STUDENT QUERY RESOLVER

A PROJECT REPORT

*Submitted by*

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*In partial fulfilment of the requirements for the course of*

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In the Department of Computational Intelligence



# DEPARTMENT OF COMPUTATIONAL INTELLIGENCE

**COLLEGE OF ENGINEERING AND TECHNOLOGY SRM INSTITUTE OF SCIENCE AND TECHNOLOGY KATTANKULATHUR – 603 203**

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Certified that this B. Tech project report titled “**Student Query Resolver**” is the bonafide work of Ms. Akkisetty Sri Satya Sai Sumanaswi [Reg. No.: RA2211026010158], Mr. Chittanuri Sukhesh [Reg. No.RA2211026010171] and Mr. Jami Jaswanth [Reg. No.: RA2211026010173] who carried out the project work under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion for this or any other candidate.

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**ABSTRACT**

The “Student Query Resolver System" is a sophisticated software application designed to streamline and simplify the process of addressing and resolving student queries in educational institutions. In today's fast-paced academic environment, students often encounter various concerns and questions related to their courses, schedules, grades, and more. This project aims to provide an efficient and user-friendly solution for managing and responding to these queries. The system integrates advanced natural language processing (NLP) and artificial intelligence (AI) technologies to categorize, prioritize, and route student queries to the appropriate departments or personnel. It employs a user- friendly web interface for students to submit their questions and track the status of their requests. Key features of the system include automated response generation for frequently asked questions, a knowledge base for instant information retrieval, and escalation protocols for more complex queries. It also offers analytics and reporting tools for educational institutions to gain insights into common student concerns and continuously improve their support services. In summary, the "Student Query Resolver System" not only enhances the overall student experience but also reduces the administrative burden on educational institutions by providing a streamlined and efficient mechanism for addressing and resolving student queries.

# CHAPTER 1 INTRODUCTION

### General

A Student Query Resolver project is a sophisticated and multifaceted system designed to revolutionize the way students interact with academic institutions and access information and support. This innovative solution is born out of the need to streamline and modernize the educational experience, making it more accessible, responsive, and user-centric.

At its core, this project involves the development of a highly intuitive and user- friendly platform that allows students to submit queries, questions, or concerns related to their academic journey. This platform can be accessed through a variety of devices, including web browsers, mobile applications, or even voice- activated assistants, ensuring that students can engage with the system in a manner most convenient for them.

The magic happens when a student submits a query. Behind the scenes, the system leverages cutting-edge technologies like artificial intelligence (AI) and natural language processing (NLP) to not only understand the query but also provide relevant and accurate responses. It does so by tapping into a vast and continually updated database of academic resources, which includes information on course offerings, schedules, academic policies, extracurricular activities, campus facilities, and more.

What truly sets this project apart is its ability to adapt and learn. Over time, the system becomes more proficient in understanding and addressing student inquiries, thanks to the AI's learning capabilities. This enables it to provide more personalized responses, catering to each student's unique needs and preferences.

In cases where the system cannot immediately provide a satisfactory answer, it does not leave the student hanging. It can seamlessly connect students with the right support personnel, such as academic advisors, departmental coordinators,

or even fellow students who may have encountered similar challenges. This way, students always have a life to the support they need.

The primary objective of a Student Query Resolver project is to make the student experience smoother and more efficient. It does so by significantly reducing the time and effort students typically expend searching for information or waiting in long queues at administrative offices. Moreover, it eliminates the constraints of office hours by offering 24/7 support, allowing students to get their questions answered at their convenience.

Beyond the immediate benefits for students, this project provides educational institutions with a treasure trove of data. By analyzing the types of inquiries and concerns raised by students, institutions can gain valuable insights into areas that may require improvement, whether it's refining curriculum offerings, streamlining administrative processes, or enhancing student services.

In sum, a Student Query Resolver project is a forward-thinking approach to enhancing the educational journey. It empowers students with a user-centric, technology-driven solution that delivers timely and accurate responses to their academic questions, and it equips institutions with actionable data to continually improve their offerings and services. It is a win-win for students and educational institutions alike, transforming the way we navigate and experience education in the 21st century.

### Purpose

The Student Query Resolver project is a pioneering and multifaceted initiative that carries a profound and transformative purpose, poised to reshape the landscape of education by harnessing the power of technology and user-centric design. At its core, this project is all about empowerment, placing students firmly at the center of the educational experience. It recognizes that students are not mere recipients of information; they are active participants in their learning journey, and as such, they deserve a mechanism that provides them with not just answers but an avenue for meaningful interaction with their academic environment. This system fundamentally redefines the concept of accessibility, transcending the boundaries of time and place. It grants students the freedom to access the system on their terms, 24/7, through a wide array of devices, breaking free from the traditional constraints of office hours and physical locations. The efficiency that comes from automation is not only a time-saver but a cost- saver as well. By automating responses to frequently asked questions, institutions can optimize resource allocation, reduce administrative workload, and create space for more strategic resource usage. The purpose of a Student Query Resolver project is to:

* **Improve Student Experience:** Enhance the overall educational experience by providing students with a user-friendly and efficient means to get answers to their academic questions and concerns.
* **Accessibility:** Ensure that students can access information and support services 24/7 from various devices, reducing the need to physically visit administrative offices or rely on specific office hours.
* **Efficiency:** Streamline communication and information retrieval, saving students time and effort in searching for academic-related information.
* **Personalization:** Provide personalized responses based on individual student needs and preferences, creating a more tailored and user-centric experience.
* **Learning and Adaptation:** Utilize artificial intelligence and natural language processing to learn and adapt over time, continuously improving the system's ability to understand and address student inquiries.
* **Support Staff Connection:** Connect students with relevant support personnel, such as academic advisors or departmental coordinators, when the system cannot provide an immediate answer

### Scope

The scope for a Student Query Resolver project is truly monumental, encapsulating a transformative vision for the future of education. This all- encompassing initiative stretches across myriad dimensions, each holding the promise of revolutionizing the way students interact with academic institutions. It extends far beyond the basic premise of question-answering, venturing into uncharted territory where education is elevated to new heights. The project's vast scope incorporates a plethora of information delivery, covering not only routine academic inquiries but also encompassing comprehensive details on academic programs, admission requirements, financial aid resources, campus facilities, extracurricular activities, and even career guidance. This breadth of information transforms the project into a comprehensive knowledge hub, enriching the educational experience for students by providing a holistic view of their academic journey.

Moreover, the project's commitment to a seamless user experience introduces innovative features such as chatbots, voice recognition, and user-friendly interfaces, catering to the digitally savvy generation of students. This adaptability aligns with the modern educational ethos, where students expect convenient and intuitive digital interactions. Furthermore, the project's embrace of emerging technologies, including virtual reality (VR) and augmented reality (AR), propels the boundaries of traditional education. Its ushers in a new era of immersive and interactive learning experiences, transcending the limitations of physical classrooms and opening the doors to remote support services and virtual campus tours. The project's futuristic outlook positions it as a trailblazer in redefining the educational landscape.

While its immediate impact is evident, the project's potential for global outreach underlines its universal applicability. It transcends geographical boundaries and can be adopted by educational institutions across the world, facilitating international collaborations and exchanges, thereby creating a global network of support for students pursuing education globally. Customization and personalization are integral aspects of its scope, allowing institutions to adapt the system to their unique identity, culture, and language preferences, rendering it not just a tool but an extension of an institution's identity.

Data analytics plays a pivotal role in the project's scope. The wealth of data generated through student interactions offers invaluable insights into student preferences, academic performance,

and areas where institutions can affect improvements. This data-driven decision-making fosters continuous enhancement, efficiency, and adaptability. The project's commitment to inclusivity and accessibility underscores the principle that education should be accessible to all. It strives to accommodate a diverse range of students, including those with disabilities, aligning with modern educational values and legal requirements.

Collaborations in research and development constitute another dimension of its scope. Educational institutions can join hands to drive innovation and further refine the system. This fosters a spirit of continuous improvement and adaptation to evolving student needs, making the project not just a tool but a dynamic and ever-evolving ecosystem. Additionally, the project's role in fostering technological literacy among students is crucial. As students interact with the system, they acquire valuable digital skills, a necessity in today's technology-driven world.

In conclusion, the scope of the Student Query Resolver project is grand and visionary, representing not merely a technological initiative but a paradigm shifts in education. It embraces the diverse and evolving needs of students in the 21st century, transforming the student- education relationship and preparing students for a future where technology and innovation are at the forefront of learning.

This project is more than a tool; it is a visionary approach to education, where the boundaries of knowledge and accessibility are expanded, and the educational experience is transformed for the better.

### Memory Management

Memory management stands as a critical and multifaceted cornerstone of the Student Query Resolver project, intricately woven into the fabric of its sophisticated operations. This ambitious system, designed to deliver seamless and efficient support to students, relies on robust memory management strategies to ensure the smooth and optimal execution of its vast array of functions. Let us embark on a comprehensive exploration of the intricate tapestry that is memory management within this intricate ecosystem.

