AUTOMATED ACADEMIC QUERY MANAGEMENT SYSTEM USING RULE BASED SYSTEM

CONTENTS

SYNOPSIS

The Automated Academic Query Management System is designed to streamline and enhance the management of academic queries within educational institutions. The system leverages Java Swing for its graphical user interface, allowing users to interact with the application through an intuitive and user-friendly interface. The Java Database Connectivity (JDBC) connector is utilized to facilitate seamless interaction with the underlying database, ensuring efficient data storage, retrieval, and manipulation. Central to this system is the integration of Drools, a powerful business rule management system (BRMS) that provides automated reasoning capabilities. Drools enables the application to process complex academic queries based on predefined rules and conditions, allowing for intelligent responses and recommendations. This capability not only improves the accuracy of the query handling but also reduces the response time, enhancing the overall user experience.

Key features of the system include:

1. User Authentication
2. Query Submission
3. Automated Response Generation
4. Database Management
5. Reporting and Analytics

This project aims to reduce the administrative burden on academic staff, promote self-service for students, and enhance the efficiency of academic query resolution. By incorporating modern technologies such as Java Swing, JDBC, and Drools, the Automated Academic Query Management System stands to significantly improve the academic experience for all stakeholders involved.

CHAPTER 1

INTRODUCTION

1.1 Automated Academic Query Management System

In the rapidly evolving landscape of educational technology, the Automated Academic Query Management System stands out as an innovative initiative aimed at streamlining the management of academic queries within educational institutions. This project represents a significant advancement in the realm of academic administration, offering a centralized solution designed to enhance user engagement and efficiency. By utilizing modern technologies such as Java Swing for the user interface, JDBC for database connectivity, and Drools for automated reasoning, the system seeks to create a reliable platform that empowers students and faculty to resolve academic queries seamlessly. The Automated Academic Query Management System signifies a critical step towards a future where academic information is accessible and efficiently managed, prioritizing user satisfaction and operational excellence.

1.2 Motivation

In today's digital age, the need for efficient query management in academic settings is more critical than ever. The motivation behind the Automated Academic Query Management System stems from the increasing volume of academic queries and the challenges faced by students and faculty in accessing timely and accurate information. Traditional methods of query resolution often fall short in responsiveness and efficiency, leading to frustration and confusion.

The primary goal of this project is to empower users by providing a secure, user-friendly system for submitting and resolving academic queries. By revitalizing the query management process through the integration of technologies like JDBC and Drools, the system aims to enhance user confidence in accessing academic information. Ultimately, the motivation is to leverage cutting-edge technology to facilitate better communication within educational institutions, ensuring that users can efficiently manage their academic inquiries and receive timely responses.

1.3 Problem Statement

The Automated Academic Query Management System aims to address the critical challenges surrounding the management of academic queries, particularly regarding response time and accuracy. Current systems often lack the capability to efficiently handle the growing number of queries, resulting in delays and miscommunications. Students and faculty frequently face difficulties in finding the necessary information, which can hinder their academic progress and engagement. To combat these challenges, the project introduces a comprehensive solution that integrates Java Swing for the user interface, JDBC for seamless database interaction, and Drools for automated reasoning. This system is designed to provide users with an intuitive platform for submitting queries, ensuring that they can easily access the information they need. By implementing advanced technologies, the project aims to enhance the overall experience in academic query management, promoting a more responsive and user-centric approach.

1.4 Objectives

The objectives of the Automated Academic Query Management System are outlined as follows:

1. **Develop an Efficient Query Management System**: The primary aim is to create a centralized platform for managing academic queries, enhancing response times and accuracy.
2. **Integrate Automated Reasoning**: The project seeks to implement Drools to facilitate intelligent processing of academic queries, ensuring users receive accurate responses.
3. **Enhance User Experience**: Through the development of a user-friendly interface using Java Swing, the objective is to simplify the query submission and resolution process.
4. **Utilize Robust Database Management**: By leveraging JDBC, the project aims to ensure efficient handling of academic data, allowing for quick retrieval and updates.
5. **Empower Users**: The goal is to equip students and faculty with the tools necessary to effectively manage their academic inquiries, promoting confidence in the system.

1.5 Scope

The scope of the Automated Academic Query Management System encompasses the comprehensive development of a user-friendly platform for managing academic queries. This initiative aims to address the current shortcomings in academic query resolution by implementing innovative solutions that prioritize efficiency and accessibility. Central to the project's scope is the integration of Java Swing for the user interface, JDBC for database management, and Drools for automated reasoning. This combination ensures that users can seamlessly interact with the system while receiving timely and accurate information regarding their academic queries. Furthermore, the scope extends to the development of a responsive and intuitive interface that facilitates easy navigation and interaction with the query management system. The goal is to create an environment where users can quickly find the information they need and receive prompt responses to their inquiries. Ultimately, the project aims to establish a secure and efficient platform for academic query management that empowers users and enhances their overall experience. By addressing the critical challenges of query resolution, the Automated Academic Query Management System aspires to set new standards for efficiency and user satisfaction in educational institutions.

CHAPTER 2

REQUIREMENT ANALYSIS

2.1 Functional Requirements

User Registration and Login

Description: Users should be able to register by providing essential details such as name, email, and password. After registration, they can log in to access the system for managing academic queries.

Actors: Users (Students, Faculty, Admins).

Precondition: Users must have valid credentials to log in.

Postcondition: Successfully authenticated users can access their dashboard, while admins can view user submissions and manage the system.

Query Submission

Description: Users should be able to submit academic queries through a user-friendly interface, attaching any relevant documents if needed. Each submission will be stored in the system for tracking and management.

Actors: Users (Students, Faculty).

Precondition: Users must be logged in.

Postcondition: Users can view their submitted queries, which will be marked as pending for review.

Admin Query Review

Description: Admins should be able to view submitted queries, respond to them, and either resolve or escalate the query based on its nature.

Actors: Admins.

Precondition: Admins must have access to the admin panel.

Postcondition: Admins can respond to queries, and users will be notified of the resolution or escalation.

Response Storage

Description: All responses from admins to user queries will be stored in a centralized database for future reference and auditing.

Actors: Admins, Users.

Precondition: A database must be set up for storing queries and responses.

Postcondition: Responses are securely stored and accessible for review by both admins and users.

2.2 Non-Functional Requirements

- User Authentication: The system should implement secure login mechanisms to prevent unauthorized access to user accounts.
- Data Integrity: All submitted queries and responses must be stored securely to ensure data integrity and avoid loss or corruption.
- Scalability: The system must be able to scale to handle an increasing number of users and queries without performance degradation.
- Response Time: The system should provide a responsive user experience, with minimal lag during query submission and response retrieval.
- User Interface: The user interface must be intuitive and user-friendly, making it easy for users to register, log in, submit queries, and track responses.
- Reliability: The system must maintain high reliability, with minimal downtime, to ensure users can continuously submit and manage queries.
- Privacy: Personal user information, including credentials and submitted queries, must be handled securely and protected from unauthorized access.

2.3 Hardware Requirements

Minimum: 8 GB RAM, 2 vCPUs, 100 GB SSD (for hosting the backend and database).

Recommended: 16 GB RAM, 4 vCPUs, 250 GB SSD.

User Machines: Any device with modern web browsers (e.g., Google Chrome, Firefox, or Edge) is sufficient for accessing the platform.

Stable Internet Connection: Required for both users and admins.

2.4 Software Requirements

- **Operating System:** Windows, Linux, or macOS for hosting the backend and database.
- **Web Framework-** Java with Spring Boot (for backend development) or other Java frameworks as needed.
- **Database-** MySQL or MongoDB (for storing user queries and responses).
- **Version Control-** Git (for code versioning and collaboration).

2.5 Technology Stack

Frontend:

1. **Swing (JFrame):**
    - Used for creating the Graphical User Interface (GUI) of the desktop application.
    - Provides windows, forms, buttons, labels, and other components for user interactions like submitting queries, logging in, etc.
2. **HTML/CSS for Rich Text Styling (embedded in JFrames):**
    - Basic HTML and CSS can be embedded within `JFrame` components for formatting and styling of messages or labels.
    - Example: Styling a success message with `<html><body>` tags inside a `JLabel` or `JTextPane`.
3. **Java (Swing):**
    - Java's Swing library is the primary toolkit for building desktop applications with forms, buttons, and text inputs.
    - `JFrame`, `JLabel`, `JButton`, `JTextField`, and `JTextArea` are used to capture user input and display responses.

