# Solent University

# Coursework Assessment Brief

# Assessment Details

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| Module Title: | Advanced Database Systems |
| Module Code: | QHO541 |
| Module Leader: | Dr Muhammad Akram |
| Level: | 5 |
| Assessment Title: | Project with Report |
| Assessment Number: | 1 |
| Assessment Type: | Individual written report |
| Restrictions on Time/Word Count: | 2000 Words (SQLite and other programming code is not included in this word count) |
| Consequence of not meeting time/word count limit: | There is no penalty for submitting below the word/count limit, but you should be aware that there is a risk you may not maximise your potential mark.  Assignments should be presented appropriately in line with the restrictions stated above; if an assignment exceeds the time/word count this will be taken in account in the marks given using the assessment criteria shown.\*  OR  It is essential that assignments keep within the time/word count limit stated above. Any work beyond the maximum time/word length permitted will be disregarded and not accounted for in the final grade.\* |
| Individual/Group: | Individual |
| If a group | N/A |
| Assessment Weighting: | 100% |
| Issue Date: | 14th October 2024 |
| Hand In Date: | **Before 4P.M. Tuesday, 4th February 2025.** |
| Planned Feedback Date: | TBC |
| Mode of Submission: | on-line  On the course SOL page  Only FINAL submissions will be accepted. DRAFT submissions will not be considered an attempt and will not be marked. |
| Anonymous Marking | This assessment will be marked anonymously |

Details of assignment brief:

You are working for an employer as a Database Analyst/Developer and required to design and implement a database system for a company of your choice. Example: bank, restaurant, online shopping, hospital, clothing store and mobile service provider to keep track of customer, inventory, employee and accounting information.

This assessment requires you to outline client requirements, create, test, and deploy, a proof-of-concept DB with using SQLite - Python Tkinter (GUI library for Python) and XML database application development.

The deliverable for this assessment will be a single pdf document containing a 2000-word report about scenario and solutions. (The document should roughly be structure as follows: A title page, contents page, page numbers). With your submission Include all your project's files, Python - SQLite and XML database codes, Screenshots of the input/output, any user interaction together with evidence of the requirements and README.md file. This file should contain information on how to run the application and database.

I consider 2000 words to be a rough estimate in the report, and your report may be anything from between 1200 to 2000 words in length.

Formatting instructions: Font: – Font Size: 12 – Line Spacing: 1.15

**Words above 2000 would not be considered and marked.**

**Assessment Task**

**Introduction**

This should pull together, and summarise, the entire project. You should also include the background and inspiration that led you to undertake this project. You may, at this point, want to pull in statistics to underpin your argument as to why this project was required.

**Part 1 – Outlining Client Requirements and Design and Create Database using SQLite (worth 30% of the marks)**

• Details of the chosen business case. Seven business requirements assumed during the analysis stage (5 marks)

• Create Flat file with collected data from business (MS Excel) minimum 5 existing records. (5 marks)

• Create Relational Schema (ERD) for the database system. Relational schema should meet the requirements of 3NF, you must provide the justification in report.

(5 marks)

• Develop SQLite Server database system based on the ERD developed as part of the assessment. (5 marks)

Your database must include the following:

• Tables with relationships using some referential integrity constraints. There should be a minimum of five substantial tables and any number of smaller tables that you require to implement your database. (5 marks)

• Tables should be linked using an appropriate method in SQLite Server. Each table must have a minimum of 5 records per table. Code must be included as a screenshot(s). Explain which referential integrity constraints are used and why? Include Data Diagram that must match relational schema. (5 marks)

**Part 2 – Database design development and test (worth 35% of the marks)**

• Minimum two Triggers to demonstrate the implementation of business needs.

(5 marks)

• Minimum one function to re-used throughout SQLite database applications for processing or manipulating data, that you can simply call that function for implementation of business needs.

(5 marks)

• Minimum two Views to demonstrate the development of virtual tables. This to help business to generate customised view of the data.