At the heart of the project lies a monumental database, an extensive repository of academic information, student records, historical interactions, and a myriad of administrative data. Effective memory management plays a pivotal role in orchestrating the storage and retrieval of this wealth of data, ensuring that the most relevant and frequently accessed information is at the fingertips of the system, thereby minimizing response times for student queries.

In the dynamic realm of education, resource allocation is a complex puzzle. The system must allocate memory efficiently for a diverse range of tasks. These encompass data storage, user interface rendering, natural language processing, machine learning model execution, and an array of other functions. Effective memory management becomes the linchpin that prevents resource conflicts, bottlenecks, and guarantees the smooth orchestration of these myriad functions.

For an optimal user experience, the project often harnesses caching and prefetching techniques. Caching stores frequently accessed data in memory, reducing the need for repeated database queries, while prefetching anticipates the data that will likely be requested and proactively loads it into memory before it is demanded. Both strategies are inextricably tied to efficient memory management, as they balance available memory capacity with data freshness.

The Student Query Resolver project is a realm of simultaneous user interactions, necessitating astute memory management for concurrent and parallel processing. This involves the allocation of memory to each concurrent task and the maintenance of data integrity when multiple processes access shared resources. It is an intricate dance that prevents conflicts and safeguards against race conditions and other concurrency-related issues.

### Virtual Memory

Implementing virtual memory within the framework of the Student Query Resolver project presents a strategic opportunity to enhance its performance, scalability, and overall reliability. Virtual memory, a memory management technique that extends the capabilities of physical RAM (Random Access Memory) by utilizing a portion of the computer's hard drive or SSD (Solid-State Drive) as temporary storage for data, can offer several benefits to this sophisticated system.

First and foremost, virtual memory contributes to enhanced performance. By providing additional memory resources, it allows the system to offload less frequently used data from RAM to disk storage in cases where physical RAM becomes saturated. This dynamic memory management ensures that the system remains responsive, even during periods of peak usage, preventing memory congestion.

As the Student Query Resolver project continues to expand, virtual memory proves invaluable in terms of resource scalability. It can dynamically adjust the amount of virtual memory allocated, enabling the system to cater to a larger audience without the need for frequent hardware upgrades.

Moreover, virtual memory ensures continuous availability of data and services by seamlessly swapping data between physical RAM and virtual memory space as needed. This guarantees uninterrupted operation even when handling substantial data volumes or complex queries.

Efficient data storage is another advantage. The system can optimize resource usage by keeping frequently accessed data in physical RAM for rapid access, while less frequently used data resides in virtual memory, achieving a balance between performance and storage efficiency

# CHAPTER 2

**LITERATURE REVIEW**

# Overview on Student Query Resolver

The Student Query Resolver project is a comprehensive and transformative initiative that redefines the educational experience, offering a multifaceted approach to streamline and enhance support for students across various educational institutions. This dynamic system, at its core, leverages cutting-edge technology and data-driven solutions to create an ecosystem that is intuitive, efficient, and deeply personalized to meet the diverse needs of students and institutions alike.

Automation is a fundamental principle of the project. It automates responses to frequently asked questions, administrative processes, and repetitive tasks, saving students valuable time and resources while increasing administrative efficiency for educational institutions.

Central to the system's functionality is its data-rich knowledge base. This repository houses an extensive array of information pertinent to student queries. From detailed academic program descriptions to admission prerequisites, course schedules, campus resources, scholarship opportunities, and more, the knowledge base acts as a comprehensive resource that empowers students to find the information they need with ease.

One of the standout features is its round-the-clock accessibility. The system is available 24/7, transcending the limitations of traditional office hours and physical locations. This ensures that students can access critical information and support precisely when they need it, empowering them to take charge of their educational journey.

Scalability is another core aspect. The system is designed to grow with the needs of educational institutions. It can be customized to align with the specific requirements and branding of each institution, accommodating their unique cultural and language preferences. This adaptability makes it an asset for a wide range of educational providers.

The changing educational landscape, marked by the emergence of hybrid and online learning models, is well-supported by the project. It provides guidance on virtual learning tools, access to online resources, and connections to remote support services, ensuring that students experience a cohesive and comprehensive learning journey.

Security and privacy are paramount. Robust data encryption and access controls are in place to safeguard sensitive student information. This guarantees data privacy and compliance with data protection regulations, a critical consideration in the modern digital landscape.

In sum, the Student Query Resolver project is a visionary and dynamic initiative, meticulously designed to reshape the educational landscape. It harnesses the potential of technology, automation, personalization, and data- driven insights to streamline access to critical information and support services. By doing so, it empowers students to take an active role in their learning, equips institutions with the tools and processes necessary to thrive in a digitally- driven educational environment, and paves the way for a future of education that is adaptable, efficient, and responsive to the ever-evolving needs of students and institutions. This project represents a significant leap forward in the journey to future-proof education in the 21st century.

# Priority Scheduling Algorithm

In a student query resolver project, the implementation of priority scheduling emerges as a pivotal and dynamic strategy for managing and addressing queries with varying degrees of urgency and importance. This scheduling algorithm offers a high level of customization, enabling the project to tailor its responses to match the specific needs and priorities of students effectively. Assigning priority values to queries is a critical aspect, and these values can be determined through a combination of criteria, such as the nature of the query, the academic level of the student, and the student's current academic situation. These criteria allow the project to categorize queries into different priority levels, ranging from high to low, reflecting the urgency and significance of each inquiry.

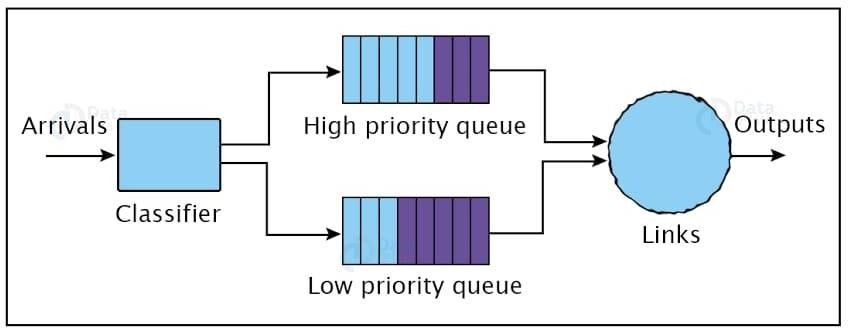
One of the challenges associated with priority scheduling is the potential for lower-priority queries to experience starvation when high-priority queries continuously arrive. To mitigate this issue, the project can implement aging mechanisms that gradually increase the priority of long- waiting queries, preventing them from being permanently deprioritized. Continuous evaluation and fine-tuning of the priority assignment criteria are vital to maintain the effectiveness of the priority scheduling algorithm. This includes regularly assessing the relevance of the chosen factors and adjusting priorities to adapt to evolving student needs and institutional requirements.

In practical terms, priority scheduling is instrumental within the student query resolver project. High-priority queries encompass urgent academic appeals, technical issues during online exams, or immediate administrative requests. By using priority scheduling, the project ensures that these critical queries receive immediate and dedicated attention, significantly enhancing the student support experience.

Moreover, the project can explore integrating priority scheduling with other scheduling algorithms, such as Round Robin. This integration allows high- priority queries to be managed using priority scheduling, while lower-priority ones can undergo Round Robin scheduling to ensure a fair distribution of resources and maintain responsiveness across the board.

The introduction of priority scheduling also introduces the distinction between non-preemptive and preemptive systems. In a non-preemptive setup, once a query begins execution, it continues until completion, irrespective of new, higher-priority queries that may arrive. In contrast, a preemptive system enables higher-priority queries to interrupt the execution of lower-priority ones, ensuring that the most critical issues are promptly addressed. The choice between these two approaches depends on the project's specific requirements and objectives, taking into consideration factors like fairness and responsiveness.

In summary, priority scheduling within a student query resolver project empowers the system to handle and respond to diverse queries from students with precision and efficiency. The assignment of priorities based on well- defined criteria ensures that critical queries receive swift and tailored attention, aligning perfectly with the project's primary objective of offering effective and timely support to students within a dynamic educational environment. By addressing challenges and continuously adapting the priority criteria to evolving



# Thread Handling

Python's threading module to handle threads for different tasks. Here is an overview of how threading is used in the project:

* + 1. **\*Query Screen Thread (Student Entry):** When a student logs in and enters a query, a new thread (task thread) is created for each submitted query using the threading. Thread class. This thread calls the schedule task function with the query details. It simulates query execution with a sleep period of 2 seconds. This allows multiple queries to be processed concurrently without blocking the main GUI thread.
    2. **\*Task Processing Thread (Queue Processor):** Another thread (task\_processor\_thread) is created to continuously check the task\_queue for tasks that need to be executed. This thread runs the process\_tasks function, which retrieves tasks from the shared priority queue and simulates their execution. The queue is checked periodically to ensure that tasks are processed as soon as they are available.
    3. **\*Admin Screen Thread (Admin Entry):** When an admin logs in and exports queries to a CSV file, the code uses the main GUI thread for these operations. No additional threads are created for the admin-specific actions.

