BIT205 - Assignment

Due date: 20 December 2021 by 11.59pm

Output: Source Code and Exe Files for CTIS
Test Data for CTIS

Value: 10%

Late Penalty: 5 marks per working day

Type of Assignment: INDIVIDUAL

Expected Learning Outcomes Assessed

CLO1 : Develop solutions to problems demonstrating usage of control structures, modularity, I/O and other standard language constructs (C4, PLO1)
CLO2 :Design object oriented solutions to programming problems demonstrating usage of data abstraction, encapsulation, inheritance, polymorhism (C6, PLO2)
CLO3:Apply templates and built-in C++ standard templates library to solve problems (C3, PLO3)

Problem statement: Covid Testing Information System (CTIS)

There are many Covid-19 test centres that have been set up to manage Covid-19 testing. A Covid Testing Information System (CTIS) is required that to allow the health ministry to keep track of tests that have been performed by the various test centres.

Patients that require testing may be of five types: “returnee”, “quarantined”, “close contact”, “infected”, or “suspected”. Testers at the medical centre will record when the test is administered and the results that are obtained. Patients can log in to the system to check on their results. Testers/Officers can also generate reports of the tests that they have performed.

The use case diagram is shown in Fig. 1.

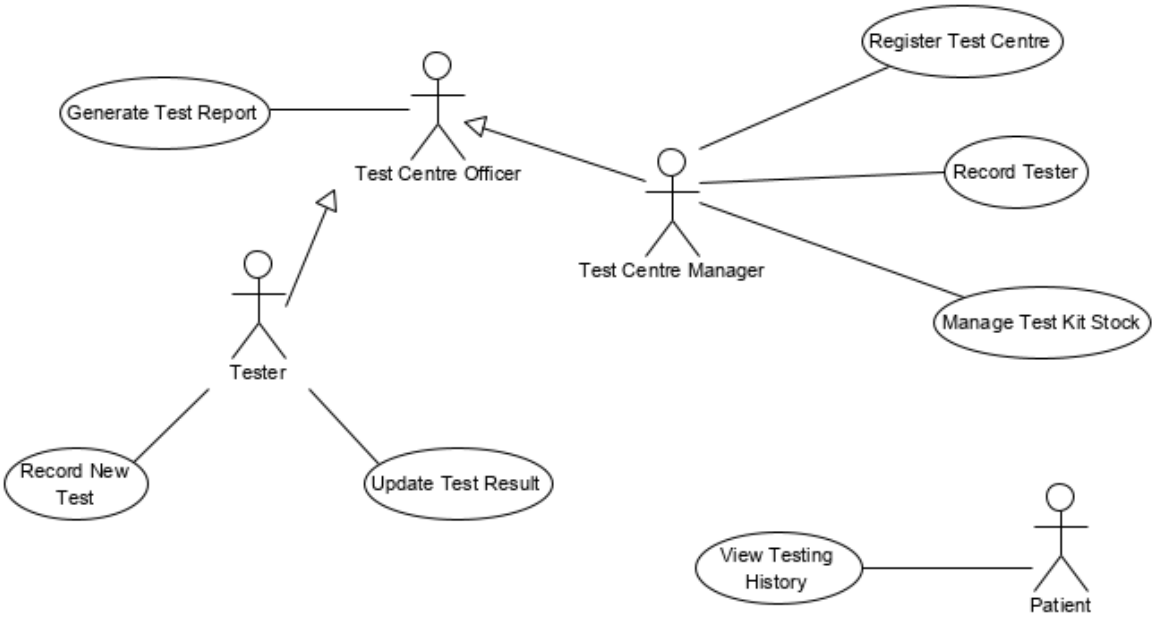

Figure 1: CTIS Use Case Diagram

The class diagram (Figure 2) shows the main information requirements for the system.

