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| **Course** | **TNABT Software Engineering** |
| **Unit Code** | **ICTPRG302** |
| **Unit Title** | **Apply Introductory Programming Techniques** |
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| **Assessment Task Title** | **Assessment 2 – Skills** |
| **Assessment Type** | **Practical** |

## Overview

The assessment provides the opportunity for you to demonstrate the following skills and knowledge:

* Design and build a simple application to specifications
* Develop algorithms
* Apply programming language syntax, sequence, selection and iteration constructs
* Test and debug a simple application
* Develop design specifications

## Instructions:

This assessment is to be completed in your own time. Time may also be made available for completing the assessment during class sessions.

You are required to enter your responses in the spaces provided in this assessment document, completed assigned activities and, follow instructions to upload resources

To achieve a ‘satisfactory’ result for this assessment you must complete all tasks and be deemed competent in all tasks by your assessor. In the event that you receive an unsatisfactory result, you will be required to review feedback from your assessor and then resubmit the assessment after making required corrections.

You will have one opportunity for resubmission. If your second assessment attempt is ‘not yet satisfactory’ you must contact your teacher or assessor to discuss how to proceed.

All responses must be your own work.

## To be submitted:

* This completed assessment document titled - Assessment 2 – Skills
* Panopto video of IDE debugger use
* Zipped up REMOTE Github repository (.zip)

Upload all documents by the due date to the drop box for ICTPRG302 Assessment 2 on VU Collaborate.

## Assessment scenario – Password Manager

You work as a programmer for a small digital development agency “Apps2U”. Apps2U have asked you to develop an application on behalf of their customer “DigiCore”.   
  
DigiCore have requested a simple password manager because their staff are resorting to insecure practices to record login credentials such as writing them down on sticky notes. The password manager will be used to store and retrieve credentials for websites and other login services used by employees.

## **Student Name: Student ID Number:**

## Task 1.1 Clarify task with required personnel

Discuss the programming specification at task 1.4 with your instructor who is acting as your work supervisor. This is your opportunity to ask any questions to ensure you fully understand what the application should do. Provide brief notes or dot points of the discussion that show your attempts to clarify and understanding the programming specification. *Note that your instructor may work with you individually, in small groups or as one large group for this task*

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| *The application will be used by DigiCore. The idea is for the employees to have a password manager to save all their credentials for different websites in order to avoid writing passwords on papers and sticky notes. About programing, the information on the file text should be appending always and not overwriting. The presented data has to be clear for the costumer and within a good order. The encryption process has to be done when the programing itself is finished.* |

## Task 1.2 Identify design specifications relevant to the task

Complete the following design specification

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| **Design specification** |
| Overview of the project  *We need to develop a password manager application* |
| Who will use the application *The staff of a company called Digicore* |
| Why is the application needed *The staff within this company need to store their credentials safely rather than a paper.* |
| What is the benefit of using the application for the client  *This will be a good tool to save several credentials in one place and have them secure.* |
| What are the features and functions of the application? *The application will allows you to input your credentials to enter to a specific website. This will store your user name, your password and the Url of the website. It also will show you all the credentials you had stored.* |
| Appearance  *The menu is going to be 3 consecutive lines with three different options. 1)Do you want to store new credentials (y/n):, 2) Show my stored credentials (y/n), 3)Exit(y/n). The output information going to be shown on consecutive lines. Each line from the top to the bottom will be Username:xxx, password:xxx, WebsiteUrl:xxx.* |
| When is the application due for completion (assessment due date)  *6 June 2022* |
| What questions do you have about the project *Will the user need a username and password just to get access to the application? How can I do the encryption?* |
| Summary of this design specification *There are three options in the menu. The first option is about asking for your credentials to be stored. It is going to be three lines asking UserName:, Password:, WebsiteUrl:. The second option is for retrieve and see all the stored credentials. The third option is for exit the application.* |

## Task 1.3 Algorithm Design

Produce a design of your intended program using pseudo-code with explanatory comments. Use the program specification checklist in task 1.4 below to guide the design of your algorithm/s

Contact your instructor for constructive and corrective feedback when complete. Make any corrections to the algorithm design and provide brief notes or bullet points of the changes.