Threading is essential in this code to ensure that the GUI remains responsive while long-running tasks, such as simulating query execution, are performed in the background threads. This way, the application does not freeze or become unresponsive when processing tasks or handling time- consuming operations.

It is important to note that while threading can help with concurrency, handling shared resources and synchronization between threads is crucial to prevent issues like race conditions. In your code, the task\_queue is used to manage shared tasks safely by using a Priority Queue for task prioritization.

This code effectively separates the user interface (GUI) operations from the background task processing, ensuring a smooth and responsive user experience.

# Query Management

A robust and effective query management system is the backbone of any student query resolver project. This multifaceted system is designed to streamline and efficiently handle the diverse array of queries and requests that students may have during their educational journey. It encompasses various critical elements, starting with the user-friendly interfaces that enable students to capture and submit their queries. These interfaces may include web forms, mobile apps, or other digital channels that facilitate the effortless entry of questions and concerns.

One of the fundamental aspects of query management is query classification. As queries are submitted, the system categorizes them into predefined categories or tags, ensuring that they can be efficiently routed and addressed. Common categories include academic inquiries, technical issues, administrative requests, and general information. Effective query classification is pivotal for the system's ability to direct each query to the right support personnel or relevant departments.

Queue management comes into play when multiple queries are in the queue awaiting resolution. The system ensures that queries are addressed in order of priority and that none are left unattended for extended periods, thereby maintaining efficient service delivery. Support personnel use the query management system to provide responses and resolutions to student queries, while tracking query progress and response times, ensuring timely communication, and keeping students informed about the status of their inquiries.

Finally, the query management system often includes analytics and reporting tools, which generate reports on query volume, resolution times, common query categories, and other key performance indicators. Analyzing this data helps in refining the system and improving support services.

Overall, your application efficiently manages queries from students, allowing them to submit their queries with specified priorities and categories. It ensures that tasks are processed concurrently using threads, and it also provides an export feature for admins to manage and analyze the queries effectively.

# Event Handling

Certainly! Event handling is a crucial aspect of graphical user interface (GUI) programming in applications developed using libraries like Tkinter. In this project, event handling is essential for managing interactions with the user. Here is a detailed overview of event handling in your application:

* + 1. **Button Click Events:** The primary interaction with the application is through button clicks. The key events are:
       - Login Button Click: When the user clicks the "Log In" button on the role selection screen (login\_screen), the login\_and\_open\_query\_screen function is triggered.
       - Admin Login Button Click: On the admin login screen (admin\_login\_screen), the "Log In" button executes the admin\_authentication function for admin login.
       - Resolve Query Button Click: On the student query screen (query\_screen), the "Resolve Query" button triggers the resolve\_query function.
    2. **Radio Button Selection Events:** This application uses radio buttons for user role selection and query categorization. When users select different roles or query categories, the selected values are stored and can be used to determine the user's role and the query's category.
    3. **Input Validation Events:** Input validation events are essential to ensure that users provide the correct data. This is primarily done within the resolve\_query function:
       - Empty Fields: The function checks if the query and priority fields are not empty. If they are, it shows an error message.
       - Invalid Priority: It verifies that the priority entered is a number within the valid range (1 to 10). If not, it displays an error message.
    4. **Admin Export Button Click Event:** The admin has the option to export all queries to a CSV file. When the admin clicks the "Export All Queries" button on the admin panel (admin\_screen), it triggers the export\_to\_csv function.
    5. **Window Closing Event:** This application doesn't explicitly handle window closing events in the code you provided. However, it is a common event in GUI applications. Depending on your requirements, you might want to add a handler to handle window close events, allowing you to perform certain actions (e.g., ask for confirmation before closing).
    6. **Thread Handling:** our code involves the use of threads, which are used for asynchronous task execution, such as simulating query processing and exporting queries. These tasks are

started in response to button clicks and run independently from the main GUI thread. Thread management is essential to ensure that the GUI remains responsive during task execution.

* + 1. **Error Handling and Event-Based Messages**: When input validation fails, event handlers display error messages using the messagebox. showerror function. This provides feedback to the user about issues with their input.

In summary, event handling in your application involves a variety of user interactions, including button clicks, radio button selections, input validation, and background task execution using threads. Event handlers play a critical role in making the application interactive and user- friendly, ensuring that users can perform actions and receive feedback as they interact with the GUI.

# CHAPTER 3 PROPOSED METHODOLOGY

* 1. **Functionality and Workflow and Overview**

### Role Selection:

The application starts with a login screen that presents users with two roles: "Student" and "Admin."

Users can select their role by clicking on the corresponding radio button and then click the "Log In" button.

### Student login:

If the "Student" role is selected, users are taken to the Student Query Screen.

On the Student Query Screen, students can enter their name, query, and query priority. Students select a query category (e.g., Technical, Maintenance) using radio buttons.

Clicking the "Resolve Query" button schedules the query for processing in the background.

### Query Scheduling:

The `schedule task` function simulates the scheduling of the query task, which involves a simulated execution delay.

The task's details, including the query, priority, and category, are added to a shared task queue,

`task\_queue`, to ensure proper task execution and prioritization.

### Admin login:

If the "Admin" role is selected, users are taken to the Admin Login Screen. Admin users need to enter a username and password to log in.

Upon successful login, they are granted access to the Admin Panel.

### Admin Panel:

The Admin Panel allows admins to export all the scheduled queries to a CSV file. This action is initiated by clicking the "Export All Queries" button.

The exported queries include their category, priority, and details.

### Background Task Processing:

A separate thread, `task\_processor\_thread`, is running in the background to process tasks from the shared `task\_queue`.

The background thread continually checks for tasks in the queue and processes them when available, ensuring that the GUI remains responsive during query execution.

### Error Handling:

Input validation is implemented to ensure that users provide valid input. Error messages are displayed using the `messagebox. showerror` function in case of input validation failure.

### Returning to Role Selection:

Users can switch between roles by clicking the "Back" button, which returns them to the role selection screen.

The proposed methodology outlines how the application allows students to submit queries, admin users to export queries, and the system to manage query scheduling and execution using a shared task queue. It emphasizes the role-based access and proper handling of user interactions through the GUI, including input validation and background task processing.

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# Algorithm

An algorithm is a step-by-step, well-defined procedure or set of rules for solving a problem or performing a specific task. It is a finite sequence of unambiguous instructions designed to achieve a particular objective or produce a desired output from given inputs. Algorithms are fundamental to computer science and programming and are used to solve a wide range of problems, from simple calculations to complex data processing and decision-making tasks.

## Student Query Resolver Algorithm

### Program Initialization:

Import necessary libraries (tkinter, threading, time, queue, csv).

Define global variables: user\_role, student\_name, query\_app, login\_window, role\_var, admin\_username, admin\_password, admin\_app.

Create a shared task queue: task\_queue.

### Task Scheduling:

Define the schedule\_task function

Simulates a task execution by sleeping for 2 seconds. Generates a task information string.

### Task Processing:

Define the process\_tasks function:

Continuously processes tasks from the task\_queue.

The function retrieves task information and can perform additional actions.

### Export Tasks to CSV:

Define the export\_to\_csv function:

Exports scheduled queries to a CSV file (queries.csv) if the task\_queue is not empty. Uses a CSV writer to format the data.

Displays a completion message or an error message if the queue is empty.

### Query Screen1:

Define the query\_screen function:

Destroys the login\_window (if exists). Creates a new query application window.

Allows students to submit queries with name, description, priority, and category. Schedules the query for execution, adding it to the task\_queue.

Starts a thread for processing tasks from the task\_queue. Includes a "Back" button to return to the previous screen.

### Return to Login:

Define the back\_to\_login function:

Closes the query\_app if the user role is "Student" and returns to the login screen.

Destroys the admin\_app (if it exists) and returns to the login screen if the user role is "Admin."

### User Role Selection:

Define the login\_and\_open\_query\_screen function:

Determines the user role selected (either "Student" or "Admin").

Calls the query\_screen function for students and admin\_login\_screen for admin users.

### Admin Login:

Define the admin\_login\_screen function:

Clear the current content in the login\_window.

Asks admin users to enter a username and password.

Authenticates admin users based on the provided username and password. Opens the admin screen (admin\_screen) if authentication is successful.

Shows an error message for authentication failure.

### Admin Panel:

Define the admin\_screen function:

Clear the current content in the login\_window.

