OBJECT ORIENTED PROGRAMMING
(CSC 2510)
INDIVIDUAL PROJECT

Full Name	:	Donovan Jude
Matric No.	:	221023210
Semester	:	June 2023
Submission Date	:	15 October 2023

Marks Allocation		
Introduction (5)	:	
Examples (10)	:	
Advantages/ Disadvantages (10)	:	
Screenshots (3)	:	
Format (2)	:	
TOTAL MARKS	:	/30

Introduction

I have created the Maxis Management System - a Java application that leverages the Swing system for its client interface and utilizes a File-based database framework, fueled by NetBeans Derby, to streamline the administration of broadcast communications bills for the regarded Maxis Broadcast Communications Company.

This strong and user-friendly framework brags a graphical client interface (GUI) outlined for directors, giving them an instinctive and available implies to oversee imperative endorser data and streamline the charging preparation. The heart of this framework lies in its comprehensive highlight set, which incorporates a GUI admin login page for secure get-to-control and a GUI Information Arrange Administration module, where directors can consistently perform operations, such as including, altering, erasing, looking, and clearing information from the database.

The Maxis Administration System's Information Arrange Administration module permits chairmen to include significant subtle elements for each endorser, counting Client ID, title, sexual orientation, web arrange, arrange a date, and arrange expiry date. These subtle elements are safely put away inside the NetBeans Derby database, guaranteeing information keenness and security. What sets this framework separated is its consistent integration of this put away endorser information into the charging handle.

The Charging page inside the framework gives a devoted GUI for creating and overseeing broadcast communications bills. Here, chairmen can productively get to the put away endorser information and utilize it to produce exact bills for clients, essentially rearranging and improving the charging prepare.

In pith, the Maxis Administration Framework speaks to a comprehensive and effective arrangement for the broadcast communications industry. Through its integration of Swing-based GUI, a secure database fueled by NetBeans Derby, and the capacity to oversee and utilize endorser information for charging, it presents an priceless instrument for Maxis Broadcast communications in streamlining their operations and giving top-tier administrations to their clients.

Objectives

The main goal of the project is to make it easier for the system administrator to handle client information. This means being able to make new records for customers, change customer information already in the system, remove customer records when needed, and find information about clients. These abilities are very important to keep a correct and current list of customers. The project revolves around managing customer data effectively. This helps to make sure that the system works well as a trustworthy place to store important information about clients.

Along with managing customer information, the project also focuses on improving the monthly billing system to make it easier and faster for customers. The goal is to make less mistakes and save time by giving the administrator a special page for billing. They can put in the right information to make correct bills each month. This information usually includes details about the customer's internet plan, when it starts and ends, and other important usage data. The computer system is being used to make the billing process more accurate and efficient.

Additionally, the project aims to keep very detailed records. The system stores all the information about customers and their bills. This goal helps keep a thorough and organized record of customer communications. These records are very important for keeping track of and solving problems and disagreements, which helps improve customer service and make customers happier.

Finally, scalability is a very important thing to think about in the project's design. The system can grow bigger and handle more customers and data as more people start using it. Being able to adjust to changing needs is very important for Maxis Telecommunications as they keep expanding and offering more services. The project can continue to be useful for a long time and can adapt to the company's growth and changing needs.

In short, the "Maxis Management System" project is a complete solution that aims to improve how customer information is handled, make billing processes more efficient, keep detailed records, and adjust to the evolving needs of Maxis Telecommunications. These goals help the telecommunications company to work better, make fewer mistakes, keep things private, and make customers happier.

Methodology

a. Software and Hardware Requirements

Software

1. NetBeans IDE 20: NetBeans is an integrated development environment that provides a convenient and feature-rich platform for creating Java applications. In this project, NetBeans IDE version 20 served as the primary development environment. It played a crucial role in managing the application's source code, user interface design, and database connections.

2. Java Development Kit (JDK) 20: The JDK is an essential component for Java development, providing the tools and libraries needed for writing, compiling, and running Java applications. In this project, JDK version 20 was employed to ensure compatibility with NetBeans IDE 20 and to leverage the latest features and capabilities offered by Java.

3. Derby Database (Java DB) 10.16.1: Derby is a lightweight, open-source relational database management system that seamlessly integrates with Java applications. You utilized Derby Database version 10.16.1 as the database system for storing and managing customer data, internet plans, and billing information within the "Maxis Management System.

