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| **Student Name** | Max Crossley | | **Student Number** | | 471075482 |
| **Unit Code/s & Name/s** | Semester 1 - ICTICT418, ICTICT509, ICTDBS502, ICTICT517, ICTPRG418, ICTPRG527, ICTPRG503  Semester 2 - ICTPRG520, ICTPRG502, ICTPRG529, ICTPRG523, ICTGAM528, ICTPRG604, ICTPRG504, ICTPRG532, ICTWEB503 | | | | |
| **Assessment Type** | Case Study  Assignment  Project  Other *(specify)* | | | | |
| **Assessment Name** | Research and Written Submission | **Assessment Task No.** | | | 1 |
| **Assessment Due Date** | Weekly – weeks: 2 to 10  **Semester 1:**  ICTICT418 – Week 2  ICTICT509 – Week 3  ICTDBS502 – Week 4  ICTICT517 – Week 5  ICTPRG418 – Week 6  ICTPRG527 – Week 7  ICTPRG503 – Week 8  **Semester 2:**  ICTPRG520 – Week 2  ICTPRG502 – Week 3  ICTPRG529 – Week 4  ICTPRG523 – Week 5  ICTGAM528 – Week 6  ICTPRG604 – Week 7  ICTPRG504 – Week 8  ICTPRG532 – Week 9  ICTWEB503 – Week 10 | **Date submitted** | | |  |
| **Assessor Name** | Mark O’Reilly | | | | |
| **Student Declaration:** I declare that this assessment is my own work. Any ideas and comments made by other people have been acknowledged as references. I understand that if this statement is found to be false, it will be regarded as misconduct and will be subject to disciplinary action as outlined in the TAFE Queensland Student Rules. I understand that by emailing or submitting this assessment electronically, I agree to this Declaration in lieu of a written signature. | | | | | |
| **Student Signature** |  | | | **Date** |  |
| **PRIVACY DISCLAIMER:** TAFE Queensland is collecting your personal information for assessment purposes. The information will only be accessed by authorised employees of TAFE Queensland. Some of this information may be given to the Australian Skills Quality Authority (ASQA) or its successor and/or TAFE Queensland for audit and/or reporting purposes. Your information will not be given to any other person or agency unless you have given us written permission or we are required by law. | | | | | |