Backend:

1. **Java (Core Java):**
    - The business logic and rule processing for the system are written in Java.
    - User queries and system responses are processed using Java classes, handling the data flow and logic between the frontend (JFrame UI) and the database.
2. **Java (Spring Boot / Java EE for API):**
    - In an alternative approach using web technologies, Spring Boot or Java EE could be utilized to build RESTful APIs for backend logic and HTTP request handling if you migrate to web-based UI in the future.
    - Servlets could be used if sticking to Java EE for handling HTTP requests and user interactions with the backend.

Database:

1. **MySQL:**
    - Relational Database Management System used to store user data, queries, and responses.

    - Tables might include `users` (for authentication), `queries` (for storing user queries), and possibly `rules` (to store automated reasoning rules).
    - JDBC (Java Database Connectivity) is used to connect to the MySQL database and execute SQL queries (insert, update, select).
2. **MongoDB (Optional for NoSQL):**
    - In case of scalability or handling unstructured data, you can use MongoDB to store user submissions and system configurations. It works well if the system needs flexibility in schema and handling large amounts of data.

Automated Reasoning / Rule-Based System:

1. **Drools:**
    - Drools is used as a rule engine for automated decision-making based on predefined rules.
    - Example: Assigning queries to faculty based on expertise, workload, and other constraints.
    - Drools executes rules to automate and prioritize responses to user queries.

Integration & Security:

1. **JWT (JSON Web Token) for User Authentication (if web-based):**
    - In a web-based solution, JWT can be used for user authentication, ensuring secure sessions and interactions between the frontend and backend.
    - RESTful API Integration:
        i. The backend (Java) must provide RESTful APIs to handle data exchange between the frontend (if using HTML/JS-based UI) and the MySQL database.
        ii. API endpoints handle query submissions, faculty assignments, and user authentication.

How These Components Work Together

Frames: Acts as the frontend, allowing users (students, faculty, or administrators) to interact with the system.

- Students can submit queries.
- Admins can configure faculty availability or workload.
- Faculty can view and respond to queries.

MySQL: Stores data related to queries, users, and system configurations.

- Query data is persisted in the database.
- Rules for the reasoning engine can also be stored in the database for easy configuration.

Automated Reasoning Engine: Handles decision-making.

- When a query is submitted, the engine checks the rules and constraints (e.g., faculty expertise, availability) to assign the query to the best-fit faculty.
- Could also be used to prioritize or automate responses based on past data.

CHAPTER 3

SYSTEM ANALYSIS

System Architecture:

This chapter presents a detailed analysis of the system requirements for the Automated Academic Query System. The analysis encompasses hardware and software requirements, environment setup, and the functional and non-functional aspects of the system.

3.1 Environment Setup

The environment setup for the Automated Academic Query System involves the following steps:

1. **Install Java Development Kit (JDK):** Ensure you have the appropriate version of JDK installed for Java development.
   - Run the installer and follow the prompts.
   - Set the `JAVA_HOME` environment variable to the JDK installation directory.
2. Download the **JDBC connector** and add the mysql-connector-java-X.X.X.jar to it in the project repository.
3. **Database Setup:** Install MySQL or MongoDB and configure the database for user queries and login. Open mysql workbench and add table queries

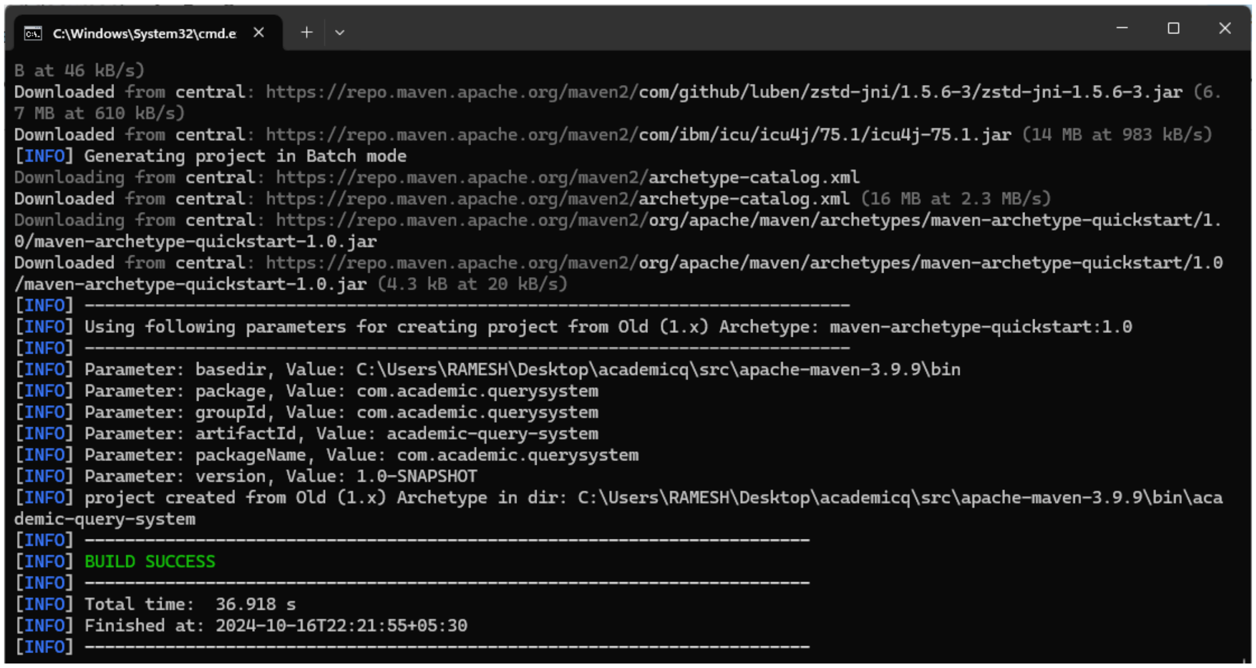
   create database academicq; use academicq; Create table login
4. **Install Development Tools:**
   - IDE (e.g., IntelliJ IDEA or Eclipse) for Java development.
   - Git for version control.
   - Or VS code- and download all the extensions required
5. **Download Maven and Extract the ZIP file**:
   - Visit the official Maven website: https://maven.apache.org/download.cgi.
   - Under **Files**, download the **Binary zip archive** (e.g.,`apache-maven-3.8.8-bin.zip`).
   - Extract the downloaded ZIP file to a folder where you want to install Maven.

Set Up Maven Environment Variables- Set `MAVEN_HOME` Variable:

- In the **Edit Environment Variable** window, click **New**, and add the Maven `bin` directory:

Verify Maven Installation

- Press `Windows + R`, type `cmd`, and hit **Enter**. mvn -v



```
B at 46 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/com/github/luben/zstd-jni/1.5.6-3/zstd-jni-1.5.6-3.jar (6.
7 MB at 610 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/com/ibm/icu/icu4j/75.1/icu4j-75.1.jar (14 MB at 983 kB/s)
[INFO] Generating project in Batch mode
Downloading from central: https://repo.maven.apache.org/maven2/archetype-catalog.xml
Downloaded from central: https://repo.maven.apache.org/maven2/archetype-catalog.xml (16 MB at 2.3 MB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/archetypes/maven-archetype-quickstart/1.
0/maven-archetype-quickstart-1.0.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/archetypes/maven-archetype-quickstart/1.0
/maven-archetype-quickstart-1.0.jar (4.3 kB at 20 kB/s)
[INFO] ----------------------------------------------------------------------------
[INFO] Using following parameters for creating project from Old (1.x) Archetype: maven-archetype-quickstart:1.0
[INFO] ----------------------------------------------------------------------------
[INFO] Parameter: basedir, Value: C:\Users\RAMESH\Desktop\academicq\src\apache-maven-3.9.9\bin
[INFO] Parameter: package, Value: com.academic.querysystem
[INFO] Parameter: groupId, Value: com.academic.querysystem
[INFO] Parameter: artifactId, Value: academic-query-system
[INFO] Parameter: packageName, Value: com.academic.querysystem
[INFO] Parameter: version, Value: 1.0-SNAPSHOT
[INFO] project created from Old (1.x) Archetype in dir: C:\Users\RAMESH\Desktop\academicq\src\apache-maven-3.9.9\bin\aca
demic-query-system
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  36.918 s
[INFO] Finished at: 2024-10-16T22:21:55+05:30
[INFO] ------------------------------------------------------------------------
```

6. **Integrate Maven into Java Project- Create a New Maven Project:**
   - Open the Command Prompt or IDE terminal.

   Maven command to create a new Maven project:

   ```
   mvn archetype:generate -DgroupId=com.academic.querysystem
   -DartifactId=academic-query-system
   -DarchetypeArtifactId=maven-archetype-quickstart
   -DinteractiveMode=false
   ```

7. This will generate a Maven project structure. Navigate to Project Directory and Open the `pom.xml`: You will now see the generated file in the root directory.
8. **Choose an Automated Reasoning Library:**

   Drools: A popular business rule management system (BRMS) that can be used for automated reasoning.

