Government of **Western Australia**
South Metropolitan **TAFE**

Document Details			
Version Number	**Last Updated**	**Developed/Edited By**	**Validation Date**
003	30/11/2020	Stewart Godwin	**Dec 2017**

Training Package	ICT Information and Communications Technology Training Package Version 5.0 (Release 1)
Qualification Title	ICT40518 BEH5 Certificate IV in Programming
Qualification Title	ICA50718 BEG8 Diploma of Software Development
Course/Cluster Title	Programming II
Assessment Title	Project Assessment Task Two (AT2) Version B

Brief Description of Assessment Task

The Analysis, design, coding, testing and documentation of a program implementing multiple classes and file I/O as specified in the assessment tool description.

Units of competency, elements to be assessed

National Code	SIN	Competency Title	Elements of Competency
ICTICT403	AUU46	Apply software development methodologies	1. Determine and select appropriate methodology for a given activity 2. Apply the selected development methodology 3. Adjust project to suit appropriate methodology
ICTPRG418	AUV62	Apply intermediate programming skills in another language	1. Code using user defined data structures 2. Code using standard algorithms 3. Debug code 4. Document activities 5. Test code 6. Create an application

Date of Assessment	Session 8	**Completed by**	Session 10

Instructions to Students	The analysis, design, coding, testing and project documentation of a C#.NET application as described on the following page.
Resources Required	Reference books / Internet / Blackboard / Visual Studio 2017/ MS Project / Project Libre
Instructions to Lecturer/Assessor	Assess each project using the exemplars. Ensure that each student gives a demonstration of their fully functional program. Use the attached Checklist to confirm functionality of student project.

Lecturer's Details (Add your lecturers details below)

Name	
Email	
Campus	

Students to sign this document when submitting an assessment

Date Submitted:	

STUDENT DECLARATION

- I have read and understand the details of the assessment.
- I have been informed of the conditions of the assessment and the appeals process.
- I agree to participate in this assessment.
- I certify that the attached is my own work.

Student ID	Student Name	Student Signature

Assessment Feedback (Lecturer and Student Copy)

Assessment Title	Project Assessment Task Two (AT2) Version B		
Candidate name		**Attempt No**	
Assessor name			
Performance demonstrated by this assessment is	Satisfactory ❑	Not Yet Satisfactory ❑	
	Assessment outcome and feedback received on	Date	

Assessor Marking Guide and Comments:

Criteria	**s/ns**	**Comment**
Program reads data from 3 binary files and writes data into each Array		
Add Drone button functionality; checks textboxes for data checks for book data type (Price – Double) add product to Array has error message for incorrect input		
Add Customer functionality; checks textboxes for data has error message for incorrect input add unknown customer add customer to Array		
Add Transaction functionality checks textboxes for data has error message for incorrect input add transaction to 2D array		
Listbox selection populates corresponding textboxes Correct functionality for “Drones” Correct functionality for “Customers” Correct functionality for “Transactions” Correct functionality for populating Transactions, Customer and Drones		
Textbox Double Click in CustomerID and SerialNumber clears all the associated input text boxes.		
All Drone data is sorted using a simple sort algorithm after each new drone is added.		

Create a simple linear search for Customer ID. Add a context menu strip for this search method. User must enter value and right click CustomerID textbox to launch search method.		
Program reads data from each Array and writes data to 3 binary files		
All data is realistic (must represent real names, and drone data)		
All major textboxes must have tooltips		
Report must have; Introduction Analysis with diagram Project plan with Gantt chart Activity diagrams for the binary file handling Test data/table and screen captures Code Method Signatures (headers) and comments		
Training guide with diagrams and explanations.		

Candidate signature: *(once feedback has been received)*		**Date**	
Assessor signature: *(once feedback has been provided)*		**Date**	

