

Email Scanning System

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1. Objective

Develop an Email Scanning System that efficiently scans, manages, and filters emails to detect and block spam or phishing attempts. The system will utilize advanced features and technologies to process emails, store and manage email data, and provide a user-friendly interface for administrators to monitor and configure scanning rules.

2. System Requirements

Hardware Requirements

- Standard PC or laptop

Software Requirements

- Java Development Kit (JDK) 8 or higher
- Eclipse IDE
- MySQL Database
- JDBC Driver for MySQL

3. System Architecture

Overview

The Email Scanning System follows a desktop application architecture with Swing for the user interface and JDBC for database connectivity.

Components

- Frontend: Java Swing
- Backend: JDBC for database interaction
- Database: MySQL

Data Flow

- User interacts with the Swing frontend.
- Requests are processed by the Java backend.
- Backend communicates with MySQL database for CRUD operations.
- The frontend updates the User Interface based on the response from the backend.

4. Features

Employee Management

- Add, view, update, delete employee records

5. Technical Specifications

Frontend (Java Swing)

- Swing components for UI design
- Event-driven programming model

Backend (Java JDBC)

- JDBC API for database connectivity
- Prepared statements for SQL queries

Database (MySQL)

- **Tables:**
 - email_logs
 - email_scans
 - logs
 - rules

6. Database Design

Tables

- **email_logs**
 - id (Primary Key)
 - log_entry
 - log_time
- **email_scans**
 - id (Primary Key)
 - email_content
 - suspicious_percentage
 - scan_timestamp
- **logs**
 - id (Primary Key)
 - log_entry
 - timestamp
- **rules**
 - id (Primary Key)
 - rule

7. User Interface

Screens

- Main Dashboard: Buttons for Scanning Email Content, Manage rules, View Logs, Export Logs, Generate Reports.
- Manage Rules Frame: Field to enter rules.
- View Logs: Field to view logs.
- Export: Field to export logs in desired format.
- Generate Reports: Chart displaying suspicious percentage by emails.

8. Installation and Setup

Steps

- Download and install Eclipse IDE.
- Clone the Java project repository.
- Import the project into Eclipse.
- Set up MySQL database and import the schema.
- Update database credentials in the Java code.
- Compile and run the `EmailScannerApp.java` file in Eclipse.

9. Future Enhancements

- Implement more sophisticated scanning algorithms to detect spam, phishing, and malware.
- Optimize database queries and indexing for faster data retrieval.
- Develop a more user-friendly web interface with real-time updates and interactive dashboards.
- Integrate with external services like email providers (e.g., Gmail, Outlook) for seamless scanning.
- Use AI to provide predictive analytics and threat detection.

10. Execution Screenshots

Main Dashboard:

Email Scanner Application

Manage Rules

View Logs

Generate Report

Export Logs

Email Content

Scan

Logs

Email Content:

Email Scanner Application

Manage Rules

View Logs

Generate Report

Export Logs

Email Content

Subject: Urgent: Verify Your Account to Avoid Suspension

Dear Valued Customer,

We noticed some unusual activity in your account and we need you to verify your information to protect your account from unauthorized access. Please take a moment to update your information by clicking the link below:

Verify Your Account

Failure to verify your account within the next 24 hours will result in a temporary suspension of your account to protect your information.

What to do next:

Click the verification link above.
Log in using your credentials.
Follow the on-screen instructions to complete the verification process.
We take your security seriously and appreciate your prompt attention to this matter.

Thank you for your cooperation.