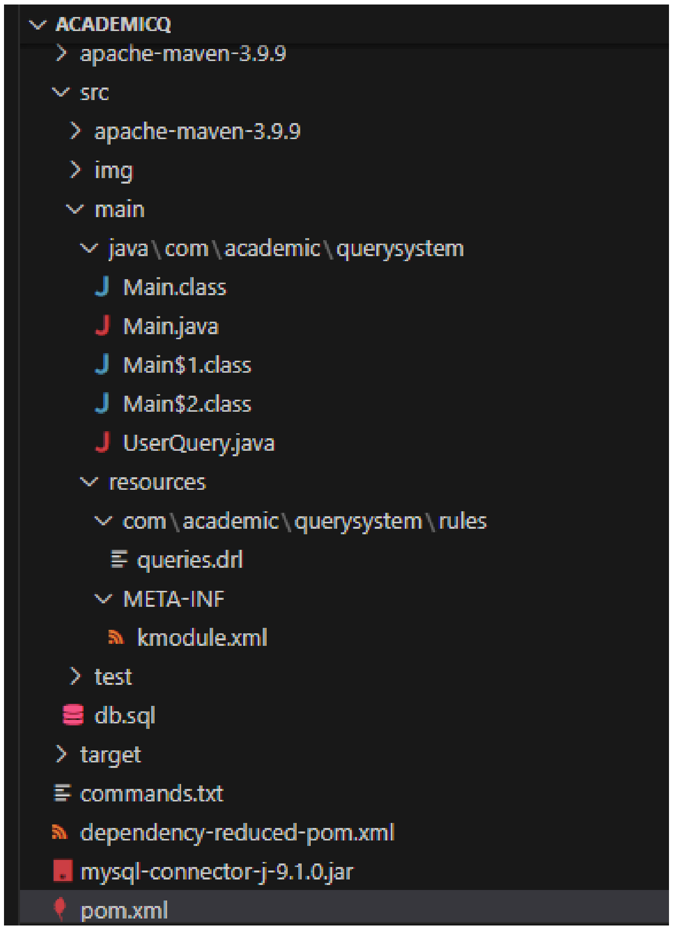
- Download
- Installation: include the required JAR files in the project.
- Add the drool dependencies in the `pom.xml` file.

9. **Create Rules (`.drl`) file**: queries.drl Define rules for query response automation.
10. **Configure `kmodule.xml` (for Rule Session Configuration)**

    Define Drools session configuration in a `kmodule.xml` file. This file should be placed in the `resources` folder.

11. Build and Run the Project

Project Directory structure



```
ACADEMICQ
  > apache-maven-3.9.9
  v src
    > apache-maven-3.9.9
    > img
    v main
      v java \ com \ academic \ querysystem
          Main.class
          Main.java
          Main$1.class
          Main$2.class
          UserQuery.java
      v resources
        v com \ academic \ querysystem \ rules
            queries.drl
        v META-INF
            kmodule.xml
    > test
    db.sql
  > target
  commands.txt
  dependency-reduced-pom.xml
  mysql-connector-j-9.1.0.jar
  pom.xml
```

3.2 Dataset Considerations

The dataset considerations for the Automated Academic Query System are crucial for ensuring effective query handling and response generation. Utilizing rule-based reasoning through a system like Drools can significantly enhance the performance and accuracy of query responses. Below are the key aspects of dataset considerations for the system:

Source of Data

- **User Data:**
    - Information collected during user registration, such as username and password which are stored in a secure database. And finally used for authorization of users.

- **Query Data:**
    - User-generated queries that are submitted to the system, encompassing various academic topics and questions. That is kept track of and is used for generating new rules maximizing the system performance.
- **Response Data:**
    - Predefined responses or knowledge base articles that can be matched with user queries for quick resolution.

3.3 Rule-Based Reasoning with Drools

- **Knowledge Base Integration:**
    - Drools can be used to create a knowledge base that encapsulates academic rules, best practices, and response templates. This allows the system to infer answers based on predefined criteria and patterns observed in user queries.
- **Rule Definition:**
    - Rules can be defined to automate the response process, ensuring that the system can handle common queries efficiently without human intervention. For example:
        - If a user queries about exam schedules, the system retrieves the latest exam dates from the database.
        - If a query involves multiple subjects, the system can prioritize based on the user's declared major or interests.
- **Dynamic Updates:**
    - The rule set can be dynamically updated as new academic policies or guidelines are introduced, ensuring that the system remains current and responsive to changing user needs.

3.4 Advantages of Rule-Based Reasoning

- Increased Accuracy:

    - By utilizing a rule-based system, the likelihood of providing accurate responses to user queries increases. The system can evaluate conditions based on user input and apply relevant rules to derive conclusions.
- Enhanced Efficiency:
    - Automating response generation through predefined rules reduces the time required for manual review and intervention, leading to faster query resolution.
- Improved User Experience:
    - Users receive timely and contextually relevant responses, enhancing their overall experience with the system. This can lead to higher user satisfaction and increased engagement.
- Scalability:
    - As the volume of queries increases, the rule-based system can easily scale to handle additional load without significant modifications. New rules can be added to the knowledge base to accommodate emerging topics or frequent queries.

3.5 Data Security

- **Confidentiality and Compliance:**
    - All user data must be handled in compliance with data protection regulations (e.g., GDPR). User queries and personal information should be encrypted and stored securely to prevent unauthorized access.
- **Data Validation:**
    - Implement validation mechanisms to ensure that the data collected from users is accurate and in the expected format before processing or storing it.

Integrating a rule-based reasoning approach using Drools into the Automated Academic Query System provides a robust mechanism for handling user queries effectively. This not only streamlines the response process but also enhances the overall functionality and user satisfaction of the system.

