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| **Qualification details** | | | | | | | | | |
| **Training Package Code and Title:** | | ICT - Information and Communications Technology (Version 8.1) | | | | | | | |
| **Qualification National Code and Title:** | | ICT40120 Certificate IV in Information Technology (Release 4) | | | | **State code:** | | | BFF9 |
| **Assessment Title** | | Assessment Task One (Individual Portfolio) | | | | | | | |
| **Unit National Code & Title** | | ICTPRG440 Apply introductory programming skills in different languages | | | | | | | |
| ICTPRG437 Build a user interface | | | | | | | |
| ICTICT449 Use version control systems in development environments | | | | | | | |
| **Date Due** | | Week Six | | **Date Received** | | | |  | |
| **Student Name** | |  | | **Student ID** | | | |  | |
| **Student Declaration** | | I declare that the evidence submitted is my own work:  ………………………………………….. | | | | | | | |
| **Assessor Name** | |  | | | | | | | |
| **Assessment Decision** | | Satisfactory | | Not Yet Satisfactory | | | | | |
| **Assessor Signature** | |  | | **Date** | | | |  | |
| **Is student eligible for reassessment (Re-sit)?** | | No | Yes | **Reassessment Date:** | | | | Week Twenty | |
| **Feedback to student** | | | | | | | | | |
| *Via Blackboard (LMS) – Please check [Grade] section.* | | | | | | | | | |
| **Feedback from student** | | | | | | | | | |
| *Via Blackboard (LMS) – Please use [Comment] section during submission.* | | | | | | | | | |
| **Signature** |  | | | | **Date** | |  | | |

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| **Assessment Instructions** | |
| **TO THE ASSESSOR** | |
| Type of Assessment | Individual Portfolio |
| Duration of Assessment | 6 Class Sessions (Week 1 - 6) |
| Location of Assessment | Classroom |
| Conditions | Assessor to ensure that the noise levels, natural interactions and time variances are maintained as it would be in the Software Development industry.  Learners are required to complete the required tasks in class and submit the required documentation electronically via Blackboard |
| Elements and Criteria | As detailed in the assessment plan  You are required to make sure that all students meet the elements, performance criteria and oral communication items as outlined in the provided solution. |
| **TO THE STUDENT** | |
| Purpose of Assessment | You are required to show you can:  ICTPRG440 Apply introductory programming skills in different languages   * Demonstrate your skills and knowledge by creating three console programs that solve simple problems * Research and collect information about the three major programming constructs and then code and debug a solution for each of the three problems. * Research and collect information to answer six (6) written questions related to definitions and principles of coding and programming languages   ICTPRG437 Build a user interface   * Demonstrate your knowledge by researching prototyping tools and application development languages. * Investigating organizational guideline, policies and procedures.   ICTICT449 Use version control systems in development environments   * Install and configure a version control system * Create and upload code to version control system   The student must demonstrate the ability to complete the tasks outlined in this assessment and is expected to use systematic analytical processes and effect time management to meet the goals/deadlines outlined in the DAP.  You are required to meet the elements, performance criteria and oral communication items as outlined in the provided checklist. |
| Allowable Materials | Blackboard (Topic One) will include the following: Weekly Readings, Class notes, and Weekly Activities. |
| Required Resources | Computer with:   * Web links and example code can be downloaded from the Blackboard portal * MS Visual Studio, * MSOffice * Internet Access to MSDN and www.citems.com.au/ |
| Reasonable Adjustment | In some circumstances, adjustments to assessments may be made for you. If you require support for literacy and numeracy issues; support for hearing, sight or mobility issues; change to assessment times/venues; use of special or adaptive technology; considerations relating to age, gender and cultural beliefs; format of assessment materials; or presence of a scribe you need to inform your lecturer. |
| Assessment Submission | All questions and activities must be attempted. All written answers must be submitted in this assessment document in the appropriate space.  Use of research tools and peers in formulating answers are acceptable – but work submitted must be your own work.  Final portfolio documentation is to be uploaded to the appropriate area in the Blackboard course created for this unit.  If you are marked as NYS (Not Yet Satisfactory) on your first attempt, you will be provided with another opportunity to re-attempt the assessment. |
| Project contents | This portfolio consists of the following tasks:   * Question 1 – Program using IF/ELSE statement, * Question 2 – Program using SWITCH/CASE statement, * Question 3 – Program using DO/WHILE loop, * Question 4 – Program using Debug, Edit and Comment, * Questions 5–12 Knowledge Based Written Answer Questions. |

## Scenario

You have accepted the role of a Junior Programmer for CITE Managed Services, your first job is to demonstrate your skills and knowledge by creating several console programs that solve simple problems. You will need to research and collect information about the three major programming constructs and then code and debug a solution for each problem.

