

CODING CHALLENGE TRIGGER BOT

A PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

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ABSTRACT

"The Coding Challenge Trigger Bot" is an innovative solution designed to inspire students and enhance their programming skills through consistent practice. This intelligent bot generates three diverse coding questions daily, carefully selected from reputed online coding platforms to ensure quality and variety. Once generated, the bot compiles these questions into a well-formatted Word document, which is then delivered directly to the user's email. By automating the process of providing regular challenges, the bot eliminates manual effort and ensures students have access to high-quality coding problems tailored to improve their problem-solving abilities. The bot fosters a habit of daily practice, enabling users to build confidence, master programming concepts, and prepare for competitive programming and technical interviews. Its seamless operation ensures a consistent supply of challenges, promoting self-learning and academic excellence. "The Coding Challenge Trigger Bot" serves as an indispensable resource for students, empowering them to develop essential programming skills and excel in their careers.

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TABLE OF CONTENTS

| CHAPTER NO. | TITLE | PAGE NO. |
|-------------|------------------------------|------------|
| | ABSTRACT | iii |
| | LIST OF FIGURES | vi |
| | LIST OF ABBREVIATIONS | vi |
| 1. | INTRODUCTION | 1 |
| 1.1 | INTRODUCTION 1 | |
| 1.2 | OBJECTIVE 3 | |
| 1.3 | EXISTING SYSTEM 3 | |
| 1.4 | PROPOSED SYSTEM | 4 |
| 2. | LITERATURE REVIEW | |
| 3. | SYSTEM DESIGN | 8 |
| 3.1 | SEQUENCE DIAGRAM | |
| 3.2 | SYSTEM FLOW DIAGRAM | |
| 3.3 | ARCHITECTURE DIAGRAM 1 | |
| 4. | PROJECT DESCRIPTION | 11 |

| | | |
|--------|--------------------------------------|-----------|
| 4.1 | MODULES | |
| 4.1.1. | INPUT HANDLING AND INITIALIZATION | |
| 4.1.2. | GENERATING CODING PROBLEMS | 11 |
| 4.1.3. | DOCUMENT GENERATION | 12 |
| 4.1.4. | EMAIL NOTIFICATION | 12 |
| 5. | OUTPUT SCREENSHOTS | 13 |
| | CONCLUSION | 16 |
| | APPENDIX | 17 |
| | REFERENCES | 18 |

LIST OF FIGURES

| Figure No. | Figure Name | Page No. |
|------------|--|----------|
| 3.1 | System Flow Diagram | 9 |
| 3.2 | Architecture Diagram | 10 |
| 3.3 | Sequence Diagram | 11 |
| 5.4 | Word Document Generation | 16 |
| 5.5 | Email Notification with PDF Attachment | 17 |

LIST OF ABBREVIATIONS

| ABBREVIATION | ACCRONYM |
|--------------|-------------------------------|
| RPA | Robotic Process Automation |
| SMTP | Simple Mail Transfer Protocol |
| PDF | Portable Document Format |
| SQL | Structured Query Language |
| CSV | Comma-Separated Values |

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The "**Coding Challenge Trigger Bot**" is an innovative automation solution designed to inspire and enhance students' programming skills through consistent practice. Developed using cutting-edge technologies, this bot eliminates the barriers of manual effort by automating the process of delivering curated coding challenges daily.

Coding practice is a crucial yet often neglected task due to the lack of consistent motivation and structured problem delivery. This bot addresses these challenges by generating three diverse coding questions daily, carefully selected from renowned coding platforms to ensure high quality and relevance. It compiles these questions into a professionally formatted Word document and delivers them directly to the user's email via automated SMTP communication.

The **Coding Challenge Trigger Bot** streamlines the process of coding practice, ensuring that users receive regular, high-quality challenges tailored to improve problem-solving skills and programming expertise. By leveraging automation, it not only fosters a habit of consistent coding but also eliminates the inefficiencies of manual problem sourcing.

This project demonstrates the potential of automation to transform the learning process. By integrating tools such as Word for document formatting and email protocols for communication, the bot ensures a seamless user experience. Its modular design allows for scalability and flexibility, making it adaptable to changing requirements and capable of accommodating advanced features in future iterations.

The **Coding Challenge Trigger Bot** serves as a practical example of how automation can enhance education, preparing students for competitive programming, technical interviews, and real-world challenges. It empowers educators and learners by automating repetitive tasks, enabling them to focus on building essential programming skills, ultimately contributing to their academic and career success.