CHAPTER 4

SYSTEM DESIGN

System Architecture

Automated academic query system user flow

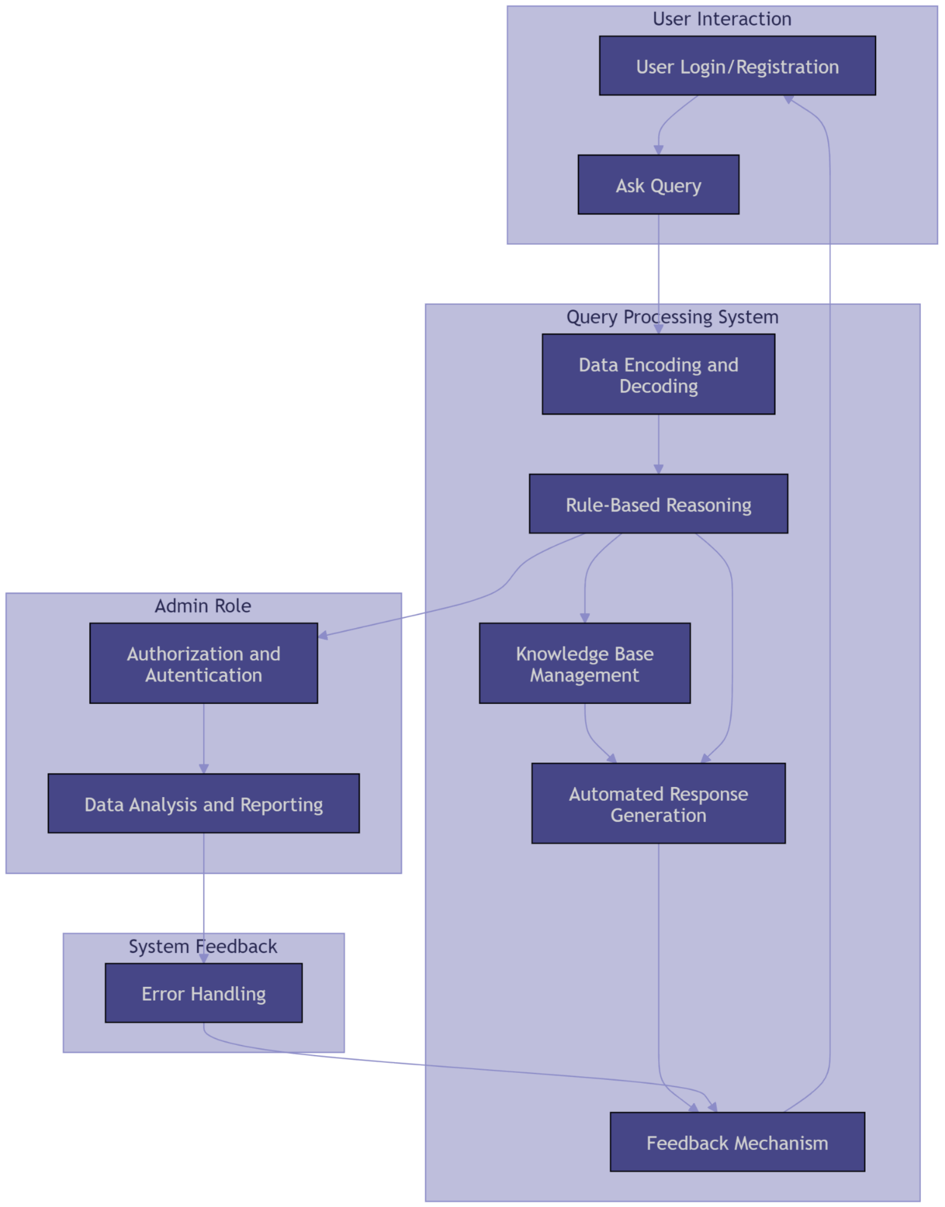


Figure 4.1 User Flow

The architecture described encompasses a user-friendly interface that allows users to log in or sign up for the Automated Academic Query System. Once authenticated, users can initiate queries or access previously answered questions. The heart of the system is the rule-based reasoning mechanism, which uses a knowledge base to efficiently process and respond to user queries. The system ensures data integrity and security through user authentication, while the admin role focuses on maintaining the system's functionality and responsiveness. The feedback loop fosters continuous improvement, ensuring the system evolves to meet user needs effectively.

User Interaction:

1. **Login:** The flow begins with the user logging into the Automated Academic Query System using their credentials. Users can also register if they are new to the platform.
2. **Input Query Data:** After successful login, users can submit academic queries. They may also choose to browse previously answered queries for reference.

Query Processing System:

3. **Data Encoding and Decoding:** The system encodes user queries to ensure security and anonymity. When retrieving responses, it decodes the data for presentation while maintaining confidentiality.
4. **Rule-Based Reasoning:** The core of the system employs a rule-based reasoning engine, such as Drools, which interprets user queries and determines the most relevant responses based on predefined rules. This allows the system to provide accurate and context-aware answers.
5. **Knowledge Base Management:** The system utilizes a centralized knowledge base that contains a repository of common queries and their corresponding responses. The knowledge base is regularly updated to reflect new academic information and user interactions.
6. **Automated Response Generation:** When a query is submitted, the system checks the knowledge base for matching responses. If a direct match is found, the system generates an automated response. If not, it may escalate the query for manual review by administrators or academic advisors.
7. **Feedback Mechanism:** Users can provide feedback on the responses they receive. This feedback is captured and analyzed to improve the accuracy and efficiency of the rule-based reasoning engine, ensuring continuous improvement.

Admin Role:

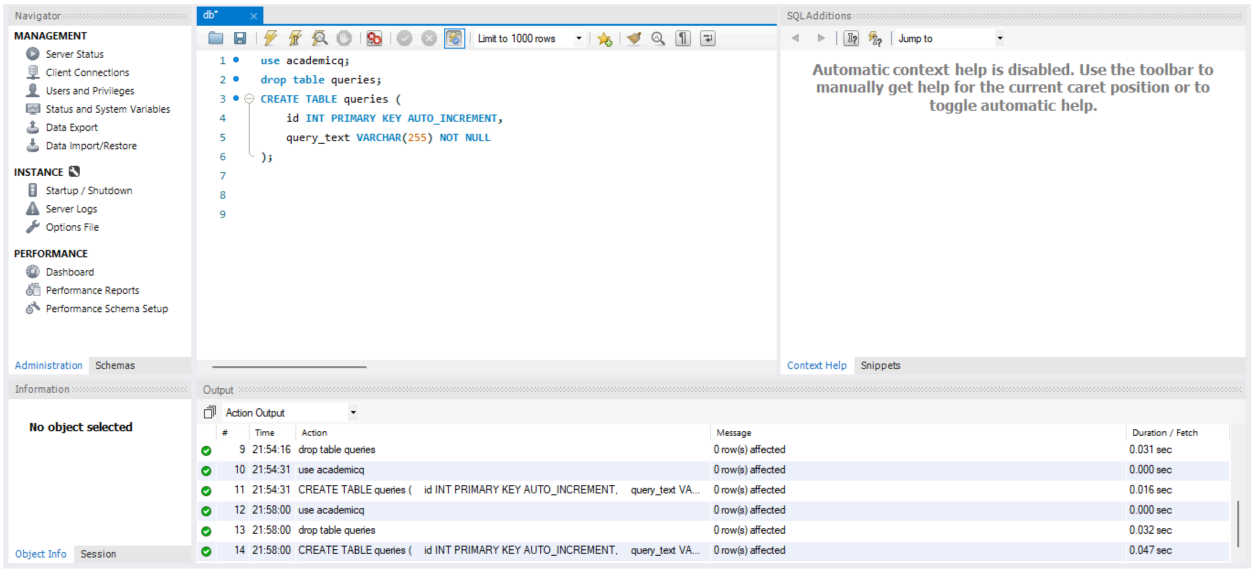
8. **Authentication and authorization:** Admins have the capability to monitor user interactions, query submissions, and response accuracy. They can update the knowledge base and modify the rules within the reasoning engine to enhance system performance and user experience.
9. **Data Analysis and Reporting:** The admin can access reports on system usage, common queries, and user feedback, which can be utilized for strategic decisions and system enhancements.

System Feedback:

10. **Error Handling:** If users encounter issues while using the system, the feedback mechanism captures errors and sends them to the admin for resolution. This ensures that problems are addressed promptly, enhancing user satisfaction and system reliability.