In addition to the programming problems there are a series of written questions; provide suitable answers for these questions. Ensure your answers have enough detail which is appropriate for a general audience and avoids complex acronyms and highly technical terms.

You should consult with the CITE representative (Your Lecturer) if you are unsure about any of the problems or questions. Your primary research should focus on the resources on the Blackboard website, additional information can be collected from the Internet, ensure all sources are fully referenced. You must write your answers in the space provided in this document or use a standard template provided by your lecturer.

## Submission Requirements

You must demonstrate your working program to the lecturer before submission to ensure your code is compliant. You must submit all programs and the written questions to the appropriate Blackboard section. Consult your lecturer for further information.

## Question 1

At the local Hydroelectric Dam an electronic sensor monitors the rate at which water flows into a turbine to generate electricity. If the water flow is too low or too high the sensor sends a message to the management console which alerts the technician. The technician will adjust the intake gate to ensure the flow is within the safe limits to generate electricity. Create a Console Application to simulate this system using a selection statement based on the following pseudo code. Your program will read a single integer value which represents the water flow rate in cubic meters per second (m3/s) and display a message which indicates the state of the system. Your Solution MUST reflect the selection programming construct outlined in the following pseudo code.

Add suitable comments to all your code which identifies the various constructs and syntax rules. Add a header comment at the top of the code as shown below, with your Name, ID, Date and a program description.

**// Your name, ID.**

**// Date,**

**// Name of the program**

**// Question 1. Brief explanation of the program and its function**

**// (what does it do?)**

This comment block must be present in all programming code for all assessment tasks.

### Pseudo Code

Declare flowrate

Read flowrate sensor from keyboard

If (flowrate < 75)

Display “Warning Flow Rate Low”

ELSE IF (flowrate > 120)

Display “Warning Flow Rate High”

ELSE

Display “Flow Rate OK”

|  |
| --- |
| Copy your question one Program.CS code here: |

## Question 2

Write a Console Application that reads the UV Index (reads an integer input from the console) and then displays the UV Index Category as a message with background and text colours which is calculated from a SWITCH/CASE statement (When a specific colour is not available use a similar substitute). Add suitable comments to your code which identifies the various constructs and syntax rules. Use the following pseudo code and colour chart as a guide to your solution.

### Pseudo Code

Integer UVindex

Read UVindex from keyboard

Switch(UVindex)

Case : 1

Display (Green : Low)

Case : 2

Display (Green : Low)

Case : 3

Display (Yellow : Moderate)

.

.

Case : 11

Display (Purple : Extreme)

Default :

Display (error)

End of Switch

// HINT: this code can be simplified by using “fall through”

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| Copy your question two Program.CS code here: |

## Scenario Update

In addition to the previous programming problems CITE Managed Services require the internal knowledge base FAQ to be reviewed. Therefore, they require written and coding answers to the following questions which will be used to update the internal resources. Provide suitable answers for the following questions, ensure your answers have enough detail which is appropriate for a general audience and avoids complex acronyms and highly technical terms. Use the following templates for your answers.

## Question 3

Write a Console Application that will display a menu with seven options. When a user selects one of the first six options, the appropriate content/definition will be displayed. The last option will quit the program. All the options are listed below;

1. Syntax Definition, (*Provide a definition for the Syntax of a programming language*)
2. Syntax Rules, (*What are the Syntax rules of a programming language?*)
3. Small Scale App Dev, (*Provide a definition of a small-scale application development?*)
4. Document Design Definition, (*Provide a definition for Document Design Principles*)
5. Coding Techniques Definition (*Provide a definition of Coding Techniques*)
6. Coding Standards Definition (*Provide a definition of Coding Standards*)
7. Quit Program.