Displays the admin panel with options for exporting scheduled queries to a CSV file.

### Login Screen:

Define the login\_screen function:

Initializes user information variables. Creates the main login application window.

Allows users to select their roles as "Student" or "Admin." Provides a "Log In" button to proceed to the chosen role.

### Main Application Start:

Starts the main login screen with the login\_screen function.

The code is structured to provide role-based interaction through a graphical user interface, with separate functionalities for students and admin users. It ensures proper task scheduling and execution using a shared task queue while maintaining a responsive GUI. Users can switch between roles and interact with the system as required.

## Student Query Resolver Execution:

**Install Python:** If you do not have Python installed, you can download it from the official Python website (https://[www.python.org/downloads/)](http://www.python.org/downloads/)) and follow the installation instructions for your operating system.

**Copy the Code:** Copy the entire code you provided in your original question.

**Create a Python File:** Open a text editor (e.g., Notepad, Visual Studio Code, PyCharm) and paste the code into a new file.

**Save the File:** Save the file with a ".py" extension, for example, "query\_resolver.py." Make sure you save it in a location where you have written permissions.

### Run the Python Script:

Open a terminal or command prompt.

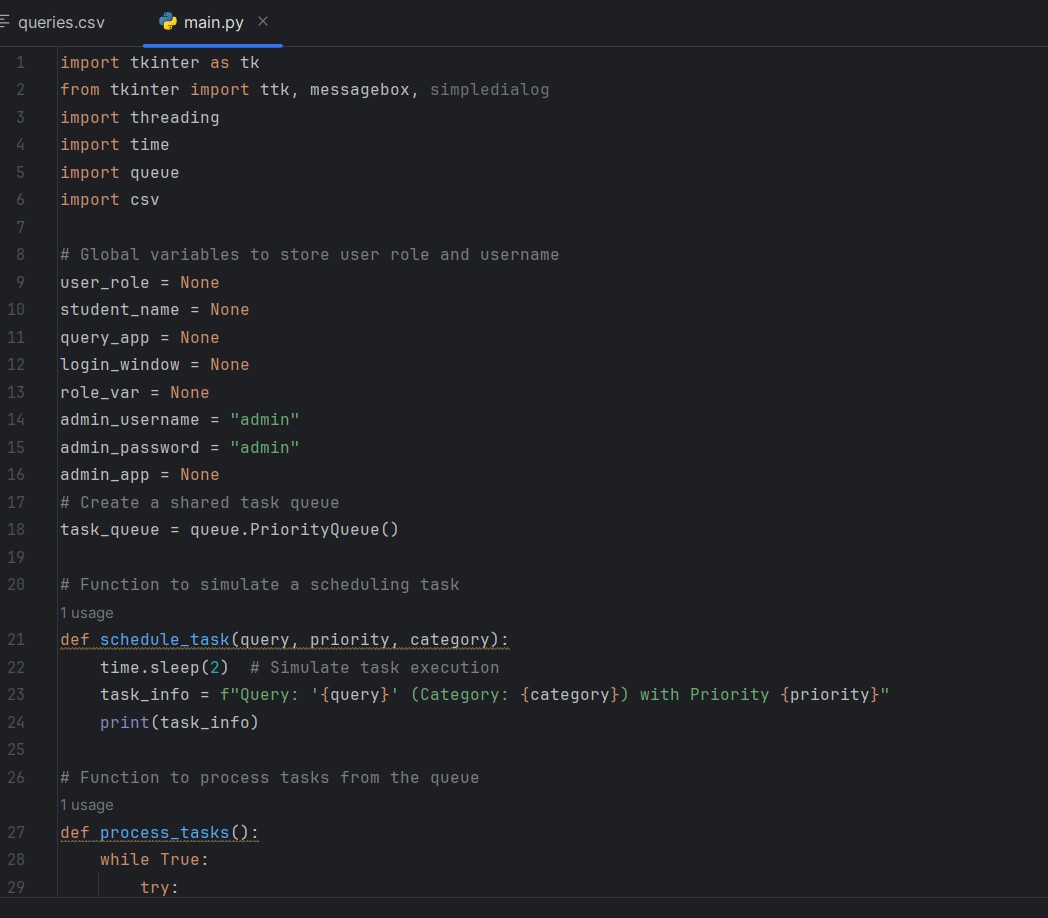
Navigate to the directory where you saved the Python file. You can use the cd command to change directories.

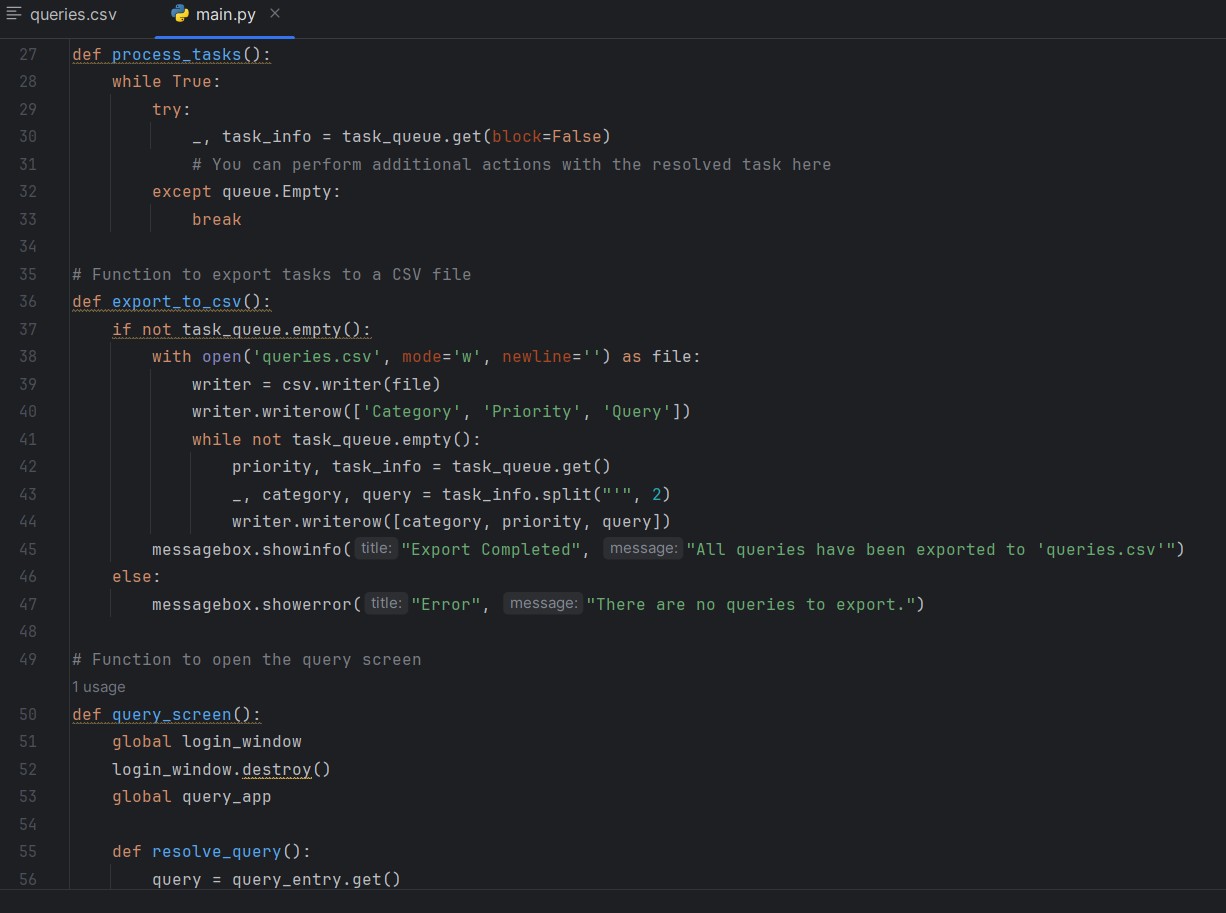
Run the script using the python command. Copy code When you run the script, the GUI application will open. You will see the login screen, where you can choose to log in as a "Student" or "Admin." Follow the prompts to interact with the application.

