Assignment

Faculty Name:	Information Technology
Module Code:	ITJA211
Module Name:	Programming in Java Semester 1
Module Leader:	Mr Sheunesu Makura
Internal Moderator:	Dr Michael Ajayi
Copy Editor:	Mr Kevin Levy
Total Marks:	100
Submission Date:	16/03/2020 – 20/03/2020

This module is presented on NQF level 6.

Mark deduction of 5% per day will be applied to late submission, up to a maximum of three days. Assignments submitted later than three days after the deadline or not submitted will get 0%. [1]

This is an individual assignment.

This assignment contributes 20% towards the final mark.

Instructions to Student

1. Remember to keep a copy of all submitted assignments.

2. All work must be typed.

3. Please note that you will be evaluated on your writing skills in all your assignments.

4. All work must be submitted through Turnitin[2] and the full Originality Report should be attached to the final assignment. Negative marking will be applied if you are found guilty of plagiarism, poor writing skills or if you have applied incorrect or insufficient referencing.

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[1] Under no circumstances will assignments be accepted for marking after the assignments of other students have been marked and returned to the students.

[2] Refer to the PIHE Policy for Intellectual Property, Copyright and Plagiarism Infringement, which is available on *my*LMS.

(See the table at the end of this document where the application of negative marking is explained.)

5. Each assignment must include a cover page, table of contents and full bibliography, based on the referencing method applicable to your faculty as applied at Pearson Institute of Higher Education.

6. Use the cover sheet template[3] for the assignment; this is available from your lecturer.

7. Students are not allowed to offer their work for sale or to purchase the work of other students. This includes the use of professional assignment writers and websites, such as Essay Box. If this should happen, Pearson Institute of Higher Education reserves the right not to accept future submissions from a student.

Assignment Format

Students must follow the requirements when writing and submitting assignments as follows:

- Use Arial, font size 10.
- Include page numbers.
- Include a title page.
- Print submissions on both sides of the page.
- Write no more than the maximum word limit.
- Ensure any diagrams, screenshots and PowerPoint presentations fit correctly on the page and are referenced.
- Include a table of contents.
- Use the accurate referencing method throughout the assignment.
- Include a bibliography based on the applicable referencing method at the end of the assignment.
- Include the completed Assessment/Project Coversheet (available on *my*LMS).
- Check spelling, grammar and punctuation.
- Run the assignment through Turnitin software.

Essential Embedded Knowledge and Skills Required of Students

- Report-writing skills
- Ability to analyse scenarios/case studies
- Understanding of subject field concepts and definitions
- Ability to apply theoretical knowledge to propose solutions to real-world problems

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[3] Available on *my*LMS.

- Referencing skills

Resource Requirements

- A device with Internet access for research
- A desktop or personal computer for typing assignments
- Access to a library or resource centre
- Prescribed reading resources

Delivery Requirements (evidence to be presented by students)

- A typed assignment[4]
- A Turnitin Originality Report

Minimum Reference Requirements

At least five references for first year, ten references for second year and fifteen references for third year.

Additional reading is required to complete this assignment successfully. You need to include the following additional information sources:

- Printed textbooks/e-books
- Printed/online journal articles
- Academic journals in electronic format accessed via PROQUEST or other databases
- Periodical articles e.g. business magazine articles
- Information or articles from relevant websites
- Other information sources e.g. geographic information (maps), census reports, interviews

Note
- It is crucial that students reference all consulted information sources, by means of in-text referencing and a bibliography, according to the applicable referencing method.   - Negative marking will be applied if a student commits plagiarism i.e. using information from information sources without acknowledgement and reference to the original source.   - In such cases, negative marking, also known as 'penalty scoring', refers to the practice of subtracting marks for insufficient/incorrect referencing.   - Consult the table at the end of this document, which outlines how negative marking will be applied as well as the way in which it will affect the assignment mark.

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[4] Refer to the Conditions of Enrolment for more guidance (available on *my*LMS).