Use the following pseudo code for the menu structure and then research each option for the correct switch/case content. Add additional formatting to enhance the readability using colour and writelines.

### Pseudo Code

Integer Option = 0

Do

Display Menu Options

Enter Option

Switch(Option)

Case 1: Display Syntax Definition,

Case 2: Display Syntax Rules.

Case 3: Display Small Scale App Dev Definition,

Case 4: Display Document Design Definition,

Case 5: Display Coding Techniques Definition,

Case 6: Display Coding Standards Definition

Case 7: Quit

Default: Display error

While (option not equal to 7)

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| Copy your question three Program.CS code here |

## Question 4

In this programming question CITE Managed Services would you to debug, correct and modify the following code. This program will calculate twin primes and perfect numbers.

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| --- | --- |
| A Twin Prime is two prime numbers which are two digits apart. For instance, 3 and 5 are twin primes.  This program will calculate the Twin Primes numbers from 3 to 200. |  |
| A perfect number is a positive integer that is equal to the sum of its positive divisors, excluding the number itself.  For instance, 6 has divisors 1, 2 and 3 (excluding itself), and 1 + 2 + 3 = 6, so 6 is a perfect number. | C:\Users\6000707\AppData\Local\Microsoft\Windows\INetCache\Content.Word\perfect-number-jpg.jpg |

### You need to complete the following tasks:

1. Create a new Console Application and use the supplied code (copy the code shown below),
2. Format the code according to CITE and VS coding standards,
3. Debug and correct all programming errors; ensure the output is correct,
4. Modify the program so the user can input any reasonable integer,
5. Add suitable user prompts before each method call,
6. Add suitable comments at the top as shown in Questions One,
7. Add XML comments for each static method,
8. Add a #Region Directive around the two calculation methods,

static void Main(string[] args){Console.Write("Input Max: ");

int max1 = Convert.ToInt32(Console.ReadLine()); PerfectNumber(max1);

Console.Write("Input Max: ");int max2 =

Convert.ToInt32(Console.ReadLine());

TwinPrimes(max1);Console.WriteLine("\n\nEnd of Program");

Console.readline();}

static void PerfectNumber(int uppperLimit){int divisor, sum;

for (int counter = 0; counter < uppperLimit; counter++){

sum = 0;for (divisor = 1; divisor < counter; divisor++){

if (counter % divisor == 0)sum = sum + divisor;}

if (sum == counter)Console.WriteLine("perfect number is {0}", counter);}}

static void TwinPrimes(int upperLimit){int secondPrime;

int count1 = 0, count2 = 0;for (int i = 3; i < upperLimit; i++){

for (int j = 2; j < i; j++){

if (i % j == 0){count1++;break;}}SecondPrime = i + 2;

for (int k = 2; k < i; k++){if (secondPrime % k == 0){count2++;break;

}}if (count1 == 0 && count2 == 0){Console.WriteLine("twin primes are {0}, {1}", i, i + 2);}count1 = 0; count2 = 0;}}

## Question 5

List the top open-source development tools, two of these tools must be for User Interface prototyping development. Ensure the list includes the application development language and a description of the basic features of each tool.

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## Scenario Update

In addition to the previous questions CITE Managed Services require a review of their policies and procedures for an internal review. Therefore, they require answers to the following questions which will be used in the audit. Provide suitable answers for the following questions, ensure your answers reference the appropriate CITE MS document section or appropriate resource location; include page number and document location. To find the relevant information visit the CITE Managed Services web site at www.citems.com.au/services/application-development/

## Question 6

What are the CITEMS coding policies and coding standards, and which are relevant to application development?

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| --- |
| Answer: |

## Question 7

What are the CITEMS organisational policies, procedures and standards for documenting programming activities?

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| --- |
| Answer: |

## Question 8

Provide a good definition of a “small-size” application development process?

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| Answer: |

## Question 9

What are differences between “distributed” and “centralised” version control systems?

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| Answer: |

## Question 10

List and provide details for three web-based DevOps lifecycle tools?

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| --- |
| Answer: |

## Question 11

What are DevOps automation tools?

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| Answer: |

## Question 12

What are the CITEMS organisational guidelines relating to user interface development?

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| Answer: |

End of Assessment Task One