TAYLOR' S UNIVERSITY
Wisdom • Integrity • Excellence

Bachelor of Computer Science (Hons)

Module Code: ITS66704 (April 2024)

Module Name: Advanced Programming

Assignment No./Title	**Assignment Task 2 & Task 3 (Group Project)** **20% (PART A - ANALYSIS AND DESIGN)** **30% (PART B - DEVELOPMENT)** **10% (PRESENTATION)**
Course Tutor/Lecturer	Mr. Subit Timalsina
Submission Date	Week 09: TBA (PART A - ANALYSIS AND DESIGN) Week 12: TBA (PART B - DEVELOPMENT) Week 13: TBA (PRESENTATION)
Student Name, ID and Signature 1. 2. 3. 4. 5. 6. (maximum with approval)	

Declaration *(need to be signed by students. Otherwise, the assessment will not be evaluated)*

Certify that this assignment is entirely my own work, except where I have given fully documented references to the work of others, and that the material contained in this assignment has not previously been submitted for assessment in any other formal course of study.

Marks/Grade:	**Evaluated by:**
Evaluator's Comments:	

* Please include this cover page for your project submission

OBJECTIVES (MLO2, MLO 3 & MLO 4)

The objectives of this assignment are to enable you to

1. Apply problem solving skills to evaluate and solve specific topics in advanced object-oriented problem and programs.
2. Demonstrate capability to interact positively within a peer group, consider other viewpoints, and foster stable and harmonious relationships in solving computational problems related to object-oriented language.
3. Present the outcome of the program developed using object-oriented language with the appropriate integrated environment.

Scenario

Simple Survey Management System

In In today's rapidly evolving landscape in Nepal, the importance of accurate, real-time data collection cannot be overstated. Whether it's for understanding public sentiment, evaluating employee satisfaction within local businesses, or gaining insights into consumer behavior amidst the unique market dynamics of Nepal, having an efficient survey system is crucial. A well-designed survey platform not only ensures the reliability and relevance of the collected data but also adapts to the cultural nuances and communication preferences prevalent in Nepal. Features such as mobile accessibility, robust data encryption, and user-friendly interfaces can significantly impact the success of a survey campaign, providing valuable insights that drive informed decision-making.

As various organizations across Nepal navigate the intricacies of their respective sectors, be it governmental bodies, small businesses, or educational institutions, the quality of their decisions will be closely tied to the quality of the data they collect. Thus, selecting the right survey system is not just a technical requirement but a strategic imperative for organizations seeking to stay responsive to the needs of Nepal's diverse population and dynamic market conditions.