Hardware Requirements

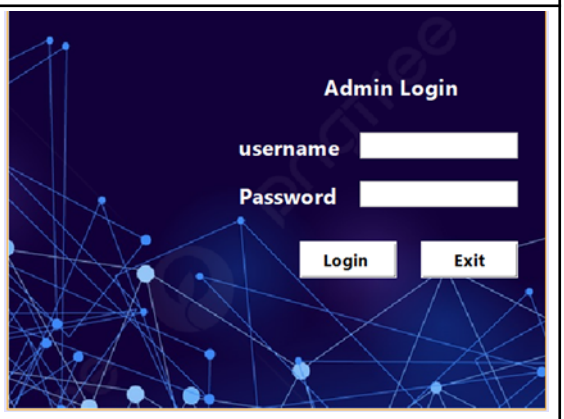
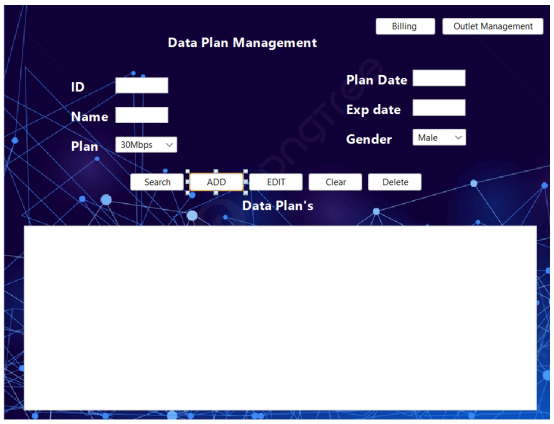
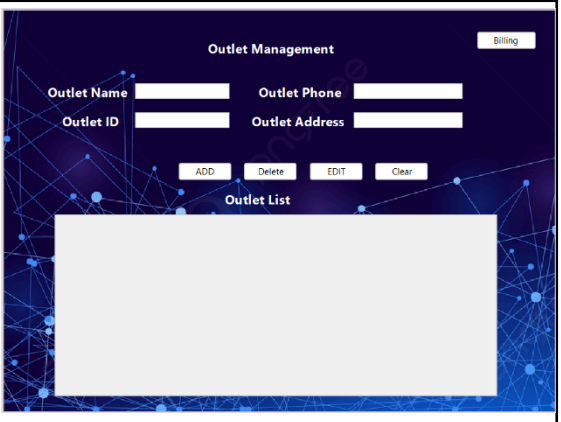
1. To create and use Java programs with NetBeans, you need a regular computer or workstation. This could be a computer that is a desktop or a laptop and uses an operating system like Windows, Linux, or macOS.

2. To run Java applications smoothly, it is best to have both a modern processor with multiple cores, like Intel Core i5 or a similar one, and at least 4GB of RAM.

3. Make sure you have enough space on your computer to store the NetBeans IDE, Java JDK 8, Derby Database 10. 161, and your project files. The amount of space needed can change depending on how big the project is and what resources it needs.

b. **UML Class diagram**

c. Interfaces diagram

Page Title	Image
Login page	
Staff Directory	
Outlet Management	

Billing	

d. Implementation Procedures

Requirements Gathering:

a. Define the project's requirements, encompassing the functionalities needed for customer data management and billing.

b. Specify the essential user interface design elements for admin login, data plan management, and billing pages.

c. Establish performance requirements, ensuring the system's efficiency and responsiveness.

Design:

a. Create a comprehensive design plan for the "Maxis Management System," outlining the user interface layout for admin login, data plan management, and billing pages.

b. Develop algorithms and logic for critical features, such as user authentication, data plan management, and billing calculations.

c. Design the data structures and database schema for storing customer information and billing records.

Implementation:

a. Write the application code for the "Maxis Management System," including the functionalities for admin login, data plan management, and billing.

b. Implement user authentication mechanisms to ensure secure access for administrators.

c. Develop code to interact with the Derby Database, enabling data insertion, updating, deletion, and retrieval.

Testing Procedures

Testing:

a. Perform rigorous testing to validate that the system functions as intended.

