rather than the actual implementation. In a way, one class should not know the inner details of another in order to use it, just knowing the interfaces should be good enough.*** 3. ***Inheritance: Inheritances expresses “is-a” and/or “has-a” relationship between two objects. Using Inheritance, In derived classes we can reuse the code of existing super classes. In Java, concept of “is-a” is based on class inheritance (using extends) or interface implementation (using implements).*** 4. ***Polymorphism: It means one name many forms. It is further of two types — static and dynamic. Static polymorphism is achieved using method overloading and dynamic polymorphism using method overriding. It is closely related to inheritance. We can write a code that works on the superclass, and it will work with any subclass type as well.***   ***Reference:*** Medium. 2020. *What Are Four Basic Principles Of Object Oriented Programming?*. [online] Available at: <https://medium.com/@cancerian0684/what-are-four-basic-principles-of-object-oriented-programming-645af8b43727> [Accessed 12 November 2020]. |

1. Summarise what an open-source development tool is, including the basic principles, and provide examples of at least two tools? Write your response in 50-100 words.

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| ***Open source software is software with source code that anyone can inspect, modify, and enhance.***  ***"Source code" is the part of software that most computer users don't ever see; it's the code computer programmers can manipulate to change how a piece of software—a "program" or "application"—works. Programmers who have access to a computer program's source code can improve that program by adding features to it or fixing parts that don't always work correctly.***  ***Open source software is different. Its authors make its source code available to others who would like to view that code, copy it, learn from it, alter it, or share it. LibreOffice and the GNU Image Manipulation Program are examples of open source software.***  ***Reference:*** Opensource.com. 2020. *What Is Open Source?*. [online] Available at: <https://opensource.com/resources/what-open-source> [Accessed 12 November 2020]. |

1. Summarise each the stages of a sequential software development life cycle (SDLC). Write your response in 150-200 words.

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| ***Software Development Life Cycle (SDLC) is a framework that defines the steps involved in the development of software at each phase. It covers the detailed plan for building, deploying and maintaining the software.***  ***SDLC defines the complete cycle of development i.e. all the tasks involved in planning, creating, testing, and deploying a Software Product.***  ***SDLC is a process which defines the various stages involved in the development of software for delivering a high-quality product. SDLC stages cover the complete life cycle of a software i.e. from inception to retirement of the product.***  ***The phases of SDLC are listed below as:***   1. ***Requirement Gathering and Analysis: During this phase, all the relevant information is collected from the customer to develop a product as per their expectation. Any ambiguities must be resolved in this phase only. Business analyst and Project Manager set up a meeting with the customer to gather all the information like what the customer wants to build, who will be the end-user, what is the purpose of the product. Before building a product a core understanding or knowledge of the product is very important.*** 2. ***Design: In this phase, the requirement gathered in the SRS document is used as an input and software architecture that is used for implementing system development is derived.*** 3. ***Implementation or Coding: Implementation/Coding starts once the developer gets the Design document. The Software design is translated into source code. All the components of the software are implemented in this phase.*** 4. ***Testing: Testing starts once the coding is complete and the modules are released for testing. In this phase, the developed software is tested thoroughly and any defects found are assigned to developers to get them fixed.*** 5. ***Deployment: Once the product is tested, it is deployed in the production environment or first UAT (User Acceptance testing) is done depending on the customer expectation.*** 6. ***Maintenance: After the deployment of a product on the production environment, maintenance of the product i.e. if any issue comes up and needs to be fixed or any enhancement is to be done is taken care by the developers.***   ***Reference:*** Softwaretestinghelp.com. 2020. *What Is SDLC (Software Development Life Cycle) Phases Methodologies*. [online] Available at: <https://www.softwaretestinghelp.com/software-development-life-cycle-sdlc/> [Accessed 12 November 2020]. |

1. Summarise how Joint Application Development (JAD) methodology works and why this should be used for small-size application development. Write your response in 100-200 words.

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| ***Joint Application Development (JAD) is a development methodology system originally used for designing a computer-based system, but can be applied to any development process. It involves continuous interaction with the users and different designers of the system in development. JAD centers around a workshop session that is structured and focused. Participants of these sessions would typically include a facilitator, end users, developers, observers, mediators and experts. JAD allows for a faster development process and minimizes errors at the same time. JAD also improves the quality of the final product by focusing on the up-front portion of the development lifecycle, thus reducing the likelihood of errors that are expensive to correct later on.***  ***Reference:*** Webopedia.com. 2020. *What Is Joint Application Development? Webopedia Definition*. [online] Available at: <https://www.webopedia.com/TERM/J/Joint\_Application\_Development.html> [Accessed 12 November 2020]. |