Section A

Learning Objective

The objective is to equip the students with the features of contemporary Java which would enable them to handle complex programs relating to managing data and processes. It will also equip students with the ability to identify and develop advance concepts of Java programming with database connectivity. Concepts of Java programming in relation to text file manipulation and multidimensional arrays will also be enhanced. The major objective of this assignment is to provide a sound foundation to the students on the concepts, precepts and practices, in a field that is of immense concern to the industry and business.

Assignment Topic

GUI and Database Manipulation

Scope

The scope covered in this assignment includes: graphical user interfaces, database connectivity and programming, exceptional handling, control statements and relational operators, and arrays. Resources needed are: the prescribed textbook, a Java IDE and MySQL or XAMMP.

Marking Criteria

Marking will be strictly based on adhering to the questions and method required to program each application.

Instruction

The following question requires the use of Java. Your programs should be well documented.

Save your project as ITJA211_STUDENT_NUMBER_Question number (e.g. ITJA211_XXXX_3).

Study the scenario and complete the question(s) that follow:

> **A Simple Login System**
>
> Emerald Network Solutions (ENS) is a new giant network company that has come to realise the importance of customer service. ENS installed enquiry systems in public areas for use by anyone to contact its call centre agents anytime. The problem with the current system is its security. Anyone can access the system without authentication; hence it is difficult to restrict access to only CNS subscribers. As a Java developer, you have been approached by ENS to design a simple log in interface in Java.
>
> Source: Makura, S.M (2020)

1.1   Name and describe any five benefits of using Java as a programming language in the development of the ENS's login interface.   (10 Marks)

1.2   Design a simple login interface in Java with the following specifications:

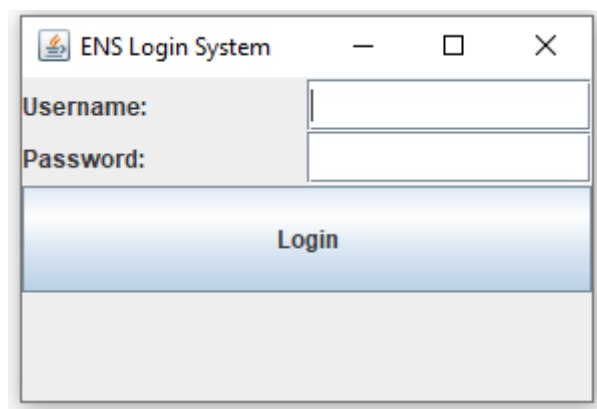   a.   A graphical user interface allowing users to enter username and password. The GUI should look as follows:

Figure 1: GUI for the ENS Login System

   b.   A MySQL database that stores usernames and passwords of ENS subscribers which can be hosted on XAMPP.

   c.   The Java program must connect to the MySQL database and authenticate users.

d. The Java program should only output a message to indicate if user logged in or not. Ensure that the name of the user who has logged in is also displayed. The following should be displayed after a successful login:
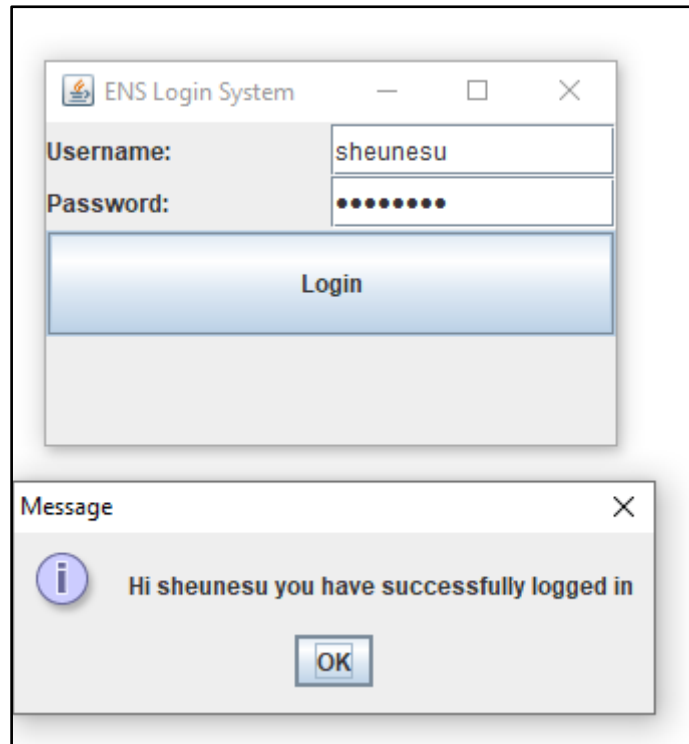

Figure 2- Successful login message

e. Ensure that you include error detection mechanism as well as internal documentation.