(5 marks)

The queries that meet business requirements must include the following features:

(10 marks)

1. Print a message.
2. Use of JOIN between two or more tables as required.
3. Use of GROUP BY with HAVING
4. Use of SQLite functions
5. Optimisation queries

Testing and reviewing the database. (10 marks)

**Part 3 – Programming for Databases and test (worth 35% of the marks)**

Develop SQLite - Python Tkinter (GUI library for Python) software application to allow a user to insert, update, delete data in the database and create a report with the frontend-backend communication**. Including:**

* Python GUI programming language (develop buttons, textboxes) to communicate with SQLite to input - output and update database. (5 marks)
* Validation or verification of input data. (5 marks)
* Encryption or decryption of input - output data. (5 marks)
* [Storing images in SQL Server](https://stackoverflow.com/questions/5613898/storing-images-in-sql-server) database (using the BLOB (Binary Large Object) data type). (5 Marks)
* Developing XML with appropriate elements using relational fields.

Retrieving data logically from a field with XML data type as well as data from fields from other data types. Modifying data in a field of XML data type. (5 marks)

* Testing and reviewing. (5 marks)
* Innovation (5 marks)

Use of any other features to enhance the usability of your database system.

Example: Protect the data from SQLite injections.

Write a paragraph on innovation and how it is useful.

# Assessment criteria

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| **Solent Grade** | **F1-F3**  **0-39** | **D1-D3**  **40 - 49** | **C1-C3**  **50-59** | **B1-B3**  **60 - 69** | **A1-A4**  **70 +** |
| **Part 1 – Outlining Client Requirements and Design and Create Database using SQLite (worth 30% of the marks)** | Does not reach required threshold.  Insufficient or incomplete tasks with poor or incomplete data model, no/poor normalisation, poor explanation, no/poor database on of requirements, etc. | Some but insufficient and poorly database with poorly developed data model, some normalisation and explanation not enough to meet the requirements. | Sufficient database with data model with normalised schema that solves problem but lack of attention to designing/creating database to cover requirements. | Well-structured database good specifications and data model with normalised schema (2NF) and with relationship diagram (ERD). | Excellent solution to problem proving originality, creativity, with evidence of research – very well written with excellent data model and normalised schema to 3NF and ERD |
| **Part 2 – Database design development and test (worth 35% of the marks)** | Does not reach required threshold.  No database development. | Some but insufficient and poorly database with poorly developed data and tools.  Poor structure of triggers, views, and functions. | Sufficient database design and development and report with developed data and tools.  good structure of triggers, views, and functions.  solved the problem but lack of attention to designing/creating database to cover requirements. | Well-structured database development and report good structure of triggers, views, and functions.  solved the problem and designing/creating database to cover requirements. | Excellent solution to problem proving originality, creativity, with evidence of research – very well written report with excellent database and all tools included. |
| **Part 3 – Programming for Databases and test (worth 35% of the marks)** | Does not reach required threshold. | Some but insufficient and poorly developed SQL - Python Tkinter connection.  Poor structure of GUI programming  no verification, encryption, and testing plan.  No/poor Developing XML  No Storing images | Sufficient developed SQL - Python Tkinter connection with developed data and tool. Som good structure validation and encryption.  Good testing plan.  solved the problem but lack of attention to designing/creating database to cover requirements.  Evidence of some XML.  Storing images (saving but not converting back) | Well-structured developed SQL - Python Tkinter connection with developed data and tools. validation and encryption.  Good testing plan.  solved the problem and cover the requirements.  good Developing XML and Storing images | Excellent solution to problem proving originality, creativity, with evidence of research.  Excellent structure of validation and encryption. Excellent development of XML and Storing images.  Good testing plan with suggestion of the solutions.  Innovation and use of features. |

# Learning Outcomes

This assessment will enable you to demonstrate in full or in part your fulfilment of the following learning outcomes identified in the Module Descriptor:

**Living CV**

As part of the University's Work Ready, Future Ready strategy, you will be expected to build a professional, Living CV as you successfully engage and pass each module of your degree.