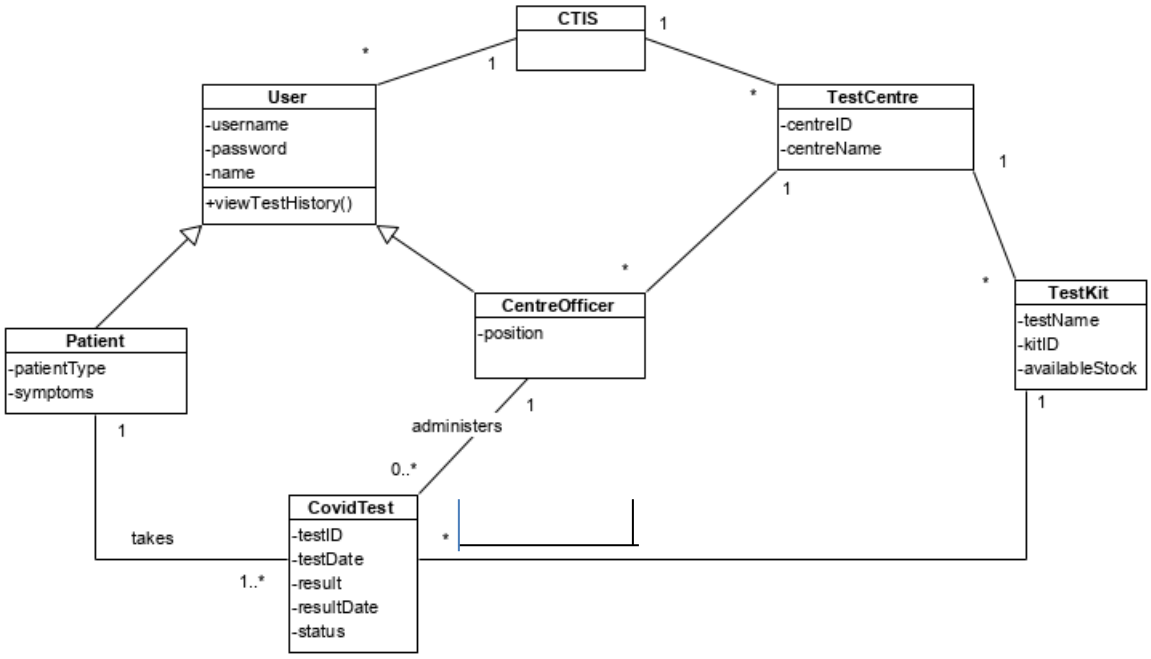

Figure 2: CTIS Class Diagram

Note: The attributes of the classes can be modified to accommodate the implementation/coding.

Fig. 2 indicates two types of users i.e. testers and patients, to be added to the system. There is only one admin per test centre who will be responsible for managing the test centre.

It is your task to decide on the placement, access modifiers and functioning of these and other supporting methods.

Your task is to allow a user of your program to perform the following operations:

1. Add a new user to the CTIS system. A user can either be a **tester** or a **patient**
2. Manage Test Kits Stock– Only the admin can add test kits and edit the information
3. Manage Test Records -The tester can administer the test for the registered patient and update the test information.
4. View History – The admin can generate the test reports, the patient can view history reports.

There are different menus and different logins for the 3 users: admin(test centre manager), tester and patient.

Refer to Appendix A for the detailed description of the use cases.

In completing this assignment, you should carefully consider the design of EACH class. Once you have coded each class, test its functionality completely. Work from the base class up. Make exclusive use of 'getters' and 'setters' to access and alter 'model' attributes. You should consider the need to include overloaded or over-riding methods in the various classes. You will also need to give careful consideration to access modifiers that you use.

You should include comments in your code stating what each block/code does and explaining any complex sections of code. You should of course use meaningful identifier names so that your code is to some extent self-documenting

Submission Requirements:

- Softcopy Submission to **LMS Turnitin** :
  i. Report with cover-sheet stating your student number. NOTE: Do not put your name on the cover-sheet.
  ii. Compiled Word Document of the source code and test data (using a table format)

- Softcopy Submission of (.cpp/.h/.exe) to LMS
  - Source file(s) and the exe file(s) are to be saved as your STUDENT ID, zipped and uploaded to LMS.

