**ASSESSOR – PRODUCT ASSESSMENT TASK**

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| Task Number | 2 of 2 | Task Name | Product Assessment |
| National unit/s code | ICTPRG435 | National unit/s title | Write script for software applications |
| National qualification code | 22334VIC | National qualification title | Certificate IV in Cyber Security |
| RMIT Program code | C4424 | RMIT Course code | COSC7420C |

Section A – **Assessment Information**

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| **Assessment duration and/or due date** | released in week 10 and is due in week 14. Specific date and time will be made aware in CANVAS. |
| **Task instructions** | |
| **Type of Product (tick which applies)**  Project  ☐ Report  ☐ Portfolio  ☐ Case study  **Summary and Purpose of Assessment**  This is the second (2) assessment task of two (2) assessments that you must satisfactorily complete, in order to be deemed competent for this unit.  This assessment is designed to allow you to demonstrate their skills and knowledge in the development of a script for software functions related to cyber security. This requires you to demonstrate the following:   * Determine the requirements for building the script * Design the script * Write the script   **Assessment Instructions**  You are required to develop and test a script to meet the client’s requirements.  ***What***  *The following tasks must be completed in this assessment:*  You have recently been employed as a Cyber Security Consultant for IT Assurance Services. IT Assurance Services specialises in the provision of ICT services to a range of small and medium enterprises, including the conduct of cyber security vulnerability assessments and the subsequent design and implementation of risk mitigation solutions to secure client systems.  Your employer has asked you to develop a script that can be used to map a series of host names to their IPv4 addresses. To achieve this, you need to produce a python script that will read in a series of host names entered by the user, with the series terminated by entering a null line. The script iteratively outputs to screen the stored host names with an associated index (starting at 0), allowing the user to specify the index of a host. The script then outputs the selected host name and it’s IP address. A null line will terminate the iteration. The script should terminate with appropriate error messages if the user:   * Failed to enter any host names * Failed to enter a valid index * Selected an invalid host name for resolving to an IP address   **Your Task**  Using the information in the case study, develop, test and debug a python script to:   1. Design the script to be used to achieve the target objective and prepare a plan for how you will achieve this. The content of this plan must include:    1. An overview of the python object model and why it is suitable for this type of script. This should include the current python model compared to the legacy model.   Before version 2.2, Python used a "classic" object model that was based on the C language's struct data type. This model was relatively simple and did not support features like properties, descriptors, or slots.  From version 2.2 onwards, Python introduced a new object model called the "new-style" object model. This model was based on the concept of "object-oriented programming," and provides a more comprehensive set of features. This is a suitable version of python to use because it is not a legacy version meaning that the script will not need to be backwards compatible   * 1. Selecting an appropriate framework and integrated development environment to build the script using the python programming language:      1. Provide an overview of the frameworks to be used, how they work and why they have been chosen.   I will be using the “socket” module because it will allow the code to resolve a host name that is inputted by the userr   * + 1. Provide an overview of the selected integrated development environment and the reasons why it has been chosen. List the benefits as well as any limitations.   The IDE I will be using is Visual Studio Code because it is a standard IDE and the preferred one to be used by the organisation  A few benefits of Visual Studio Code are:   * free and open source * highlights syntax * auto indentation * interactive debugger * built in support for intelligent code completion * support for Git   A few limitations of Visual Studio Code are:   * CPU and memory intensive * challenging to select and configure correct extensions out of box   1. Document the pseudo code to outline the logic needed in the script. This must clearly explain the functions of the code including the protocols and object models. It must be clear to a person who does not understand python programming how the logic is applied to achieve the necessary outcomes. Where required symbols and diagrams can be utilised to explain functionality.   BEGIN  *SET* hostNames to an empty list  *SET* ipAddresses to an empty list  PRINT "Enter a hostname or press ENTER to quit:"  READ hostname from the user  WHILE hostname is NOT empty:  ADD hostname to hostNames  READ hostname from the user  IF the length of hostNames is 0:  PRINT "No host names entered. Exiting program."  ELSE:  PRINT "Here is what you input with the associated index"  FOR i in range of the length of hostNames:  PRINT i and hostNames  READ index from the user  WHILE index is NOT empty:  TRY:  CONVERT index to an integer  IF index is less than 0 OR index is greater than OR equal to the length of hostNames:  PRINT "Invalid index exiting program"  BREAK  ELSE:  *SET* hostname to hostNames  TRY:  COMPUTE address  PRINT "IP address for", hostname, address  ADD address to ipAddresses  EXCEPT cannot find a valid address  PRINT "Unable to resolve hostname or not a real hostname, exiting program"  BREAK  EXCEPT wrong value entered  PRINT "Invalid input exiting program"  BREAK  READ index from the user  END   * 1. Review the pseudo code to ensure that there are no errors including missing logic or errors in functionality and output.   **Note:** This plan is to be submitted as a separate document. The finalised script from Step 2 will be checked against the content of this plan to ensure that it has been followed and that any errors within the pseudo code have been identified and corrected as necessary.  2. Develop, debug and test the python script. As part of this process, you must demonstrate the following:   * 1. Translate the written pseudo code from 1c into the finalised python script using the required basic language elements and python libraries. The finalised script must include item manipulation to generate the required output.   2. Include comments within the script to explain each function and process. These comments must fully explain the purpose of each block and how it contributes to the overall outcome of the completed script.   