Government of Western Australia
North Metropolitan TAFE

Assessment Tool

Qualification national code and title	ICT40120 Certificate IV in Information Technology (Programming)
Cluster	Introductory Programming (C#)
Unit/s national code/s and title/s	ICTPRG433 Test Software ICTPRG440 Apply introductory programming skills in different languages

Assessment type (☑):

☐ Questioning (Oral/Written)
☒ Practical Demonstration
☐ 3rd Party Report
☒ Other – Project/App

Assessment Resources:

Visual Studio Community Edition 2022
Microsoft Word / Office 365

Assessment Instructions:

This assessment requires you to write a program that meets the requirements specifications, comment, debug and test the program. You will be demonstrating use of basic coding syntax, data structures and algorithms. You are being assessed on elements 1-3 of ICTPRG440 and elements 1-4 of ICTPRG433.

Due Date:
Assessment 2 Part A (Documented program): **Due end of week 15**
Assessment 2 Part B (Testing Plan): **Due end of week 16**
Assessment 2 Part C (Testing Implementation and Report): **Due end of week 18**

If your first submission does not achieve a satisfactory result, you will have the opportunity to resubmit the assessment again for re-marking, if you meet the due dates.
Students who can demonstrate all the required skills through prior experience may apply for skills recognition through the RPL (Recognition of Prior Learning) process as an alternative to doing this assessment.

1. Complete all the assessment tasks below.
2. Observation by your lecturer of you doing the assessment is considered part of the assessment process. (This is to be completed in time allocated in LAP)
3. Submit your documentation into the Blackboard assessments area.
4. All skills must be demonstrated to achieve a satisfactory result.
5. All work submitted must be your own individual effort.

Assessment Conditions
During the units you will have classes allocated to complete assessments. During this time, the assessment conditions will emulate the industry working environment. You should expect interruptions, differing noise levels and time variances as a result. In class time also forms aspects of observational evaluation for the purposes of assessment.

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Assessment Instrument:

Assessment 2: C# Program with unit tests

Read the attached appendix document and ensure that you create the described program. The application must

Please complete the following tasks.

Part A: Documented Program

1. Write a C# WPF program that meets the requirements. The program must include the following features:
    a. The program must have a graphical user interface (GUI) frontend that displays the program for the user to manipulate the data such as add remove and search.
    b. The program must use a data structure to hold a custom class in your program.
    c. The program must include validation of user input.
2. The program should adhere to the C# coding standards document provided.
3. Comment your program to explain the purpose of your code. Use single-line, multi-line and XML documentation comments.

Part B: Testing Plan

1. Discuss and confirm testing requirements using class assessment time.
2. Prepare a test plan document to summarise the testing approach. It should include:
    a. An overview describing the testing approach, testing types, unit test framework / tools, testing roles in the SDLC, standards and benefits of testing.
3. Design tests for interactively testing the software:
    a. Document which tests are needed to interactively test the UI and verify that it meets the functional requirements
    b. Demonstrate three test case design techniques.
    c. Determine what test data to use for each test.
4. Submit test plan to stakeholders for review.

Part C: Test Implementation & Report

1. Perform manual tests of UI:
    a. Complete test plan table for UI tests.
    b. Record all results.
    c. Update code where necessary to resolve any issues.
2. Use a unit test framework to write automated test cases to test your program algorithms.
    a. Write scripts to test the algorithms from your Part A Program.
    b. Execute the automated tests.
    c. Capture the test results.

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d. Analyse and repair any code defects. Then rerun the tests until the correct output results are achieved.

3. Based off the test plan and its results, maintain and update the code base where possible.
4. Compile results into a short Test Progress report that includes:
    a. All interactive UI test results and outcomes.
    b. Unit Test results
    c. Compiled pass/fail Use the debugger to debug and resolve any errors in your program.
    d. You must provide screenshot evidence showing debug session variables when the debugger has paused at a breakpoint.
    e. Updates completed and to complete/unresolved.
    f. Submit Test Progress Report for review and discuss with stakeholders.

Deliverables

- **Part A** - A functional, documented program,
- **Part B** - Testing plan document outlining tests to be conducted.
- **Part C** - Test progress report outlining passes, fails and changes made or left to make in code. Full Visual Studio solution with unit testing project included.

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Appendix 1

Brief

A local recruitment agency has contacted our company to develop an application for their head office to manage and keep track of their contractors. Contractors get added to the system's employment pool and can then be assigned to a job. The job is then completed when the contractor lets head office know, and the contractors return to the available employment pool.

Business Requirements

The system should be able to meet the following requirements as determined by the client and stakeholders:

1. Add Contractor.
2. Remove Contractor.
3. Create Job
4. Assign a contractor to a job
5. Complete a job (returning the contractor to the available pool).

To complete some of the above requirements it would be necessary to be able to view and manage the following:

6. View/filter available contractors to add to a job.
7. View/filter jobs that do not have a contractor assigned.

As part of the monthly reporting, managers would like to be able to output the following reports:

8. Search for a job by cost within a given range.

From discussion with the client the following Class Diagram has been created to show the objects and their data within the application *(This is a draft overview only; variation may be necessary and is acceptable to complete the application)*:

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