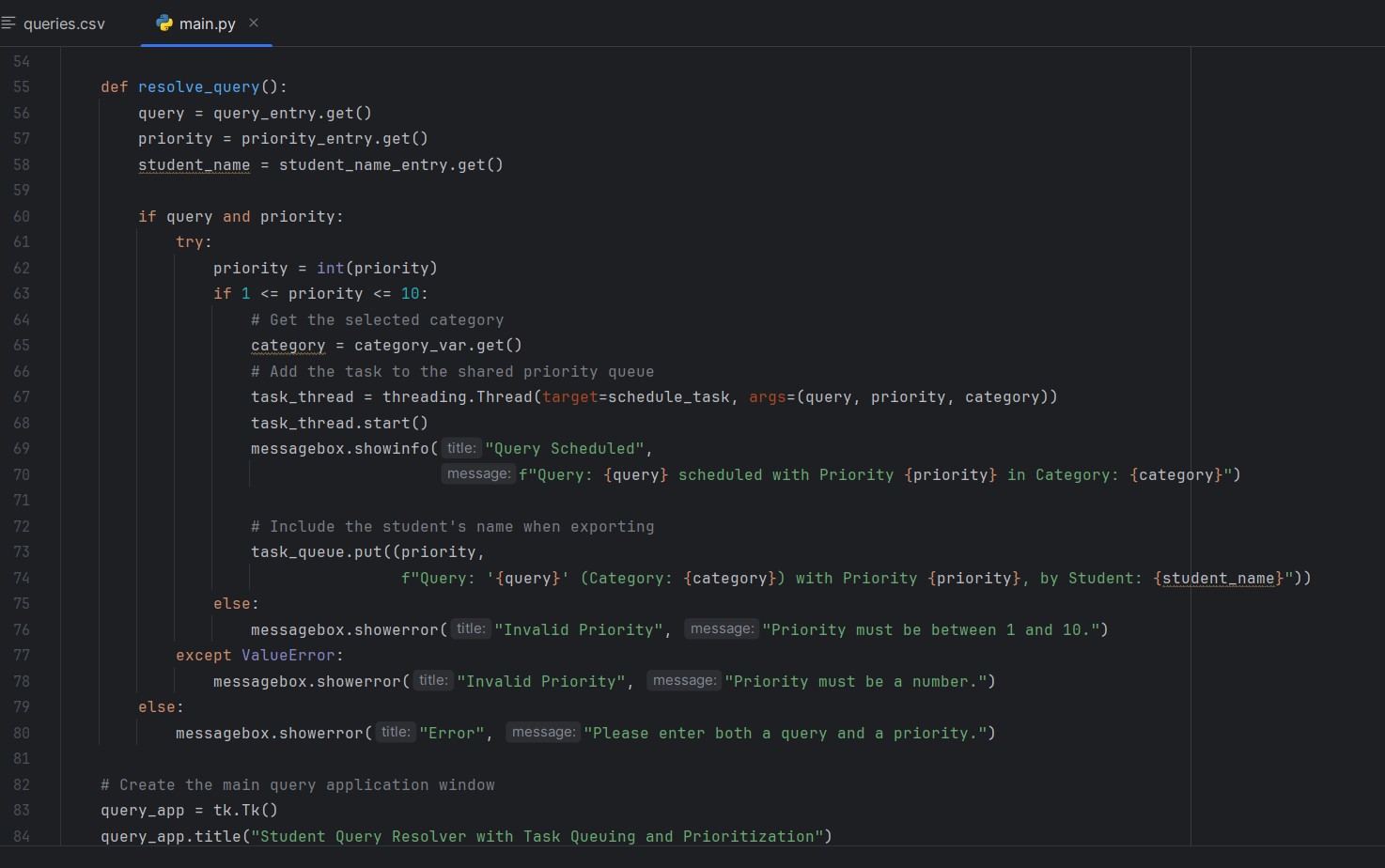
Make sure to have the required Python packages installed. The code uses the tkinter library for the graphical user interface (GUI). It is a standard library in Python, so you don't need to install it separately. However, ensure that you have a Python installation that includes tkinter.

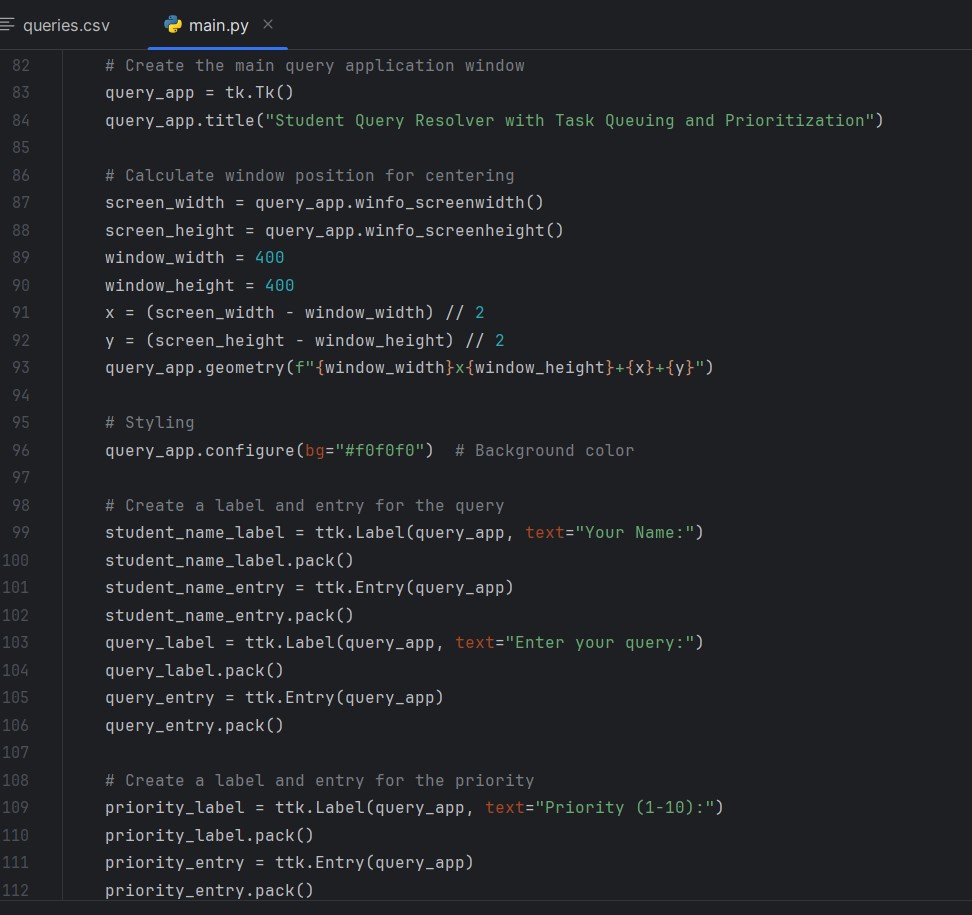
Please note that for the code to run successfully, it's important that the environment you're using supports GUI applications, and you should be able to interact with the GUI elements provided in the code. If you are using a Python IDE or code editor, you can also run the script directly from there.