1.2 OBJECTIVE

The objective of the **Coding Challenge Trigger Bot** is to automate and streamline the process of delivering daily coding challenges to users, fostering consistent practice and skill development. This bot is designed to efficiently generate three diverse coding questions daily, sourced from reputable platforms, and compile them into a professionally formatted Word document. By leveraging automation, it eliminates the need for manual question curation and ensures timely delivery of challenges via email.

The bot aims to enhance programming skills by providing users with high-quality, diverse problems tailored to improve problem-solving abilities and technical expertise. This project minimizes manual effort, encourages regular practice, and promotes self-learning among students, enabling them to prepare effectively for competitive programming, technical interviews, and academic success. Through its scalable and user-friendly design, the bot addresses the dynamic needs of learners while demonstrating the potential of automation in educational systems.

1.3 EXISTING SYSTEM

The existing system for delivering coding challenges is largely manual, requiring educators or administrators to source problems from various platforms, compile them into a readable format, and share them with students individually. This approach is time-consuming, inconsistent, and prone to errors such as selecting repetitive or irrelevant problems. Additionally, the lack of automation often results in delays and irregular delivery of challenges, leading to missed opportunities for consistent practice.

Managing this process manually becomes increasingly inefficient, especially when catering to a large group of learners with diverse skill levels and requirements. These challenges highlight the need for an automated solution that ensures the regular, accurate, and timely delivery of diverse and high-quality coding problems, fostering a habit of consistent learning and skill enhancement among students.

CHAPTER 2

LITERATURE REVIEW

1.4 PROPOSED SYSTEM

The **Coding Challenge Trigger Bot** offers an automated and efficient solution to the manual process of delivering coding challenges to students. Developed using Robotic Process Automation (RPA), the bot handles the end-to-end process of generating daily coding problems, selecting them from reputable online platforms, and delivering them directly to the user's email. By automating tasks such as problem selection, formatting into a Word document, and timely delivery, the bot ensures accuracy, consistency, and regularity in providing learning materials.

The bot eliminates the need for manual intervention, streamlining the workflow and saving time for educators and administrators. It compiles the selected problems into a structured format, creating a seamless experience for both users and administrators. The bot leverages email protocols to deliver challenges efficiently, ensuring that students receive their assignments promptly. This proposed system not only saves time and reduces human error but also provides a scalable solution that caters to the dynamic needs of learners, enhancing their problem-solving skills and preparing them for competitive programming and technical interviews.

In addition, the bot can be easily integrated into existing educational platforms, making it adaptable for both small and large institutions. Its modular design ensures that it can be customized to meet the specific needs of different user groups, from beginners to advanced programmers. The automation of daily challenges promotes consistent learning habits, empowering students to improve their coding abilities and stay engaged in continuous practice. The system also offers the potential for future enhancements, such as real-time progress tracking and integration with coding platforms for dynamic problem generation. Ultimately, the **Coding Challenge Trigger Bot** is a powerful tool that transforms the way coding challenges

are delivered, ensuring a more efficient, effective, and personalized learning experience for students.

2.1 Survey on Robotic Process Automation (RPA) in Educational Automation:

Robotic Process Automation (RPA) has gained significant traction in educational systems to automate administrative and learning-related tasks, particularly for improving students' coding skills. RPA's ability to automate repetitive processes such as problem selection, delivery, and scheduling has been explored in several studies. In the context of coding practice, RPA helps to streamline the process of delivering daily challenges, reducing manual intervention and ensuring timely and consistent problem delivery. Research has highlighted the potential of RPA in educational settings by providing automated solutions that reduce administrative burdens and enhance students' learning experiences. However, challenges persist in the adoption of RPA, such as integrating it with existing educational platforms and the need for adaptability to different learning styles and programming levels. Relevant studies on RPA in education include:

- [1] A study discusses how RPA is transforming educational workflows by automating routine tasks like daily coding problem delivery, improving the efficiency of learning systems.
- [2] A paper from IJITEE explores RPA's effectiveness in automating task scheduling, including coding challenges, and emphasizes its potential to enhance student engagement by providing personalized learning materials.

2.2 Survey on Automation in Personalized Coding Challenge Delivery:

The automation of personalized coding challenge delivery is an emerging trend in education, aimed at improving students' coding skills through regular practice. The use of RPA in this context automates the process of delivering daily coding challenges tailored to individual student needs. This approach not only reduces manual effort but also ensures consistency and timeliness in challenge delivery. While automated systems have become prevalent in course management, challenges such as scalability and the ability to adapt to various skill levels

remain.

