ABSTRACT

In today's digital age, efficient data management plays a vital role in streamlining both personal and professional activities. The project titled "Design and Development of a Phone Book Management System Using JDBC with CRUD Functionality" aims to deliver a structured, user-friendly, and persistent solution for managing personal contact details. Developed using Java for the front-end and JDBC (Java Database Connectivity) for backend integration, the system connects seamlessly to a MySQL database, enabling secure and efficient storage, retrieval, modification, and deletion of contact records.

The system follows a modular and layered architectural design, separating the presentation layer, business logic, and data access layers to enhance scalability and maintainability. At its core, the application implements CRUD (Create, Read, Update, Delete) operations through SQL queries executed via JDBC. Key implementation considerations include robust exception handling, comprehensive input validation, and effective transaction management to maintain data integrity and ensure reliable system behavior.

The development involves establishing a JDBC connection between the Java application and the MySQL database. The database schema is designed for optimal performance, supporting structured storage and efficient indexing of fields such as contact name, phone number, email, and address. The system is designed to handle concurrent operations safely using proper locking mechanisms, while performance is optimized using JDBC drivers and connection pooling.

Functionally, the system enables users to add new contacts, view existing entries, modify contact details, and delete obsolete or incorrect records. It also optionally supports advanced features such as search (by name or number), sorting, and data export. To ensure security, all database interactions use prepared statements, protecting the system from SQL injection attacks. The system adheres to object-oriented programming principles, using classes and objects to represent and manage contact data effectively.

Introduction

In the modern digital landscape, the need for organized and efficient contact management has become increasingly important. Managing contact details manually is both time-consuming and error-prone. To address this issue, the **Phone Book Management System** is developed as a Java-based application using **JDBC** to interface with a **MySQL** database. This project provides a reliable and secure way to store, retrieve, update, and delete contact information.

The system is intended to simplify contact management through an easy-to-use interface that supports core CRUD operations and additional functionalities like search and sort. By adopting a modular and layered architecture, the system promotes better maintainability, scalability, and separation of concerns. This application serves as a foundational example of using Java and database connectivity for real-world utility software.

System Requirements

Hardware Requirements:

Component	Minimum Requirement
Processor	Intel Core i3 or higher
RAM	4 GB (8 GB recommended)
Hard Disk	250 GB HDD or SSD
Monitor	15" Color Monitor
Keyboard & Mouse	Standard
Internet	Required for downloading dependencies

Software Requirements

Software	Version / Details
Operating System	Windows 10 / Linux / macOS
Java Development Kit (JDK)	JDK 8 or above
Database	MySQL 5.7 or above
JDBC Driver	MySQL JDBC Connector
IDE (optional)	IntelliJ IDEA / Eclipse / NetBeans
Build Tool (optional)	Apache Maven or Gradle

Technology Stack

Programming Language	Java
Backend Connectivity	JDBC (Java Database Connectivity)
Database	MySQL
Development Tools	Eclipse / IntelliJ / NetBeans
Database Tools	MySQL Workbench / phpMyAdmin
Build Tools (optional)	Maven or Gradle
Version Control	Git (with GitHub or GitLab)
UI (optional)	Console-based or Java Swing (GUI)

SYSTEM DESIGN