CHAPTER 5

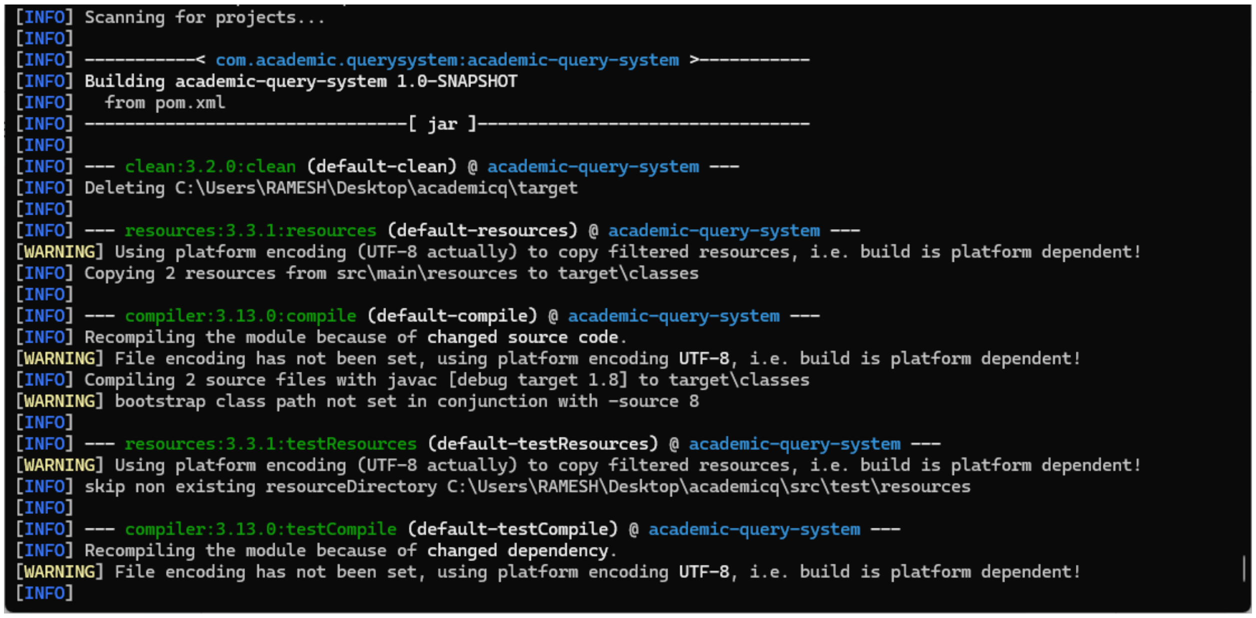
IMPLEMENTATION



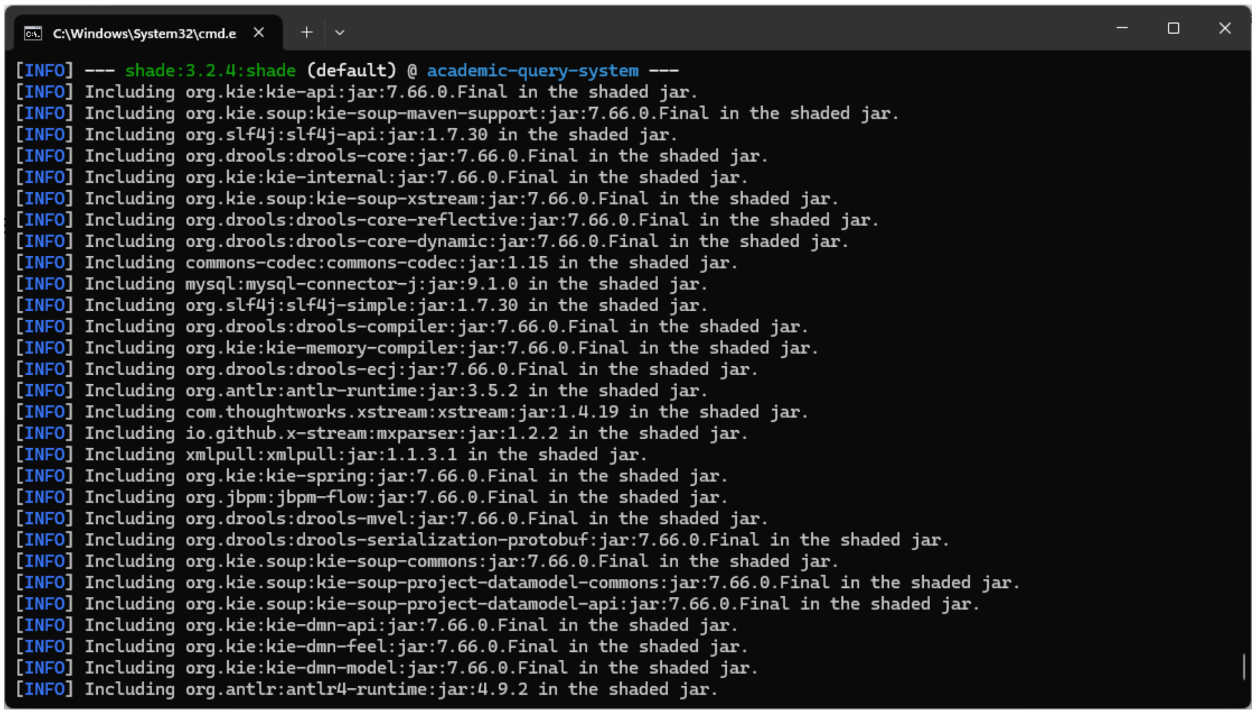
```sql
use academicq;
drop table queries;
CREATE TABLE queries (
    id INT PRIMARY KEY AUTO_INCREMENT,
    query_text VARCHAR(255) NOT NULL
);
```