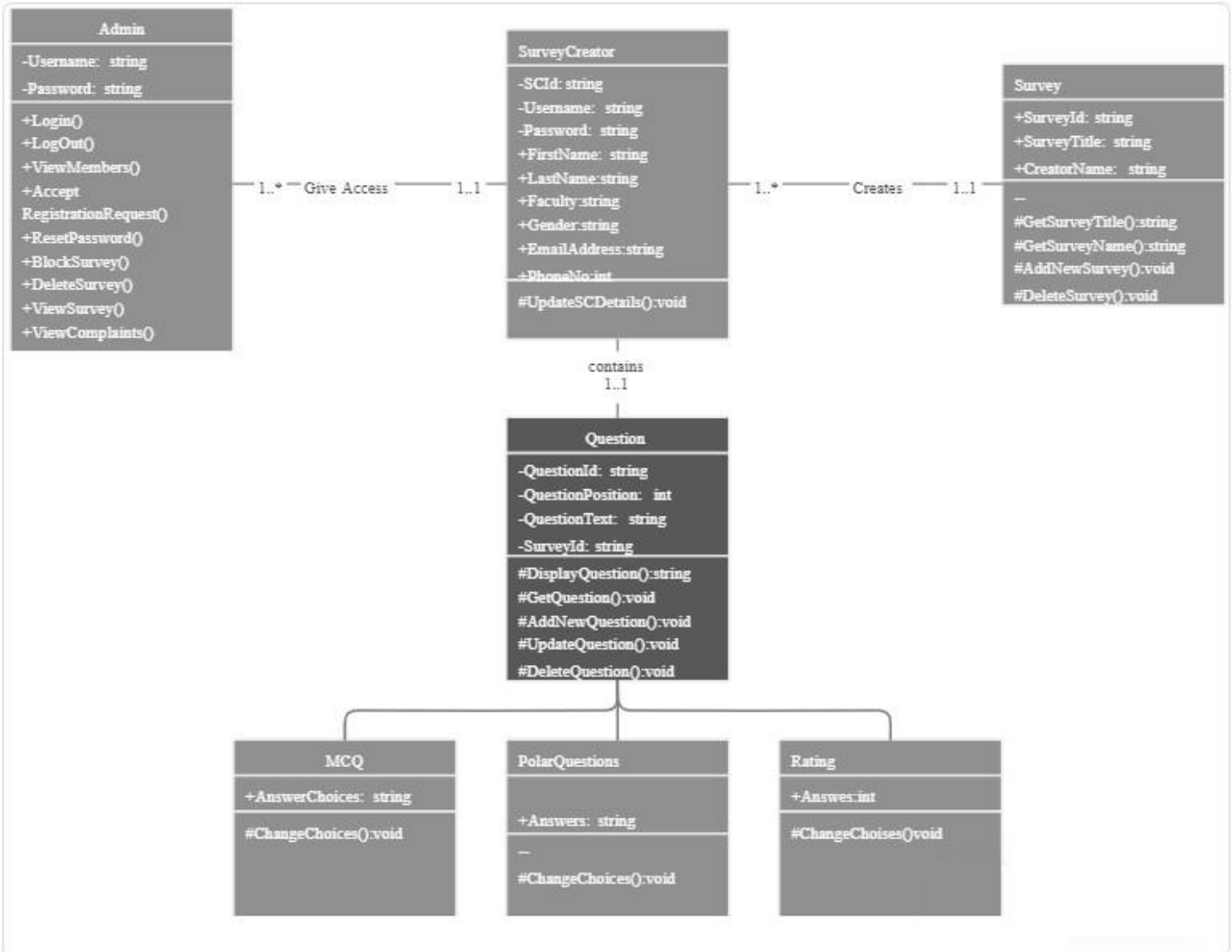
Your task is to assemble a team of experts to develop a simple Survey Management System tailored for the Nepalese context. Using an object-oriented approach, your team must design the primary classes, their subclasses (if applicable), and their respective attributes and methods. Below is a sample class diagram of a survey system customized for Nepal. It includes the following modules (but is not limited to):

1. Admin
2. Survey Creator
3. Survey
4. Question Types
    a. Multiple Choice Questions (MCQ)
    b. Polar Questions (Yes-No, True-False)
    c. Opinion Scale
    d. Likert Scale
    e. Rank Order
    f. Rating
    g. Demographic (e.g., age, gender, income, location, etc.)
    h. Open-ended

Each member must contribute to the design of at least one class or subclass definition. The intended system should maximize the implementation of object-oriented concepts such as instantiation, encapsulation, inheritance, and polymorphism. The data storage method is confined to what is covered in the syllabus, i.e., text and binary files only and does not cover various SQL, network, or cloud storage. You must strictly adhere to this rule. No marks will be awarded to data storage methods that are not within the syllabus coverage.

For a quick start, the following UML class diagram will give you a broad idea of the class relationship. It contains the corresponding attributes and methods for the respective classes. *You may add, remove, or modify any items that you feel are inappropriate*.

Figure 1: Sample Survey UML Class Diagram



Your final design may follow or differ from the recommended structure mentioned above. In addition, you may implement each of the above using suitable UI components available in Java FX / Swing. Rememberto document and justify your UI selection.

The following are the basic specifications for the system (non-exhaustive):

1. Identify the end users of your system: Staff and students from various departments/faculties within Tribhuvan University, Kathmandu University, and other educational institutions in Nepal.
2. Once you have selected the end users, please collaborate with them to determine the detailed survey requirements. They will provide you with the necessary specifications for your system. Specific questions about the survey content should be directed to the end users.
3. Your system should consist of the four main forms: Admin Form, Survey Creator Form, Survey Form, and Questions Form. Additionally, include three sub-forms as specified by the end users, which must include MCQ, Open-ended, and one more question form. Implement these forms using JavaFX/Swing.
4. For security measures, ensure that passwords are securely stored in a binary file, and utilize appropriate encryption algorithms to encrypt the password field.
5. The Admin Form should store admin account information such as Username and Password in an external file named "admin.txt." Admin accounts should have full control over system settings and data management.
6. The Survey Creator Form should include details of the survey designer, including SCId (Survey Creator ID), Username, Password, FirstName, LastName, Faculty, EmailAddress, Gender, PhoneNo, etc.
7. The Survey Form should contain fields for SurveyId, SurveyTitle, SCId, and CreatorName to identify and categorize each survey created within the system.
8. The Question Form should capture question details such as QuestionId, QuestionPosition, QuestionText, SurveyId, etc.
9. Ensure that your system allows for flexibility in the sequence of questions asked, accommodating any types of questions specified by the end users.
10. Consider rewarding group members who contribute significantly to the development of more forms, as per the specifications provided by the end users.

