1st SIT COURSEWORK QUESTION PAPER **Year Long 2023/2024**

Module Code:	**CS6004NI**
Module Title:	**Application Development**
Module Leader:	**Mr. Samyush Maharjan** (Islington College)

Coursework Type:	**Individual**
Coursework Weight:	This coursework accounts for **30%** of your total module grades.
Submission Date:	**Thursday, 11 January 2024**
When Coursework is given out:	**Week 8**
Submission Instructions:	Submit the followings to the Islington College's MST portal before the due date (before 1PM on the due date): ● The software application to be developed in C# ● The documentation in MS Word compatible or PDF format
Warning:	London Metropolitan University and Islington College take Plagiarism seriously. Offenders will be dealt with sternly.

Plagiarism Notice

You are reminded that there exist regulations concerning plagiarism.

Extracts from University Regulations on Cheating, Plagiarism and Collusion

Section 2.3: “The following broad types of offence can be identified and are provided as indicative examples ….

(i) Cheating: including copying coursework.
(ii) Falsifying data in experimental results.
(iii) Personation, where a substitute takes an examination or test on behalf of the candidate. Both candidate and substitute may be guilty of an offence under these Regulations.
(iv) Bribery or attempted bribery of a person is thought to have some influence on the candidate’s assessment.
(v) Collusion to present joint work as the work solely of one individual.
(vi) Plagiarism, where the work or ideas of another are presented as the candidate’s own.
(vii) Other conduct calculated to secure an advantage on assessment.
(viii) Assisting in any of the above.

Some notes on what this means for students:

(i) Copying another student's work is an offence, whether from a copy on paper or a computer file and in whatever form the intellectual property being copied takes, including text, mathematical notation and computer programs.

(ii) Taking extracts from published sources without attribution is an offence. To quote ideas, sometimes using extracts, is generally to be encouraged. Quoting ideas is achieved by stating an author's argument and attributing it, perhaps by quoting, immediately in the text, his or her name and year of publication, e.g. " e = mc2 (Einstein 1905)". A reference section at the end of your work should then list all such references in alphabetical order of authors' surnames. (There are variations on this referencing system that your tutors may prefer you to use.) If you wish to quote a paragraph or so from published work then indent the quotation on both left and right margins, using an italic font where practicable, and introduce the quotation with attribution.

Further information concerning the existing London Metropolitan University regulations concerning plagiarism can be obtained from http://www.londonmet.ac.uk/academic-regulations

Introduction

This individual coursework requires developing and documenting an application software. C# .NET framework should be used for the development. Your software artefact must be submitted as a Visual Studio project.

The coursework carries 30% of the module mark.

Submission Deadlines: Week

Coursework Submission in-class Demo: Week

This individual coursework has 2 parts, both of which are to be submitted to RTE.

(1) The software application to be developed in C# .NET

(2) The documentation in MS Word compatible or PDF format

NB– Anyone not meeting the deadline must submit the work to the Undergraduate Registry with a completed *mitigating circumstances form*. It will only be marked if the mitigating circumstances are accepted. All parts of the late submission must be handed into the Undergraduate Registry with the form. You must ensure that you have a receipt from the Registry for your work.

Please note the rules on plagiarism

The application should be implemented individually. This is not a group/team effort. Any material which is a direct copy from someone else (student or another source) or a close paraphrase/code must be indicated where it is quoted i.e. it must be made clear what material is a quotation or close paraphrase e.g. by showing the text in italics or quotation marks. It is not sufficient to show the source in a list of references or bibliography. If you are unclear, please discuss your examples with your seminar tutor or the module leader. Plagiarism is a serious offence and conviction for plagiarism may lead to suspension from the University, even for a first offence (please see the section on Academic Misconduct in the Student Handbook).