*Note that your instructor may choose to provide feedback individually, in small groups or as a large group.*

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| *Enter your pseudo code:*  *program start*  *Display "wellcome to the password manager app"*  *Display "please select one of the following options"*  *Function write\_credentials():*  *Open credentials.txt, “a”*  *Write input (“website url: ”)*  *Write input (“username: ”)*  *Write input (“password: ”)*  *Close()*  *Function open\_credentials():*  *Open credentials.txt, “r”*  *Display text.read()*  *Text.Close()*    *choice = ""*  *while choice is not [q]*  *display "select [1] to save new credentials"*  *display "select [2] to open saved credentialas"*  *display "select [q] to exit"*  *choice = input "select choice"*    *if select option [1]*  *write\_credentials()*  *print “new credentials has been stored!”*  *elif select option [2]*  *open\_credentials()*    *elif select option [q]*  *display "see you next time"*  *anything else*  *display "wrong option, please select again"* |
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## Task 1.4 Create a simple application to specifications

Translate your pseudo code into a Python3 script that adheres to the code layout, white space and comments recommendations of the PEP 8 Style guide for Python code. You may use the provided code examples in the appendices, as part of your script.  
  
Use the program specification below as well as the coding checklist in the appendices to ensure that the application contains all required elements.

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| **Program specification and checklist**  Your code will be written to the following specification | |
|  | Done |
| Include an options menu for the user allowing them to carry out the following actions   * Add stored credentials (username, password and URL/resource) * View stored credentials * Exit the program | **Check!** |
| Return to the menu after each action has completed | **Check!** |
| Create a text file for credential storage if a text file does not already exist | **Check!** |
| Append new records to the text file without overwriting previous entries | **Check!** |
| Display the text file contents in a visually presentable way including spacing and headings | **Check!** |
| Handle any input from the user and carry out actions, without errors | **Check!** |
| Include embedded explanatory comments (#) to clarify the meaning of the code | **Check!** |
| Provide simple rot3 encryption on all written data and, decryption on read data |  |

Record the development of your script using the GitHub development platform. Add your instructor as a collaborator to your repository. Push and pull changes frequently to keep the local and remote repositories synchronised and so as to keep your instructor informed of your progress. Your instructor, acting as your supervisor, will check the repository and make comments during code development. You are to review your code based on those comments and when committing reviewed code using GitHub Desktop, state the words “acted on review” in the summary field of GitHub desktop.  
*Do not produce code with Window elements or complexity beyond what is required.*

## Task 1.5 Debug

Debug your application

* Use an IDE and its inbuilt debugger to debug your script
* Provide a brief Panopto video (3 minutes maximum) with **vocal commentary** that shows the IDE debugger in action, including a variables contents changing, stopping at a breakpoint, stepping over a function, stepping into a function and, identification of the cause of an error. Provide the hyperlink to the video below. *Be brief by not including any more content than is required for the task*

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| Upload the Panopto video to the assessment dropbox for this unit so a permanent record of your video is created for VU. Also, for easy access, enter the hyperlink to the Panopto video here and ensure that you have enabled READ access for your instructor.  Video link: [https://vu.ap.panopto.com/Panopto/Pages/Viewer.aspx?id=13e3cb8d-1198-4ae1-bdcb-aeae00336f96](https://vu.ap.panopto.com/Panopto/Pages/Viewer.aspx?id=13e3cb8d-1198-4ae1-bdcb-aeae00336f96%20) |

* Provide a list of three semantic errors you have encountered and how you rectified them.   
  *Note that syntax errors are* ***NOT*** *acceptable. The errors* ***MUST*** *be caused through incorrect logic*

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| **Error** | **Rectification** |
| *The menu was showing itself in infinity loop and does not stop rolling* | The “input” was missing within the while loop to ask for the user to select a choice. |
| *The application crashed when the user selected option 2 for read credentials and there is not file created yet.* | I used a Try except block to send a message to the user about the non-existing file and to avoid the app to crash. |
| *The credentials were stored without spaces and in the same line* | I ad “\n” to create one line per each value. |

## Task 1.6 Test

Develop a complete set of test cases to confirm the code meets the program specifications. Record the Test cases below.