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

```
#   Time      Action                                                                     Message              Duration / Fetch
9   21:54:16  drop table queries                                                         0 row(s) affected    0.031 sec
10  21:54:31  use academicq                                                              0 row(s) affected    0.000 sec
11  21:54:31  CREATE TABLE queries (   id INT PRIMARY KEY AUTO_INCREMENT,   query_text VA...  0 row(s) affected    0.016 sec
12  21:58:00  use academicq                                                              0 row(s) affected    0.000 sec
13  21:58:00  drop table queries                                                         0 row(s) affected    0.032 sec
14  21:58:00  CREATE TABLE queries (   id INT PRIMARY KEY AUTO_INCREMENT,   query_text VA...  0 row(s) affected    0.047 sec
```



```
[INFO] Scanning for projects...
[INFO]
[INFO] -----------< com.academic.querysystem:academic-query-system >-----------
[INFO] Building academic-query-system 1.0-SNAPSHOT
[INFO]   from pom.xml
[INFO] --------------------------------[ jar ]---------------------------------
[INFO]
[INFO] --- clean:3.2.0:clean (default-clean) @ academic-query-system ---
[INFO] Deleting C:\Users\RAMESH\Desktop\academicq\target
[INFO]
[INFO] --- resources:3.3.1:resources (default-resources) @ academic-query-system ---
[WARNING] Using platform encoding (UTF-8 actually) to copy filtered resources, i.e. build is platform dependent!
[INFO] Copying 2 resources from src\main\resources to target\classes
[INFO]
[INFO] --- compiler:3.13.0:compile (default-compile) @ academic-query-system ---
[INFO] Recompiling the module because of changed source code.
[WARNING] File encoding has not been set, using platform encoding UTF-8, i.e. build is platform dependent!
[INFO] Compiling 2 source files with javac [debug target 1.8] to target\classes
[WARNING] bootstrap class path not set in conjunction with -source 8
[INFO]
[INFO] --- resources:3.3.1:testResources (default-testResources) @ academic-query-system ---
[WARNING] Using platform encoding (UTF-8 actually) to copy filtered resources, i.e. build is platform dependent!
[INFO] skip non existing resourceDirectory C:\Users\RAMESH\Desktop\academicq\src\test\resources
[INFO]
[INFO] --- compiler:3.13.0:testCompile (default-testCompile) @ academic-query-system ---
[INFO] Recompiling the module because of changed dependency.
[WARNING] File encoding has not been set, using platform encoding UTF-8, i.e. build is platform dependent!
[INFO]
```



```
[INFO] --- shade:3.2.4:shade (default) @ academic-query-system ---
[INFO] Including org.kie:kie-api:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.kie.soup:kie-soup-maven-support:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.slf4j:slf4j-api:jar:1.7.30 in the shaded jar.
[INFO] Including org.drools:drools-core:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.kie:kie-internal:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.kie.soup:kie-soup-xstream:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.drools:drools-core-reflective:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.drools:drools-core-dynamic:jar:7.66.0.Final in the shaded jar.
[INFO] Including commons-codec:commons-codec:jar:1.15 in the shaded jar.
[INFO] Including mysql:mysql-connector-j:jar:9.1.0 in the shaded jar.
[INFO] Including org.slf4j:slf4j-simple:jar:1.7.30 in the shaded jar.
[INFO] Including org.drools:drools-compiler:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.kie:kie-memory-compiler:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.drools:drools-ecj:jar:7.66.0.Final in the shaded jar.
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[INFO] Including org.drools:drools-mvel:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.drools:drools-serialization-protobuf:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.kie.soup:kie-soup-commons:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.kie.soup:kie-soup-project-datamodel-commons:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.kie.soup:kie-soup-project-datamodel-api:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.kie:kie-dmn-api:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.kie:kie-dmn-feel:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.kie:kie-dmn-model:jar:7.66.0.Final in the shaded jar.
[INFO] Including org.antlr:antlr4-runtime:jar:4.9.2 in the shaded jar.
```
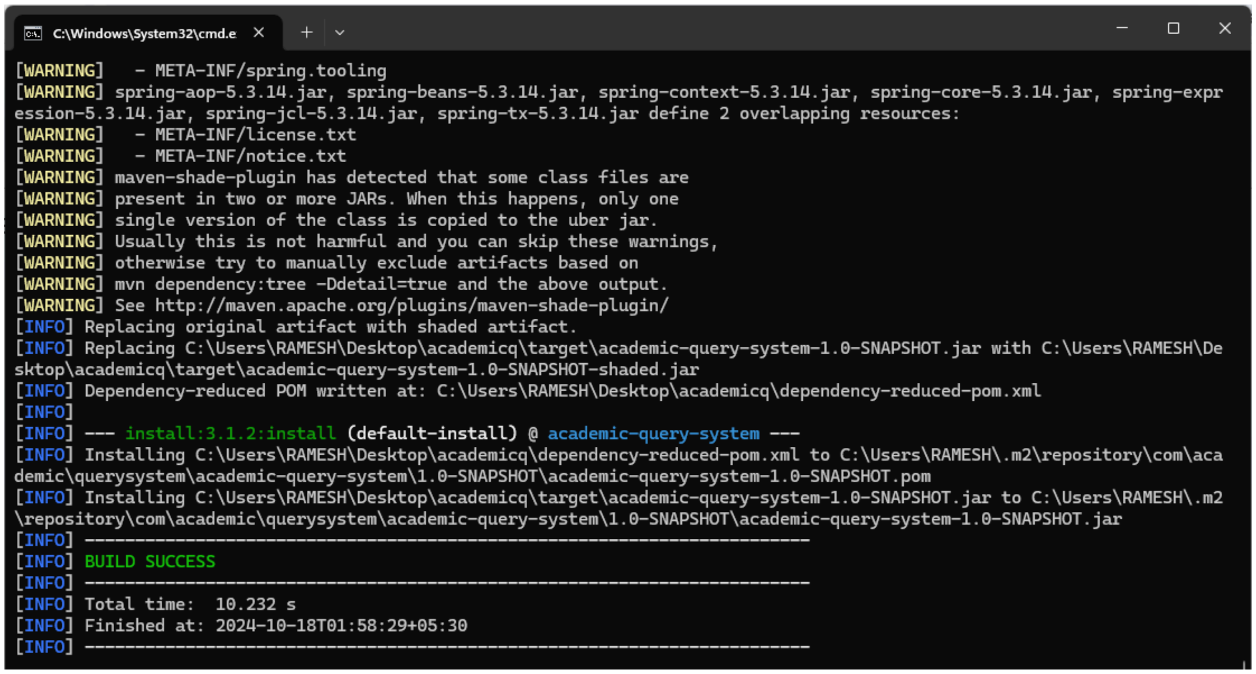
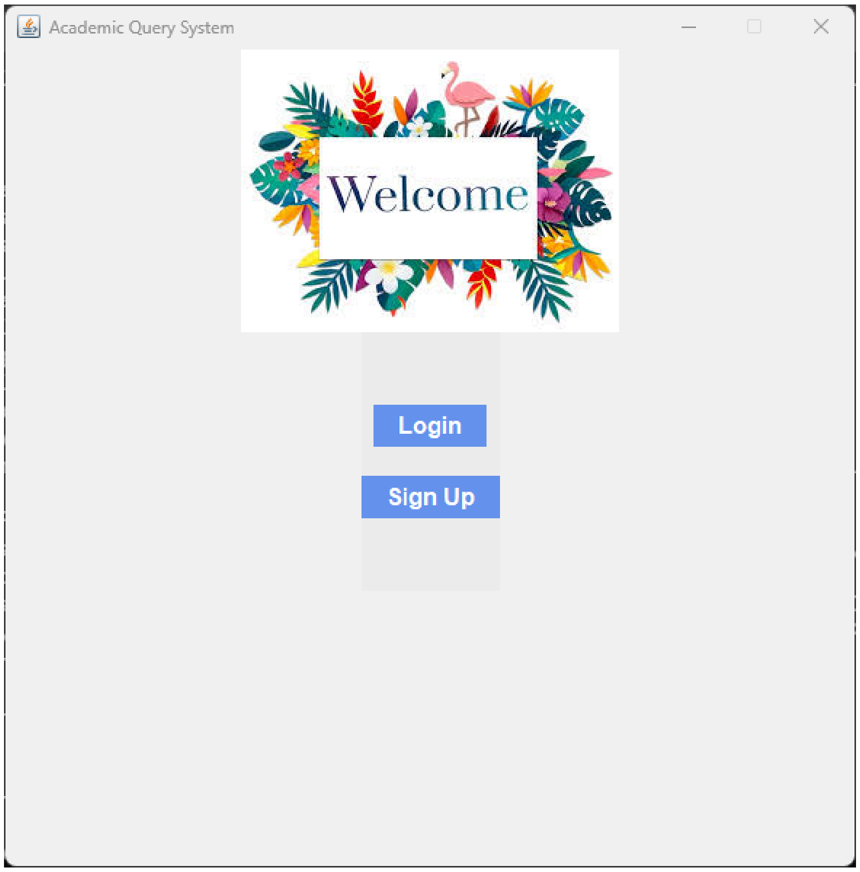
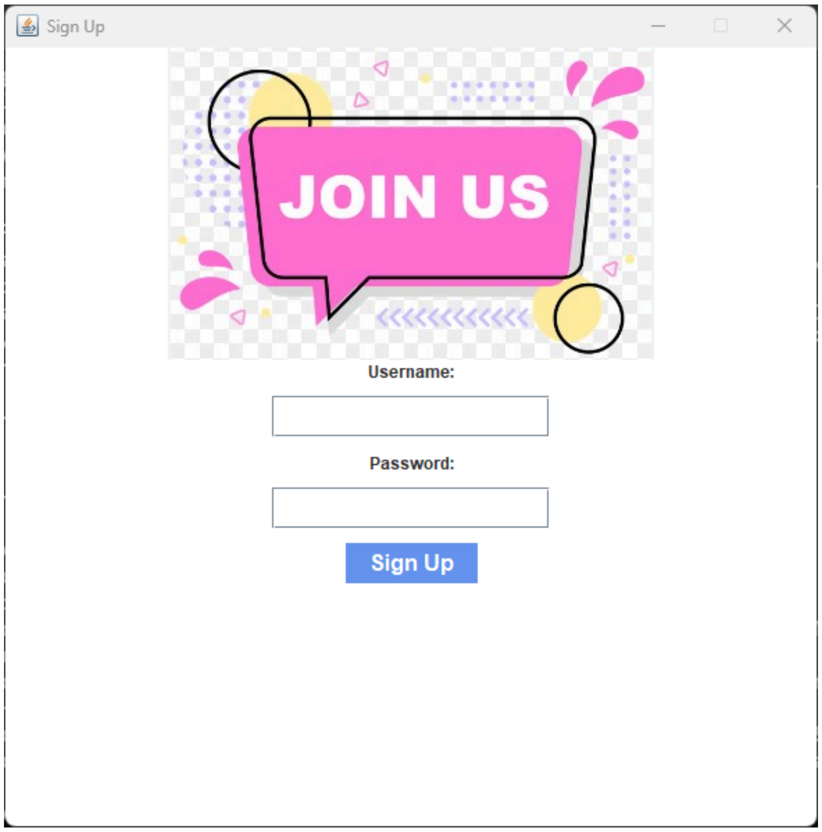



```
[WARNING]   - META-INF/spring.tooling
[WARNING] spring-aop-5.3.14.jar, spring-beans-5.3.14.jar, spring-context-5.3.14.jar, spring-core-5.3.14.jar, spring-expr
ession-5.3.14.jar, spring-jcl-5.3.14.jar, spring-tx-5.3.14.jar define 2 overlapping resources:
[WARNING]   - META-INF/license.txt
[WARNING]   - META-INF/notice.txt
[WARNING] maven-shade-plugin has detected that some class files are
[WARNING] present in two or more JARs. When this happens, only one
[WARNING] single version of the class is copied to the uber jar.
[WARNING] Usually this is not harmful and you can skip these warnings,
[WARNING] otherwise try to manually exclude artifacts based on
[WARNING] mvn dependency:tree -Ddetail=true and the above output.
[WARNING] See http://maven.apache.org/plugins/maven-shade-plugin/
[INFO] Replacing original artifact with shaded artifact.
[INFO] Replacing C:\Users\RAMESH\Desktop\academicq\target\academic-query-system-1.0-SNAPSHOT.jar with C:\Users\RAMESH\De
sktop\academicq\target\academic-query-system-1.0-SNAPSHOT-shaded.jar
[INFO] Dependency-reduced POM written at: C:\Users\RAMESH\Desktop\academicq\dependency-reduced-pom.xml
[INFO]
[INFO] --- install:3.1.2:install (default-install) @ academic-query-system ---
[INFO] Installing C:\Users\RAMESH\Desktop\academicq\dependency-reduced-pom.xml to C:\Users\RAMESH\.m2\repository\com\aca
demic\querysystem\academic-query-system\1.0-SNAPSHOT\academic-query-system-1.0-SNAPSHOT.pom
[INFO] Installing C:\Users\RAMESH\Desktop\academicq\target\academic-query-system-1.0-SNAPSHOT.jar to C:\Users\RAMESH\.m2
\repository\com\academic\querysystem\academic-query-system\1.0-SNAPSHOT\academic-query-system-1.0-SNAPSHOT.jar
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  10.232 s
[INFO] Finished at: 2024-10-18T01:58:29+05:30
[INFO] ------------------------------------------------------------------------
```