Software Development Task

Design and build a desktop application by analysing the below project overview and requirements:

Bislerium **café** is currently on the lookout for a Point of Sale (POS) software solution. This software will be accessed through **password protection**. Its primary functions involve enabling staff to take **customer orders** and **generate essential reports**. Customers will be presented with a range of **choices** for **coffee types** (such as Cappuccino, Latte, Espresso, etc.) and various **add-ins** (like Cinnamon, Honey, Ginger, Chocolate, Ice Cream, etc.) to enhance the flavours. It's important to note that each type and add-in will come with its own **pricing**, which can be **configured** by the administrator using a **separate password**.

Additionally, the software needs to incorporate a **customer membership** feature, providing diverse **discounts** and **redemption** opportunities. Members of the coffee shop will have the privilege to redeem a **free complimentary coffee** of their choice after every **10 purchases**. Furthermore, regular members will enjoy a **flat 10%** discount on all their purchases for an **entire month**. It's worth mentioning that "regular" customers in this context are those who make daily purchases for a full month, excluding weekends. This concept of being a regular customer operates like a monthly subscription that renews automatically. To streamline the membership process, customers will be issued NFC-enabled identification cards. However, given time constraints, customers can **opt** to simply provide their **username** or **phone number** during the payment process.

For the coffee shop staff, the software will empower them to view and document **purchases/sales transactions** by saving them as **PDF reports**. A user-friendly interface will allow for the **generation of reports** on either a **daily** basis or for specific **months**. These reports will offer insights into the top **5 most frequently purchased coffee types and add-ins**, complete with corresponding **quantities**. Furthermore, the generated reports will also include **revenue**.

Your software implementation should demonstrate the following features.

1. Use of appropriate data types (built-in and programmer-defined) to handle the application data.
2. Use of appropriate data structures e.g., Arrays/List/Dictionary for the required programming scenario.
3. Use suitable algorithms e.g., sorting and searching.
4. Define and use your class(es) or services.
5. Provide a window-based user interface for your application
6. Save and retrieve the object's state using serialisation.
7. Generate PDF report.

Deliverables

Your submission should include the software project and a reflective essay as described below.

1. Your software artefact is in the form of a Visual Studio 2022 or above project, which should include the program's source code and data file (if any). *Make sure to exclude **.git**, **.vs**, **.github**, **bin,** and **obj** folder*.

2. A reflective essay (1000 words), which concisely documents:

    a. detailed instructions to run the program.

    b. the architecture of your software in terms of software classes, clearly indicating which classes to be of your own work and which classes from other sources (e.g., from textbooks, online sources such as MSDN etc.).

    c. a detailed description of the classes' properties and methods

    d. description of your algorithm to build the user record/ revenue collection chart in the form of a flowchart and/or decision table.

    e. which data structures and which algorithms you have used, in which part of your program, and why.

    f. your reflection of your own experience of using C# and Visual Studio for the development task, which features you like and why, what issues you experienced and your solution to overcome it.

Marking Scheme

Section	Topic	Full Marks
A	**Implementation of Application**	**60**
1.	Password-protected access, with an additional layer of password security required for making changes to the prices of coffee options and add-ins.	10
2.	A working view to order coffee(s).	5
3.	Ability to add multiple add-ins.	5
4.	Application's state is saved and restored using any semi-structured formats like JSON, CSV, or Excel.	10
5.	Membership registration with applied benefits like free coffee redemption and discounts.	10
6.	A table to display all the purchases/sales transactions.	10
7.	PDF generation that includes daily or specific month purchases/sales transactions featuring revenue and top 5 most-purchased coffees and add-ins.	10

B	**Documentation**	**10**
1.	Detailed instruction to run the program	2
2.	Concise description of your logical solution to each of the implemented functions of the application.	2
3.	The software architecture, i.e., class and their purpose	2
4.	Detailed description of the classes' properties and method	2
5.	Individual member's own reflection of own experience	2
C	**Programming Style**	**30**
1.	Clarity of code, Proper Naming conventions & comments	5
2.	Sensible naming of programmer-defined variables, classes, properties, and methods	3
3.	Useful comments in code	2
4.	Data validation and exception handling	10
5.	Interface design and usability of the system	10
	Total Marks	**100**