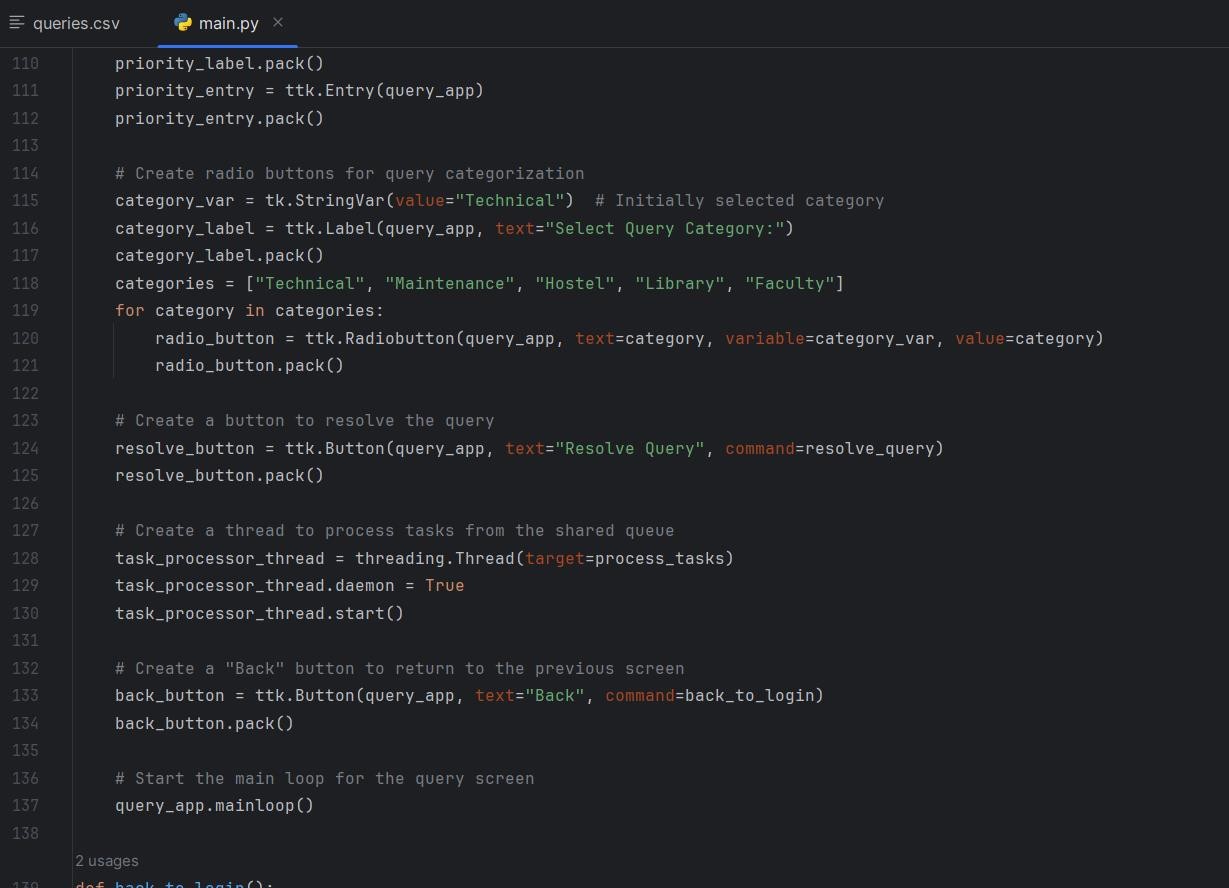
# Program

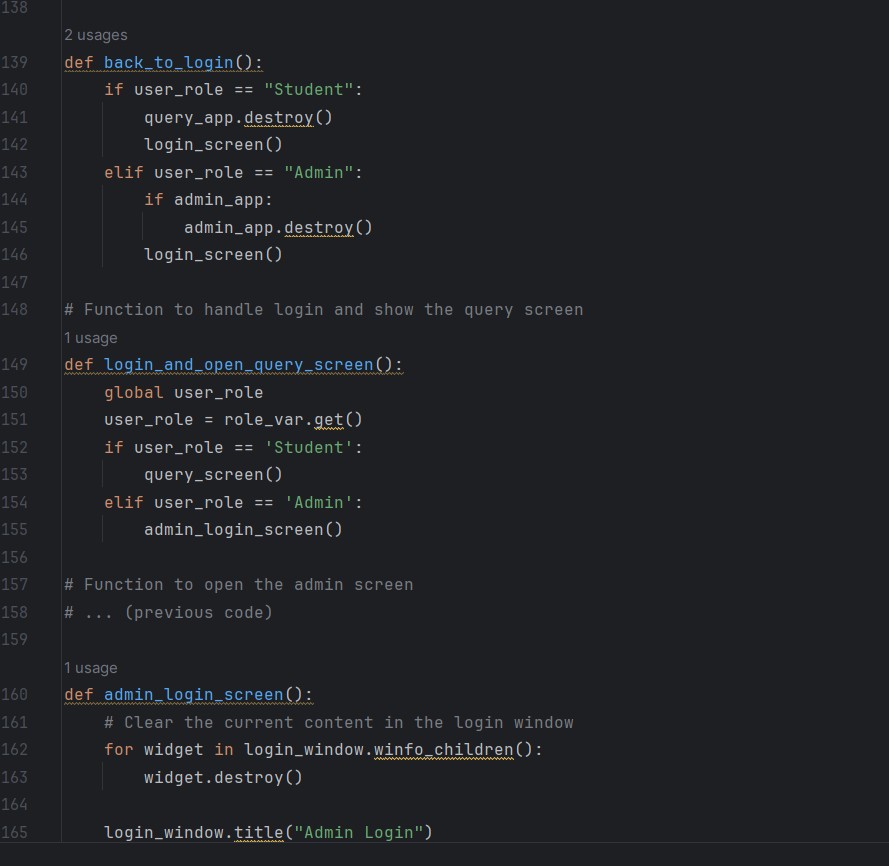


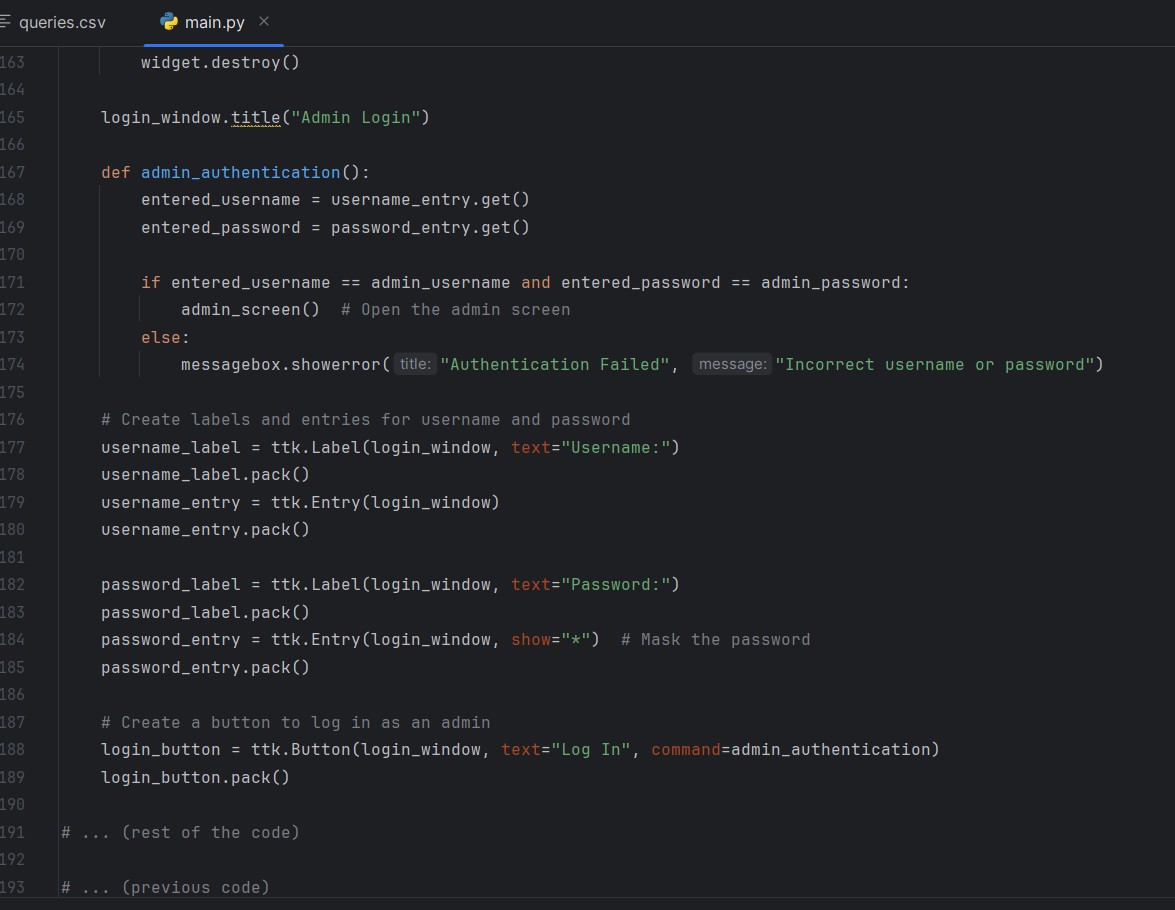




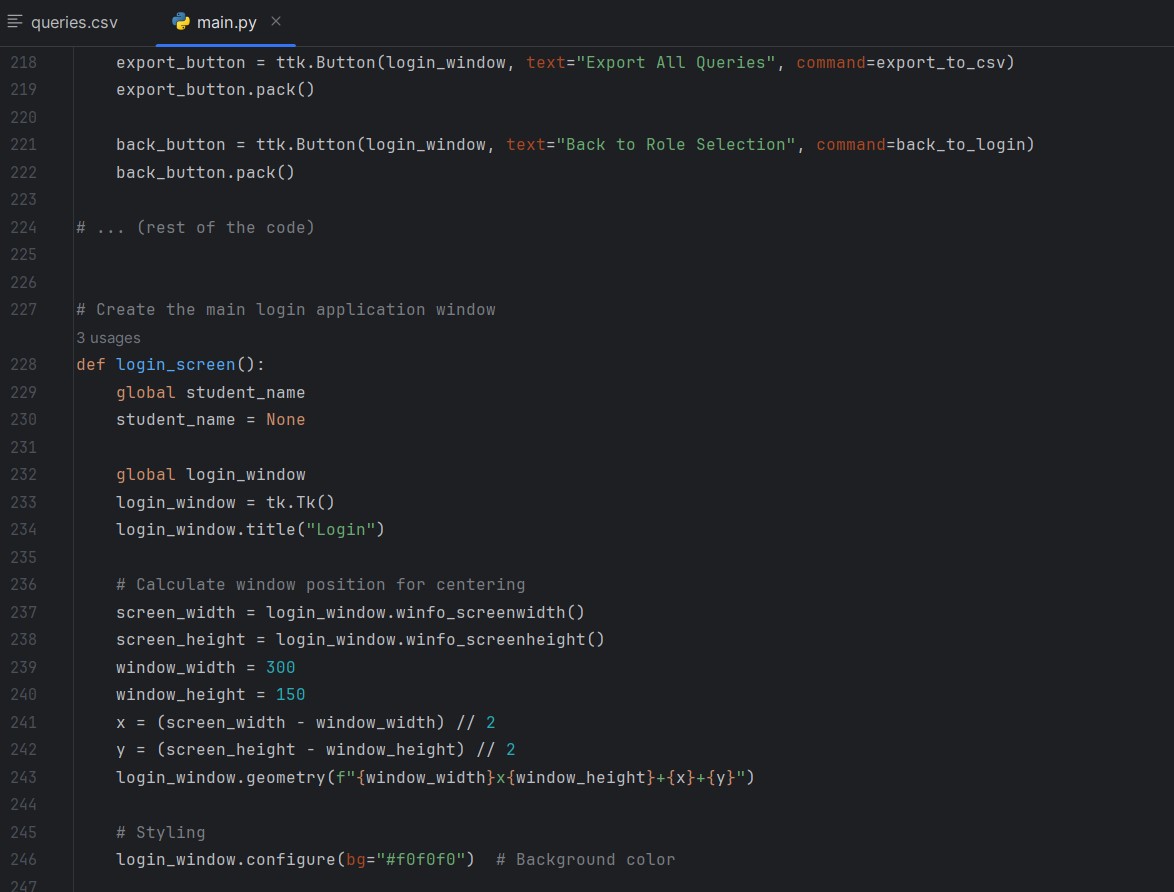


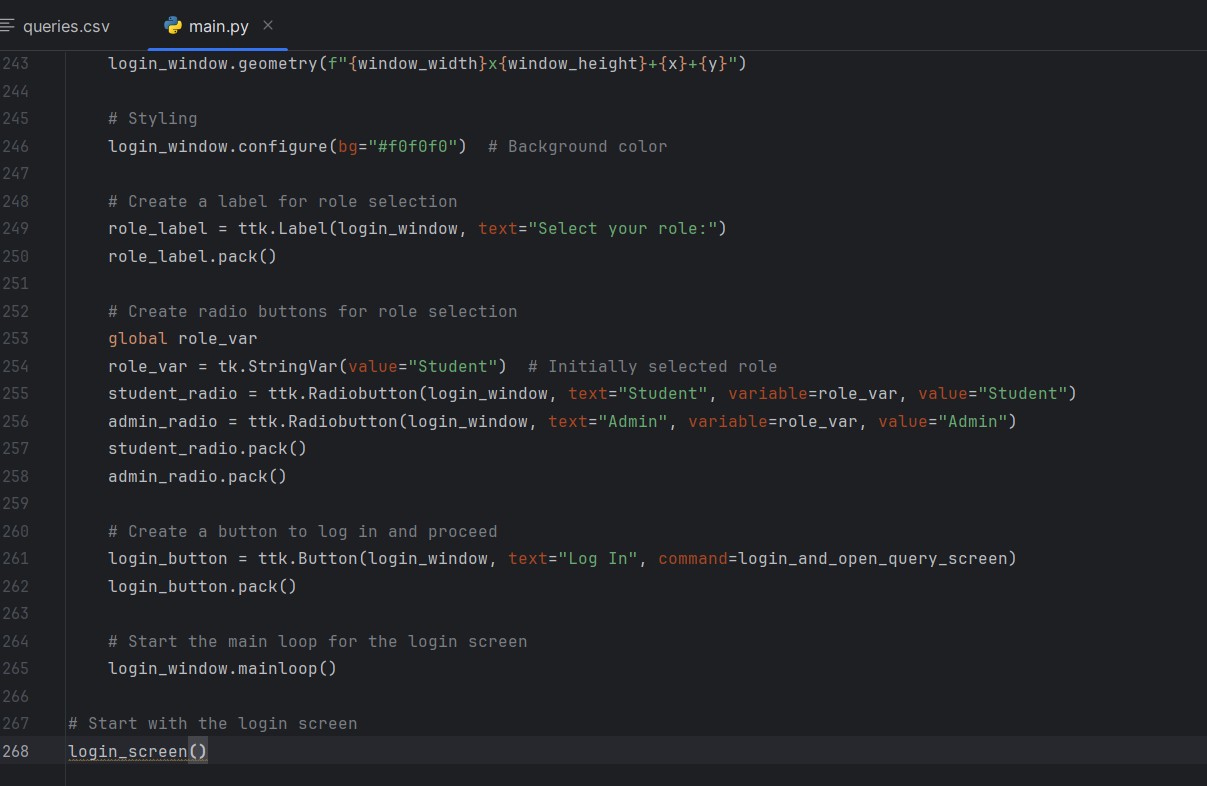








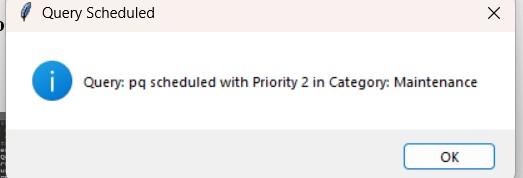
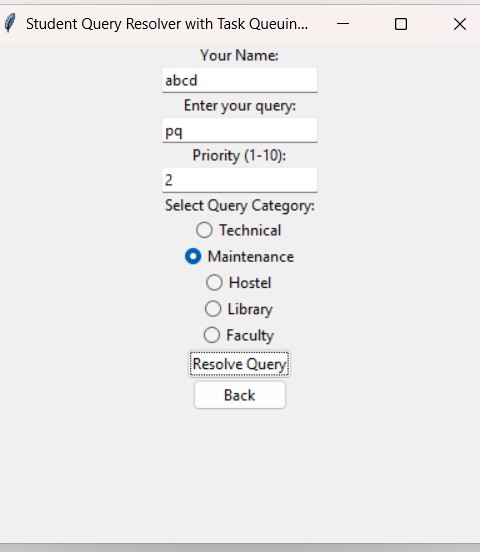
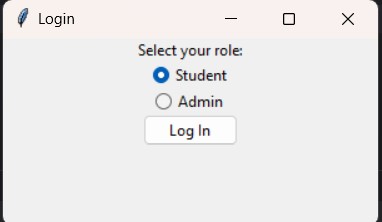




**CHAPTER 4**

# RESULTS

* 1. **Output**



# Result

The program has been successfully executed. The resolver works byprocessing the student's query, analyzing its context, and generating an appropriate response based on the available data and predefined rules.

# CHAPTER 5 CONCLUSION

In conclusion, the student query solver project represents a pivotal step forward in the realm of education and beyond, underlining the transformative potential of artificial intelligence and natural language processing. Throughout the development and implementation of this project, we have witnessed not only immediate benefits it offers to students and educators but also the expansive possibilities it opens for the future.

The project's impact on education is noteworthy. By providing students with quick and accurate answers to their questions, it empowers them to take a more active role in their learning. Moreover, the ability of the system to adapt and personalize responses based on individual student needs promises to foster independent thinking, critical problem-solving skills, and a deeper understanding of the subject matter. Educators, in turn, can leverage the supportof the query solver to focus on higher-level teaching and guidance, thus optimizing their role in the educational process.

Moreover, the broader applications of artificial intelligence and natural language processing technology make this project highly adaptable. It can be incorporated into various industries, such as customer support, healthcare, legal services, and more, to provide swift, accurate, and personalized responses to inquiries. This will not only improve efficiency but also enhance the overall user experience in these domains.

In sum, the student query solver project is a testament to the transformative power of technology in shaping the future of education and beyond