(30 Marks)

End of Question 1

Instruction

The following question requires the use of Java. Your programs should be well documented.

Save your project as ITJA211_STUDENT_NUMBER_Question number (e.g. ITJA211_XXXX_3)

Study the scenario and complete the question(s) that follow:

Emerald Network Solutions (ENS) (from Question one) realised there is a need to keep their customer details on their system. This will ensure that if need arise that the call centre agents get hold of customers, they can do so by searching for the customer records on their system.

The ENS technical department have suggested the following interface:

Figure 3- Application Interface when running

Source: Makura, S.M (2020)

Recreate the above interface using a Java Integrated Development Environment (IDE) and add the required functionality to allow a user to add records to a database, search for records in a database and update the records in a database. When implementing the solution, take the following into consideration:

With regards to the application interface:

a. Your application should be called 'ENS Customer Program'.

b. The icon in the titlebar and the picture can be an image of your choice, but **must** be the same image.

c. The interface must make use of the `GridLayout` manager.

d. Each button must have an appropriate tooltip associated with it.

e. The background colour of the panel must be white.

f. The background colour of the frame must be blue.

g. When the user clicks on the 'Add record' button, all of the information entered into the text boxes must be added to the database. Once the record has been added, a message box must be displayed to inform the user of the success of the transaction. This is as shown in the design below:
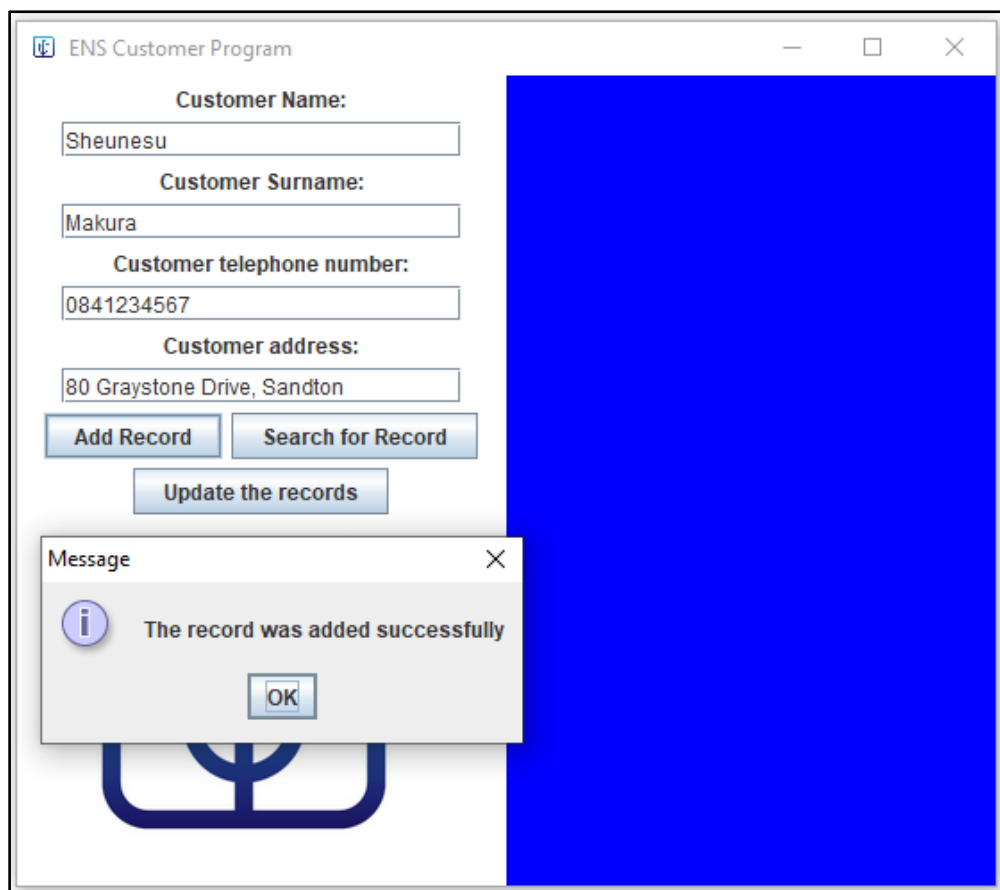