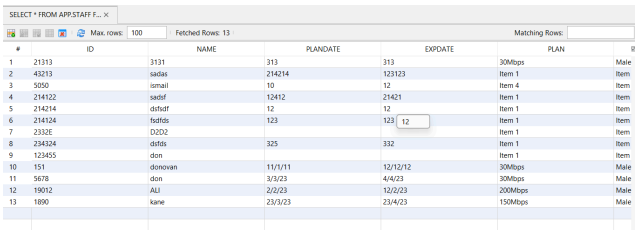
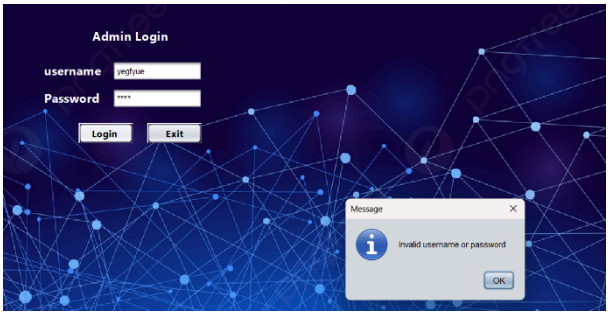
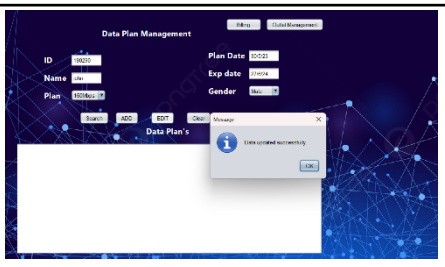
b. Conduct unit testing to confirm the correctness of individual components and functions.

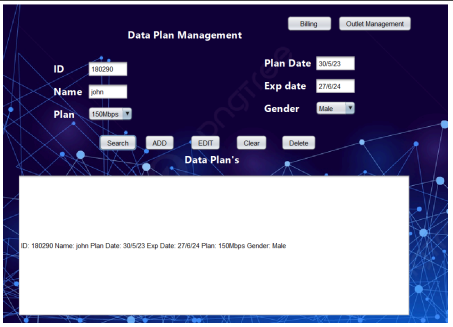
c. Execute functional testing to verify the proper operation of features, including customer data management and billing processes.

d. Perform boundary testing to assess the system's behavior under extreme conditions, such as handling outlier data values.

Results and analysis

a. Test with various inputs

Testing	Images of test output
Inputs inserted into database	
Output if the login password doesn't match the database predefined password. **Username: Don** **Password: 123**	
Adding data into the database	
Editing data into the database	

Searching data into the database	

b. Discussion about limitation, significant operation, runtime performance.

One important problem is that there is no button to print bills from the database. This is because there wasn't enough time to create it. The system does not have automatic page removal when navigating, so users need to close the pages themselves. The "Clear" button only gets rid of the text in the text area, so you have to manually delete the data from the text fields.

On the other hand, important functions in the system include simplified management of data plans, quick generation of bills, and a secure login for administrators. These actions make the information more correct, increase the speed of billing, and protect the information from being accessed by unauthorized people.

The system works well and quickly, and the user interface is easy to use. Although there are some restrictions, like deleting data manually and managing pages, effective resource management ensures that everything runs smoothly.

In simple terms, the "Maxis Management System" has both limits and important operational features. Print functionality may be limited, as well as getting rid of pages and deleting data. However, important tasks improve the way data is managed and billed. The speed of operations is usually good, even though some things need to be done manually. Fixing these problems can make the system easier to use and work better.

Conclusion

In conclusion, Creating the "Maxis Management System" has been a valuable opportunity to learn. One important thing I learned from this project is how to make and handle a database using Derby Database. Although the journey was difficult, it had many moments of finding and understanding new things. The text means that it helped people to understand how to manage databases, design their structure, and retrieve data in an efficient way.

Additionally, this project helped me improve my coding skills and introduced me to new code, which made me better at solving problems. I had difficult coding tasks that helped me get better at programming.

Yes, the project needed a lot of commitment and effort, which sometimes caused nights without sleep. But it made the idea stronger that being determined and wanting to learn are important in software development. In summary, the "Maxis Management System" project has not only helped me improve my technical skills but also showed me how important it is to keep trying in order to succeed.

References

1. https://www.javatpoint.com/java-oops-concepts
2. https://www.youtube.com/watch?v=cOAU3fZLe5U
3. https://www.youtube.com/watch?v=3Ctb5G1oDDY&t=4360s
4. https://www.youtube.com/watch?v=b3JrNm-9vgg&t=126s
5. https://www.w3schools.com/java/java_encapsulation.asp