[1] Research highlights how automation systems can deliver personalized coding problems, improving student engagement and fostering a habit of regular practice. Automated systems analyze user preferences, select appropriate problems, and deliver them, creating a more efficient learning environment.

[2] A study on RPA integration with email systems demonstrates how automation can facilitate mass notifications for coding challenges, ensuring that students receive their daily problems promptly and with minimal administrative oversight.

2.3 Survey on Challenges in Coding Practice Delivery and Proposed RPA Integration:

Manual delivery of coding challenges faces several limitations, including inconsistencies, delayed delivery, and a lack of personalization. Studies have pointed out the difficulties in curating and delivering coding problems manually, particularly when dealing with large groups of students and diverse skill levels. Automation through RPA offers a solution to these issues by ensuring accurate, timely, and personalized problem delivery.

[1] A study on traditional coding challenge delivery systems highlights inefficiencies, such as the time-consuming process of curating questions and sending them manually. The research advocates for RPA integration to streamline this process and reduce administrative effort.

[2] A paper discusses the challenges in maintaining consistency and quality in coding problem delivery and proposes RPA as an ideal solution to automate selection, formatting, and email dispatch, ensuring better engagement and skill-building opportunities for students.

2.4 Summary of the Intersection of RPA and Coding Challenge Delivery:

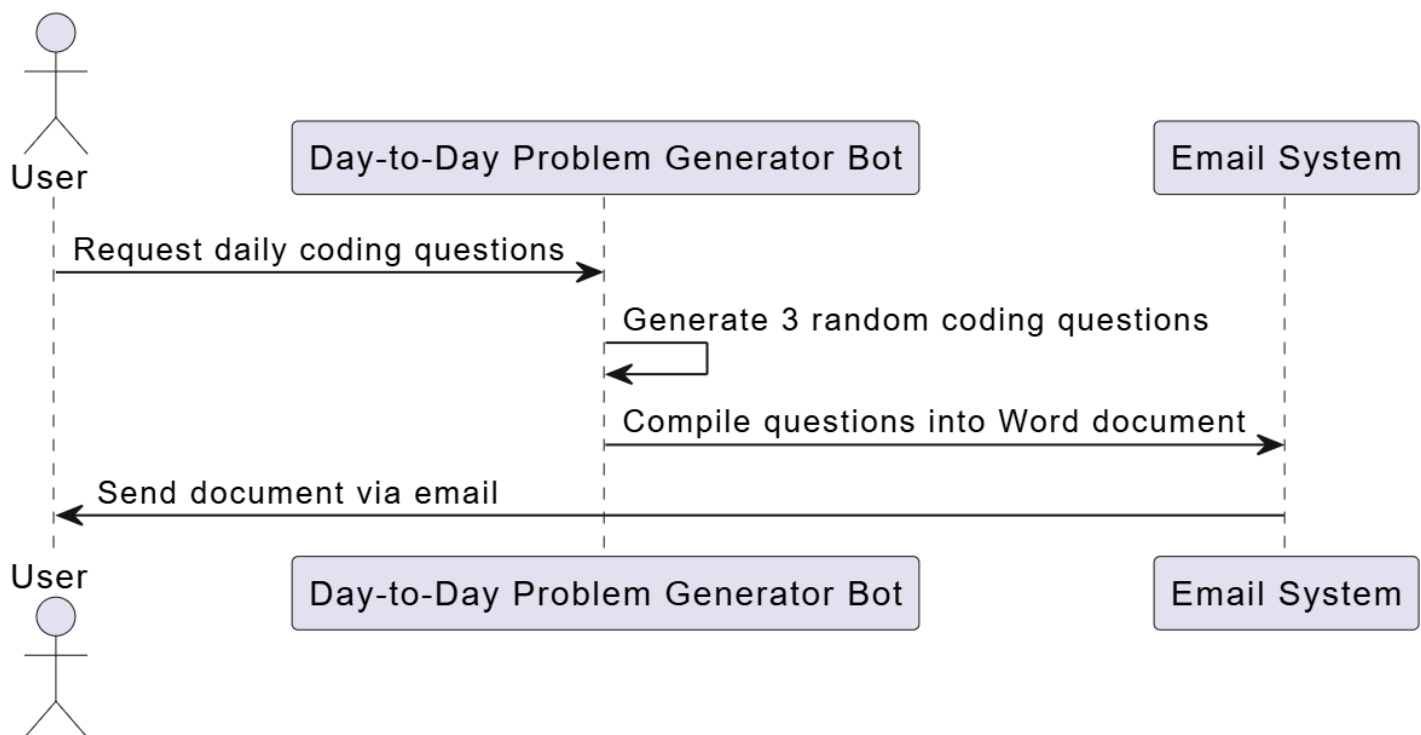
The **Coding Challenge Trigger Bot** integrates RPA to automate the entire process of delivering daily coding challenges to students. This innovative system automates problem selection from trusted online platforms, compiles them into a structured format, and delivers them to students' emails with minimal manual intervention. By automating these workflows, the bot ensures timely delivery, consistency, and high-quality problem sets, enhancing students' engagement in regular coding practice.