1. Explain how you would create a custom event log which can write event messages to Event Viewer within a C# application. You should specify the namespace you should use, and the class and methods.

|  |
| --- |
| ***The EventLog class allows you to access or customize Windows NT, 2000, and XP event logs, which record information about important software or hardware events. Using the EventLog class, you can read from existing logs, write entries to logs, create or delete event sources, delete logs, and respond to log entries. You can also create new logs when creating an event source.***  ***Event logging provides a standard, centralized way for you to have your applications record important software and hardware events. Windows supplies a standard user interface for viewing the event logs (you can open Event Viewer MMC from Control Panel?Administrative Tools?Computer Management?Event Viewer). Using the Microsoft .NET Framework's EventLog component, you can easily connect to existing event logs on both local and remote computers and read entries from those logs programmatically.***  ***The types of event logs are defined under the HKEY\_LOCAL\_MACHINE\SYSTEM\ControlSet\ Services\Eventlog registry hive. Windows 2000 includes Application, Security, System, Active Directory, and Domain Name System (DNS) logs by default. In an earlier example, we also added a "Demo" event log source hive in our listener program. Code below illustrates how you can create an event source, check the existence of the Application and Demo event sources (which will be created by us) as an event log or in Event Viewer, enumerate and read event log entries, write entries to a log, and monitor the event log source for any new entries written to the log.***  ***using System;***  ***using System.IO;***  ***using System.Diagnostics;***  ***public class Test***  ***{***  ***public static void Main()***  ***{***  ***// check for the event log source on specified machine***  ***// the Application event log source on MCBcomputer***  ***if (!EventLog.Exists("Application", "MCBcomputer"))***  ***{***  ***Console.WriteLine("The log does not exist!");***  ***return;***  ***}***  ***EventLog myLog = new EventLog();***  ***myLog.Log = "Application";***  ***myLog.MachineName = "MCBcomputer";***  ***Console.WriteLine("There are " + myLog.Entries.Count + " entr[y|ies] in the Application log:");***  ***foreach (EventLogEntry entry in myLog.Entries)***  ***{***  ***Console.WriteLine("\tEntry: " + entry.Message);***  ***}***  ***// check for Demo event log source existence***  ***// create it if it not exist***  ***if (!EventLog.SourceExists("Demo"))***  ***{***  ***EventLog.CreateEventSource("Demo", "Demo");***  ***}***  ***EventLog.WriteEntry("AnySource", "writing error to demo log.", EventLogEntryType.Error);***  ***Console.WriteLine("Monitoring of Application event log began...");***  ***Console.WriteLine(@"Press 'q' and 'Enter' to quit");***  ***while (Console.Read() != 'q')***  ***{***  ***// Now we will monitor the new entries that will be written.***  ***// When you create an EntryWrittenEventHandler delegate***  ***// you identify the method that will handle the event.***  ***myLog.EntryWritten += new EntryWrittenEventHandler(OnEntryWritten);***  ***// EnableRaisingEvents gets or sets a value indicating whether the***  ***// EventLog instance receives EntryWritten event notifications.***  ***myLog.EnableRaisingEvents = true;***  ***}***  ***}***  ***public static void OnEntryWritten(Object source, EntryWrittenEventArgs e)***  ***{***  ***Console.WriteLine("written entry: " + e.Entry.Message);***  ***}***  ***}***  ***Reference:*** C-sharpcorner.com. 2020. *Eventlog In C#*. [online] Available at: <https://www.c-sharpcorner.com/uploadfile/puranindia/eventlog-in-C-Sharp/> [Accessed 12 November 2020]. |

1. Explain how you would open and use the Event Viewer utility to check the state of a running application that is writing to the Event Viewer logs. Write your response in 100-150 words.

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| ***The Windows Event Viewer shows a log of application and system messages, including errors, information messages, and warnings. It’s a useful tool for troubleshooting all kinds of different Windows problems.***  ***To launch the Event Viewer, just hit Start, type “Event Viewer” into the search box, and then click the result.***  ***Events are placed in different categories, each of which is related to a log that Windows keeps on events regarding that category. While there are a lot of categories, the vast amount of troubleshooting you might want to do pertains to three of them:***   * ***Application: The Application log records events related to Windows system components, such as drivers and built-in interface elements.*** * ***System: The System log records events related to programs installed on the system.*** * ***Security: When security logging is enabled (it’s off by default in Windows), this log records events related to security, such as logon attempts and resource access.***   ***The Event Viewer is designed to help system administrators keep tabs on their computers and troubleshoot problems. If there isn’t a problem with your computer, the errors in here are unlikely to be important. For example, you’ll often see errors that indicate a program crashed at a specific time—which may have been weeks ago—or that a service failed to start with Windows, but was likely started on a subsequent attempt.***  ***Reference:*** How-To Geek. 2020. *What Is The Windows Event Viewer, And How Can I Use It?*. [online] Available at: <https://www.howtogeek.com/123646/htg-explains-what-the-windows-event-viewer-is-and-how-you-can-use-it/> [Accessed 12 November 2020]. |

1. Summarise how common debugging techniques and how they work including breakpoints, step-into, and step-over. Write your response in 100-150 words.