Figure 3 - When a record is successfully added

h. When the user enters the name and surname of a customer and clicks on the 'Search for Record' button, the telephone number and address of that particular customer need to be retrieved from the database and displayed in the appropriate text boxes. Once the record has been retrieved, a message box should inform the user that they can change the values in one of the text boxes and update the record of that employee by clicking on the 'Update the Records' button.
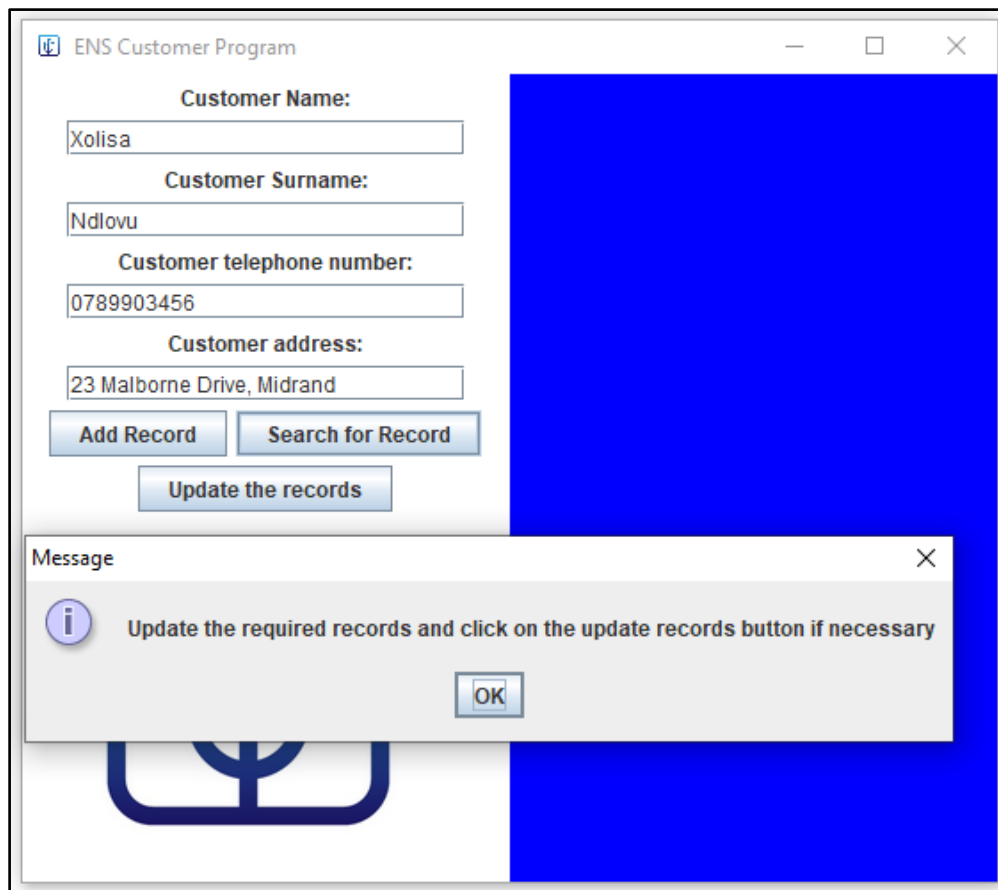

