1. **Introduction**

The EcoTrack system is a user-friendly desktop application designed to facilitate environmental monitoring and reporting for both environmental agencies and citizens. This system aims to empower users to monitor key environmental parameters across various locations, log and review pollution-related data over time, and submit and assess citizen-generated environmental reports. A robust MySQL database is integrated into the system for efficient data storage, retrieval, and management.

1. **Technologies Used**

The EcoTrack system is developed using a combination of established and reliable technologies to ensure robust performance and ease of development:

Programming Language: Java GUI Framework: Java Swing Database: MySQL

Database Connectivity: JDBC (Java Database Connectivity) Development IDE: IntelliJ IDEA / Eclipse

1. **System Modules**

The EcoTrack system is structured into several modules, each designed to perform specific functions and contribute to the overall objective of environmental monitoring and reporting.

* 1. **Add Monitoring Station**

Functionality: Allows for the creation of new entries for environmental monitoring stations. User Role: Authorized users (e.g., administrators of environmental agencies).

Fields: station\_id, station\_name, location

* 1. **View Monitoring Stations**

Functionality: Displays a tabular list of all monitoring stations that have been registered in the system.

User Role: Administrative users.

Output: Presents station\_id, station\_name, and location

* 1. **Insert Environmental Data**

Functionality: Enables the recording of environmental parameters linked to a specific monitoring station.

User Role: Authorized users responsible for data entry. Fields: station\_id, temperature, humidity, air\_quality, date

* 1. **View Environmental Data**

Functionality: Displays a comprehensive table of all environmental data collected across all stations. User Role: All users with access to environmental data, including administrators and citizens.

Output: station\_id, temperature, humidity, air\_quality, date

* 1. **Submit Citizen Report**

Functionality: Allows citizens to submit reports regarding environmental concerns or pollution incidents.

User Role: Citizens.

Fields: name, contact info, priority, description, date

* 1. **View Citizen Reports**

Functionality: Presents a list of all citizen-submitted reports. User Role: Administrative users, authorities.

Output: name, contact info, priority, description, date

1. **Key Features**
   1. **User Login System**

The system features a secure login mechanism for both citizens and administrative users. This ensures that only authorized individuals can access specific functionalities and data. User credentials are authenticated against the MySQL database, providing a secure access control mechanism.

* 1. **Environmental Monitoring**

A core feature of EcoTrack is its ability to monitor and input vital environmental parameters such as temperature, humidity, and air quality index data for various locations. This forms the basis for environmental assessment and trend analysis.

* 1. **Data Visualization**

The application presents recorded environmental data in clear and organized tables. This tabular presentation facilitates easy analysis and monitoring of pollution trends, making complex data readily understandable for users.

* 1. **Citizen Reporting**

Empowering citizens to actively participate in environmental protection, this feature allows them to

directly submit pollution concerns through the application. Reports include crucial details like location, priority level, and a descriptive account of the issue.

* 1. **Admin Dashboard**

The administrative dashboard provides a centralized interface for administrators to effectively manage and oversee environmental activities. From this dashboard, admins can view submitted citizen reports, review environmental logs, and initiate necessary actions. The system optionally supports charts for visual data representation and filtering capabilities for refined data analysis.

* 1. **Date-wise Data Logging**

All environmental data and citizen reports are automatically stored with timestamps. This date-wise logging is essential for accurate tracking of events over time and enables comprehensive historical analysis of environmental conditions and reported incidents.