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| ***Print statements are a very simple way to debug your code. They’re great, if someone need something quick they still drop one in. they will even remember to remove them later, usually… Their biggest drawback though is that they limit your view into what’s actually going on in your program, both in the variables that you’ve printed and how the program flows before and after your print statement.***  ***If you want to really understand what’s going on in your program at a given point in time you need to be using a step-through debugger. Step-through debuggers are commonplace among compiled languages but for whatever reason in web development, they haven’t seemed to catch on. This needs to change. There are some common features of step-through debuggers they are listed below as:***   * ***Breakpoint: A line number of interest in your program. When the debugger is running it halts execution of the program at this line.*** * ***Step-Over: An action to take in the debugger that will step over a given line. If the line contains a function the function will be executed and the result returned without debugging each line.*** * ***Step-into: An action to take in the debugger. If the line does not contain a function it behaves the same as “step over” but if it does the debugger will enter the called function and continue line-by-line debugging there.***   ***Reference:*** Four Kitchens. 2020. *Step Into Step-Through Debugging | Four Kitchens*. [online] Available at: <https://www.fourkitchens.com/blog/article/step-step-through-debugging/> [Accessed 12 November 2020]. |

1. Summarise the print, assert, and fail debugging techniques in C# including how they are implement and what they are designed to achieve (or do) when they are used within an applications code. Write your response in 100-200 words.

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| --- |
| ***In a debug compilation, Assert takes in a Boolean condition as a parameter, and shows the error dialog if the condition is false. The program proceeds without any interruption if the condition is true. If you compile in Release, all Debug. Assert's are automatically left out.***  ***Print will write to the Console, not the Debug Console. If you then run the code in a non-debug environment it will still print out, which isn't really what you want for debugging messages. Debug messages appear in the Output window if you select "Show Output From Debug".***  ***Fail method emits the specified error message and the detailed error message.*** |

1. You are analysing an application that is hanging which is causing extra load to be placed on the Central Processing Unit (Unit) of the system. Upon review of the code you notice that an endless loop is occurring in a while loop. Based on this you must determine one method that you could use to ensure that the while loop will terminate at some point which will result in better performance for the application. Write your response in 100-150 words.

|  |
| --- |
| ***A loop in programming, also called iteration or repetition, is a way to repeat one or more statements. If you didn’t have loops to allow you to repeat code, your programs would get very long very quickly! Using a sequence of code, selection (ifs), and repetition (loops), the control structures in programming, you can construct an algorithm to solve almost any programming problem! A while loop executes the body of the loop as long as (or while) a Boolean condition is true. When the condition is false, we exit the loop and continue with the statements that are after the body of the while loop. If the condition is false the first time you check it, the body of the loop will not execute. Notice the while statement looks a lot like an if statement, but it runs more than once.*** |

