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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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| *Enter brief notes or dot points of the discussion*  *The URLs can be stored with or without prefix (www/http)*  *Credentials will be displayed on screen unencrypted*  *Given ROT3 encryption will be used for the program*  *There is no password required to access this program*  *There will be only 1 file for storing the credentials.* |

## 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  *This project is to delivery password manager application to Apps2U client DigiCore. There is a requirement from DigiCore for providing secure ways of storing credentials for their staff who are currently practicing insure ways to save them by writing the credentials on sticky notes and other forms which can potentially lead to loss of valuable information and details of the client.* |
| Who will use the application *This password manager application will be used by the staff of DigiCore* |
| Why is the application needed *This application is needed to remove the insecure practices in place and to store credentials by the staff of DigiCore.* |
| What is the benefit of using the application for the client  *This application will provide secure ways to save credentials for staff so that they avoid risk at company by not writing them on the sticky notes. The current practices are huge risk if the credentials are lost or taken by any unauthorised persons* |
| What are the features and functions of the application? *What is it that the application does overall, what are its individual functions, how will a user navigate the application, what are the inputs, what are the outputs, are there any special features?*  *This application will add and view credentials for the url’s accessed by the staff of DigiCore*  *The application will provide user friendly option with menu options to store and retrieve the credentials and an option to exit the program.*  *This application will take credentials like URL, Username, and password from users after choosing to store, and will encrypt the password and save it.*  *There will be a menu to navigate to the functions or options of this application like*   1. Add stored credentials (username, password and URL/resource) 2. View stored credentials 3. Exit the program   *This application will use encryption to store the credentials so that if anyone access the file directly, it will not give the password in actual text.* |
| Appearance  *How will the user interface look? How will any outputs from the program look?*  *The interface of this application will be in the menu form*  *The user will be asked to select options and taken inputs or display output* |
| When is the application due for completion (assessment due date)  *The due date of this application is 10th June 2022.* |
| *What questions do you have about the project What do you not understand about the design of the application?*   1. *Is there a need to encrypt the URL, username also or just the password?* 2. *Will there be individual credentials for each staff of DigiCore? If yes, how will the user know whose details to display? As there will only be 1 file* 3. *Is it expected to display all credentials when the option to display is selected? Or is there an expectation that only selected URL’s details are displayed?*   *Discussed with instructor*  *Yes, encryption is required. but do it when everything else is complete and working There is only one text file. The entire contents will be displayed at one time All credentials will be displayed* |
| Summary of this design specification *Describe this entire design specification concisely*  *The program is interactive with a menu option which drives the functionality of this program.*  *User enters the options* |

## 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:*  *Print program title*  *function add credentials*    *Take user details (Username, password, url)*  *append the credentials taken from user to the file*  *close the file*  *function display credentials*  *if file exists*  *open file*  *read file*  *display the credentials*  *close the file*  *if file doesnt exist*  *display error message that no file exists and to add credentials first*    *While selection not equals to quit*  *display menu options*  *option 1 to enter credentials*  *option 2 to display credentials*  *option 3 to quit the program*    *if option 1*  *call function add credentials*  *if option 2*  *call function display credentials*  *if option 3*  *exit the program*  *else*  *display error message*                *Enter brief notes or bullet points of any changes made after supervisor review:* |
| *After supervisor review I have removed “File existes condition“ from Add credentials function.* |
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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 |  |
| Return to the menu after each action has completed |  |
| Create a text file for credential storage if a text file does not already exist |  |
| Append new records to the text file without overwriting previous entries |  |
| Display the text file contents in a visually presentable way including spacing and headings |  |
| Handle any input from the user and carry out actions, without errors |  |
| Include embedded explanatory comments (#) to clarify the meaning of the code |  |
| 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  <https://vu.ap.panopto.com/Panopto/Pages/Viewer.aspx?id=4c662d9b-d115-4484-b513-aeb0001ba484>  I forgot to explain the logical error of printing header multiple time for every user details. |

* 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** |
| *e.g. Code to view the text file is not being ran* | *The menu option was capitalised but user entry was in lower case* |
| *Part of debugging I found that if the user entered option 2 for display first, then the program was failing with file not found error.* | *Added checking of file is present first before reading the file* |
| *Displaying of contents from password file was all showing in one row. This was because I was initialling using read () function* | *Changed the program using for loop to go through each list item returned by the file.* |
| *Header was printing for each user credentials. This was because my logic in the heading print was in the for loop which was repeating* | Removed the header from the for loop and put it above in the display function so that the header is displayed only once. |
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## 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** |
| *e.g Add a new record for the first time* | *Text file is created; username, password and URL are add to the text file. Password is encoded.* | *Yes* |
| *Display menu* | Menu is displayed with the required options to choose |  |
| *View credentials before entering any credentials* | Display message “No Password manager file exits, please enter credentials first” is displayed |  |
| *Add Credentials* | Terminal displays message asking user to key in credentials |  |
| *Add Credentials with empty values* | Program accepts blank inputs as there is no validation requirement |  |
| *View Credentials (after entering at least one entry to the file)* | Program displays header with “Username, Password, URL” and also the contents |  |

## 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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| *Enter notes of*   * The discussion with your supervisor confirming that your application meets the initial design specifications and program specifications. |

**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)