**.**

# CHAPTER 6 FUTURE SCOPE

The outlook for student query solvers is exceptionally promising, reflecting the broader trends in artificial intelligence and natural language processing. As technology continues to evolve, these systems are poised to play a central role in shaping the educational landscape and extending their influenceinto various other domains.

In the context of education, AI-driven query solvers are expected to become more sophisticated and pervasive. They will not only provide quick and accurate answers to students' questions but also offer personalized learning experiences. By analyzing individual learning patterns and adapting to students ‘needs, these systems can help foster independent learning and critical thinking skills. This, in turn, will reduce the burden on educators and enable them to focus more on guiding students' deeper understanding of subjects.

The future of student query solvers also holds the potential to expand beyond their primary role in education. These systems may evolve to provide comprehensive career guidance. By assessing a student's academic performance, interests, and aptitudes, they could offer tailored advice on choosing the right career path or academic major, contributing to better-informed decision-making.

Furthermore, the broader applications of AI and natural language processing technology will enable student query solvers to transcend the education sector. They can be employed in various fields, such as customer support, healthcare, and legal services, to provide quick and accurate responses to queries from customers, patients, or clients. This will enhance efficiency and improve the overall user experience in these domains.

In summary, the future scope for student query solvers is incredibly promising, as these systems are expected to not only revolutionize education but also extend their influence into various other sectors. Their ability to provide instant, accurate, and personalized responses to queries positions them as a crucial component of the ongoing digital transformation across divers

# CHAPTER 7 REFERENCES

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# APPENDIX 1

This section contains details on the language, software and packages used in our project.