# **Unit Assessment Result Sheet (UARS)**

## **Assessment Task 1 – Unit Knowledge Test (UKT)**

## **Student and Trainer/Assessor Details**

|  |  |
| --- | --- |
| **Unit code** | ICTPRG503 |
| **Unit name** | Debug and monitor applications |
| **Outcome of Unit Assessment Task (UAT)** | |  | | --- | | **First attempt:** |   Outcome (please make sure to tick the correct checkbox):  Satisfactory (S)  or Not Satisfactory (NS)  Date: \_\_\_\_\_\_\_(day)/ \_\_\_\_\_\_\_(month)/ \_\_\_\_\_\_\_\_\_\_\_\_(year)   |  | | --- | | **Second attempt:** |   Outcome (please make sure to tick the correct checkbox):  Satisfactory (S)  or Not Satisfactory (NS)  Date: \_\_\_\_\_\_\_(day)/ \_\_\_\_\_\_\_(month)/ \_\_\_\_\_\_\_\_\_\_\_\_(year) |
| **Feedback to Student** | |  | | --- | | * **First attempt:** |  |  | | --- | | * **Second attempt:** | |
| **Student Declaration** | * I declare that the answers I have provided are my own work. Where I have accessed information from other sources, I have provided references and or links to my sources. * I have kept a copy of all relevant notes and reference material that I used as part of my submission. * I have provided references for all sources where the information is not my own. I understand the consequences of falsifying documentation and plagiarism. I understand how the assessment is structured. I accept that all work I submit must be verifiable as my own. * I understand that if I disagree with the assessment outcome, I can appeal the assessment process, and either re-submit additional evidence undertake gap training and or have my submission re-assessed. * All appeal options have been explained to me. |
| **Student Signature** |  |
| **Date** |  |
| **Trainer/Assessor Name** |  |
| **Trainer/Assessor Declaration** | I hold:  🗹 Vocational competencies at least to the level being delivered  🗹 Current relevant industry skills  🗹 Current knowledge and skills in VET, *and undertake*  🗹 Ongoing professional development in VET  *I declare that I have conducted an assessment of this candidate’s submission. The assessment tasks were deemed current, sufficient, valid and reliable. I declare that I have conducted a fair, valid, reliable, and flexible assessment. I have provided feedback to the above-named candidate.* |
| **Trainer/Assessor Signature** |  |
| **Date** |  |
| **Office Use Only** | Outcome of Assessment has been entered onto the Student Management System on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (insert date)  by (insert Name) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**Unit Pre-Assessment Checklist (UPAC)**

# **UAT 2 – Unit Project (UP)**

## **Purpose of the checklist**

The pre-assessment checklist helps students determine if they are ready for assessment. The trainer/assessor must review the checklist with the student before the student attempts the assessment task. If any items of the checklist are incomplete or not clear to the student, the trainer/assessor must provide relevant information to the student to ensure they understand the requirements of the assessment task. The student must ensure they are ready for the assessment task before undertaking it.**Section 1: Information for Students**

* Please make sure you have completed the necessary prior learning before attempting this assessment.
* Please make sure your trainer/assessor clearly explained the assessment process and tasks to be completed.
* Please make sure you understand what evidence is required to be collected and how.
* Please make sure you know your rights and the Complaints and Appeal process.
* Please make sure you discuss any special needs or reasonable adjustments to be considered during the assessment (refer to the Reasonable Adjustments Strategy Matrix and negotiate these with your trainer/assessor).
* Please make sure that you have access to a computer and the internet (if you prefer to type the answers).
* Please ensure that you have all the required resources needed to complete this Unit Assessment Task (UAT).
* Due date of this assessment task is according to your timetable.
* In exceptional (compelling and compassionate) circumstances, an extension to submit an assessment can be granted by the trainer/assessor.
* Evidence of the compelling and compassionate circumstances must be provided together with your request for an extension to submit your assessment work.
* Request for an extension to submit your assessment work must be made before the due date of this assessment task.

## **Section 2: Reasonable adjustments**

* Students with carer responsibilities, cultural or religious obligations, English as an additional language, disability etc. can request for reasonable adjustments.
* Please note, academic standards of the unit/course will not be lowered to accommodate the needs of any student, but there is a requirement to be flexible about the way in which it is delivered or assessed.
* The Disability Standards for Education requires institutions to take reasonable steps to enable the student with a disability to participate in education on the same basis as a student without a disability.
* Trainer/Assessor must complete the section below “Reasonable Adjustment Strategies Matrix” to ensure the explanation and correct strategy have been recorded and implemented.
* Trainer/Assessor must notify the administration/compliance and quality assurance department for any reasonable adjustments made.
* All evidence and supplementary documentation must be submitted with the assessment pack to the administration/compliance and quality assurance department.