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| **Instructions to Student** | **Learning Support**  Additional support is available to help you achieve your learning goals. Speak to your teacher or a Learning Skills Centre team member if you feel that you may benefit from some extra support. The Institute provides extra support through the Disability Support Unit and the Learning Skills Centre.  RPL (Recognition of Prior Learning) is available for this unit. Speak to your teacher/assessor to check if you qualify for RPL.  **Conditions of Assessment**  You will need to complete the learning and undertake all assessments satisfactorily to be deemed competent. You are responsible for complying with all assessment item instructions; submission and collection requirements; undertaking assessment tasks honestly and retaining a copy of all assessment items.  You must submit assessment items by the **due date**, unless an extension has been granted by your teacher. Failure to submit assessment items by the due date will result in a “did not submit” being recorded and depending on your circumstances, you may be granted one final resubmission.  To be judged competent in this assessment item the student is required to demonstrate competence in all indicators shown in the marking guide.  **The Classroom as a Simulated Work Environment**  Students must be aware and take responsibility for the problems of working in a shared IT environment. Problems such as noise levels, production flow, interruptions and time variances are common to workplaces. In the simulated environment provided in the classroom these problems can take the form of:   * Other students who continually ask questions or talk aloud while thinking * Fire drills, projector not working, printers running out of paper or toner cartridge * Miscalculating how much work you can do in one day, missing classes and so on.   Some things are unavoidable and you must devise strategies to overcome them, for example, we cannot stop students from asking questions or entering at exiting the class. Other things are unpredictable (e.g. fire drills). You need to be aware and plan and organise your work allowing some extra time for unavoidable and unpredicted events.  **Assessment Criteria:**  To achieve a satisfactory result, your assessor will be looking for your ability to demonstrate key skills/tasks/knowledge to an acceptable industry standard.  Refer to the marking criteria document for a detailed list of items.  **General Instructions:**   * This is a homework-based assessment * In this assessment you will be assessed on the quality of your consideration of each item. Its emphasis is in the demonstration of your knowledge in each specific area. * Each answer is to be no longer than approximately one page. As a guide between 1 and 3 paragraphs are adequate to explain your answers. Diagrams, dot point answers are acceptable where appropriate. * Please submit this assessment document when finished. |
|  | **Number of Attempts:**   * You will receive up to two (2) attempts at this assessment task. * Should your 1st attempt be unsatisfactory (U), your teacher will provide feedback and discuss the relevant sections / questions with you and will arrange a due date for the submission of your 2nd attempt. * If your 2nd submission is unsatisfactory (U), or you fail to submit a 2nd attempt, you will receive an overall unsatisfactory result for this assessment task. * Only one re-assessment attempt may be granted for each assessment task, with the exception of Apprentices or Trainees who are permitted an additional supplementary assessment. * **For more information, refer to the Student Rules.** |
| **Submission details** (if relevant) | Submit your assessment to the allocated dropbox in **Connect** or to the allocated network folder.  Your teacher will provide all the details for the submission system or network.  Your assignment must be saved with your surname\_student number\_unit/cluster\_AssessmentNumber. For example:  **surname\_1234567890\_KE\_1**  For re-submissions, an “R” must be added to the file name. For example:  **surname\_1234567890\_KE\_1\_R**  The Marking Criteria Sheet must be signed and submitted with your work. |
| **Instructions to Assessor** | To be judged competent in this assessment item the student is required to demonstrate an understanding in all items listed. |
| **Note to Student** | An overview of all Assessment Tasks relevant to this unit is located in the Unit Study Guide. |

**Knowledge Evidence Questions**

**Semester 1**

**ICTICT418 - Contribute to copyright, ethics and privacy in an information technology environment**

1. Discuss codes of ethics pertinent to the computing industry
2. Discuss federal and state or territory legislation and policy relevant to an ICT environment and relating to:
   * access and equity
   * copyright and intellectual property
   * workplace health and safety (WHS)
   * privacy
3. What are organisational communication processes and procedures
4. Discuss organisational requirements for customer service
5. Discuss the security features of server operating systems
6. Outline two sample system security procedures.

**ICTICT509 - Gather data to identify business requirements**

1. What is a client business domain? How might it be relevant to understanding the needs of the client project?
2. In relation to a web-based software project, outline current industry accepted hardware and software products applicable to users, the web-hosting, and to developers.
3. What are programming standards?
4. List stakeholders and outline their respective roles in a web-based software project.
5. Outline 2 approaches or procedures applicable to gathering requirements for a web-based software project.
6. Describe what communication protocols and/or functionality might be required for a web-based software project.

**ICTDBS502 - Design a database**

1. Outline a series of steps that might be taken in analysing a client’s requirements so as to establish:
   1. A conceptual data model,
   2. A complete entity relationship diagram, and…
   3. Required queries and reports.
2. What are the primary components of a conceptual data model?
3. Explain how data redundancy is identified.
4. What are the primary components of a database management system (DBMS)?
5. Explain encryption and authentication as these apply to database security features.
6. What are (describe / give examples of): data types and data structures.
7. Describe the functions and features of databases.
8. What is a logical data model? Why is it important to database queries, screens and reports?
9. What is an object model. How might it be important to database queries, screens and reports?
10. Explain the term ‘scalability’ as it applies to databases.

**ICTICT517 - Match ICT needs with the strategic direction of the organisation**

1. What are the key sections that would be included within an action plan for a software development project?
2. Organisations generally have a strategic plan outlining goals and objectives for business growth and development. How might you anticipate and plan for technical solutions to assist the organisation with its strategic growth?
3. How would you look to assess alternate options that an organisation might purchase or develop to support their technical requirements?
4. List and describe 5 current technologies that have appeared on the market over the last few years.