Sincerely,
Security Team
[Edubot]

Scan

Logs

Scanned email with suspicious percentage: 36.363636363637%

Manage Rules:

The screenshot displays the 'Email Scanner Application' window. At the top, there are four buttons: 'Manage Rules', 'View Logs', 'Generate Report', and 'Export Logs'. The 'Email Content' section shows a phishing email with a subject line 'Subject: Urgent: Verify Your Account to Avoid Suspension'. The email body contains a message from the 'Security Team [Edubot]' asking the user to verify their account. A 'Manage Rules' dialog box is open in the center, listing rules: 'Password', 'password', 'Urgent', 'urgent', 'Lottery', 'Suspension', 'Click Me', 'Clicking', 'clicking', 'link', and 'Link'. A 'Save' button is at the bottom of the dialog. A 'Scan' button is located at the bottom right of the application window. The 'Logs' section at the bottom shows a message: 'Scanned email with suspicious percentage: 36.363636363637%'.

Log of email content:

This screenshot shows the same 'Email Scanner Application' window as before, but with the 'View Logs' dialog box open. The dialog box displays the log entry: 'Scanned email with suspicious percentage: 36.363636363637%'. The background email content and the 'Scan' button remain visible. The 'Logs' section at the bottom of the application window also shows the same log entry.

View Logs:

Email Scanner Application

Manage Rules

View Logs

Generate Report

Export Logs

Email Content

View Logs

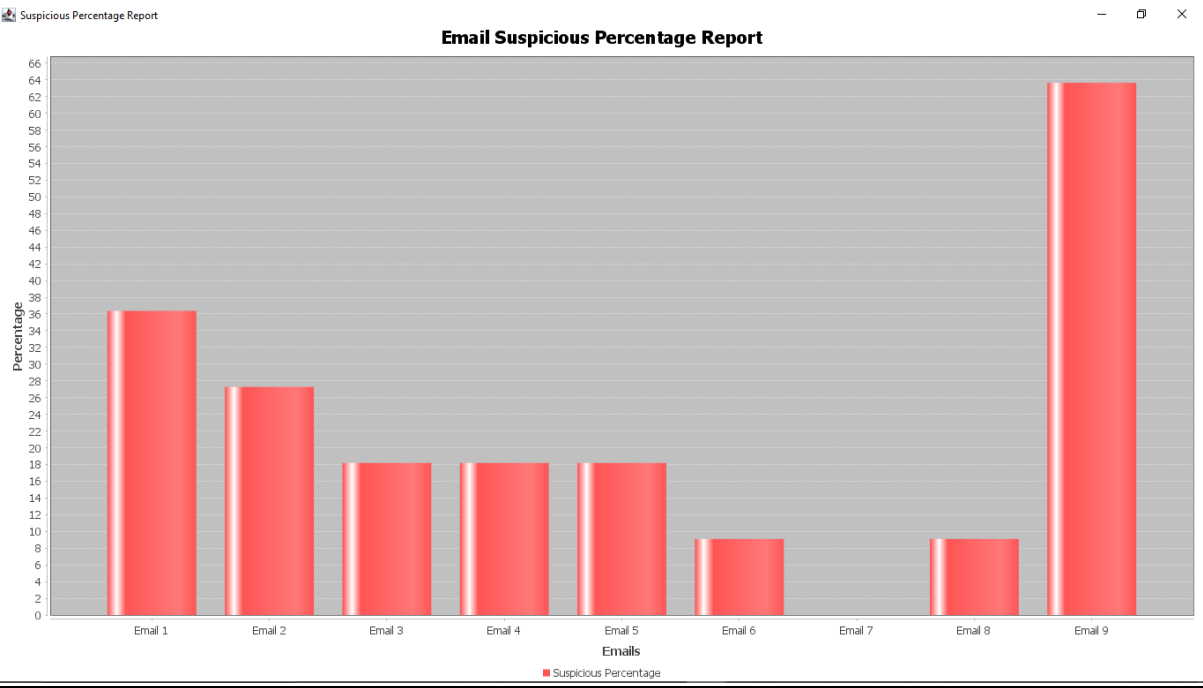
Scanned email with suspicious percentage: 36.363636363637%
Scanned email with suspicious percentage: 27.272727272727%
Scanned email with suspicious percentage: 18.1818181818183%
Scanned email with suspicious percentage: 18.1818181818183%
Scanned email with suspicious percentage: 18.1818181818183%
Scanned email with suspicious percentage: 9.0909090909092%
Scanned email with suspicious percentage: 0.0%
Scanned email with suspicious percentage: 9.0909090909092%
Scanned email with suspicious percentage: 63.636363636363%