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| **Description:  *(what is being tested)*** | **Expected response or output** | **OK** |
| *Create a file and input the credentials for the first time* | *The .txt file is created and the credentials are saved in with spaces and in a good order.* | *Yes* |
| *Select option [2] to open the existing and non-existing file* | If the file is not created yet, a message of “missing file” will appear and the menu is presented again. If the file exist, all the credential will be shown. | *Yes* |
| *The user selected an invalid option.* | A message will appear “wrong option, please select again” and the menu will be presented again. | *Yes* |
| *The user select the option [1] the save more credentials.* | The new credentials are added after the previews ones with a good spacing and organized. |  |
| *The user select the option [q] to exit.* | A message appears “see you next time!” and the application is terminated. |  |
| *When opening the .txt file, all the data should be encrypted* | The encryption function was added. All the credentials are stored encrypted and they are decrypted when the user select option 2 to retrieve them. |  |

## Task 1.7 Gain feedback, review and finalise

Seek feedback from your supervisor and review the code.

* Contact your instructor, acting as your supervisor, when your application is complete to confirm that your application meets the initial design specifications and program specifications. Document this discussion via bullet points or brief notes, make any required adjustments to the code and, obtain final verbal sign-off.
* Make one final GitHub commit and included the words "supervisor sign-off" as a comment in your .py file and the words "supervisor sign-off" in the summary field of GitHub Desktop. Ensure you have pushed all commits to remote Github, download your REMOTE GitHub repository in.zip format and submit as part of your assessment.

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| * The observations from the instructor: * \*Some of the comments where too obvious from the task they were pointing out. * \*Changing the name of some variables will help to avoid the need of a comment. “open\_credentials” has been changed to “display\_credentials”. * \*The script has been organize better using some spaces between lines. |

**Appendix A** – Coding Checklist

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| **Coding Checklist**  Your code must include following criteria. *The checklist is given to* ***ensure*** *all aspects of the assessment are covered. Your assessor will confirm that your code includes the criteria when marking your submission* | |
| Criteria | Tick when complete |
| At least one of each of the following:   * Global variable * Local variable |  |
| At least two library functions  *(internal or external)* |  |
| At least one self-created function |  |
| Clarifying comments |  |
| A data structure  (i.e list, dictionary, tuple or set) |  |
| Manipulation of strings |  |

**Appendix B – Provided code**

You may use the following premade code in your script

**Menu system**

# Give the user some context.

print("\nThis program…………………………")

# Set an initial value for choice other than the value for 'quit'.

choice = ''

# Start a loop that runs until the user enters the value for 'quit'.

while choice != 'q':

    # Give all the choices in a series of print statements.

    print("\n[1] Enter 1 to create an encryption key.")

    print("[2] Enter 2 to …….")

    print("[3] Enter 3 to……")

    print("[q] Enter q to quit.")

    # Ask for the user's choice.

    choice = input("\nMake your choice ")

    # Respond to the user's choice.

    if choice == '1':

        print("\nEnter a name for the encryption key\n")

    elif choice == '2':

        print("\nEnter …….\n")

    elif choice == '3':

        print("\nEnter ……\n")

    elif choice == 'q':

        print("\nExiting the menu\n")

    else:

        print("\nInvalid option, please try again.\n")

# Print a message that we are all finished.

print("Program exit.")

**ROT3 encryption**

clearText = "myPassword"

charSet="0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz`~!@#$%^&\*()\_-=+|\}]{[\"':;?/>.<, "

encText = "".join([charSet[(charSet.find(c)+3)%95] for c in clearText])

print(encText)