**ICTPRG418 - Apply intermediate programming skills in another language**

1. What are dynamic variables
2. Describe in detail how small and medium-size application development projects might differ?
3. For a small single text file application, how might file handling and arrays be handled? *(Provide extended detail, examples, diagrams, code and/or pseudo code to demonstrate your understanding)*.
4. Provide a description or example of a user-defined data structure.
5. Describe a limited range of development methodologies and their application.
6. Outline the principles associated with developing a programming language *(such as Java, C#.Net, Python, etc.)*.

**ICTPRG527 - Apply intermediate object-oriented language skills**

1. Explain data structures. ICTDBS502, Q6
2. Explain small-size and medium-size application development. - ICTPRG418, Q2
3. Describe the following object-oriented programming concepts:
   1. Classes and Objects
   2. Inheritance,
   3. Polymorphism
   4. Method Overloading
   5. Association
   6. Multiple Inheritance
4. Define object-oriented programming language
5. In relation to a program with a graphical user interface (GUI):
   1. Outline the steps you would take in setting up such a program.
   2. Describe what programming you would have to put in place to allow the user to interact with the program.
6. Describe internal and external programming / technical documentation.

**ICTPRG503 - Debug and monitor applications**

1. Provide examples of common logging frameworks. logging and tracing tools, and profiling tools.
2. Explain the functions of profiling tools, and logging and tracing tools.
3. Give examples and briefly describe 2 open-source development tools.
4. Explain the basic principles of:

* computer hardware, networking and components - ICTICT509, Q2
* database-management systems. - ICTDBS502, Q4
* object-oriented programming. - ICTPRG527, Q3
* open-source development tools - ICTPRG523, Q3

1. Describe procedures for developing small-size applications. - ICTPRG418, Q2
2. Outline the software development life cycle (SDLC). – ICTPRG418, Q5

**Knowledge Evidence Questions**

**Semester 2**

**ICTPRG520 - Validate an application design against specifications**

1. Explain the database design and implementation – Database design is an important part of any project regarding data. Sorting your data into appropriate data types and normalising the

LETS GO

Figure out data

Normalise

Data sheet

1. Draw samples of three (3) UML diagrams and explain how each would assist in a software development project.
2. Outline current software development methodologies – ICTPRG418, Q5
3. Describe, in detail, the system development life cycle (SDLC) – ICTPRG418, Q5
4. Explain object-oriented programming - ICTPRG527, Q3
5. Describe open-source development tools - ICTPRG503, Q3
6. Describe three (3) software-testing techniques.

**ICTPRG502 - Manage a project using software management tools**

1. List and describe 5 Knowledge Areas of Project Management, **or** explain the basic principles of project management.
2. Describe the key features of the software development life cycle (SDLC) – ICTPRG418, Q5
3. Outline two (2) reasons why software specifications are important.
4. Identify the methods and importance of version control.

**ICTPRG529 - Apply testing techniques for software development**

1. Describe the characteristics of the programming language. - ICTPRG418, Q6
2. How does an IPO chart assist in the analysis and design of a software project?
3. Outline software development life cycle (SDLC) methodologies. – ICTPRG418, Q5
4. Define system layers such as:
   1. the data network
   2. hardware
   3. operating system
   4. database management systems
   5. web servers
   6. application servers, and…
   7. client deployment *(deploying software to the hardware that is to be used by a client).*
5. Explain the processes and techniques related to small-size application development. - ICTPRG418, Q2

**ICTPRG523 - Apply advanced programming skills in another language**

1. Identify and describe three (3) programming languages. Indicate which of these provide for the development of GUI interfaces.
2. Identify and describe languages for a GUI environment. – Q1 above.
3. Describe in detail how medium-size and large-scale application development projects might differ?
4. Describe the complex data structures: Linked Lists and Binary Trees.
5. How would you link or connect a third-party supplied library within your software project?