The Living CV outputs evidenced on completion of this assessment are:

1. Understand the importance and role of relational and non-relational databases in modern IT systems

2. Have a good understanding of the SQL language and be able to crate write a range of SQL queries to meet specific reporting requirements

3. Able to design, implement and test relational databases to maintain the integrity of the data

4. Able to develop web applications that securely interact with a backend database

Please add these to your CV via the Living CV builder platform on Solent Futures Online [Solent Futures Online](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fsolentfutures.careercentre.me%2Fprogrammes%2F%3FprogrammeID%3DThzJ%252bRbk%252bQXoSlEaujPR0g%253d%253d&data=04%7C01%7Cian.harris%40solent.ac.uk%7Cf1bda34c4d564e82f6cb08da067fdf48%7Cd684e4cd491a4577bf33546478d72e3c%7C0%7C0%7C637829443517919744%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000&sdata=ObCFbM3zY7CgU6SVNtitaq1udg0%2Bzlp1GuCAJ1y1utw%3D&reserved=0)

# Important Information

[Solent University Academic Regulations 2024-2](https://students.solent.ac.uk/official-documents/quality-management/academic-handbook/2o-assessment-principles-and-regulations.pdf)5

# Late Submissions

You are reminded that:

1. If this assessment is submitted late i.e. within 7 calendar days of the submission deadline, the mark will be capped at 40% if a pass mark is achieved;
2. If this assessment is submitted later than 7 calendar days after the submission deadline, the work will be regarded as a non-submission and will be awarded a zero;
3. If this assessment is being submitted as a referred piece of work, then it must be submitted by the deadline date; any Refer assessment submitted late will be regarded as a non-submission and will be awarded a zero.

[Assessment regulations](https://www.solent.ac.uk/about/documents/assessment-regulations.pdf)

# Extenuating Circumstances

The University’s Extenuating Circumstances (EC) procedure is in place if there are genuine short term exceptional circumstances that may prevent you submitting an assessment. You are able to self-certify for up to two assessment dates in any semester without supporting evidence for an extension of up to seven calendar days for coursework or to defer an exam to the resit period.

Alternatively, if you are not 'fit to study’ (or you have used up your two self-certification opportunities), you can request:

* an extension to the submission deadline of 7 calendar days, or
* a request to submit the assessment at the next opportunity, i.e. the resit period (as a Defer without capping of the grade).

In both instances you must submit an EC application with relevant evidence. If accepted under the university regulations there will be no academic penalty for late submission or non-submission dependent on what is requested. You are reminded that EC covers only short-term issues (20 working days) and that if you experience longer term matters that impact on your learning then you must contact the Student Hub for advice.

Please find a link to the EC policy below:

[Extenuating Circumstances](https://students.solent.ac.uk/official-documents/quality-management/academic-handbook/2p-extenuating-circumstances.pdf)

# Academic Misconduct

Any submission must be your own work and, where facts or ideas have been used from other sources, these sources must be appropriately referenced. The University’s Academic Regulations includes the definitions of all practices that will be deemed to constitute academic misconduct. You should check this link before submitting your work.

Procedures relating to student academic misconduct are given below:

[Academic Misconduct](https://students.solent.ac.uk/official-documents/quality-management/academic-handbook/4l-student-academic-misconduct-procedure.pdf)

**Ethics Policy**

The work being carried out must be in compliance with the university Ethics Policy. Where there is an ethical issue, as specified within the Ethics Policy, then you will need an ethics release or ethics approval prior to the start of the project.

The Ethics Policy is contained within Section 2S of the Academic Handbook:

[Ethics Policy](https://staff.solent.ac.uk/official-documents/quality-management/academic-handbook/2s-solent-university-ethics-policy.pdf)

**Grade marking**

The University uses an alpha numeric grade scale for the marking of assessments. Unless you have been specifically informed otherwise your marked assignment will be awarded a letter/number grade. More detailed information on grade marking and the grade scale can be found on the portal and in the Student Handbook.

[Grade Marking Scale](https://staff.solent.ac.uk/official-documents/quality-management/academic-handbook/2o-assessment-regulations-annex-1-grade-marking-scale.pdf)

**Guidance for online submission through Solent Online Learning (SOL)**

[Online Submission](http://learn.solent.ac.uk/onlinesubmission)