|  |  |  |
| --- | --- | --- |
| **Reasonable Adjustment Strategies Matrix (Trainer/Assessor to complete)** | | |
| **Category** | **Possible Issue** | **Reasonable Adjustment Strategy**  **(select as applicable)** |
| 🞎 LLN | 🞎 Speaking  🞎 Reading  🞎 Writing  🞎 Confidence | 🞎 Verbal assessment  🞎 Presentations  🞎 Demonstration of a skill  🞎 Use of diagrams  🞎 Use of supporting documents such as wordlists |
| 🞎 Non-English Speaking Background | 🞎 Speaking  🞎 Reading  🞎 Writing  🞎 Cultural background  🞎 Confidence | 🞎 Discuss with the student and supervisor (if applicable) whether language, literacy and numeracy are likely to impact on the assessment process  🞎 Use methods that do not require a higher level of language or literacy than is required to perform the job role  🞎 Use short sentences that do not contain large amounts of information  🞎 Clarify information by rephrasing, confirm understanding  🞎 Read any printed information to the student  🞎 Use graphics, pictures and colour coding instead of, or to support, text  🞎 Offer to write down, or have someone else write, oral responses given by the student  🞎 Ensure that the time available to complete the assessment, while meeting enterprise requirements, takes account of the student’s needs |
| 🞎 Indigenous | 🞎 Knowledge and understanding  🞎 Flexibility  🞎 Services  🞎 Inappropriate training and assessment | 🞎 Culturally appropriate training  🞎 Explore understanding of concepts and practical application through oral assessment  🞎 Flexible delivery  🞎 Using group rather than individual assessments  🞎 Assessment through completion of practical tasks in the field after demonstration of skills and knowledge. |
| 🞎 Age | 🞎 Educational background  🞎 Limited study skills | 🞎 Make sure font size is not too small  🞎 Trainer/Assessor should refer to the student’s experience  🞎 Ensure that the time available to complete the assessment takes account of the student’s needs  🞎 Provision of information or course materials in accessible format.  🞎 Changes in teaching practices, e.g. wearing an FM microphone to enable a student to hear lectures  🞎 Supply of specialised equipment or services, e.g. a note-taker for a student who cannot write  🞎 Changes in lecture schedules and arrangements, e.g. relocating classes to an accessible venue  🞎 Changes to course design, e.g. substituting an assessment task  🞎 Modifications to physical environment, e.g. installing lever taps, building ramps, installing a lift |
| 🞎 Educational background | 🞎 Reading  🞎 Writing  🞎 Numeracy  🞎 Limited study skills and/or learning strategies | 🞎 Discuss with the Student previous learning experience  🞎 Ensure learning and assessment methods meet the student’s individual need |
| 🞎 Disability | 🞎 Speaking  🞎 Reading  🞎 Writing  🞎 Numeracy  🞎 Limited study skills and/or learning strategies | 🞎 Identify the issues  🞎 Create a climate of support  🞎 Ensure access to support that the student has agreed to  🞎 Appropriately structure the assessment  🞎 Provision of information or course materials in accessible format, e.g. a text book in braille  🞎 Changes in teaching practices, e.g. wearing an FM microphone to enable a student to hear lectures  🞎 Supply of specialised equipment or services, e.g. a note taker for a student who cannot write  🞎 Changes in lecture schedules and arrangements, e.g. relocating classes to an accessible venue  🞎 Changes to course design, e.g. substituting an assessment task  🞎 Modifications to physical environment, e.g. installing lever taps, building ramps, installing a lift |

| **Explanation of reasonable adjustments strategy used (If required)** |
| --- |
|  |

# **Unit Assessment Task (UAT)**

## **Assessment Task 2 – Unit Project (UP)**

**Assessment type:**

Unit Project (UP)

**Assessment task description:**

* This is the second (2) assessment task you have to successfully complete to be deemed competent in this unit of competency.
* This assessment task requires you to complete a project.
* You will receive your feedback within two weeks - you will be notified by your trainer/assessor when results are available.
* You must attempt all activities of the project for your trainer/assessor to assess your competency in this assessment task.

**Applicable conditions:**

* All four activities are untimed.
* You must read and respond to all criteria of the project.
* You may handwrite/use computers to answer the criteria of the project.
* You must complete the task independently.
* No marks or grades are allocated for this assessment task. The outcome of the task will be Satisfactory or Not Satisfactory.
* As you complete this assessment task you are predominately demonstrating your practical skills, techniques and knowledge to your trainer/assessor.
* The trainer/assessor may ask you relevant questions on this assessment task to ensure that this is your own work.

**Resubmissions and reattempts:**

* Where a student’s answers are deemed not satisfactory after the first attempt, a resubmission attempt will be allowed.
* You must speak to your Trainer/Assessor if you have any difficulty in completing this task and require reasonable adjustments (e.g. can be given as an oral assessment).
* For more information, please refer to your RTO Student Handbook.

**Location:**

* This assessment task may be completed in a simulated learning environment.
* Your trainer/assessor will provide you further information regarding the location of completing this assessment task.

**General Instructions for attempting the project:**

## You will be required to correctly attempt all activities of this assessment task.

## You must concise to the point and write answers according to the given word-limit to each question and do not provide irrelevant information.

## You must use non-discriminatory language. The language used should not devalue, demean, or exclude individuals or groups on the basis of attributes such as gender, disability, culture, race, religion, sexual preference or age. Gender inclusive language should be used.

