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[**CT4029 Principles of Programming (SEM1 - 2023/24)**](file:///C:\Users\cgatt\Desktop\Semister1\CT4029%20-%20Principles%20of%20Programming\index.html)

CT4029\_SEM1\_2023/24

**CT4029 - Assignment Submission Point**

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**Description**

**Problem Description**

The purpose of this exercise is to provide the experience of creating interactive software by using Python.

The assessment contributes to all learning outcomes as indicated and will comprise of the following components:

**1.**   Write a report including the design and specification of your project, highlighting the design pattern used for development and its motivation. **(40 marks)**

**2.**    Develop the product (software) using appropriate programming concepts and conventions. **(40 marks)**

**3.**    Develop and document a testing process. **(10 marks)**

**4.**    Prepare a 5 mins video to demonstrate a working prototype of your software with all the features you have developed. **(10 marks)**

**Scenario:** Secure Marketing Application with Graphical User Interface using SQLite and QR Code

**Overview:**As a programmer, you have been tasked with developing a secure marketing application with a graphical user interface (GUI) using SQLite database and QR code. The system should allow users to view marketing promotions, scan QR codes to access additional information, and track their interactions with promotions.

**Software Requirements:**

**1.**Graphical User Interface: You will need to develop a GUI for the marketing application using Python programming language. The GUI should be user-friendly and visually appealing, with at least the following features to include search bar, promotion categories, and a QR code scanner. **(12 marks)**

**2.**     User Authentication: The system should have a secure user authentication process, requiring users to provide their login credentials to access their personal information and view promotions. Passwords must be hashed and stored securely in the SQLite database. **(5 marks)**

**3.**     QR Code Generator and Scanner: The system should be able to generate and scan QR codes and retrieve additional information about promotions, such as product details or discounts. You will need to implement a QR code generator and scanner in the application. QR codes generated should be saved in the local directory of your developed software (application). **(8 marks)**

**4.**SQLite Database: You will need to create a SQLite database to store promotion and user information. The database should have at least three tables: one for promotions, one for user registration, and another for storing user interactions with promotions. The database should be linked with developed GUI. **(12 marks)**

**5.**     SQL Injection Prevention: The system should be protected against SQL injection attacks. You must ensure that all user inputs are sanitized and validated before being passed to the SQLite database. For this application, any user’s age under 18 is considered as an attack and details should be rejected and not saved in the database. **(3 marks)**

You can use one of the following Python GUI libraries:

·        [PyQt5](https://pypi.org/project/PyQt5/)

·        [Python Tkinter](https://docs.python.org/3/library/tkinter.html)

·        [PySide2](https://pypi.org/project/PySide2/)

·        [Kivy](https://kivy.org/doc/stable/guide/basic.html)

It is very important to focus on the consistency of your application. Your Secure Marketing Application can contain one or more windows linked together.

**Report Structure:**

You are asked to write a report with at least the following sections:

**Table of contents**

**1.    Introduction (5 marks)**

A short, informal description of the software, its objectives and an indication of the extent to which it has been implemented and any problems faced in its development

**2.    Design of system (25 marks)**

Discussion and reflection on the design and development of the software, showing the structure of the software and identifying appropriate features.

Discussion of implementation logic, code snippets, diagrams, and screenshots where needed.

A flowchart of the overall system and ER diagram of the database are required.

**3.    Testing the system (10 marks)**

A set of test results to be submitted.

A discussion on failed tests and how much of your code you think your tests cover. Do they cover every aspect?

**4.    Conclusion (5 marks)**

**5.    References (5 marks)**

**6.   Appendices**

**Appendix 1**: User guide: you will need to provide a user manual detailing how to use the marketing application, including instructions for registration, viewing promotions, generating and scanning QR codes, and tracking interactions with promotions.

**Appendix 2**: Code

**Appendix 3**: Test Suites

Your submission must be done via **Moodle**.

