**Information Technology/Ultimo**

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| **Learner Number** | 807135473 | **Learner Name** | Alex Goulden |
| **Unit code** | ICTPRG425 | **Unit name and release number** | **Use structured query language (Release 1)** |

**Please note that TAFE NSW is required to retain copies of all completed assessments, where practical, for a *minimum* period of three (3) years (or in accordance with regulatory/licencing requirements) after the completion of a learner’s studies. *Refer to procedure to determine the retention period required.***

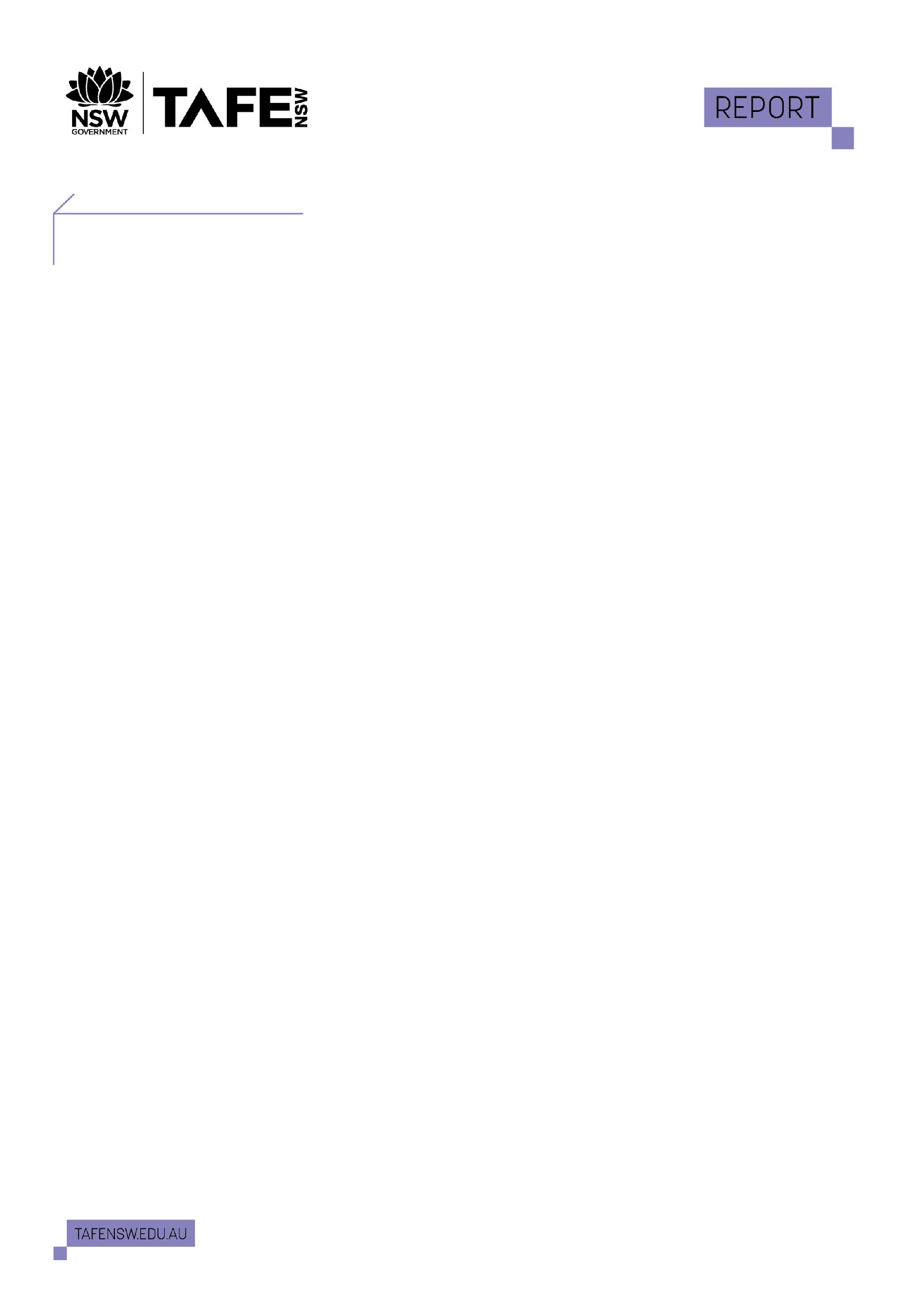
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| **Assessment Instructions** | | **This is assessment event number** 2 **of** 2 events for this unit |
| **Type of Assessment** | Written assessment. Theory and research | |
| **Instructions for Written Assessment** | Answer all tasks.  Ensure the answers are in your own words.  Ensure your name and student ID is on every page.  Fill in the feedback form section with your name, email and student ID.  Submit to your trainer by due date. | |
| **Submission instructions** | You must deliver your assessment by two methods:   * Edit this document and submit it electronically * Print this whole document with your answers (include a cover page) and delivery it in class. | |
| **What do I need to do to achieve a satisfactory result?** | To successfully complete this assessment event **all questions** must be answered correctly | |
| **Due date/time allowed** | End of semester 1, 2020. | |
| **Assessment feedback, review or appeals** | Feedback must be provided to you no later than 10 days after all assessment activities have been conducted.  If you want a review of your results or if you have any concerns about your results, you can contact the teacher/assessor or your Head Teacher.  You have three weeks from the date you receive your results in which to make an appeal and/or request a review.  You should receive a response within ten days of the receipt of the request.  Teachers and their Head Teacher will address any appeal in accordance with [Assessment Guidelines for TAFE NSW.](https://staff.tafensw.edu.au/policies-procedures/student-administration/assessment-guidelines/) | |