CHAPTER 3

SYSTEM DESIGN

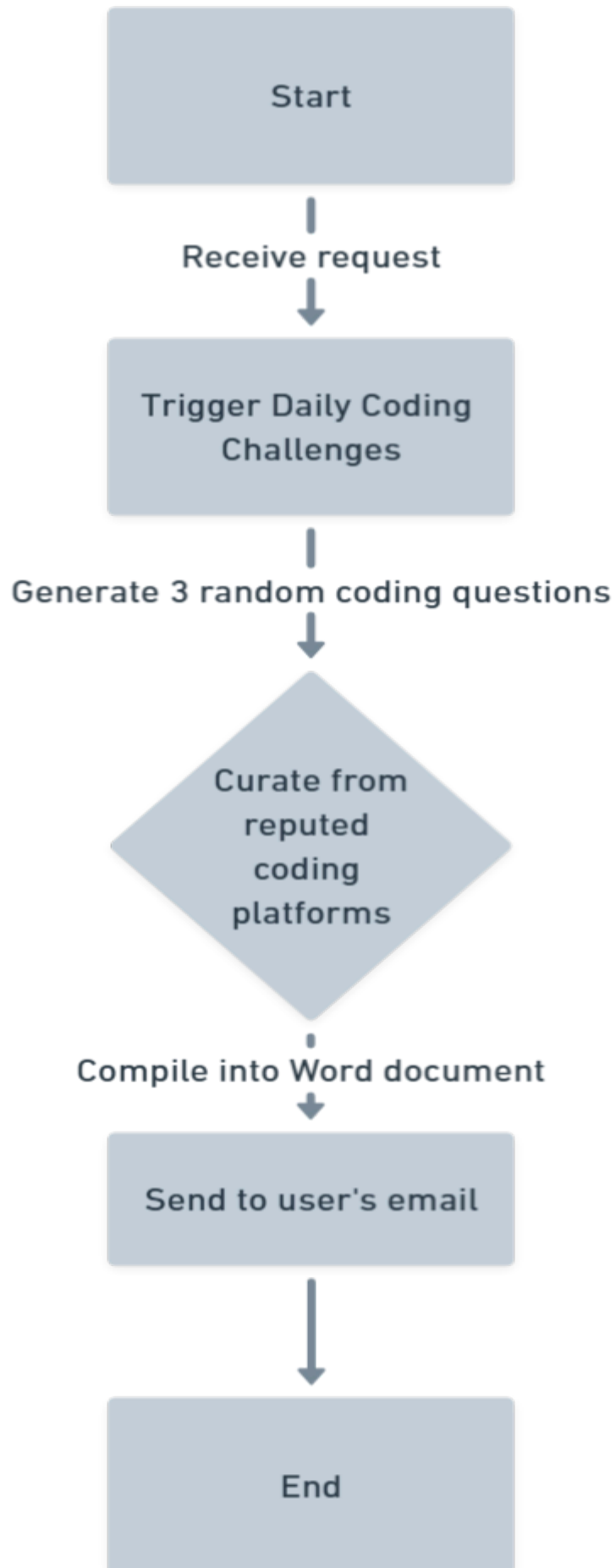
3.1 SEQUENCE DIAGRAM

A sequence diagram is a type of interaction diagram because it describes and how in what order a group of objects works together.