Assessment Instructions

Case Study – Ace Drones

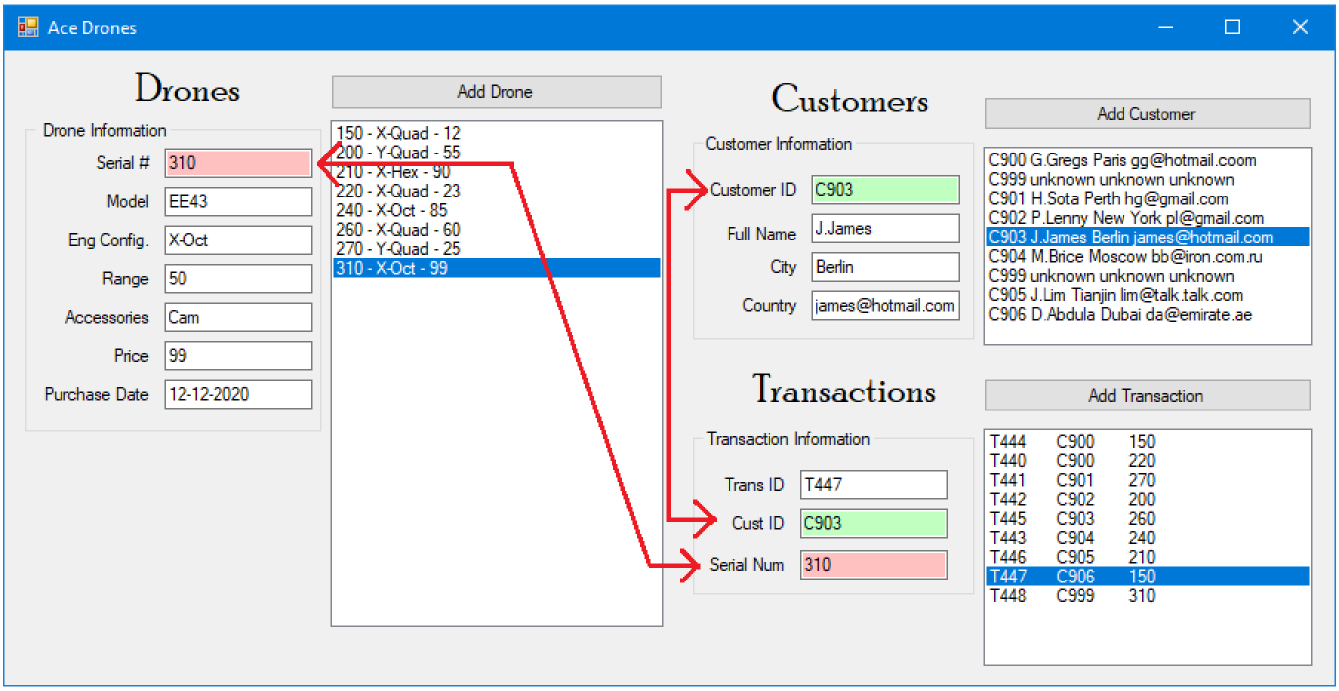
Ace Drones is a company building and selling military grade security drones around the world, they have a team of 15 sales consultants who visit various government agencies and private organisations. They require a simple application to maintain a list of the drones they have sold.

- A Drone class which has the following attributes; ***serialNumber, model***, ***engineConfiguration, range, accessories, price*** and ***purchaseDate***, these must be private, with associated assessor methods to store and retrieve information.
- A Customer class to store basic information about the customer; create a class with private attributes and associated assessor methods to store and retrieve information,
    - ***customerID***, ***name***, ***city***, ***country***.
    - If no details are provided, they can be grouped as a single unknown customer with an ID of "C999". The other fields can be filled with “unknown”.
- Transactions do not have a class; this data will be stored in a 2D array which contains the following info
    - ***transactionNumber, customerID***, ***serialNumber***.

In the role of Senior Programmer for CITE Managed Services you have completed the research and analysis of the Ace Drone Application. Your final task is to create a fully functional application to be demonstrated with real data. The final submission will include the application and a detailed report. Complete the following questions to satisfy the requires of this assessment;

Question 1. User Interface Design

The Graphical Interface is as follows



Drone Information

Serial # 310
Model EE43
Eng Config. X-Oct
Range 50
Accessories Cam
Price 99
Purchase Date 12-12-2020

```
150 - X-Quad - 12
200 - Y-Quad - 55
210 - X-Hex - 90
220 - X-Quad - 23
240 - X-Oct - 85
260 - X-Quad - 60
270 - Y-Quad - 25
310 - X-Oct - 99
```

Customer Information

Customer ID C903
Full Name J.James
City Berlin
Country james@hotmail.com

```
C900 G.Gregs Paris gg@hotmail.coom
C999 unknown unknown unknown
C901 H.Sota Perth hg@gmail.com
C902 P.Lenny New York pl@gmail.com
C903 J.James Berlin james@hotmail.com
C904 M.Brice Moscow bb@iron.com.ru
C999 unknown unknown unknown
C905 J.Lim Tianjin lim@talk.talk.com
C906 D.Abdula Dubai da@emirate.ae
```