### Language:

Programming Language: Python

### Software and Packages:

Pycharm 2023.24:

The code is written in python, so a Pycharm is required for compilation and execution. The specific version of the pycharm 2023.24 used can be identified by checking the python code or project configuration.

### Integrated Development Environment (IDE):

The code can be developed using any Java-compatible Integrated Development Environment. Some popular choices include:

JetBrains

visual Studio Code

### Graphical User Interface (GUI) Library:

. The code provided primarily uses the tkinter library for creating the graphical user interface (GUI) in Python. tkinter is a standard GUI library that comes bundled with most Python installations, making it a popular choice for developing simple and lightweight desktop applications with basic GUI elements such as windows, labels, buttons, and entry fields. It provides a simple way to create and manage windows, widgets, and other GUI components.

Here is the import statement that includes the tkinter library in the code: import tkinter as tk

from tkinter import ttk, messagebox, simpledialog

**OUTPUT MODULE:**

# APPENDIX 2

import tkinter as tk

from tkinter import ttk, messagebox, simpledialog import threading

import time import queue import csv

# Global variables to store user role and username user\_role = None

student\_name = None query\_app = None login\_window = None role\_var = None admin\_username = "admin" admin\_password = "admin" admin\_app = None

# Create a shared task queue task\_queue = queue.PriorityQueue()

# Function to simulate a scheduling task

def schedule\_task(query, priority, category): time.sleep(2) # Simulate task execution

task\_info = f"Query: '{query}' (Category: {category}) with Priority {priority}" print(task\_info)

# Function to process tasks from the queue def process\_tasks():

while True: try:

\_, task\_info = task\_queue.get(block=False)

# You can perform additional actions with the resolved task here except queue.Empty:

break

# Function to export tasks to a CSV file def export\_to\_csv():

if not task\_queue.empty():

with open('queries.csv', mode='w', newline='') as file: writer = csv.writer(file) writer.writerow(['Category', 'Priority', 'Query']) while not task\_queue.empty():

priority, task\_info = task\_queue.get()

\_, category, query = task\_info.split("'", 2) writer.writerow([category, priority, query])

messagebox.showinfo("Export Completed", "All queries have been exported to 'queries.csv'") else:

messagebox.showerror("Error", "There are no queries to export.")

def query\_screen(): global login\_window

login\_window.destroy() global query\_app

def resolve\_query():

query = query\_entry.get() priority = priority\_entry.get()

student\_name = student\_name\_entry.get()

if query and priority: try:

priority = int(priority) if 1 <= priority <= 10:

# Get the selected category category = category\_var.get()

# Add the task to the shared priority queue

task\_thread = threading.Thread(target=schedule\_task, args=(query, priority, category)) task\_thread.start()

messagebox.showinfo("Query Scheduled",

f"Query: {query} scheduled with Priority {priority} in Category: {category}")

# Include the student's name when exporting task\_queue.put((priority,

f"Query: '{query}' (Category: {category}) with Priority {priority}, by Student:

{student\_name}"))

else:

messagebox.showerror("Invalid Priority", "Priority must be between 1 and 10.") except ValueError:

messagebox.showerror("Invalid Priority", "Priority must be a number.")

else:

messagebox.showerror("Error", "Please enter both a query and a priority.")

# Create the main query application window query\_app = tk.Tk()

query\_app.title("Student Query Resolver with Task Queuing and Prioritization")

# Calculate window position for centering screen\_width = query\_app.winfo\_screenwidth() screen\_height = query\_app.winfo\_screenheight() window\_width = 400

window\_height = 400

x = (screen\_width - window\_width) // 2 y = (screen\_height - window\_height) // 2

query\_app.geometry(f"{window\_width}x{window\_height}+{x}+{y}")

query\_app.configure(bg="#f0f0f0")

student\_name\_label = ttk.Label(query\_app, text="Your Name:") student\_name\_label.pack()

student\_name\_entry = ttk.Entry(query\_app)

student\_name\_entry.pack()

query\_label = ttk.Label(query\_app, text="Enter your query:") query\_label.pack()

query\_entry = ttk.Entry(query\_app) query\_entry.pack()

# Create a label and entry for the priority

priority\_label = ttk.Label(query\_app, text="Priority (1-10):") priority\_label.pack()

priority\_entry = ttk.Entry(query\_app) priority\_entry.pack()

category\_var = tk.StringVar(value="Technical") # Initially selected category category\_label = ttk.Label(query\_app, text="Select Query Category:") category\_label.pack()

categories = ["Technical", "Maintenance", "Hostel", "Library", "Faculty"] for category in categories:

radio\_button = ttk.Radiobutton(query\_app, text=category, variable=category\_var, value=category) radio\_button.pack()

# Create a button to resolve the query

resolve\_button = ttk.Button(query\_app, text="Resolve Query", command=resolve\_query) resolve\_button.pack()

# Create a thread to process tasks from the shared queue task\_processor\_thread = threading.Thread(target=process\_tasks) task\_processor\_thread.daemon = True task\_processor\_thread.start()

# Create a "Back" button to return to the previous screen

back\_button = ttk.Button(query\_app, text="Back", command=back\_to\_login) back\_button.pack()

# Start the main loop for the query screen query\_app.mainloop()

def back\_to\_login():

if user\_role == "Student": query\_app.destroy() login\_screen()

elif user\_role == "Admin": if admin\_app:

admin\_app.destroy() login\_screen()

# Function to handle login and show the query screen def login\_and\_open\_query\_screen():

global user\_role user\_role = role\_var.get() if user\_role == 'Student':

query\_screen()

elif user\_role == 'Admin': admin\_login\_screen()

def admin\_login\_screen():

# Clear the current content in the login window for widget in login\_window.winfo\_children():

widget.destroy() login\_window.title("Admin Login")

def admin\_authentication():

entered\_username = username\_entry.get() entered\_password = password\_entry.get()

if entered\_username == admin\_username and entered\_password == admin\_password: admin\_screen() # Open the admin screen

else:

messagebox.showerror("Authentication Failed", "Incorrect username or password")

username\_label = ttk.Label(login\_window, text="Username:") username\_label.pack()

username\_entry = ttk.Entry(login\_window) username\_entry.pack()

password\_label = ttk.Label(login\_window, text="Password:") password\_label.pack()

password\_entry = ttk.Entry(login\_window, show="\*") # Mask the password password\_entry.pack()

# Create a button to log in as an admin

login\_button = ttk.Button(login\_window, text="Log In", command=admin\_authentication) login\_button.pack()

def admin\_screen(): global login\_window global admin\_app

# Clear the current content in the login window for widget in login\_window.winfo\_children():

widget.destroy()

login\_window.title("Admin Panel") def export\_to\_csv():

if not task\_queue.empty():

with open('queries.csv', mode='w', newline='') as file: writer = csv.writer(file) writer.writerow(['Category', 'Priority', 'Query']) while not task\_queue.empty():

priority, task\_info = task\_queue.get()

\_, category, query = task\_info.split("'", 2) writer.writerow([category, priority, query])

messagebox.showinfo("Export Completed", "All queries have been exported to 'queries.csv'") else:

messagebox.showerror("Error", "There are no queries to export.")

# Create a button to export all queries to a CSV file

export\_button = ttk.Button(login\_window, text="Export All Queries", command=export\_to\_csv) export\_button.pack()

back\_button = ttk.Button(login\_window, text="Back to Role Selection", command=back\_to\_login) back\_button.pack()

}

def login\_screen(): global student\_name student\_name = None global login\_window

login\_window = tk.Tk() login\_window.title("Login")

screen\_width = login\_window.winfo\_screenwidth() screen\_height = login\_window.winfo\_screenheight() window\_width = 300

window\_height = 150

x = (screen\_width - window\_width) // 2 y = (screen\_height - window\_height) // 2

login\_window.geometry(f"{window\_width}x{window\_height}+{x}+{y}")

# Styling

login\_window.configure(bg="#f0f0f0") # Background color

# Create a label for role selection

role\_label = ttk.Label(login\_window, text="Select your role:") role\_label.pack()

# Create radio buttons for role selection global role\_var

role\_var = tk.StringVar(value="Student") # Initially selected role

student\_radio = ttk.Radiobutton(login\_window, text="Student", variable=role\_var, value="Student") admin\_radio = ttk.Radiobutton(login\_window, text="Admin", variable=role\_var, value="Admin") student\_radio.pack()

admin\_radio.pack()

# Create a button to log in and proceed

login\_button = ttk.Button(login\_window, text="Log In", command=login\_and\_open\_query\_screen) login\_button.pack()

# Start the main loop for the login screen login\_window.mainloop()

# Start with the login screen login\_screen()