# Submission cover sheet

# and declaration

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| **Learner number:** | | 807135473 | **Learner name:** | | **Alex Goulden** | |
| **Unit code:** | | ICTPRG425 | **Unit name:** | | **Use Structured Query Language (Release 1)** | |
| **Assessment event number** | | **1** | **Assessment title** | | Technical Journal | |
| **Learner declaration** | | | | | | |
| This assignment is my original work and no part of it has been copied from any other source except where due acknowledgement is made.  No part of this assignment has been written for me by any other person except where such collaboration has been authorised by the assessor concerned.  I understand that plagiarism in the presentation of the work, idea or creation of another person as though it is your own. Plagiarism occurs when the origin of the material used is not appropriately cited. No part of this assignment is plagiarised.  I understand that TAFE NSW is required to retain copies of all my completed assessments, where practical, for a period of 3 years (or in accordance with regulatory/licencing requirements) after the completion of my studies | | | | | | |
| **Learner Signature:** |  | | | **Date**: | |  |

### Part 1



### Explain client-server concepts

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| The client / server model is an application structure that separates required work between two parties: the provider of a service (servers) and the consumers or requestors (clients), this is conducted through a connection over a network (the internet in web development situations) most often on different hardware.    For the web, the most common setup is:  HTML/CSS for placement and styling, along with JavaScript for interactions (client)  PHP and MySQL for server interaction and database communication (server)  Both of these interact to provide web content for a user, while sessions (server) and cookies (client) are used to provide a form of short-term memory storage and information consistency throughout applications  <https://techterms.com/definition/client-server_model#:~:text=Server%20Model%20Definition-,Client%2DServer%20Model,laptops%2C%20tablets%2C%20and%20smartphones.> |