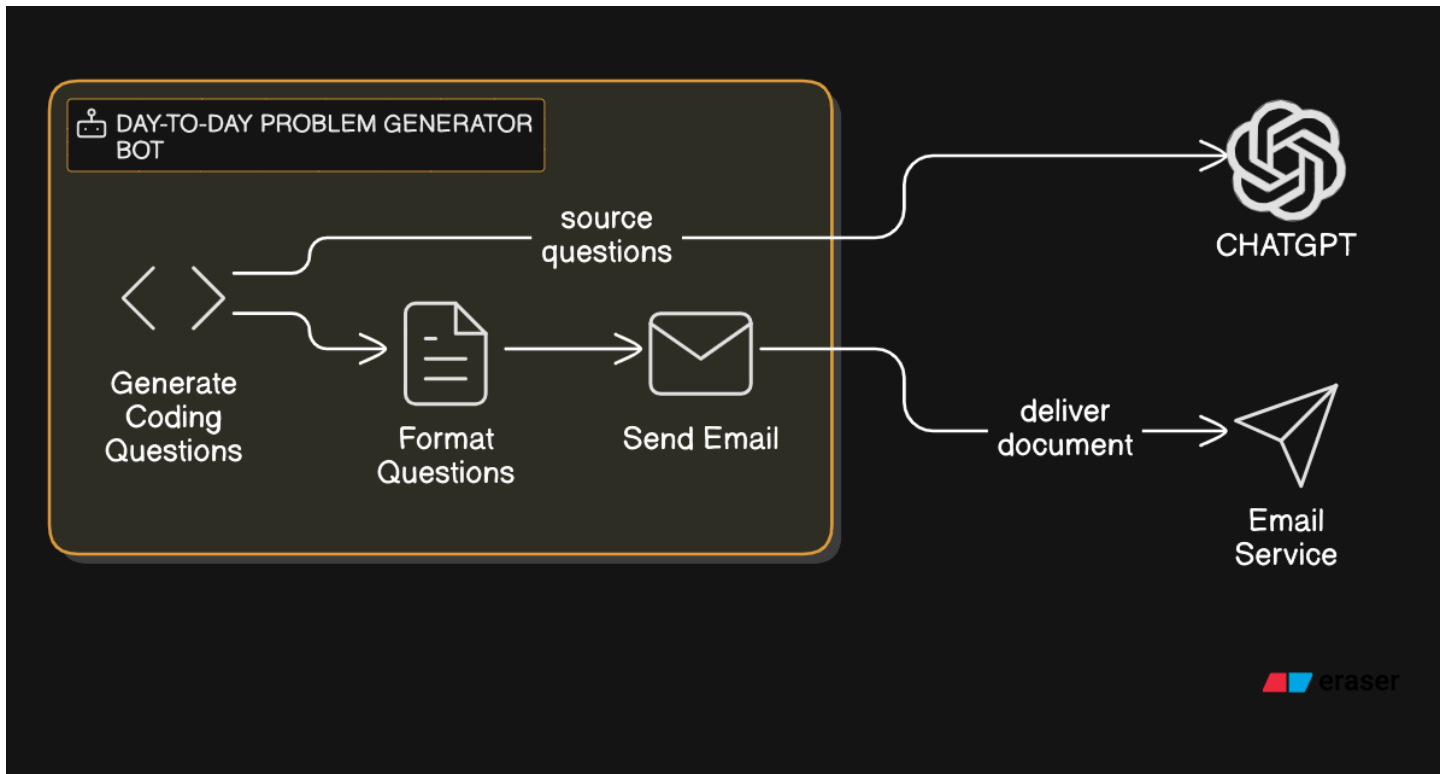


3.2 SYSTEM FLOW DIAGRAM

A system flow diagram is a graphical representation of the sequence of steps or processes involved in a system. It provides a visual framework to understand the flow of data and tasks, representing various components as labeled boxes and connecting them with arrows to depict their relationships. These diagrams simplify complex processes by breaking them into smaller, manageable steps, making it easier to analyze, design, or troubleshoot a system.



3.3 ARCHITECTURE DIAGRAM



CHAPTER 4

PROJECT DESCRIPTION

The "The Coding Challenge Trigger Bot" is an innovative automation project designed to enhance programming skills by generating and delivering daily coding challenges to users. The bot utilizes Robotic Process Automation (RPA) with UiPath to automate critical tasks such as selecting coding problems from reputable platforms, compiling them into a structured document, and sending them to users via email. This bot ensures consistent engagement, skill enhancement, and seamless communication while minimizing manual intervention.

4.1 MODULES

4.1.1 INPUT HANDLING AND INITIALIZATION

4.1.1.1 Problem Selection:

- The bot begins by collecting three random coding problems from chatgpt

4.1.1.2 Data Initialization:

- The selected coding problems are fetched and validated to ensure they meet the difficulty criteria.
 - Problems are categorized based on their complexity levels: Easy, Medium, and Hard.
-

4.1.2 CODING QUESTION COMPILATION

4.1.2.1 Document Creation:

- Each coding problem is formatted into a predesigned Word document template.
- The document includes details such as problem description, difficulty level, and platform source.