**How your trainer/assessor will assess your work?**

* This assessment task requires the student to successfully complete and submit a project.
* Answers must demonstrate the student’s understanding and skills of the unit.
* You will be assessed according to the provided performance checklist/ performance criteria.
* Assessment objectives/ measurable learning outcome(s) are attached as performance checklist/ performance criteria with this assessment task to ensure that you have successfully completed and submitted the assessment task.
* If all assessment tasks are deemed Satisfactory (S), then the unit outcome is Competent (C).
* If at least one of the assessment task is deemed Not Satisfactory (NS), then the unit outcome is Not Yet Competent (NYC).
* Once all assessment tasks allocated to this Unit of Competency have been undertaken, trainer/assessor will complete an Assessment plan to record the unit outcome. The outcome will be either Competent (C) or Not Yet Competent (NYC).
* The “Assessment Plan” is available with the Unit Assessment Pack (UAP) – Cover Sheet.

## **Assessment Task 2 - Unit Project (UP)**

**Instructions to complete this assessment task**:

* Please write your responses using a word processor.
* You should copy your application source code to a word document.
* You must include the following particulars in the footer section of each page of the attached sheets:
  + Student ID or Student Name
  + Unit ID or Unit Code
  + Course ID or Course Code
  + Trainer and assessor name
  + Page numbers
* You must staple the loose sheets together along with the cover page.
* You must attach the loose sheets chronologically as per the page numbers.
* Correction fluid and tape are not permitted. Please do any corrections by striking through the incorrect words with one or two lines and rewriting the correct words.
* This submission must be well presented and follow the guidelines and instructions provided.
* Please follow the format as indicated in the template section below.
* One of the most important steps that you can take: proofread your answers and code.
* All RTO policies are in effect, including the plagiarism policy.

**Scenario:**

Eminent Education is a private Registered Training Organisation (RTO) with campuses throughout Australia in a number of main capital cities. It offers over 120 certificate and diploma level qualifications in the Vocational Education Sector (VET) for a number of subject areas including business, community services, education, information technology, health, hospitality, and many others.

You work in the information technology department at Eminent Education at its headquarters based in Western Sydney. You have been tasked by your supervisor to work on developing the functionality to add a student to the student management application that is used by the academic team to administer student studies.

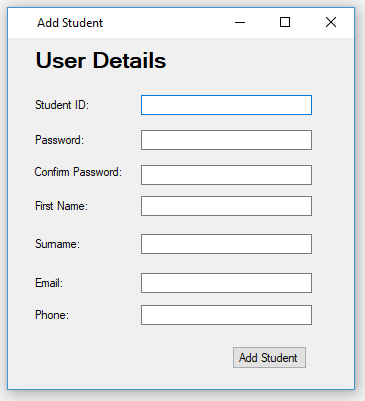
Your supervisor wants you to develop a test application that can:

* add a student to the system checking that all information has been supplied
* implements a logging function so major events can be logged
* implements debugging and tracing
* performance on system components can be monitored

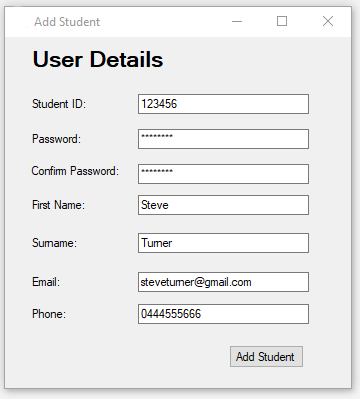
The application needs to request the following data from the user:

* Student ID
* Password
* Confirm password
* First name
* Surname
* Email
* Phone

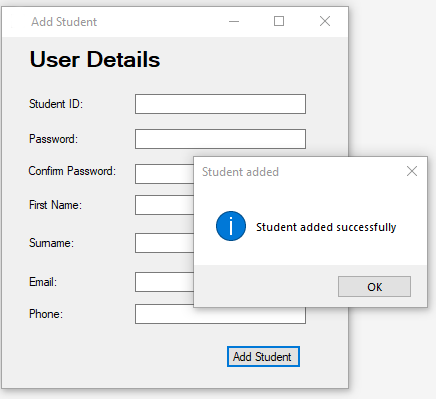
A button should be used to check if data has been added for each field. An example of how the application should appear is shown below when launched:



The **Add Student** button should check that the user has entered some data for each text field.

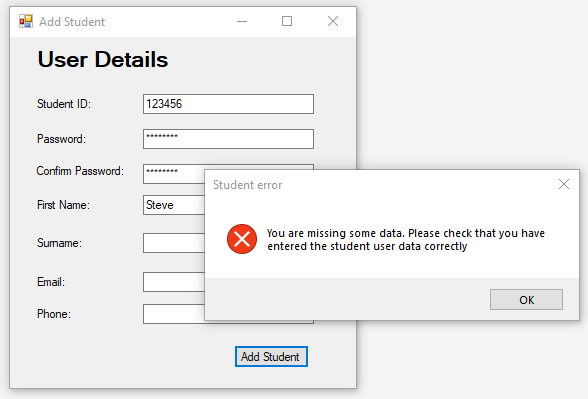


If the user enters some data for each of the text fields and then clicks the **Add Student** button a success message should be displayed similar to the following:



All text field data should also be deleted.