Answers correct ☐ Yes ☐ No

### Describe the SQL client environment

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| The client SQL environment can vary depending on what programs are being used. While Wamp, Mamp and Xamp are the most popular client-based environments – they also have their unique differences in operation and layout. Wamp for example allows for both client and server running.  These are used to emulate a production environment and most often used to test PHP applications and databases before being pushed to the official project hosted online. With the main three, a virtual database is formed along with a connection to a server (hosted on the local machine), allowing for interaction to occur for both client and server side and internal access to the database is achieved through the use  Access to the database is achived through tools such as MySQL Workbench or phpMyAdmin, and allow for creation, manipulation and editing of databases directly through the use of a UI. But both also have their own differences - MySQL Workbench provides data modelling, SQL development, and comprehensive administration tools for server configuration, user administration, backup, and more advanced features – compared to phpMyAdmin, which is more general.  <https://www.wampserver.com/en/>  <https://www.mysql.com/products/workbench/>  <https://www.phpmyadmin.net/> |

Answers correct ☐ Yes ☐ No

### Explain data-integrity concepts

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| There are a variety of ways to ensure data integrity through SQL. One of the most commonly found is the use of Primary and Unique Keys, most often auto incremented to ensure there is a consistent separation of rows in a table.  When database tables are required to interact with each other (e.g. Categories, Products), a Foreign Key is essential. Acting as a link to a second table, it holds the id and prevents invalid data from being inserted into the foreign key column, because it has to be one of the values contained in the table it points to.  Data is given constraints in the forms data types – which specify what forms of information may be held. Char = text, Int = numbers, Date = An organised day/month/year.  Data held in a row remains consistent and unchanged unless specified with an SQL UPDATE query, this however can be done in a number of ways – phpMyAdmin/workbench UI access, server SQL query and php based query  <https://www.w3schools.com/sql/sql_foreignkey.asp>  <https://www.w3schools.com/sql/sql_update.asp>  <https://www.w3schools.com/sql/sql_primarykey.ASP> |

Answers correct ☐ Yes ☐ No

### Explain data-modelling structures

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| Relational modelling provides a framework for constructing an information system through databases and helps map out what is required, planning out the construction of a database.  Relational databases for instance are a type of database that provide and store data points that interact with one another in some form. It is straight forward and intuitive as each row in a table holds a unique ID (Key).  With relational databases comes the various forms of relation   * 1. – one record in a table is associated with one and only one record in another table (Product, Product inventory)   1-many – When one row in table A may be linked with many rows in table B, but one row in table B is linked to only one row in table A. (One order = A, many products = B)  Many-many - when multiple records in a table are associated with multiple records in another table. (Many Customers purchasing the same Products)  <https://www.oracle.com/au/database/what-is-a-relational-database/#:~:text=A%20relational%20database%20is%20a,of%20representing%20data%20in%20tables.>  <https://fmhelp.filemaker.com/help/18/fmp/en/index.html#page/FMP_Help/many-to-many-relationships.html> |

Answers correct ☐ Yes ☐ No

### Explain databases and database objects:

### · Data types

### · Data structures

### · Identifiers and metadata

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| Data types are used to differentiate data. Such examples in SQL include Numeric datatypes (int, float), Date/time, character/string (text, char, varchar), Unicode and binary  Data structures are a way of organising data in an efficient manner. In SQL this is built upon tables, titles, rows, and columns – which together make up a database and may interact and alter each other  An identifier is the representation within the language of items created by the user, as opposed to language keywords or commands.    Metadata is defined as “data that provides information about other data” and in SQL refers to collected information about a database, objects, files, groups and so on in a server.  <https://www.journaldev.com/16774/sql-data-types>  [https://www.sqlshack.com/sql-server-table-structure-overview/](https://www.sqlshack.com/sql-server-table-structure-overview/#:~:text=The%20tables%20are%20the%20database,the%20attributes%20of%20the%20entity.)  [https://www.sqlshack.com/a-complete-guide-to-t-sql-metadata-functions-in-sql-server/](https://www.sqlshack.com/a-complete-guide-to-t-sql-metadata-functions-in-sql-server/#:~:text=Metadata%2C%20as%20most%20of%20you,in%20SQL%20Server.)  <https://docs.oracle.com/javadb/10.8.3.0/ref/crefsqlj18919.html> |