Run the .jar to open the application

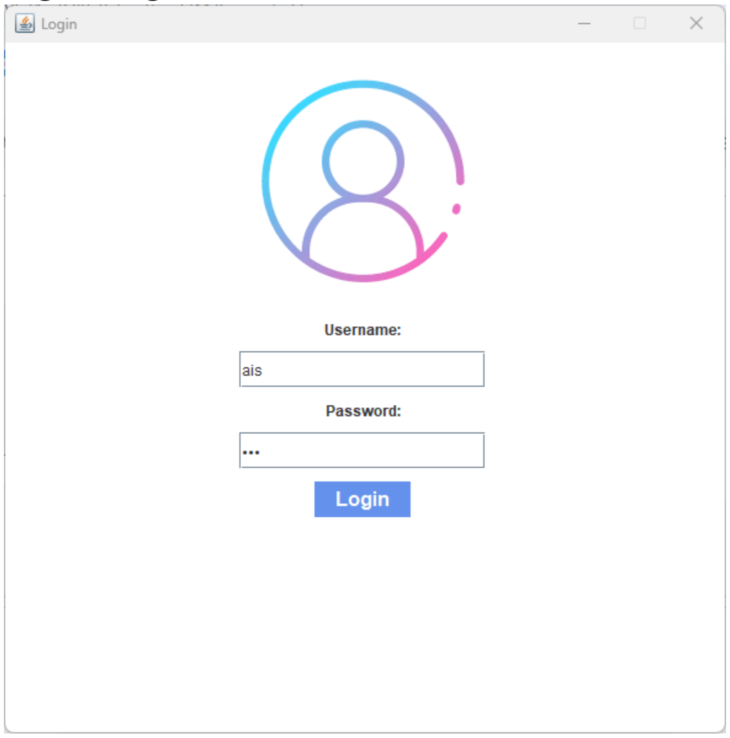
```
academicq>java -jar target/academic-query-system-1.0-SNAPSHOT.jar
```

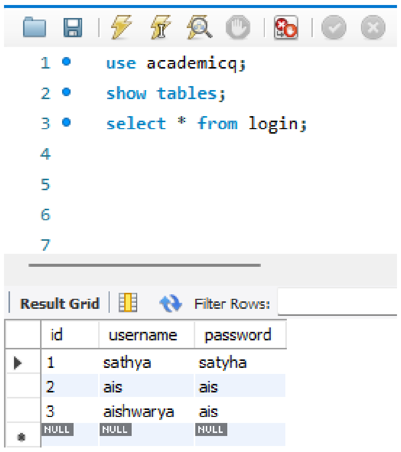

Academic Query System
Welcome
Login
Sign Up


Sign Up
JOIN US
Username:
Password:
Sign Up

CHAPTER 6
RESULTS

1. Login using credentials

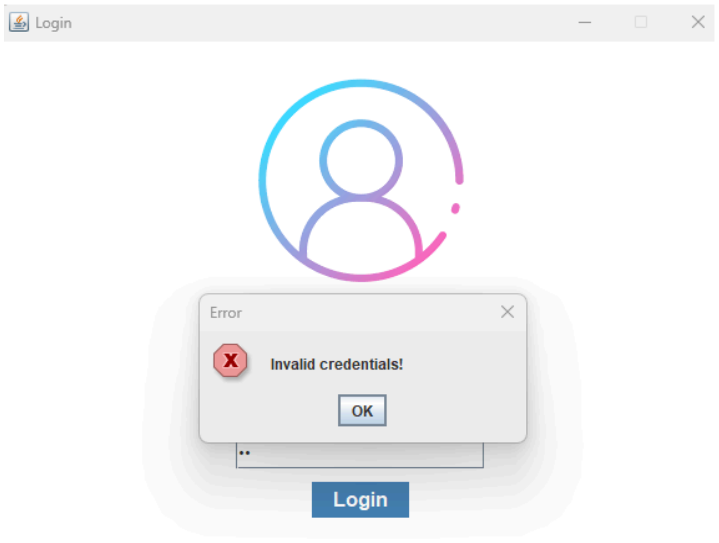




```
use academicq;
show tables;
select * from login;
```

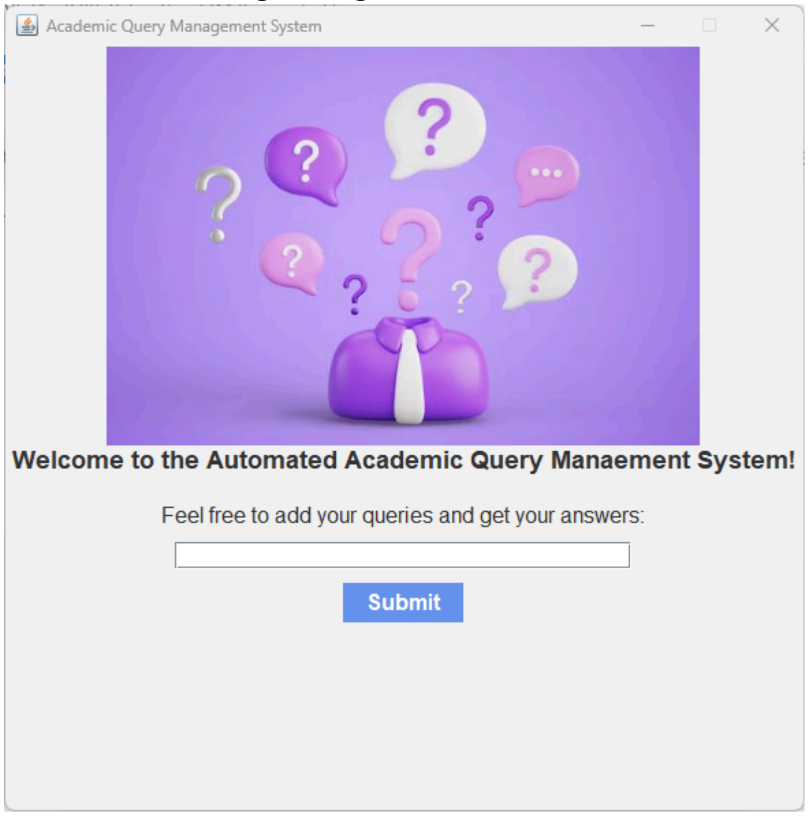
id	username	password
1	sathya	satyha
2	ais	ais
3	aishwarya	ais
NULL	NULL	NULL

2. If invalid credentials



Invalid credentials!

3. **Successful login using credentials**



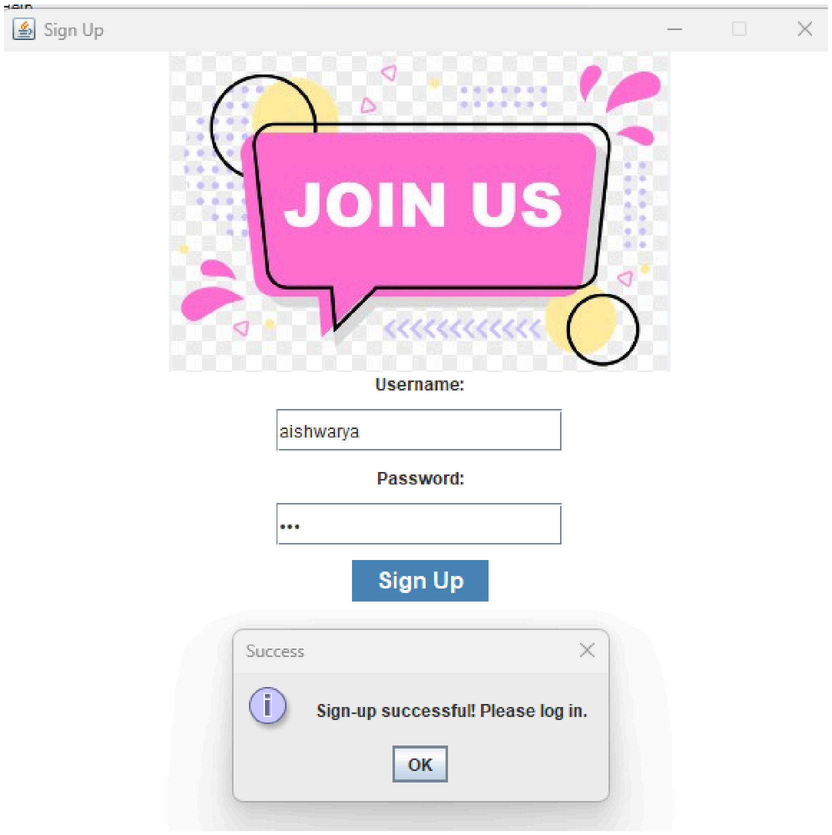
Academic Query Management System

Welcome to the Automated Academic Query Manaement System!