4.1.2.2 PDF Conversion:

- The Word document is converted into a professional PDF format for consistency and ease of sharing.
-

4.1.3 EMAIL NOTIFICATION

4.1.3.1 Email Preparation:

- The bot extracts user email addresses from an Excel file or a user database.
- The generated PDF with coding questions is attached to each email.

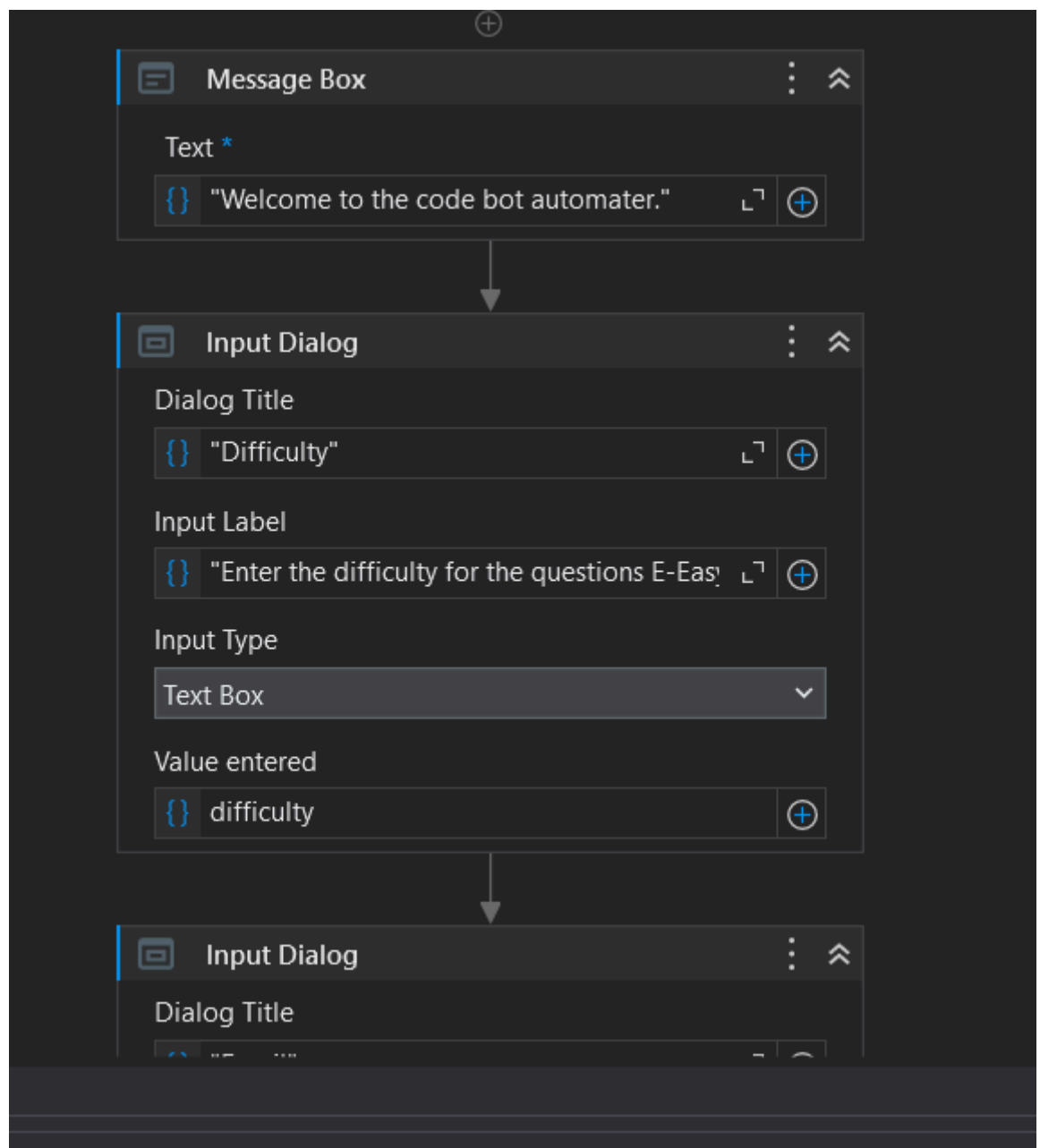
4.1.3.2 Email Dispatch:

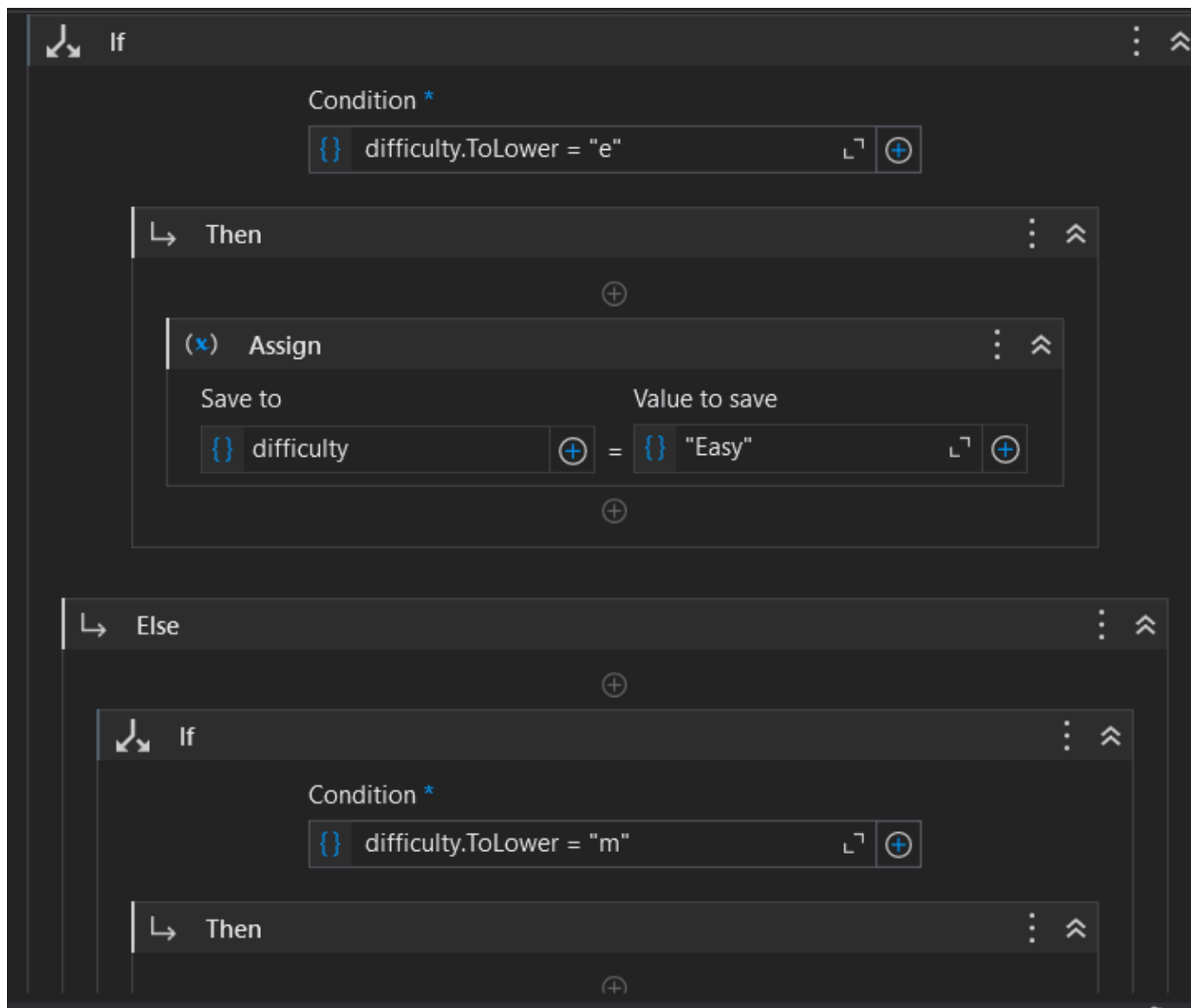
- The bot uses SMTP services to send emails to users.
- A personalized message is included, encouraging users to solve the challenges and improve their skills.