**ICTGAM528 - Create games for mobile devices**

1. List and describe two (2) currently successful mobile game devices.
2. Summarise three (3) current tools, technologies and programming languages needed for creating applications on mobile devices products.
3. Summarise the technical constraints that mobile devices place on design and development of games.
4. Outline suitable programming languages for mobile devices. – Q2, above
5. Describe how you might estimate the cost of a mobile game development project.
6. Explain the importance of assessing risks within a mobile software development project.
7. List and describe the roles of five (5) different team members that may be required in the process of creating a game for a mobile device.
8. Outline two techniques for concept visualisation and development.

**ICTPRG604 - Create cloud computing services**

1. Which of the following are the most appropriate development tools for creating web services that can be deployed on the cloud and describe each tool?

* UML Modelling Tools
* WSDL Generators
* Microsoft Visio
* Netbeans

1. Suggest two other such development tools and indicate how they are applicable.
2. Draw a diagram clearly illustrating how a client connects to a cloud-based application, which in turn connects to a web service. Clearly note and describe the hardware and software (infrastructure) required for each section or aspect of this.
3. Draw a diagram clearly illustrating how a client connects to a cloud-based application, which in turn connects to a web service. Clearly note and describe the hardware and software (infrastructure) required for each section or aspect of this.
4. List and explain what would need to be considered in applying object-oriented programming to a cloud-based solution.
5. Describe (potentially with one or more supporting diagram(s)) how to access and manipulate the database content on the web using HTML and XML.
6. Define the term “big data” in relation to cloud computing.

**ICTPRG504 - Deploy an application to a production environment**

1. Describe the basic principles of database management systems. - ICTDBS502, Q4
2. Under what circumstances might you use a Waterfall Software Development Life Cycle? Describe the standard phases within a Waterfall SDLC.
3. Define system layers such as: - ICTPRG529, Q4
   1. the data network
   2. hardware
   3. operating system
   4. database management systems
   5. web servers
   6. application servers, and…
   7. client deployment (deploying software to the hardware that is to be used by a client).
4. When writing code or scripts for deploying your application to a production environment, what are the components that you will need to consider in order for it to be ready for the end-users?
5. Why is it important to know the policies, procedures and security protocols of an organisation when deploying software?

**ICTPRG532 - Apply advanced object-oriented language skills**

1. Describe a current framework for a web-based software project.
2. Describe the communication mechanism that would be applicable to a web-based application.
3. Why would a software development methodology be significantly more critical for large-size applications? What aspects might such a methodology cover?
4. Outline (in detail) a process that could be utilised in testing a distributed software application.
5. Describe the concept of a design pattern.
6. Describe 5 design principles applicable to user-interface design.
7. Describe the structure of a client-server software application.
8. List 3 dynamic data structures and outline their respective advantages and disadvantages.
9. List 3 hash functions (and/or data structures that utilise hash functions) and outline their respective advantages and disadvantages.
10. In considering the following sort algorithms – bubble, merge and quick – explain how they differ in relation to programming complexity, speed, and resource usage.
11. In considering the following search algorithms – sequential and binary – explain how they differ in relation to programming complexity, speed, and resource usage.
12. Outline the principles associated with developing a programming language (such as Java, C#.Net, Python, etc.) – ICTPRG418, Q6 copy and paste here

**ICTWEB503 - Create web-based programs**

1. Describe in detail:
   1. Three (3) methods or techniques that would assist you in analysing a client’s web project
   2. Three (3) considerations or approaches that would assist you in designing a client’s web project
2. What are programming control structures and how might they be applicable to a web-based application project?
3. Summarise web programming concepts including:
   1. authentication and web security
   2. hypertext transfer protocol (HTTP)
   3. session management
   4. stateless programming.