Feel free to add your queries and get your answers:

4. **Sign up**

If successful sign up redirected to login page



Sign Up

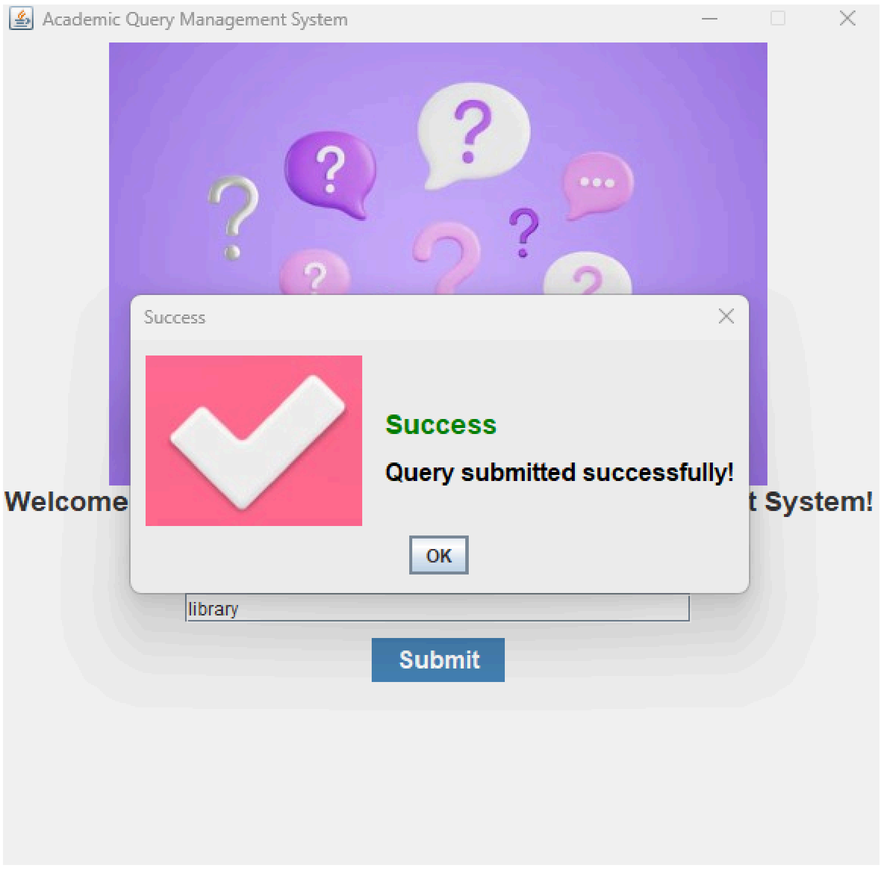
Username: aishwarya

Password: •••

Success

Sign-up successful! Please log in.

5. **Add a query- Store in mysql**



Academic Query Management System

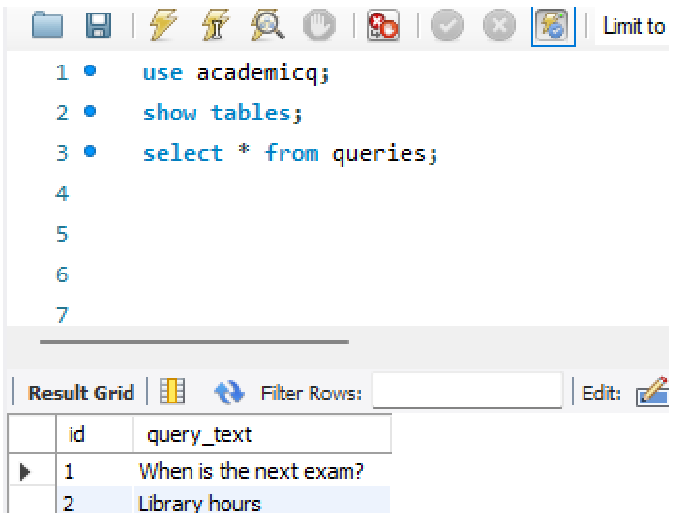
Success

Success

Query submitted successfully!

Welcome ... **t System!**

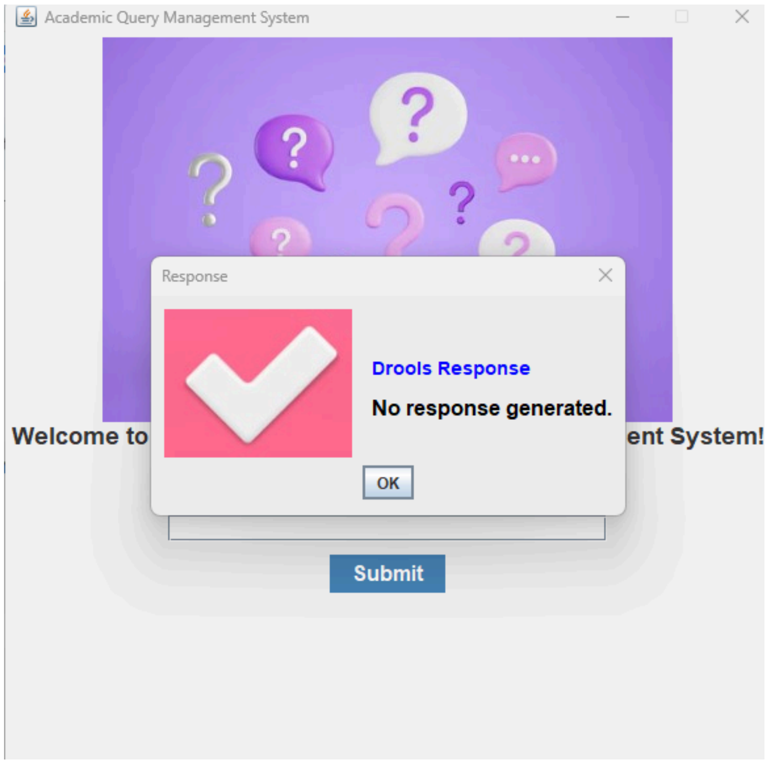
library



```sql
use academicq;
show tables;
select * from queries;
```

id	query_text
1	When is the next exam?
2	Library hours

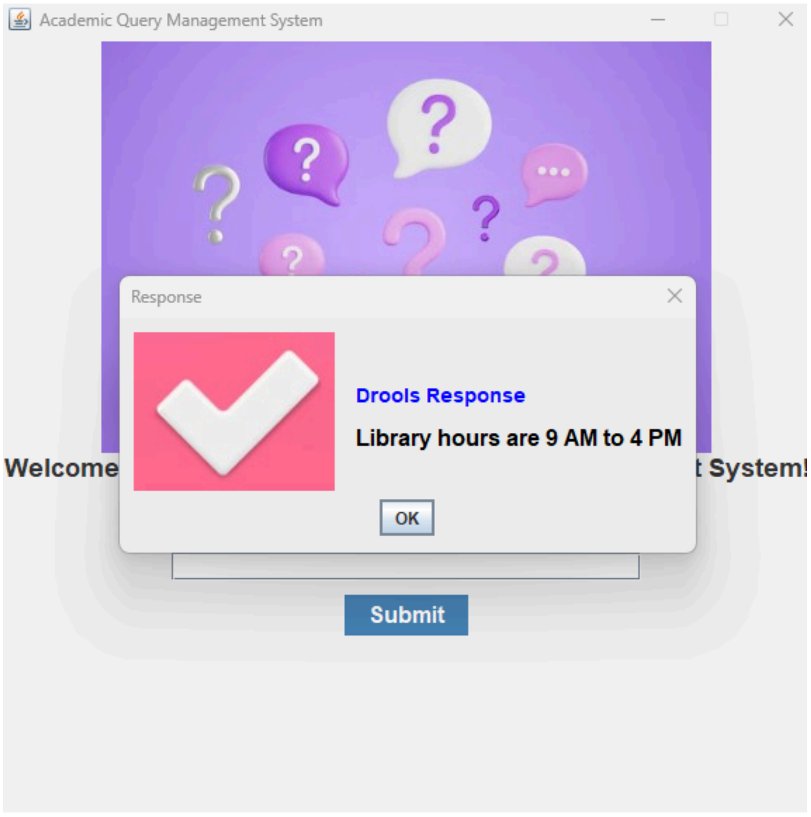
6. **Response- If not in predefined rules set**



Drools Response

No response generated.

7. **If present**



Drools Response

Library hours are 9 AM to 4 PM

CHAPTER 7

CONCLUSION

The Automated Academic Query Management System has been successfully developed using Java Swing for the user interface and JDBC for database connectivity, ensuring smooth and efficient interaction between users and the system. The core functionality of the system leverages Drools, a rule-based reasoning engine, to automate the processing of academic queries, providing fast and accurate responses based on predefined rules. This implementation enhances query handling by reducing the need for manual intervention, enabling a more responsive and scalable solution.

The system's integration of a rule-based reasoning approach ensures that users receive contextually relevant answers while maintaining flexibility for future updates. The use of Java Swing provides a clean and intuitive interface, ensuring a user-friendly experience for both students and administrators. Additionally, JDBC allows for robust database operations, facilitating seamless query storage, retrieval, and processing.

With features like automated response generation, a feedback mechanism, and admin management, the system is well-equipped to handle a wide range of academic queries efficiently. The combination of these technologies ensures a reliable and scalable platform that can easily adapt to evolving academic needs. This successful implementation demonstrates the power of integrating rule-based systems into academic environments, improving both user satisfaction and system performance.