TURNITIN Submission	A Final Compiled report to be submitted to LMS Turnitin: by 11.59 PM.
Late Submission	Please fill out the Late Submission Form to be considered for extension. Penalty of 5 marks per working day will be imposed if: • late submission form is not included; • reason for extension is not given; • extension is not granted.
Cover Sheet	Include the Assignment Cover Sheet
Academic Integrity	You are expected to adhere to the Academic Integrity Policy. All referencing and citation should use APA Style (7th Edition preferred). You do not need to submit the similarity report. Turnitin similarity reports will be generated by the lecturer and penalties imposed for similarity exceeding 15%. You may be subject to additional penalties according to the Academic Integrity Policy.

Appendix A: CTIS High Level Use Cases

The use cases are given briefly below:

Use Case Name	Register Test Centre
Actor	Test Centre Manager/Admin
Description	This use case begins when a Test Centre has been approved and the test centre manager's account has been set up as a centre officer. The test centre manager logs in to register the centre's name. The centreID is generated. The test centre is created and recorded for the centre manager.

Use Case Name	Record Tester
Actor	Test Centre Manager
Description	This use case begins when the test centre manager wants to record a new test centre officer with the position 'tester'. The test centre manager records the username, password and name of the officer. The position of the new centre officer is set as "Tester".

Use Case Name	Manage Test Kit Stock
Actor	Test Centre Manager
Description	This use case begins when the test centre manager receives new stock of test kits. The centre manager logs in and is able to manage the stock of test kits for the centre. If it is a new test kit, the test kit name and stock is recorded, and a kitID is generated. If there is existing stock for a given kitID, the stock is updated.

Use Case Name	Record New Test
Actor	Tester
Description	This use case begins when a tester wants to record that a patient has taken a test. If the patient has not taken a test before, the tester records the username, password, name, patient type ("returnee", "quarantined", "close contact", "infected", or "suspected") and symptoms. If the patient has taken a test before, the tester updates the patient type and symptoms only. The date of the test and the testID is generated. The status of the test is "pending".

Use Case Name	Update Test Result
Actor	Tester
Description	This use case begins when a tester wants to update the results of a test. The tester logs in and enters the testID to retrieve the test details. The tester enters the results and the result date is recorded. The status of the test is set to "complete".

Use Case Name	View Testing History
Actor	Patient
Description	This use case begins when a patient wants to view the results of tests. The patient logs in with the username and password and the history of tests that have been taken is shown.

Use Case Name	Generate Test Report
Actor	Test Centre Officer

Description	This use case begins when a test centre officer wants to view a test report. The officer logs in with a username and password. The test history of all tests that have been administered at the centre that the officer is employed at are shown.

Marking Scheme

Student ID : ……..

		Marks	Allocated
Coding style: (CLO3)	Your submission makes effective and correct usage of C++ coding constructs and C++ coding conventions. a) Correct Usage of STL template (2) b) Implementation of polymorphism through virtual (2) c) Usage of separate files (2) d) Comments/Appropriate Variable Names/Indentation (2) e) Parameter Passing (2)	10	
Submission completeness : (CLO1, CLO3)	Completion of all of the requirements that are outlined, deducible or desirable from the problem specification. Appropriate choice of data structure a) User (abstract) (5) b) Patient (5) c) CentreOfficer (5) d) TestKit (5) e) TestCentre (5) f) CovidTest (5)	30	
Program execution: (CLO2, CLO3)	Your system correctly implements all of the tasks that are identifiable. a) Registering Patient (5) b) Registering Tester (5) c) Managing Test Records (add/update) (10) d) Managing Test Kits (add/update) (10) e) View Test History by Patient (5) f) View Test Centre Report (5) g) Appropriate validations (5) h) Menu & Logins for (Admin) (5) i) Menu & Logins for (Patient) (5) j) Menu & Logins for (Tester) (5)	60	
	Late Penalty (-5 mark per day)		
	Not adhering to the Academic Integrity		
	Total marks allocated to this assignment item:	100	