Answers correct ☐ Yes ☐ No

### Summarise programming concepts

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| The use of PHP in reading and writing information in relation to databases is a major aspect of server-side implementation – through php a channel is opened between SQL and the client to allow data to become visible, interactable and creatable. This has been used in the creation of the database course employees  Functions as used in SQL provide an opportunity for queries to be expedited, and as they are built in, they are readily accessible. Examples include CHAR\_LENGTH which returns the length of a string, LCASE converts string to lower-case and STRCMP which compares two strings.  Stored procedures are prepared SQL code that you can save, as so it can be reused a multitude of times. This can save a great deal of time when queries are likely to be required more then once. Parameters can also be passed to a stored procedure, so that the stored procedure can act based on the parameter value/s that get passed.  <https://www.w3schools.com/sql/sql_ref_mysql.asp>  <https://www.w3schools.com/sql/sql_stored_procedures.asp> |
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Answers correct ☐ Yes ☐ No

### Give an overview of query design

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| SQL has been built to make its queries highly readable, with emphasis on key words such as SELECT, FROM, WHERE. Much of what is required to send a read query is intuitive and utilised through simple commands.  Queries relating to writing in SQL can often get complicated however, especially when dealing with PHP. Often data is required to be updated or inserted into a database, which is passed through php while usually being visually accessible to a user, potentially involving classes, forum values and actions. Inserting/updating data must be handled carefully to insure it is placed correctly and user inputs must be secure.  <https://www.w3schools.com/sql/sql_syntax.asp> |

Answers correct ☐ Yes ☐ No

### Give an overview of relational database design

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| Relational databases are structured from tables, which hold rows and columns.  Data in columns are a group of data relating to the same title (FirstNames), data in rows relate to each other - usually in the form of an entity (a person’s info filled in FirstName, LastName, DateOfBirth). These are contained in tables which are a way of categorising on a global scope (Users, Orders, Products)  Database normalization refers to the process of structuring a relational database according to a series of so-called normal forms, in order to reduce data redundancy and improve data integrity. It essentially breaks down data and categorises in more specific ways.  Denormalization on the other hand, combines data in an attempt to speed up the query process and results in an overall decline of data separation/categorization.  Both have their own place and neither is better or worse than the other, but normalization is often related to safety where denormalization is speed.  <http://heuristnetwork.org/define-database-structure/#:~:text=The%20database%20structure%20is%20the,Fields.>  <https://www.tutorialspoint.com/difference-between-normalization-and-denormalization#:~:text=Normalization%20is%20used%20to%20remove,it%20can%20be%20queried%20quickly.>  <https://www.sqlshack.com/sql-server-table-structure-overview/#:~:text=Microsoft%20SQL%20Server%20is%20a,in%20rows%20and%20columns%20format.> |

Answers correct ☐ Yes ☐ No

### End of questions

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| Make sure you have written your name on each page  (for written assessments only)  then submit this whole document to your teacher/assessor for marking |

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| **IMPORTANT NOTE: When this document is complete, the assessor must**   * mark the answers using the relevant marking guide * attach it to the learner’s *Unit outcome and event results* document * complete the relevant details in the learner’s *Unit outcome and event results* document |

## **Assessment Feedback**

*NOTE: This section* ***must*** *have the assessor signature and student signature to complete the feedback.*

### Assessment outcome

☐ Satisfactory

☐ Unsatisfactory

### Assessor Feedback

☐ Has the Assessment Declaration been signed and dated by the student?

☐ Are you assured that the evidence presented for assessment is the student’s own work?

☐ Was the assessment event successfully completed?

☐ If no, was the resubmission/re-assessment successfully completed?

☐ Was reasonable adjustment in place for this assessment event?  
*If yes, ensure it is detailed on the assessment document.*

Comments:

### Assessor name, signature and date:

### Student acknowledgement of assessment outcome

Would you like to make any comments about this assessment?

### Student name, signature and date

***NOTE: Make sure you have written your name at the bottom of each page of your submission before attaching the cover sheet and submitting to your assessor for marking.***

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