3. Review and debug the script to ensure that it is free of errors. To confirm this, you must be observed undertaking this task by a qualified assessor. This will be completed during a meeting organised by your assessor, where you will demonstrate your understanding of this assessment and demonstrate the correct operation of your code. The tests will be the following as a minimum:      1. Failing to enter any host names      2. Entering host names: examplex.org scanme.org hackthissite.org and selecting the first host name (example.org) for resolving to an IPv4 address      3. Entering host names: examplex.org scanme.org hackthissite.org and selecting the second host name (scanme.org) for resolving to an IPv4 address, and then selecting the third host name (hackthissite.org) for resolving to an IPv4 address      4. Entering host names: examplex.org scanme.org hackthissite.org and entering an associated index that is out of the range (0..2)      5. Entering host names: examplex.org scanme.org hackthissite.org and entering a non-integer as an associated index  1. Document the operation of the script. This user documentation must include:    * 1. Process for launching the script including any runtime environment requirements   Open the script using **Visual Studio Code** and have **Python** downloaded  To run the script on Visual Studio Code hit the “Run Python file” button on the top right   * + 1. Steps for entering data   You will be first prompted to enter a hostname you can enter any website some example sites you can use are:   * + - * rmit.edu.au       * google.com       * facebook.com       * youtube.com   You then will be then be asked to enter an index number to resolve the host name and be presented with the websites you input and a number next to them you can then hit a valid number next to the website to reslove a host name you will be prompted to keep doing so until you hit enter to exit   * + 1. Any error messages what they mean and steps for resolution   The first error you may encounter is failing to enter any host name this means you entered nothing when prompted to enter a host name to resolve this enter a host name when prompted  Another error you may find is failing to enter a valid index this means that you did not enter a correct number to the presented index to reslove this look at the avaliable numbers to the index and enter again  The final error you my receive is “Unable to resolve a hostname” this means that you may have not entered a valid website to reslove this start the code again and put in a valid website   * + 1. Explanation of the types of results presented and what they mean.   The first few results you may find are errors to see what they mean refer to iii.  Another result you will encounter is you will be asked to enter an index number resolve the host name and be presented with the websites you input and a number next to them, this means that you can choose which website you want to reslove the address to this will keep looping until you hit ENTER to stop  The final result you will get is the IPv4 address of the website you chose, this means that the host name has been resolved and you have been given the result of it  **Note:** You must submit the completed python script as well as the user documentation for the script. Within your script include your name and the purpose of the script in a comment before the script itself.  **Where**  This assessment will be completed during classroom time and outside classroom time. The classroom will be a standard lecture or computer lab environment. You must successfully complete all parts of this assignment to achieve a satisfactory result.  **How**  You will be assessed against the criteria listed in the marking guide in Section B of this task. To achieve a satisfactory result, you will need to address all criteria satisfactorily.  **Additional Instructions:**   1. Attempt ALL the questions/tasks in this Assignment. 2. Performance requirement: 3. **Satisfactory (S) performance**- met the minimum requirement of all the tasks listed for the Assignment Task. 4. **Not Yet Satisfactory (NYS) performance** - did not meet the minimum requirement of all the tasks listed for the Assignment Task. 5. You need to achieve satisfactory (S) results in all two (2) assessments to be deemed Competent (CA). | |
| **Conditions for assessment** | |
| * You must be observed undertaking this assessment task by a qualified assessor * As an assessor you can negotiate a suitable time and location for assessment at least one week prior to the assessment taking place * You must complete the task within the maximum allowed duration as directed by the assessor. * This is an individual assessment task. You will be assessed individually against all assessment criteria. * You can make arrangements with the assessor at least one week prior to the assessment due date if they require special allowance or allowable adjustment to this task. * If found in breach of assessment conditions you can be charged with academic misconduct, have your results cancelled, be excluded from the program, and receive other penalties. Penalties can also apply if your test material is copied by others. * Plagiarism is the presentation of the work, idea, or creation of another person as though it is one’s own. It is a form of cheating and is a very serious academic offence that may lead to expulsion from the University. Plagiarised material can be drawn from, and presented in, written, graphic and visual form, including electronic data, and oral presentations. Plagiarism occurs when the origin of the material used is not appropriately cited. * RMIT special consideration is to enable students to maintain students’ academic progress despite adverse circumstances. The process for special consideration can be found at <http://www.rmit.edu.au/students/specialconsideration> * Students with a disability or long-term medical or mental health condition can apply for adjustments to their study and assessment conditions (Reasonable Adjustments and Equitable Assessment Arrangements) by registering with the Equitable Learning Services (ELS) at <https://www.rmit.edu.au/students/support-and-facilities/student-support/equitable-learning-services>  If students already registered with ELS and students study plan is approved, please inform your teacher if this assessment task is not adjusted in line with an approved study plan. * Please ensure your full and correct name is written on the student version of this assessment task (do not use nicknames or abbreviations). * You can appeal the assessment decision according to the [RMIT Assessment Appeal Processes](https://www.rmit.edu.au/content/dam/rmit/documents/about/policy/assessment/assessment-processes.pdf) * You will have the opportunity to resubmit any tools that are deemed unsatisfactory (one resubmission allowed per unit, so that means you have two opportunities to submit) | |
| **Instructions on submitting students’ Product Assessment** | |
| You need to submit this assignment through CANVAS with the naming convention of: <Student\_Number>\_<Student\_Full\_Name> \_Project.zip | |
| **Equipment/resources students must supply (if applicable):** | **Equipment/resources to be provided by RMIT or the workplace (if applicable):** |
| * Pens * Notebook * Laptop (optional) | * Onsite computers with internet connectivity * Canvas access |