Transaction Information

Trans ID T447
Cust ID C903
Serial Num 310

```
T444    C900    150
T440    C900    220
T441    C901    270
T442    C902    200
T445    C903    260
T443    C904    240
T446    C905    210
T447    C906    150
T448    C999    310
```

Figure 1

Question 2. Program Functionality

The program functionality must satisfy the following criteria:

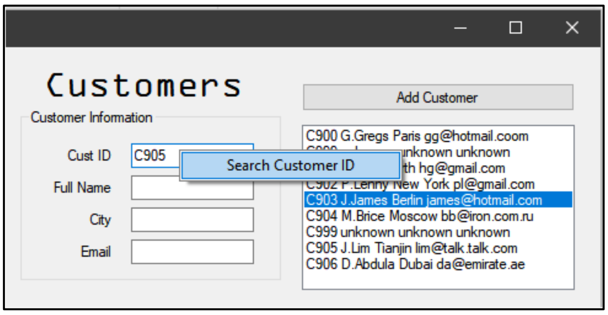
1. The program loads the drone information from a binary file called ***drones.dat*** when the program starts into an appropriate single array structure. Array size of 20.
2. The program loads the customer information from a binary file called ***customers.dat*** when the program starts into an appropriate single array structure. Array size of 20.
3. The program loads the transaction information from a binary file called ***transactions.dat*** when the program starts into an appropriate 2D array structure.
4. When the Drone ADD button is clicked,
   a The information in the textboxes is checked to verify the data type,
   b If information is in too many or too few input boxes then an error message is generated,
   c If the information is correct then a Drone object is created and the object is added to the array structure and the ***serialNumber, engineConfiguration*** and ***price*** are displayed in the listbox. Add hyphens between data items.
   d The array is sorted by ***serialNumber*** in ascending order. Use a simple Bubble sort algorithm, when a record is swapped ensure the index/object is passed by reference to a separate swap method.
   e Once the new drone has been added to the array and displayed in the listbox the input text boxes are cleared.
5. When the Customer ADD button is clicked,
   a The information in the textboxes is checked to verify it is present,
   b If information is not present then a dialog popup is generated with a request to generate a default customer using a yes/no option,
   c If the user selects YES then a default customer is added (refer Case Study info and Figure 1.)
   d If the user selects NO then no further action is taken,
   e When all the correct information is present a Customer object is created and the object is added to the array structure and all the data is displayed in the listbox.
   f Once the new customer has been added to the array and displayed in the listbox the input text boxes are cleared.
6. When a record in either of the two upper listboxes (Drone or Customer) is clicked, the information relating to that record is to be added to the correct Drone and Customer textboxes. The appropriate information is also added to the textboxes under Transaction, (refer: red arrows in Figure 1).
7. Before the Transaction ADD button is clicked the user must first select a customer and drone. This action will populate the ***customerID*** and ***serialNumber*** textboxes in the transactions groupbox (ensure these textboxes are read only).
   a The information in the input textboxes is checked to verify all data is present, otherwise generate an error message,
   b If all data is present a Transaction object is created and the object is added to the 2D array structure and the information is added to the listbox. Use a tab delimiter between the data items in the listbox.

- c When a record in the transaction listbox is clicked the transaction information is filled into the remaining transaction input text boxes, and the appropriate Book and Customer records are selected in the upper listboxes. This should autofill the upper textboxes.

8. If the user double clicks the ***serialNumber*** input textbox it will clear the all the input textboxes associated with the Book and allow a new book to be entered.

9. If the user double clicks the ***customerID*** input textbox it will clear the all the input textboxes associated with the Customer and allow a new customer to be entered.

10. To search for a customer the user will enter text into the ***customerID*** input textbox. The user then right clicks the ***customerID*** input textbox and a context menu will appear with a search button. If the record is found the other fields will be populated. If the record is not found generate an error message box. The search algorithm must use the simple built-in binary search.