BONUS (Extra credit)

1. Your application has full support for Create, Read, Update and Delete (**CRUD**), i.e., the basic operations of persistent storage.
2. The use of **encryption** to secure the user password is highly desirable.
3. Data is stored in a **serialized** data file.

Follow proper coding style, naming convention, indentation, and comment on the code appropriately. Assessment marks will also take aesthetic (how beautiful system and user interface are) and uniqueness (how your application differs from that of other groups) into consideration.

Part A – Analysis and Design (20%)

Conduct an in-depth analysis, and design of the solution to the problem above. Specifically, you need to provide the followings:

1. Works responsibilities and delegation.
2. Brief documentation of the system together with data and processing steps.
3. Your UML use case and UML class diagrams.
4. Your user interface static prototypes.

Deliverables

A well-structured and properly formatted academic document that contains the detailed specifications for the proposed system, associated solution high level design diagrams, and interface prototype diagrams. Ensure that your submission includes a cover page which shows your group member names and student IDs. All submissions should be in pdf format (ProjectPartA_GroupNo.pdf).

Part 1 Due Date: TBA submit via **mytimes.taylors.edu.my** submission link.

Part B - Development (30%)

Develop the system based on your analysis and design in Part A. Specifically, you need to provide the followings:

1. Java source code of the application (system) including the resource files (pictures etc.).
2. Relevant screenshots to prove adequate testing are done.
3. Your OOP documentation to point out where the OOP concepts are implemented in your application.

Deliverables

Your pdf report along with your zipped application project folder. Ensure that your submission includes a cover page which shows your group member names and student IDs. File names should be named as follow:

"**ProjectPartBReport_GroupNo.pdf**" – The pdf copy of your report

"ProjectPartBProgram_GroupNo.zip" – The application project folder

Part 2 Due Date: TBA submit via **mytimes.taylors.edu.my** submission link.

Presentation (10%)

Present your system identifying all items conforming to the requirements and features that are added to enhance the system. All group members must present and demonstrate parts of the system. Each group member is limited to a 7-minute presentation.

The presentation day is on **week 13 TBA.** Please make sure your group made an appointment to present to the designated instructor who will evaluate your group presentation. **All group members must be present during the presentation.** Submission of presentation is not required.

MARKING SCHEME – PART A

Items	Marks
Works responsibilities and delegation	3
Chosen survey options	1
Data attributes and method	5
UML Use case diagram	2
UML class diagram	4
User Interface static prototype	4
Overall documentation	1
TOTAL	**20**

MARKING SCHEME – PART B

Existence of Admin data	1
Existence of Survey Creator data	1
Existence of Survey data	1
Existence of three types of question banks	3
Working Admin Form	3
Working Survey Creator Form	3
Working Survey Form	3
Working Question Forms	3
Proper variable name, indentation & comments	2
Source code and screenshot of the system	5
Proper submission file organization and documentation	2
Aesthetic	3
TOTAL	**30**

Bonus (max 4 marks)

Items	Marks
1. Implementation of CRUD	**1**
2. Encryption	**1**
3. Serialized data	**2**

Note: Marks are capped at maximum of 30 even if total marks + bonus is greater than 30.

<u>Individual – Presentation</u> (10 marks)

Items	Marks
Professionalism	2
System demonstration	4
Delivery	2
Confidence	2
TOTAL	**10**

MARKING RUBRICS

For EACH criterion of marks allocated, the following rubrics will be applied:

100% of allocated marks	75% of allocated marks	50% of allocated marks	25% allocated marks	0% allocated marks
• Complete understanding of the problem • A plan that could lead to a correct solution with no algorithmic errors. • Correct solution	• Misinterprets minor part of the problem. • Substantially correct solution with minor omission or procedural error	• Misinterprets major part of the problem. • Partially correct solution but with major fault • Computational error, partial solution for problem.	• Completely misinterprets the problem. • Substantially inappropriate solution	• No attempt • No answer or wrong answer based upon an inappropriate solution