Figure 4- Searching for a record

i.   When the user clicks on the 'Update the Records' button, the details of the particular employee need to be updated in the database. A message box should inform the user if the update has been successful.
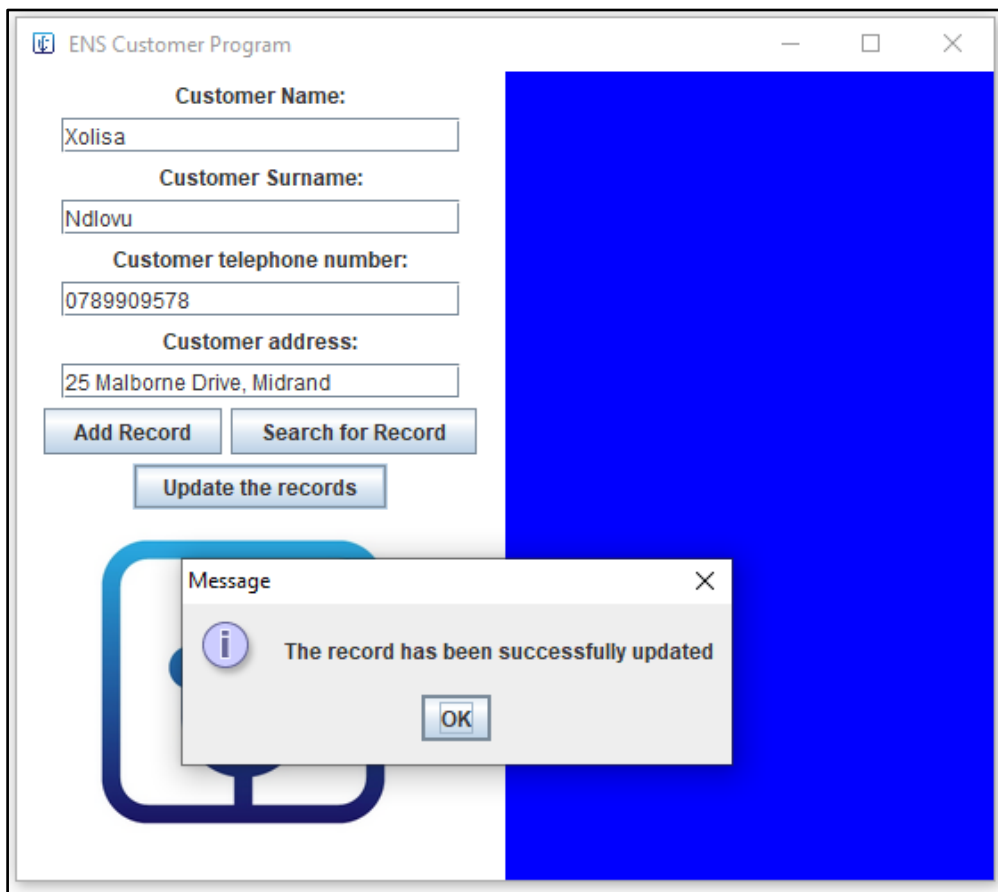

Figure 5- When a record is updated

j.   Ensure that you include comments as part of your code.

With regards to the database:

a.   The database can be created using MySQL Workbench or XAMPP.

b.   When submitting your assignment, make sure that you export the database and submit the **.sql** file.

(60 Marks)

End of Question 2

Section B

Plagiarism and Referencing

Pearson Institute of Higher Education places high importance on honesty in academic work submitted by students, and adopts a policy of zero tolerance on cheating and plagiarism. In academic writing, any source material e.g. journal articles, books, magazines, newspapers, reference material (dictionaries), online resources (websites, electronic journals or online newspaper articles), must be properly acknowledged. Failure to acknowledge such material is considered plagiarism; this is deemed an attempt to mislead and deceive the reader, and is unacceptable.

Pearson Institute of Higher Education adopts a zero tolerance policy on plagiarism, therefore, any submitted assessment that has been plagiarised will be subject to severe penalties. Students who are found guilty of plagiarism may be subject to disciplinary procedures and outcomes may include suspension from the institution or even expulsion. Therefore, students are strongly encouraged to familiarise themselves with referencing techniques for academic work. Students can access the PIHE Guide to Referencing on *my*LMS.