ITSE322 Assignment

Report Assignment: Java Language Features and Applications

For this assignment, you must write a report (10 pages maximum) that covers the following key topics in Java:

1- Object-Oriented Programming (OOP) Main Concepts
   - Discuss the core OOP principles such as encapsulation, abstraction, inheritance, and polymorphism.
   - Provide examples of how these concepts are implemented in Java.
   - Explain the advantages of using an OOP approach in Java development.
2- Threading in Java
   - Describe the purpose and benefits of multithreading in Java applications.
   - Explain the different ways to create and manage threads in Java, such as extending the Thread class or implementing the Runnable interface.
   - Discuss common threading concepts like thread synchronization, deadlocks, and race conditions, and how to handle them.
   - Give examples of real-world Java applications that utilize multithreading effectively.

3- GUI and Client-Server Applications
   - Outline the key Java GUI frameworks, such as Swing and JavaFX, and their features.
   - Demonstrate your understanding of building interactive graphical user interfaces in Java.
   - Describe the architecture and components of a typical client-server application in Java.

- Provide an example of a Java-based client-server system and explain how the client and server components interact.

4- Database Connectivity in Java
- Discuss the importance of database integration in Java applications.
- Explain the JDBC (Java Database Connectivity) API and how it enables Java programs to interact with databases.
- Demonstrate your knowledge of executing SQL queries, managing database connections, and handling result sets in Java.
- Give an example of a Java application that connects to a database and performs CRUD (Create, Read, Update, Delete) operations.

For each topic, ensure to provide clear explanations, relevant code examples, and references to support your discussion. The report should be well-structured, with an introduction, detailed sections for each topic, and a conclusion.

Note:

- Using ChatGPT is not permitted.
- Report should be submitted through Classhub in PDF format (any other form will not be accepted)
- For any attempt to copy from the internet or from other students, you will get zero.
- Deadline: 15/7/2024