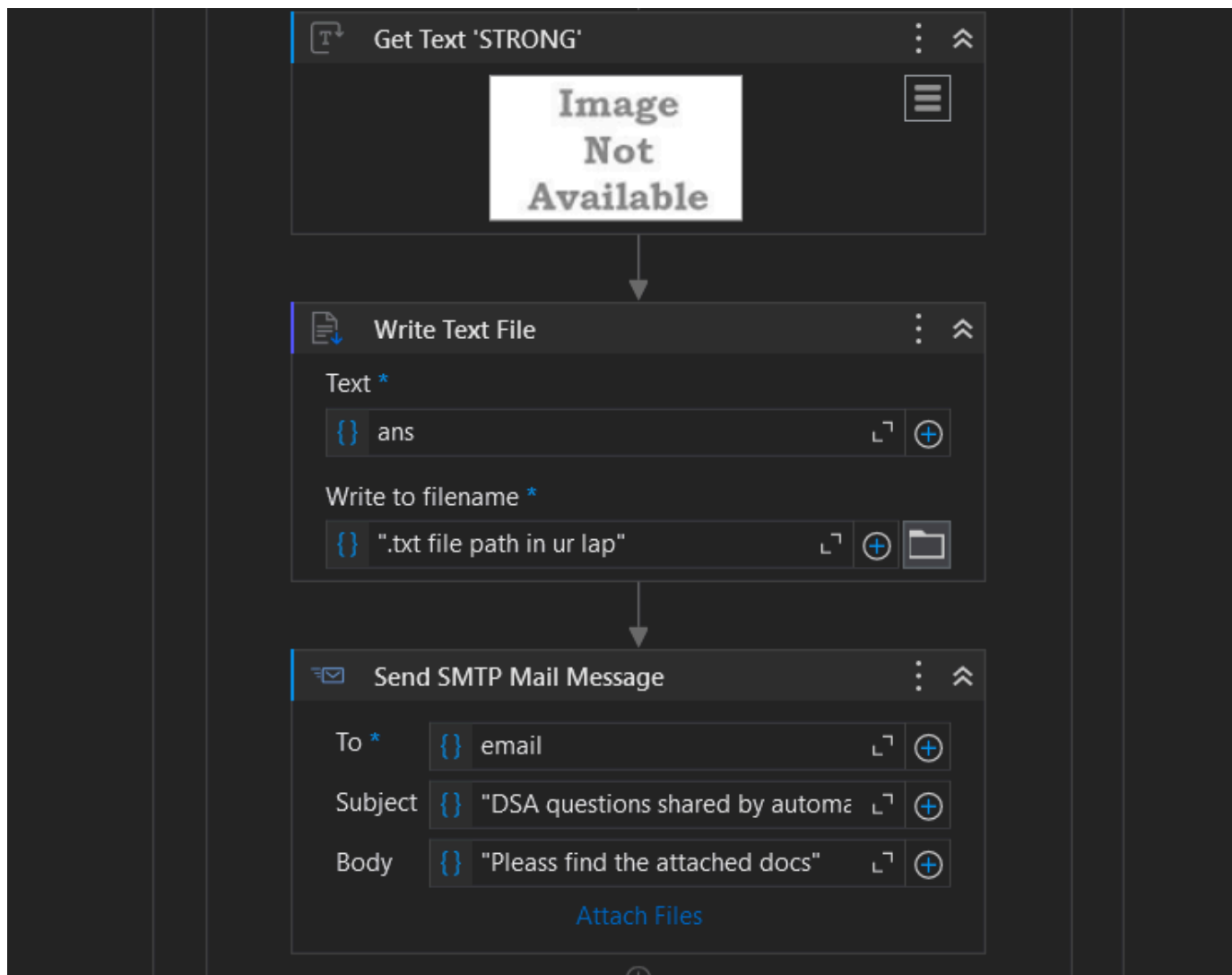
4.1.3.3 Completion Notification:

- After all emails are successfully dispatched, the bot displays a completion message to indicate the task is finished.

CHAPTER 5 : PROJECT WORKFLOW







CHAPTER 6

CONCLUSION

The **CODING CHALLENGE TRIGGER BOT** successfully demonstrates the potential of Robotic Process Automation (RPA) in enhancing programming skills by automating the process of generating and delivering daily coding challenges. By streamlining tasks such as

selecting coding problems from reputed platforms, compiling them into structured documents, and sending them to users via email, the bot ensures consistent engagement, reduces manual efforts, and promotes skill development.

This project highlights the efficiency and reliability of RPA in managing repetitive workflows, making it a valuable tool for students, educators, and coding enthusiasts. The bot not only saves time but also motivates users to practice coding regularly, fostering a culture of continuous learning and improvement.

While the current implementation addresses the key challenges of daily coding engagement, there is scope for future enhancements, such as integrating user feedback, customizing problem difficulty based on user skill levels, and incorporating progress tracking mechanisms. The success of the **CODING CHALLENGE TRIGGER BOT** emphasizes the importance of automation in modern education and lays a strong foundation for further innovation in learning technologies.