# Software Documentation

## Title

Data Visualization and Management System

## Introduction of Project Topic

This project focuses on developing a Java-based data visualization and management system integrated with a SQL database. The system aims to provide users with an efficient way to manage, analyze, and visualize data through an interactive user interface.

## Objective and Scope of Project

Objective:  
- To develop a scalable and efficient system for data visualization and management.  
- To enable users to store, retrieve, and manipulate data efficiently.  
- To provide interactive data visualization features.  
  
Scope:  
- Handling large datasets with ease.  
- Providing real-time data updates and reports.  
- Secure user authentication and role-based access.  
- Cloud-based integration for remote data management.

## Frontend and Backend

- Frontend: Java Swing (GUI-based interface for user interaction)  
- Backend: Java (Business Logic) and SQL (Database Management)  
- Database: MySQL/PostgreSQL for structured data storage

## Future Scope and Further Enhancement

- Implement AI/ML features for predictive analytics.  
- Develop a web-based version for better accessibility.  
- Integrate with cloud platforms for remote data access.  
- Mobile application support for on-the-go data management.  
- Enhance security measures with advanced encryption techniques.

## E-R Diagram

(To be designed - Entity-Relationship Diagram will define the relationship between various tables in the database.)

## Database Design

The database consists of multiple tables to handle different aspects of the application. Some of the key tables include:  
- Users Table: Stores user credentials and roles.  
- Data Records Table: Contains records that users can analyze and visualize.  
- Visualization Config Table: Stores user-defined visualization preferences.  
- Audit Log Table: Keeps track of user activities for security and compliance.  
  
This document serves as the primary guide for the development and future scalability of the project.