Scan

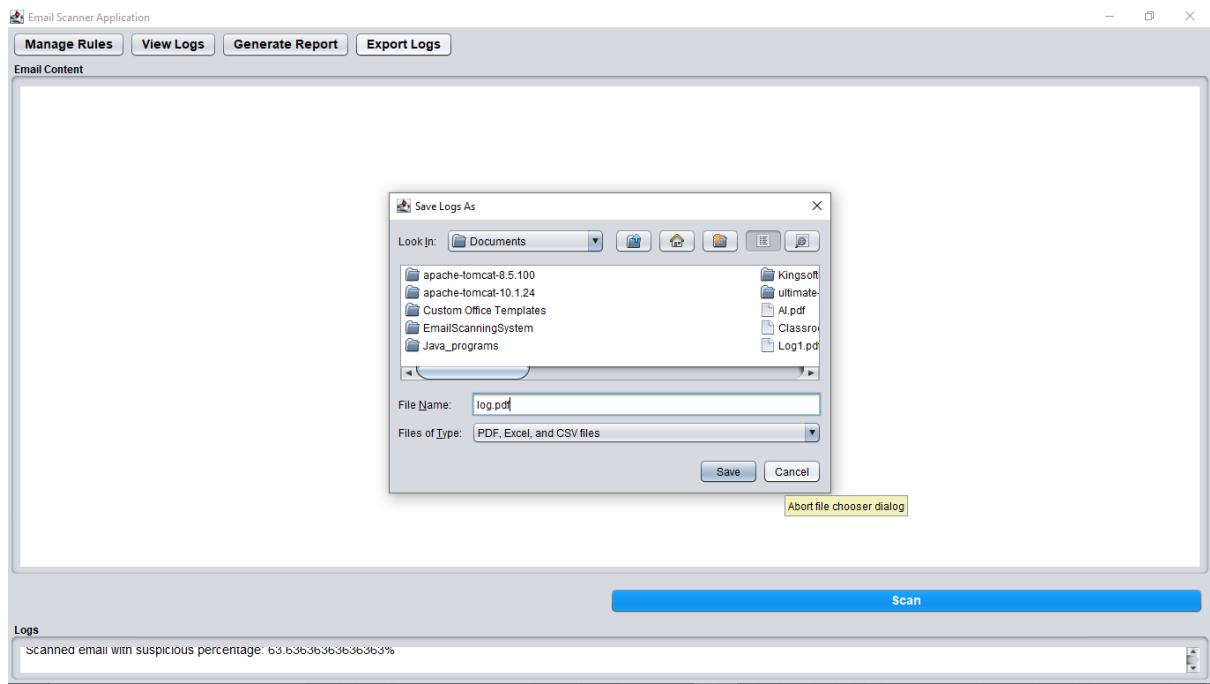
Logs

Scanned email with suspicious percentage: 63.636363636363%