Customers

Customer Information

Cust ID: C905

Full Name:

City:

Email:

Search Customer ID

Add Customer

C900 G.Gregs Paris gg@hotmail.coom
unknown unknown
th hg@gmail.com
P.Lenny New York pl@gmail.com
C903 J.James Berlin james@hotmail.com
C904 M.Brice Moscow bb@iron.com.ru
C999 unknown unknown unknown
C905 J.Lim Tianjin lim@talk.talk.com
C906 D.Abdula Dubai da@emirate.ae

Figure 2

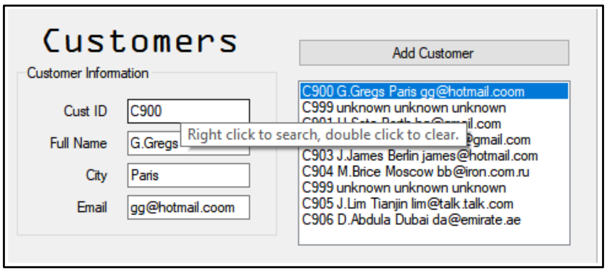
11. If the user double clicks the ***transactionID*** input textbox it will clear the all the input textboxes associated with the Transaction and allow a new transaction to be entered.

12. All data should be written back to the three binary files when the form closes.

13. Add code comments to all Methods and Classes. Ensure all key aspects of your code are fully documented (do not use complex or technical terms)

14. Add realistic data to test the application
    - 8 customers (max of 3 unknown),
    - 15 drones,
    - 10 transactions

15. Each of the major controls should have a tool tip text attached, refer Figure 3.



Customers

Customer Information

Cust ID: C900

Full Name: G.Gregs

City: Paris

Email: gg@hotmail.coom

Right click to search, double click to clear.

Add Customer

C900 G.Gregs Paris gg@hotmail.coom
C999 unknown unknown unknown
il.com
gmail.com
C903 J.James Berlin james@hotmail.com
C904 M.Brice Moscow bb@iron.com.ru
C999 unknown unknown unknown
C905 J.Lim Tianjin lim@talk.talk.com
C906 D.Abdula Dubai da@emirate.ae

Figure 3

Question 3. Report

Create a Formal report with the following sections. Saved as Docx format (or similar). Ensure your report has a title and content page; the footer will require page numbers and student details (name and ID). Your report will require the following headings;

- Introduction
  - A detailed explanation of what the program is required to do,
  - What development methodology did you use for this project, explain why you believe that it is the best in this situation (include a diagram)
- Analysis

  A statement and explanation for each of the following;
  - What data needs to be inputted into the program,
  - What processes need to be performed while the program is running,
  - What output is generated when the program closes?
- Project Plan

  A statement and explanation of the following;
  - List the tasks that needed to be performed to create this project
  - List the job title for each task, when and in what order (UI designer, programmer, etc)
  - List the physical resources required to complete the project (PC, software, etc)
  - Draw a Gantt chart to show the above information (Project file)

  NOTE: this must be accomplished using MS Project (or similar Project Libre)
- Algorithm Design
  - A UML diagram or Pseudo Code for the following major code methods,
    - Drone ADD button
    - Drone Load binary file
    - Drone Save binary file
    - Sort algorithm
- Test Data and Evidence
  - Describe the test data and activities that will be used to test the design and program functionality. Include a test table of the data to be used and the expected outcome. Ensure all the code is tested.
  - Run a series of tests using the test data previously stated. Record your tests and collect screenshots of the program functionality.
- Internal Documentation (Code Comments)
  - List all code comments for all methods and global variables (Method Signature and comment)
- Recommendations and Improvements
  - Describe all concerns and improvements that can be added to you program.
  - Explain the limitations, error trapping, data filters and usability/portability of your application.

Ensure that you include all references to all resources you used to complete your responses.

Question 4. Demonstration and Observation

Before you can submit your final project and associated files you will need to demonstrate the fully functional program.

The following observation checklist will be used to verify your program

Observation Checklist			
Criteria		Yes	No
#1, 2, 3	Loads "drones.dat", "customers.dat" and "transactions.dat" from binary file	□	□
#4	Correct functionality for Add Button in "Drones"	□	□
#5	Correct functionality for Add Button in "Customers"	□	□
#7	Correct functionality for Add Button in "Transactions"	□	□
#6, 11	Correct functionality for populating Transactions	□	□
#7.c	Correct functionality for drones listbox	□	□
#6	Correct functionality for customer listbox	□	□
#6	Correct functionality for transaction listbox	□	□
#8, 9	Double click method to clear textboxes	□	□
#10	Context menu for Search	□	□
#12	Save method to write data to binary files	□	□
#15	Tool tips on all controls	□	□
#13	Fully commented methods and classes	□	□
#14	Demonstration of working program	□	□
	Final outcome:		

Submission Requirements

Following is a checklist to help you check whether you have completed all requirements. Submit each as a separate file

Files	Checklist
Zipped solution folder	□
Report	□

End of Assessment Task Two (AT2)