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| |  |  | | --- | --- | |  | | | **Assessment Task**  **- Written – All Units** |  | |  | |   ASSESSMENT SUMMARY | | |
| **Student Name** | | **Student Number** |
|  | |  |
| **Qualification Code & Name** | | **Stream / Specialisation** |
| ICT50718 - Diploma of Information Technology | | Software Development |
| **Unit/s of Competency Code** | **Unit/s of Competency Name** | |
| **Semester 1** | | |
| ICTICT418 | Contribute to copyright, ethics and privacy in an information technology environment | |
| ICTICT509 | Gather data to identify business requirements | |
| ICTDBS502 | Design a database | |
| ICTICT517 | Match ICT needs with the strategic direction of the organisation | |
| ICTPRG418 | Apply intermediate programming skills in another language | |
| ICTPRG527 | Apply intermediate object-oriented language skills | |
| ICTPRG503 | Debug and monitor applications | |
| **Semester 2** | | |
| ICTPRG520 | Validate an application design against specifications | |
| ICTPRG502 | Manage a project using software management tools | |
| ICTPRG529 | Apply testing techniques for software development | |
| ICTPRG523 | Apply advanced programming skills in another language | |
| ICTPRG532 | Apply advanced object-oriented language skills | |
| ICTWEB503 | Create web-based programs | |
| ICTPRG604 | Create cloud computing services | |
| ICTWEB503 | Deploy an application to a production environment | |
| ICTGAM528 | Create games for mobile devices | |
| **Assessment Task Number** | **Assessment Name** | |
| Various | Assignment | |
| **Student Declaration**  I declare that this assessment is my own work. Any ideas and comments made by other people have been acknowledged as references. I understand that if this statement is found to be false, it will be regarded as misconduct and will be subject to disciplinary action as outlined in the TAFE Queensland Student Rules. I understand that by me emailing this assessment item, I agree to this Declaration in lieu of a written signature. | | |
| **Student Signature** | | **Date** |
|  | | /     /20 |

| MARKING CRITERIA | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Attempt** | **Result** | | **Date** | | | | |
| 1st Attempt | Satisfactory | Unsatisfactory | /     /20 | | | | |
| 2nd Attempt | Satisfactory | Unsatisfactory | /     /20 | | | | |
| Supplementary (apprentice / trainees only) | Satisfactory | Unsatisfactory | /     /20 | | | | |
|  | | | | | | | |
|  | | | | **1st Attempt** | | **2nd Attempt** | |
| **Did the student satisfactorily:** | | | | **S** | **U** | **S** | **U** |

**Semester 1 units**

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| --- | --- | --- | --- | --- | --- |
| 1 | Contribute to copyright, ethics and privacy in an information technology environment |  |  |  |  |
| 2 | Gather data to identify business requirements |  |  |  |  |
| 3 | Design a database |  |  |  |  |
| 4 | Match ICT needs with the strategic direction of the organisation |  |  |  |  |
| 5 | Apply intermediate programming skills in another language |  |  |  |  |
| 6 | Apply intermediate object-oriented language skills |  |  |  |  |
| 7 | Debug and monitor applications |  |  |  |  |

**Semester 2 units**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Validate an application design against specifications | | | | |  |  |  |  |
| 2 | Manage a project using software management tools | | | | |  |  |  |  |
| 3 | Apply testing techniques for software development | | | | |  |  |  |  |
| 4 | Apply advanced programming skills in another language | | | | |  |  |  |  |
| 5 | Apply advanced object-oriented language skills | | | | |  |  |  |  |
| 6 | Create web-based programs | | | | |  |  |  |  |
| 7 | Create cloud computing services | | | | |  |  |  |  |
| 8 | Deploy an application to a production environment | | | | |  |  |  |  |
| 9 | Create games for mobile devices | | | | |  |  |  |  |
| **Reasonable Adjustment applied to assessment** *(if ‘yes’ record details)* | | | | | | | | | |
| No | | Yes | Details: |  | | | | | |
| **Assessor Name** | | | | | **Assessor Signature** | | | | |
| TBA | | | | |  | | | | |
| **Summary of Feedback / Action Plan** | | | | | | | | | |
|  | | | | | | | | | |