Section B – **Marking Guide**

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| **TASK:** | You need to complete all the tasks listed below. You must be deemed satisfactory in all the tasks to successfully complete this assessment. |

| **Key Criteria that must be demonstrated** | | | |
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| **Criteria for assessment** | **Satisfactory** | | **Marking Guide** |
| **Y** | **N** |
| 1. Designed the script to be used to meet the client brief and prepared a plan for how the script will be designed: | ☐ | ☐ |  |
| * 1. Provided a detailed overview of the python object model and why is suitable for the type of script required, including comparison of current (new) python model and legacy model. | ☐ | ☐ |  |
| * 1. Selection of appropriate framework and integrated development environment for building the python script including:      1. Providing an overview of the frameworks to be used, how they work and why they have been chosen      2. Provided an overview of the selected integrated development environment and the reasons why it has been chosen including the benefits and potential limitations | ☐ | ☐ |  |
| * 1. Detailed documentation of the pseudo code which clearly outlines the logic needed within the script which clearly explains the functions of the code including the protocols and object models. | ☐ | ☐ |  |
| * 1. Reviewed the pseudo code to ensure no errors including missing logic or errors in functionality and output. | ☐ | ☐ |  |
| 1. Developed, debugged and tested the python script ensuring correct operation and adherence to client requirements: | ☐ | ☐ |  |
| * 1. Translated written pseudo code from 1c into finalised python script using the required basic language elements and python libraries, including item manipulation to achieve the required output. | ☐ | ☐ |  |
| * 1. Inclusion of detailed comments within the script to fully explain each function and process with full explanation of the operation of each block and its contribution to overall outcome included. | ☐ | ☐ |  |
| Reviewed and debugged the script effectively to ensure that final script is free from errors and demonstrated to the assessor at a scheduled time that the following minimum testing requirements have been met:   * + 1. Failing to enter any host names     2. Entering host names: examplex.org scanme.org hackthissite.org and selecting the first host name (examplex.org) for resolving to an IPv4 address     3. Entering host names: examplex.org scanme.org hackthissite.org and selecting the second host name (scanme.org) for resolving to an IPv4 address, and then selecting the third host name (hackthissite.org) for resolving to an IPv4 address     4. Entering host names: examplex.org scanme.org hackthissite.org and entering an associated index that is out of the range (0..2)     5. Entering host names: examplex.org scanme.org hackthissite.org and entering a non-integer as an associated index | ☐ | ☐ |  |
| * 1. Documented operation of the script for end users including:      1. Process for launching the script including any runtime environment requirements      2. Steps for entering data      3. Any error messages what they mean and steps for resolution | ☐ | ☐ |  |

Section C **– Feedback to Student**

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| **Has the student successfully completed the task?** | | Yes No | |
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| **Feedback to student:** | | | |
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| **Assessor Name** | **Date** | | |