If the user doesn’t enter data for every text field and clicks the **Add Student** button, and error message similar to the following should be displayed:



**Activity 1: (Event Logging)**

After having a detailed look at the scenario given above, you need to develop the application and then implement event logging as follows:

* Ensure that each event is written to the Application log in the Event Viewer utility in Windows.
* The source of each event is called “AddStudent”.
* Each time a user is added successfully a success type event should be raised with the following message: “User added successfully”.
* Each time a user is not added successfully a failure (error) type event should be raised with the following message: “Adding user error occurred”.
* Undertake some successful and unsuccessful events to ensure that the events are being logged correctly.

*You should copy and paste your source code for the application to a word processor, as well as a screenshot of the Event Viewer that shows an event message from your application and submit this as evidence of completing this activity.*

## **Performance criteria checklist for unit assessment task:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Trainer/ Assessor to complete** | | | |
| **Assessment activities to be completed** | * Event logging * For a full project outline, please refer to the student assessment instructions | | |
| **Resources required for the unit assessment task** | * Unit assessment guide template * Access to an Integrated Development Environment (IDE) where student has sufficient privileges to access tracing and debugging tools * Microsoft Windows * Event Viewer utility | | |
| **Does the candidate meet the following criteria** | **Yes** | **No** | **Trainer/Assessor Comments** |
| Develop the application as per the functionality required |  |  |  |
| Ensured that custom events are written to the Event Viewer |  |  |  |
| Ensured that a success message is written to the Event log based on an successful action |  |  |  |
| Ensured that a fail message is written to the Event log based on an unsuccessful action |  |  |  |

**Activity 2: (Debugging)**

**Note: This activity is in continuation of activity 1.**

After you have successfully developed and added event logging for your application, your supervisor has asked you to capture instructions on how to use debugging tools, which can be used to train other programmers within the organisation.

For this activity you need to write some basic instructions using a word processor on how to use debugging tools within the code for your application. You need to provide the following instructions:

* Show how to set and remove a breakpoint within the code.
* Show how to step into a code function.
* Show how to step over a code function.
* Show how to use the stack trace information while stepping through the code.

For each instruction, you need to describe (in words) to the user how they need to undertake the task, identify the tool they should use including one or more screenshots to supplement the written instructions.

*You should submit your word processor documents that contains your instructions (both written and screenshots) as evidence that you have completed this task.*

**Performance criteria checklist for unit assessment task:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Trainer/ Assessor to complete** | | | |
| **Assessment activities to be completed** | * Debugging * For a full project outline, please refer to the student assessment instructions | | |
| **Resources required for the unit assessment task** | * Unit assessment guide template * Access to an Integrated Development Environment (IDE) where student has sufficient privileges to access tracing and debugging tools * Word processor * Application created in the previous activity | | |
| **Does the candidate meet the following criteria** | **Yes** | **No** | **Trainer/Assessor Comments** |
| Has provided written and screenshot instruction of how to set breakpoints |  |  |  |
| Has provided written and screenshot instruction of how to step over code |  |  |  |
| Has provided written and screenshot instruction of how to step into code |  |  |  |
| Has provided written and screenshot instruction of how to use Stack Trace information |  |  |  |

**Activity 3: (Tracing errors)**

**Note: This activity is in continuation of activities 1 and 2.**

Your supervisor has asked that you implement further debugging into your application, so that developers can better trace where issues are occurring.

Your application code to include at least one instance of the following statements in an appropriate place:

* assert
* print
* stop (or fail)

You need to identify the appropriate class or classes that should be implemented within the code and implement the previously given statements within your as appropriate.

*You should copy and paste your source code for the application to a word processor and submit this as evidence of completing this activity.*

**Performance criteria checklist for unit assessment task:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Trainer/ Assessor to complete** | | | |
| **Assessment activities to be completed** | * Tracing errors * For a full project outline, please refer to the student assessment instructions | | |
| **Resources required for the unit assessment task** | * Unit assessment guide template * Access to an Integrated Development Environment (IDE) where student has sufficient privileges to access tracing and debugging tools * Application created in the previous activity | | |
| **Does the candidate meet the following criteria** | **Yes** | **No** | **Trainer/Assessor Comments** |
| Has implemented an assert statement in an appropriate place |  |  |  |
| Has implemented a print statement in an appropriate place |  |  |  |
| Has implemented a stop (or fail) statement in an appropriate place |  |  |  |

**Activity 4: (Monitoring performance)**

**Note: This activity is in continuation of activities 1, 2 and 3.**

Your supervisor has asked that monitor the applications performance while undertaking some tasks to ensure that you can identify any performance issues.