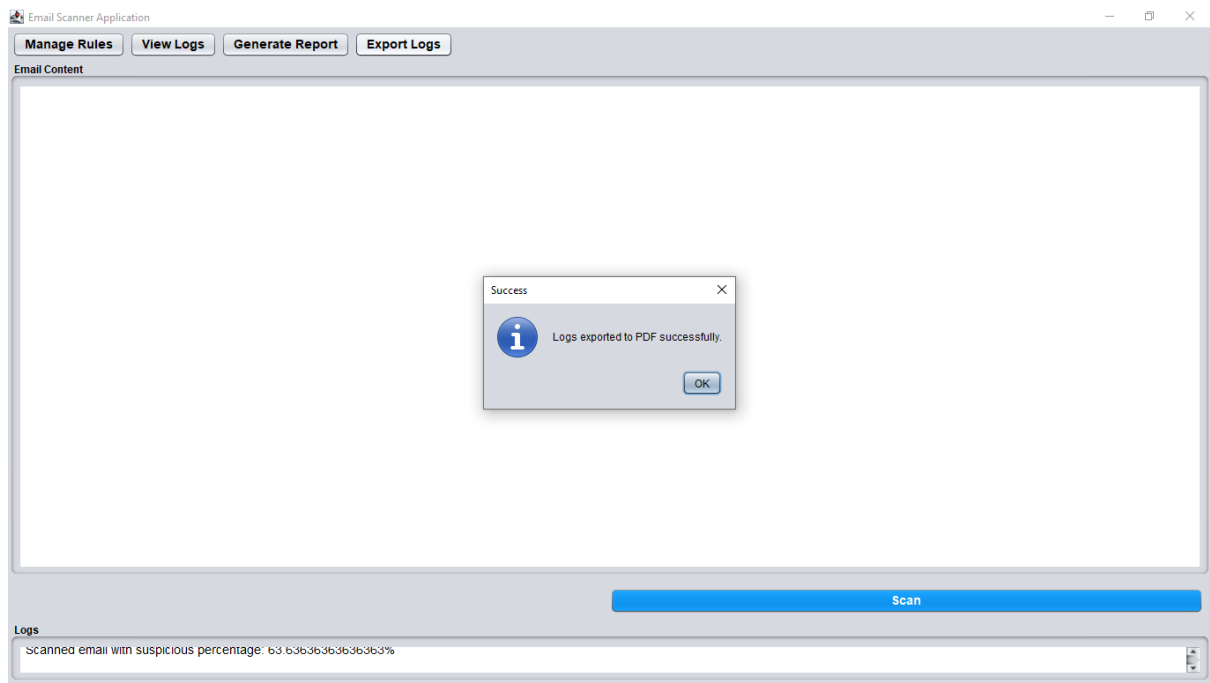
Email Suspicious Percentage Report:



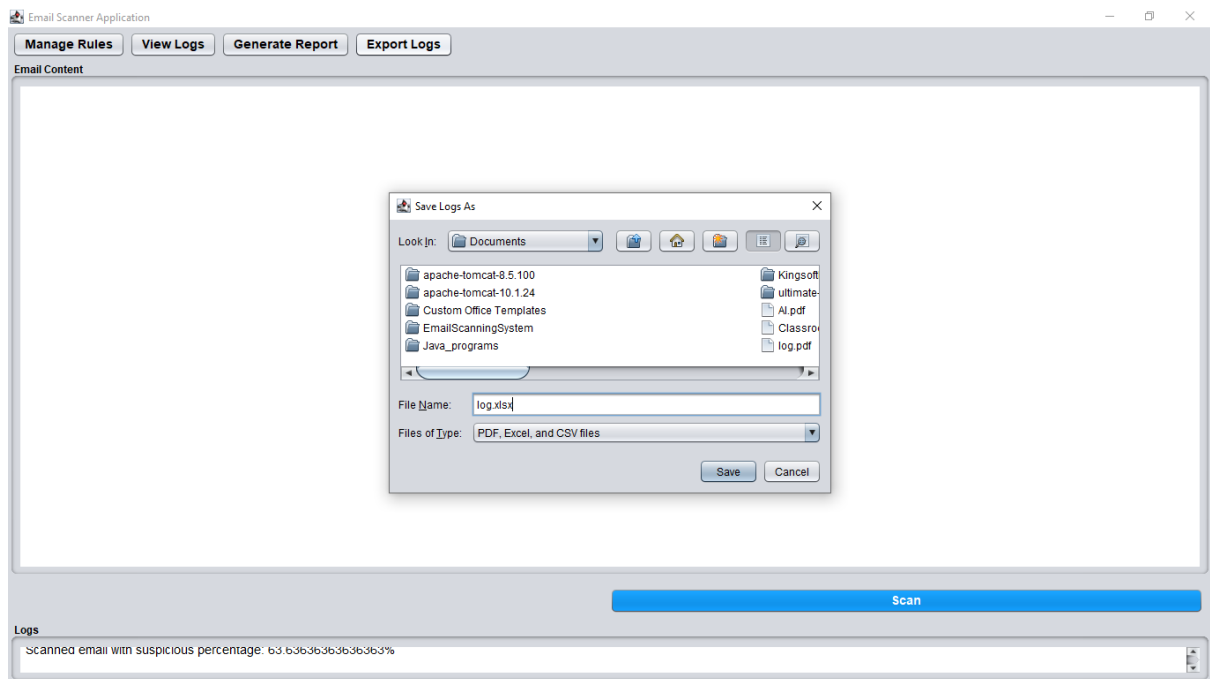
Export as PDF:



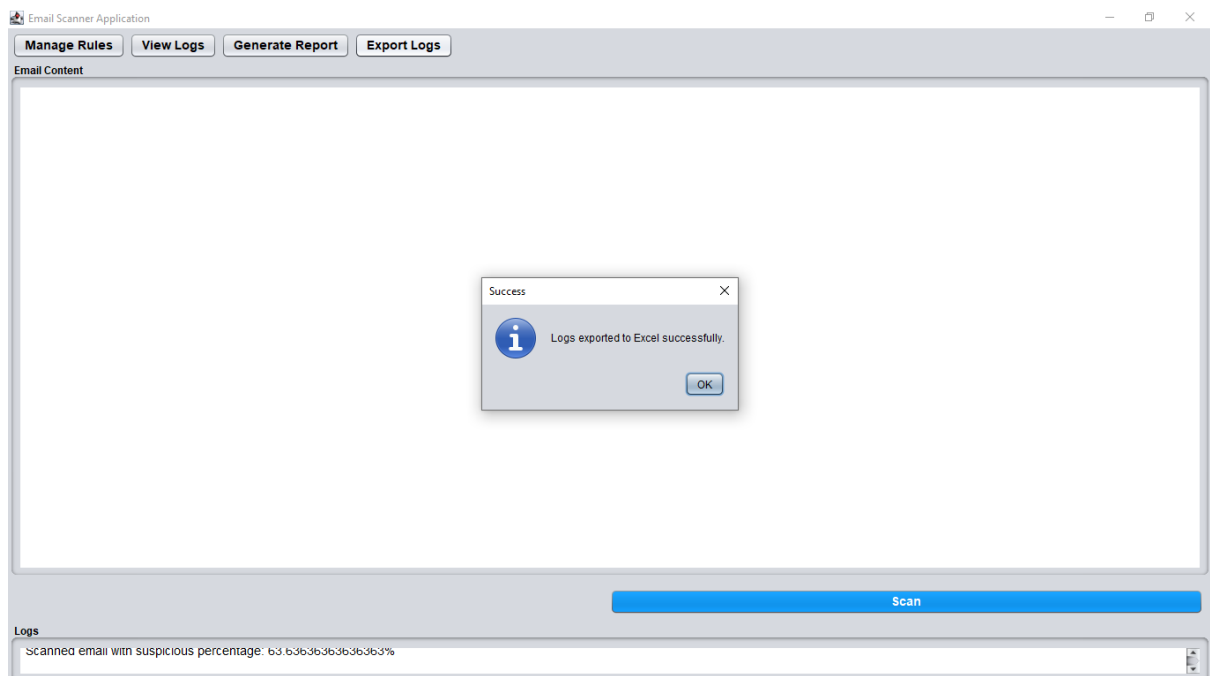
Export as PDF Success:



Export as Excel:



Export as Excel Success:



11. Conclusion

The Email Scanning System offers a comprehensive solution for managing and filtering email communications using Java, Swing GUI and JDBC. It ensures efficient email sorting, spam detection, and threat prevention. Future enhancements will focus on improving accuracy, expanding feature sets, and integrating with various email clients to provide a more secure and user-friendly experience.

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