**Submit:**

·      **A report of 1500 words (or equivalent (+/- 10%)) in word format (.docx).**

·      **Source codes:**You are required to submit the complete source code for the marketing application. The code must be well-documented and clearly written including (separately)

o   **Source code of your application (GUI including QR code scanner and generator)**

o   **Source code of your SQLite database**

·      **5 min Video demonstration of your software**

**IMPORTANT:** The report (item 1 above) should be submitted as **.docx** and **NOT** as a **.zip** file. Any report that will be submitted as part of a .zip file **will not be considered**as it cannot be processed by **Turnitin** system for similarity check.

Submit/add the complete software code for your system, appropriate data and test-cases as a zip file (item 2, 3, and 4 above).

**Marking Grid:**

|  |  |  |
| --- | --- | --- |
| **Mark** | **Grade** | **Characteristics** |
| 0 | Fail | Plagiarism, collusion, non-pres, name only. |
| 1-39 | Reassess | Project not working or extremely limited scope.  Report is inadequate. No demonstration. No references. |
| 40-49 | 3rd, D  Pass | Project works but has limited scope and application.  Report meet basic requirement correctly but limited, no design or discussion of functionalities.  Demonstration not satisfactory. Inadequate references (mainly websites). |
| 50-59 | 2ii, C  Satisfactory | Project is complete and offers considerable application.  Report is coherent and organised, some limited evidence of self-criticism concerning deliverables.  Sufficient demonstration of functionality, complexity can be improved.  Evidence of inclusion and use of references. |
| 60-69 | 2i, B  Good | Project is fully functional, advanced application and complexity.  Report has good reflection, is coherent and organised, good integration of academic & practical issues, good evaluation of deliverables.  Well explained demonstration showing prototype, working and application.  Good quality relevant academic references. |
| 70-100 | 1st class, A  Excellent | Project is fully functional, innovative concept, good application scope and advanced complexity for software concepts.  Report has good reflection, evidence of elegance, innovation, very good evaluation of deliverables.  Well-presented demonstration, all the concepts, ideas, design, implementation, and fully functional software thoroughly explained.  Excellent quality relevant academic references (books, journals etc.). Reflective critical analysis built around academic references and experiences from the module. |

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***This assessment will be marked anonymously. This means Moodle will hide student identities from the marker during the marking process. To protect this anonymity, please do not incorporate your personal details, including your name, email and student number anywhere within the actual assignment or its file name.***

***Please also be aware that if you take an extension, it may not be possible for your work to be marked anonymously. This is because the technology reveals all student identities to the marker on the standard feedback return date, but your assignment might be marked after this.***

***If you have any questions about anonymous assessment, please contact your Module Tutor.***

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**Important Information**

**Please be aware your assessment must be uploaded and submitted before 3.00pm. It is advisable you allow additional time to complete this.**

**Should you require additional support please email the tutor to request a tutorial well in advance of the submission deadline.**

**The Student Achievement Team (e-mail:**[**studentachievement@glos.ac.uk**](mailto:studentachievement@glos.ac.uk)**) offer various academic skills workshops and one-to-one tutorials. Referencing is an important skill for all modules and guidance on the Harvard style can be found in [myglos help](https://myhelp.glos.ac.uk/study-resources/look-up-referencing-guides/Pages/default.aspx" \t "_blank).**

**Your individualised submission deadline will be available through your assessment submission points.  Although there are standard submission deadlines, in all cases those become individualised for you, and presented to you through the assessment points itself.**

**Questions You might have:**

**What is the word count? 2000 words +/- 10%Are tables included in the word count? YesHow many references should I have? Quality is more important than quantity, but try and have at least 8.What makes a quality reference? Generally we want academic sources, check out Scopus, ACM Digital Library, and IEEE Xplore for some good journal articles and conference papers.Can I have an extension? Module tutors can not grant extensions. In the first instance, go on to student records to self administer an extension. Anything beyond that you would need to get in touch with the helpzone.If I fail an assessment what happens? If you submit an assessment and achieve between 1-39 you will be entitled to a reassessment (which will appear on this page when and if applicable). However, if you do not submit anything for your assessment, you will not be entitled to a reassessment.What happens if I submit late? If you submit an assessment passed the deadline but within seven days, your mark (if it is above 40) will be capped at 40. If you submit later then this, the work will be awarded a 0.**