You should start the application and then undertake some functions so performance data can be captured. You need to capture the following in a word processor document:

1. Undertake some functions and then capture analysis data within the IDE so that Random Access Memory (RAM), Central Processing Unit (CPU) usage is captured over time for those functions. You should capture a screenshot of this analysis and this will serve as the baseline analysis.
2. Make a change to your code, and then undertake the same functions again capturing the analysis data so that Random Access Memory (RAM), Central Processing Unit (CPU) usage is captured over time for those functions. You should capture a screenshot of this analysis and this will serve as the comparison analysis.
3. Compare the baseline analysis with the comparison analysis to determine whether the change made to your code increased, decreased, or resulted in the same performance. You should summarise this analysis in a short paragraph.
4. Based on the outcome of your analysis, suggest a change that could be made to improve performance. This change can either be to lessen the load on system resources (CPU, RAM), or to ensure that more errors or issues are captured which improves the performance of the application.

*You should capture the baseline and comparison analysis as screenshots, and then provide a summary of this analysis, as well as a way that an improvement can be made to the code to improve the performance as evidence of completing this activity.*

**Performance criteria checklist for unit assessment task:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Trainer/ Assessor to complete** | | | |
| **Assessment activities to be completed** | * Monitoring performance * For a full project outline, please refer to the student assessment instructions | | |
| **Resources required for the unit assessment task** | * Unit assessment guide template * Access to an Integrated Development Environment (IDE) where student has sufficient privileges to access tracing and debugging tools * Application created in the previous activity | | |
| **Does the candidate meet the following criteria** | **Yes** | **No** | **Trainer/Assessor Comments** |
| Has captured baseline performance of RAM and CPU over time |  |  |  |
| Has adjusted code and captured comparison performance of RAM and CPU over time |  |  |  |
| Has summarised whether the code change improved, decreased, or kept performance the same |  |  |  |
| Has provide one method for improving the performance of their code |  |  |  |

# **Unit Assessment Result Sheet (UARS)**

## **Assessment Task 2 – Unit Project**

## **Student and Trainer/Assessor Details**

|  |  |
| --- | --- |
| **Unit code** | ICTPRG502 |
| **Unit name** | Debug and monitor applications |
| **Outcome of Unit Assessment Task (UAT)** | |  | | --- | | **First attempt:** |   Outcome (please make sure to tick the correct checkbox):  Satisfactory (S)  or Not Satisfactory (NS)  Date: \_\_\_\_\_\_\_(day)/ \_\_\_\_\_\_\_(month)/ \_\_\_\_\_\_\_\_\_\_\_\_(year)   |  | | --- | | **Second attempt:** |   Outcome (please make sure to tick the correct checkbox):  Satisfactory (S)  or Not Satisfactory (NS)  Date: \_\_\_\_\_\_\_(day)/ \_\_\_\_\_\_\_(month)/ \_\_\_\_\_\_\_\_\_\_\_\_(year) |
| **Feedback to Student** | |  | | --- | | * **First attempt:** |  |  | | --- | | * **Second attempt:** | |
| **Student Declaration** | * I declare that the answers I have provided are my own work. Where I have accessed information from other sources, I have provided references and or links to my sources. * I have kept a copy of all relevant notes and reference material that I used as part of my submission. * I have provided references for all sources where the information is not my own. I understand the consequences of falsifying documentation and plagiarism. I understand how the assessment is structured. I accept that all work I submit must be verifiable as my own. * I understand that if I disagree with the assessment outcome, I can appeal the assessment process, and either re-submit additional evidence undertake gap training and or have my submission re-assessed. * All appeal options have been explained to me. |
| **Student Signature** |  |
| **Date** |  |
| **Trainer/Assessor Name** |  |
| **Trainer/Assessor Declaration** | I hold:  🗹 Vocational competencies at least to the level being delivered  🗹 Current relevant industry skills  🗹 Current knowledge and skills in VET, *and undertake*  🗹 Ongoing professional development in VET  *I declare that I have conducted an assessment of this candidate’s submission. The assessment tasks were deemed current, sufficient, valid and reliable. I declare that I have conducted a fair, valid, reliable, and flexible assessment. I have provided feedback to the above-named candidate.* |
| **Trainer/Assessor Signature** |  |
| **Date** |  |
| **Office Use Only** | Outcome of Assessment has been entered onto the Student Management System on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (insert date)  by (insert Name) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |