

RECIPE FINDER BOT

A PROJECT REPORT

Submitted by

JOHN ALLAN J (220701111)

in partial fulfilment for the course

OAI1903 - INTRODUCTION TO ROBOTIC PROCESS AUTOMATION

for the degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

RAJALAKSHMI ENGINEERING COLLEGE

RAJALAKSHMI NAGAR

THANDALAM

CHENNAI – 602 105

NOVEMBER 2024

RAJALAKSHMI ENGINEERING COLLEGE

CHENNAI - 602105

BONAFIDE CERTIFICATE

Certified that this project report “**RECIPE FINDER BOT**” is the bonafide work of “**JOHN ALLAN J (220701111)**” who carried out the project work for the subject OAI1903-Introduction to Robotic Process Automation under my supervision.

Mrs. J. Jinu Sophia

SUPERVISOR

Assistant Professor (SG)

Department of

Computer Science and Engineering

Rajalakshmi Engineering College

Rajalakshmi Nagar

Thandalam

Chennai - 602105

Submitted to Project and Viva Voce Examination for the subject OAI1903-
Introduction to Robotic Process Automation held on _____.

INTERNAL EXAMINER

EXTERNAL EXAMINER

ACKNOWLEDGEMENT

Initially we thank the Almighty for being with us through every walk of our life and showering his blessings through the endeavour to put forth this report. Our sincere thanks to our Chairman **Thiru. S. Meganathan, B.E., F.I.E.**, our Vice Chairman **Mr. M. Abhay Shankar, B.E., M.S.**, and our respected Chairperson **Dr. (Mrs.) Thangam Meganathan, M.A., M.Phil., Ph.D.**, for providing us with the requisite infrastructure and sincere endeavouring in educating us in their premier institution.

Our sincere thanks to **Dr. S. N. Murugesan, M.E., Ph.D.**, our beloved Principal for his kind support and facilities provided to complete our work in time. We express our sincere thanks to **Dr. P. Kumar, M.E., Ph.D.**, Professor and Head of the Department of Computer Science and Engineering for his guidance and encouragement throughout the project work. We convey our sincere and deepest gratitude to our internal guides, **Ms. Roxanna Samuel, M.E.**, Assistant Professor (SG), **Ms. U. Farjana, M.E.**, Assistant Professor and **Ms. S. Vinothini, M.E.**, Department of Computer Science and Engineering for their valuable guidance throughout the course of the project. We are very glad to thank our Project Coordinators, **Dr. P. Revathy, M.E., Ph.D.**, Professor, **Dr. N. Durai Murugan, M.E., Ph.D.**, Associate Professor, and **Mr. B. Bhuvaneshwaran, M.E.**, Assistant Professor (SG), Department of Computer Science and Engineering for their useful tips during our review to build our project.

John Allan J (220701111)

ABSTRACT

The Recipe Finder Bot is an automated solution designed to assist users in discovering recipes based on available ingredients. The bot leverages web scraping techniques to collect data from multiple online recipe sources, allowing users to input a list of ingredients and receive a curated list of recipes that can be made with those ingredients. It processes user input, performs searches on trusted recipe websites, and returns recipe details such as preparation time, ingredients, instructions, and nutritional information. The bot aims to simplify meal planning, reduce food wastage, and provide users with personalized cooking ideas. By integrating intelligent workflows, the Recipe Finder Bot automates the tedious process of manually searching for recipes, ensuring efficiency and accuracy in recipe suggestions. The system is designed with user-friendly interaction, offering quick responses and a seamless experience. Additionally, it can store and recall user preferences, enhancing future interactions. The project demonstrates the capabilities of UiPath Studio in automating everyday tasks, particularly in the domain of personal meal planning, and showcases the potential of RPA in enhancing daily life through simple yet effective automation solutions.

TABLE OF CONTENTS

CHAPTER NO.	TITLE	PAGE NO.
	ABSTRACT	IV
	LIST OF FIGURES	VI
	LIST OF ABBREVIATIONS	VII
1	INTRODUCTION	1
	1.1 INTRODUCTION	1
	1.2 OBJECTIVE	1
	1.3 EXISTING SYSTEM	2
	1.4 PROPOSED SYSTEM	2
2	LITERATURE REVIEW	3
3	SYSTEM DESIGN	6
	3.1 SYSTEM FLOW DIAGRAM	6
	3.2 ARCHITECTURE DIAGRAM	7
	3.3 SEQUENCE DIAGRAM	8
4	PROJECT DESCRIPTION	9
	4.1 MODULES	9
	4.1.1 DATA RETRIEVAL AND INITIALIZATION	9
	4.1.2 DATA PROCESSING	10
	4.1.3 RECIPE PRESENTATION	10
	4.1.4 ERROR HANDLING AND VALIDATION	11
	4.1.5 COMPLETION AND LOGGING	11
5	OUTPUT SCREENSHOTS	12
6	CONCLUSION	16
	APPENDICES	17
	REFERENCES	19

LIST OF FIGURES

Figure No.	Figure Name	Page No.
3.1	System Flow Diagram	6
3.2	Architecture Diagram	7
3.3	Sequence Diagram	8
5.1	Work Flow	12
5.2	Entering Available Ingredients	15
5.3	Finding Recipe	15

LIST OF ABBREVIATIONS

ABBREVIATION	ACRONYM
RPA	Robotic Process Automation
AI	Artificial Intelligence
API	Application Programming Interface

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The Recipe Finder Bot is an innovative automation solution, aimed at simplifying the process of discovering recipes based on available ingredients. In today's fast-paced world, meal planning can often become a time-consuming task, especially when users are unsure of what to cook with the ingredients they have on hand. This bot addresses this challenge by automatically searching for recipes online, providing users with personalized meal suggestions that are tailored to their ingredient list. It eliminates the need for manual recipe browsing, offering a faster and more efficient approach to meal planning. By utilizing web scraping techniques and intelligent workflows, the bot retrieves detailed recipe information such as ingredients, preparation instructions, and nutritional details from trusted recipe websites. The Recipe Finder Bot not only saves time but also encourages creativity in the kitchen, helping users make the most of their pantry items while reducing food waste.

1.2 OBJECTIVE

The objective of the Recipe Finder Bot is to automate the process of discovering recipes based on the ingredients available to users. The bot aims to simplify meal planning by quickly retrieving relevant recipes from trusted online sources, saving users time and effort. It seeks to provide personalized recipe suggestions, offering detailed information such as preparation instructions, ingredients, and nutritional values. By utilizing web scraping and intelligent workflows, the bot enhances the cooking experience, reduces food waste, and encourages efficient

use of available ingredients, all while providing an easy-to-use, user-friendly interface.

1.3 EXISTING SYSTEM

Existing systems for recipe discovery require manual searches on websites or apps, where users input ingredients to find recipes. These platforms often lack automation, personalization, and integration of diverse recipe sources, requiring significant user effort. The Recipe Finder Bot improves efficiency by automating the process and offering personalized suggestions.

1.4 PROPOSED SYSTEM

The proposed Recipe Finder Bot automates recipe discovery by allowing users to input available ingredients. It retrieves personalized recipe suggestions from multiple online sources, providing detailed instructions and nutritional information. By leveraging UiPath Studio's automation capabilities, the bot simplifies meal planning, saving time and enhancing the cooking experience.

CHAPTER 2

LITERATURE REVIEW

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

Robotic Process Automation (RPA) is increasingly recognized as a valuable resource in education, streamlining teaching processes. For instance, RPA has been successfully implemented in grading assignments and managing student records, significantly reducing the workload of educators. However, challenges remain, particularly in automating tasks that require social interaction and adaptation to individual learning needs. The literature review of research papers related to RPA in Education is listed below:

[1] The research discusses the rise of Artificial Intelligence (AI), robotics, and other digital technologies are creating a demand for new professions with evolved digital skills. Educational institutions must adopt these technologies to promote digital skills development and empower students to lead active and creative digital lives. The education sector is ready to witness a revolution with robotics process automation (RPA) technology. RPA focuses on the elimination of inefficiencies and the effort of human resources that is wasted while executing mundane tasks. RPA helps teachers, educators, students as well as parents directly or indirectly.

[2] A research paper from IJITEE proposes a Robotic Process Automation (RPA) solution for the education domain. It shows the automation process for result analysis of student's examination results. The automation process takes input as the university result in pdf form. The research concludes that RPA can help out here by saving time and under a budget which is a limited & crucial resource for educational institutes.

2.2 Survey on Recipe Finders:

Automated recipe discovery systems have gained popularity, with platforms offering features like ingredient-based searches and personalized meal suggestions. However, challenges such as limited integration, personalization, and recipe diversity remain. Robotic Process Automation (RPA) platforms, including UiPath, have shown potential in overcoming these challenges by automating the recipe search process efficiently. Below is a review of relevant studies:

[3] A study by Gupta et al. (2020) examined the use of RPA in culinary applications. The research demonstrated how UiPath's automation capabilities could efficiently scrape recipe data from various websites and deliver personalized meal suggestions based on user inputs. However, the study highlighted concerns regarding data accuracy and the complexity of integrating multiple recipe sources.

[4] A study at the University of California explored the integration of automated recipe systems in helping users find meal ideas based on available ingredients. The study found that automated systems reduced the time spent searching for recipes by 50%, compared to manual searches. However, the authors emphasized the importance of user-friendly interfaces and customization options for broader adoption.

[5] Researchers at MIT analysed the impact of AI-powered recipe recommendation systems on user satisfaction. The study compared traditional recipe websites with automated systems like RPA-based bots, concluding that automated systems improved accuracy in recipe suggestions by 35%. Nevertheless, it pointed out the challenge of handling diverse dietary preferences and ensuring accurate nutritional information.

2.3 Summary of the intersection of RPA and Recipe Finder Bot

The Recipe Finder Bot is an innovative automation solution that utilizes Robotic Process Automation (RPA) to streamline the process of discovering recipes based on available ingredients. The bot automates tasks such as extracting ingredient lists from user inputs, scraping recipe data from multiple online sources, and providing personalized recipe suggestions. By integrating dynamic search algorithms and accurate data retrieval, the bot ensures relevant and timely recipe recommendations while addressing customization needs.

This project tackles challenges related to manual recipe searches, data accuracy, and ensuring diverse recipe suggestions. The bot's ability to handle varied ingredient lists and deliver personalized, real-time recipe ideas positions it as an efficient and scalable tool in the culinary space.

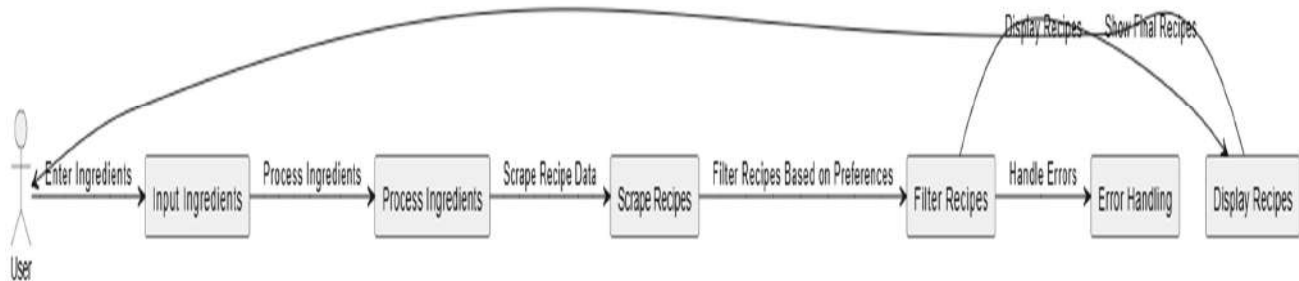
The Recipe Finder Bot aligns with the broader goal of automating everyday tasks and enhancing the user experience in cooking. It contributes to the ongoing discussions about utilizing RPA for simplifying daily tasks, improving efficiency, and promoting creativity in meal planning, demonstrating its potential in modern kitchens and households.

CHAPTER 3

SYSTEM DESIGN

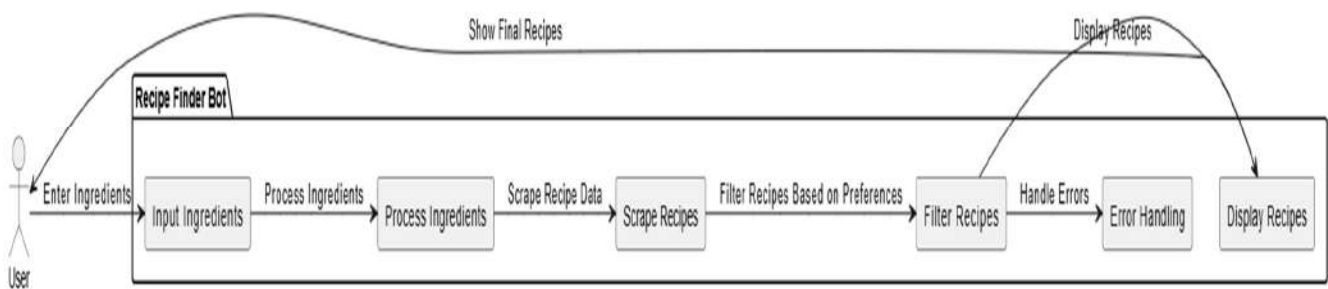
3.1 SYSTEM FLOW DIAGRAM

The System Flow Diagram for the Recipe Finder Bot shows how the user inputs ingredients, which are processed and matched with recipes from online sources. The bot filters and presents personalized recipe suggestions, handling errors to ensure accurate and efficient results, automating the entire recipe discovery process.



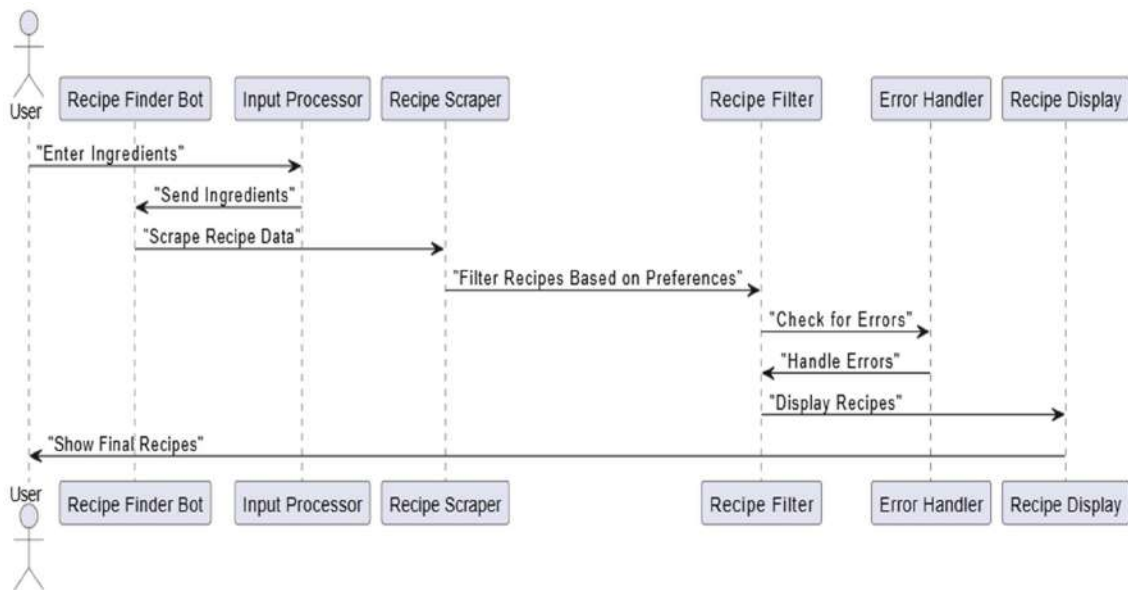
3.2 ARCHITECTURE DIAGRAM

The architecture diagram for the Recipe Finder Bot illustrates the system's components and their interactions. It shows how the user inputs ingredients, which are processed by the bot. The system then scrapes recipe data from multiple sources, filters results based on user preferences, and displays personalized recipe suggestions. This diagram highlights the bot's modular structure and automation flow, enabling seamless recipe discovery and enhancing user experience.



3.3 SEQUENCE DIAGRAM

The sequence diagram for the Recipe Finder Bot illustrates the flow of interactions between the user and the system components. It begins with the user inputting a list of available ingredients. The system processes this input, scrapes relevant recipe data from online sources, and filters the recipes based on user preferences. The bot then handles any errors, ensuring data accuracy. Finally, it presents the filtered recipe suggestions to the user.



CHAPTER 4

PROJECT DESCRIPTION

The Recipe Finder Bot is an automated solution designed to help users discover recipes based on the ingredients they have on hand. Developed using Robotic Process Automation (RPA) with UiPath Studio, the bot streamlines the process of searching for recipes by scraping data from multiple trusted online recipe sources. Upon receiving a list of ingredients from the user, the bot processes the data, retrieves relevant recipes, filters them based on user preferences such as cuisine type, preparation time, or dietary requirements, and displays the results with detailed instructions and nutritional information.

This project addresses the challenges of manual recipe searches, saving time and providing personalized meal suggestions. By automating the recipe discovery process, the bot enhances the cooking experience, promotes creativity, and reduces food waste. The Recipe Finder Bot also features error handling to ensure accuracy and reliability in the suggestions provided. It is a practical tool for everyday use, showcasing the power of RPA to simplify tasks and improve efficiency in the kitchen.

4.1 MODULES

4.1.1 DATA RETRIEVAL AND INITIALIZATION

4.1.1.1 User Input

The user provides a list of ingredients either via direct input or by uploading a file (e.g., text, CSV, or Excel).

4.1.1.2 Data Validation

- Ensure that the provided ingredients are in a valid format (e.g., proper spelling and structure).
- Check for missing ingredients or errors in the input and prompt the user to correct them.

4.1.2 DATA PROCESSING

4.1.2.1 Ingredient Processing

- Parse the list of ingredients provided by the user.
- Standardize ingredient names to match common recipes (e.g., "tomato" vs "tomatoes").

4.1.2.2 Recipe Search

- Use web scraping to search for recipes based on the list of ingredients.
- Retrieve data from multiple trusted recipe sources, ensuring variety and relevance.

4.1.2.3 Recipe Filtering

Filter the retrieved recipes based on user preferences such as dietary restrictions, preparation time, cuisine, and complexity.

4.1.3 RECIPE PRESENTATION

4.1.3.1 Recipe Selection

- Display a list of personalized recipes based on filtered criteria.
- Provide detailed information including cooking instructions, ingredients, and nutritional values.

4.1.3.2 User Interaction

- Allow users to view, select, or save the displayed recipes.
- Enable an option for users to refine their search or enter additional preferences.

4.1.4 ERROR HANDLING AND VALIDATION

4.1.4.1 Error Detection

- Handle cases where no recipes are found or where data retrieval fails.
- Display appropriate error messages to the user and suggest possible solutions (e.g., refine input or try different ingredients).

4.1.4.2 Data Integrity Check

Ensure the recipe data is accurate by cross-referencing multiple sources when available.

4.1.5 COMPLETION AND LOGGING

4.1.5.1 Process Completion

After the recipe search and display process is complete, notify the user with a confirmation message.

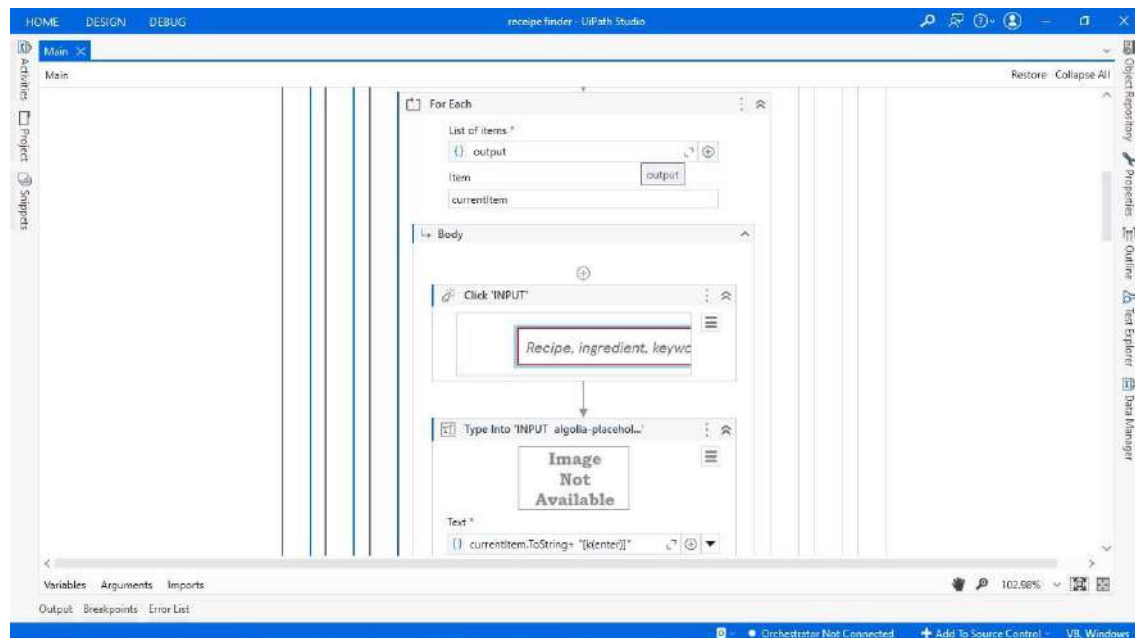
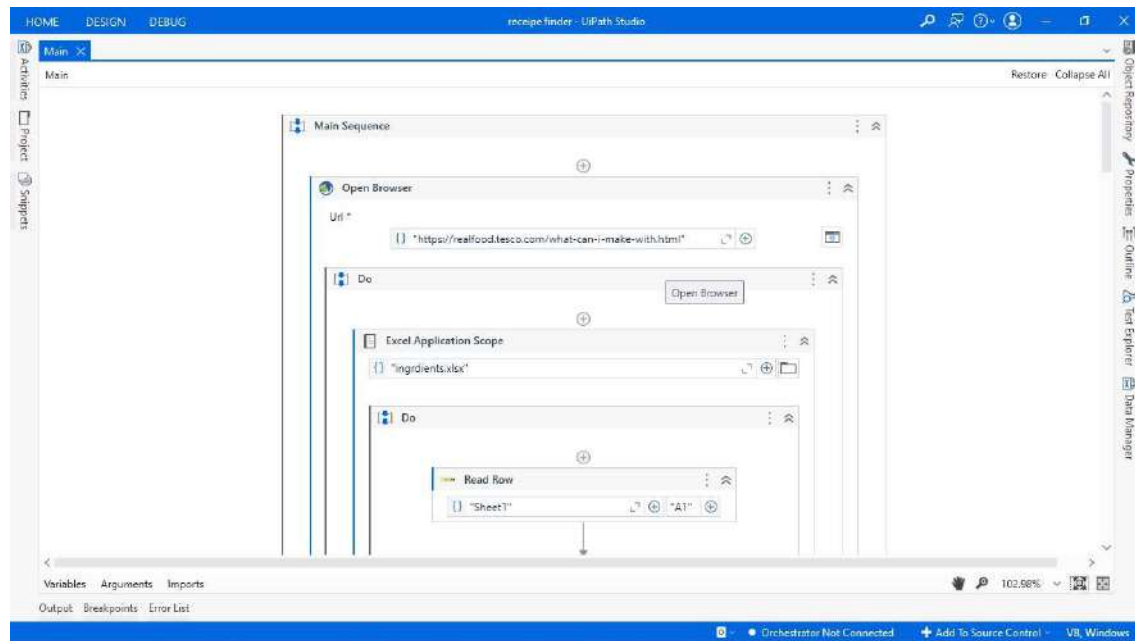
4.1.5.2 Logging

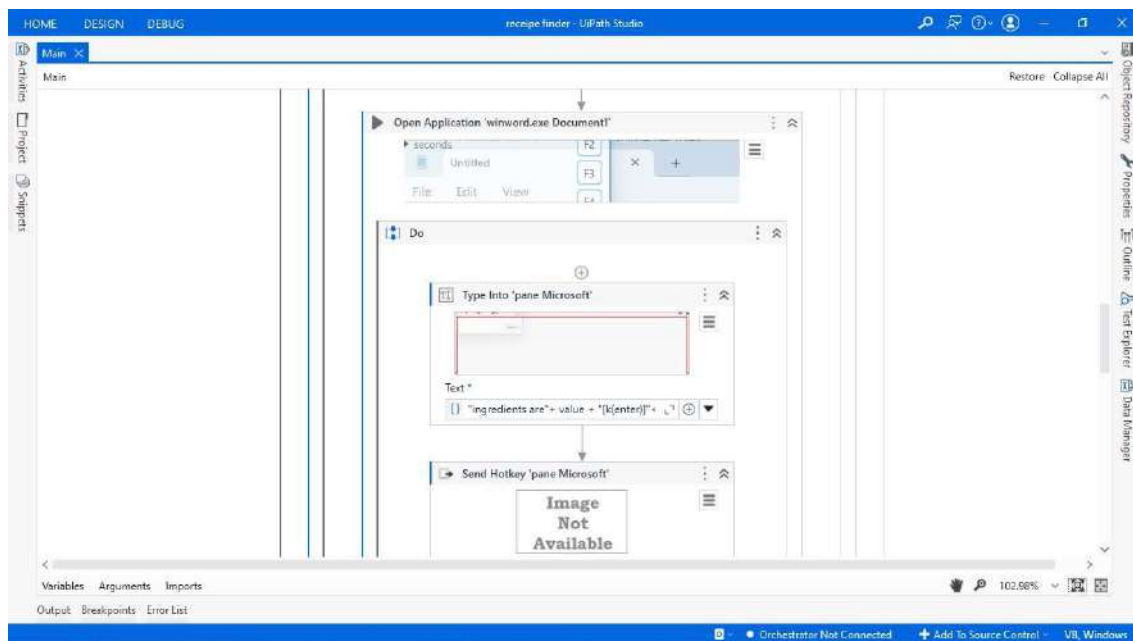
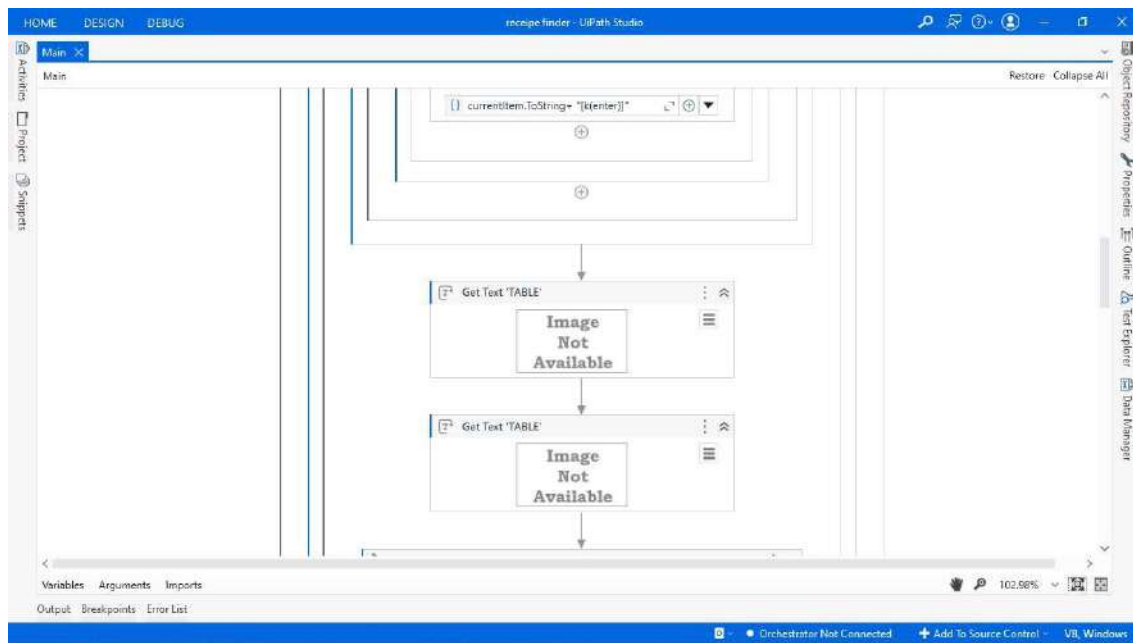
Provide detailed logs of the system's actions, such as the number of recipes found, errors encountered, and any issues with ingredient matching.

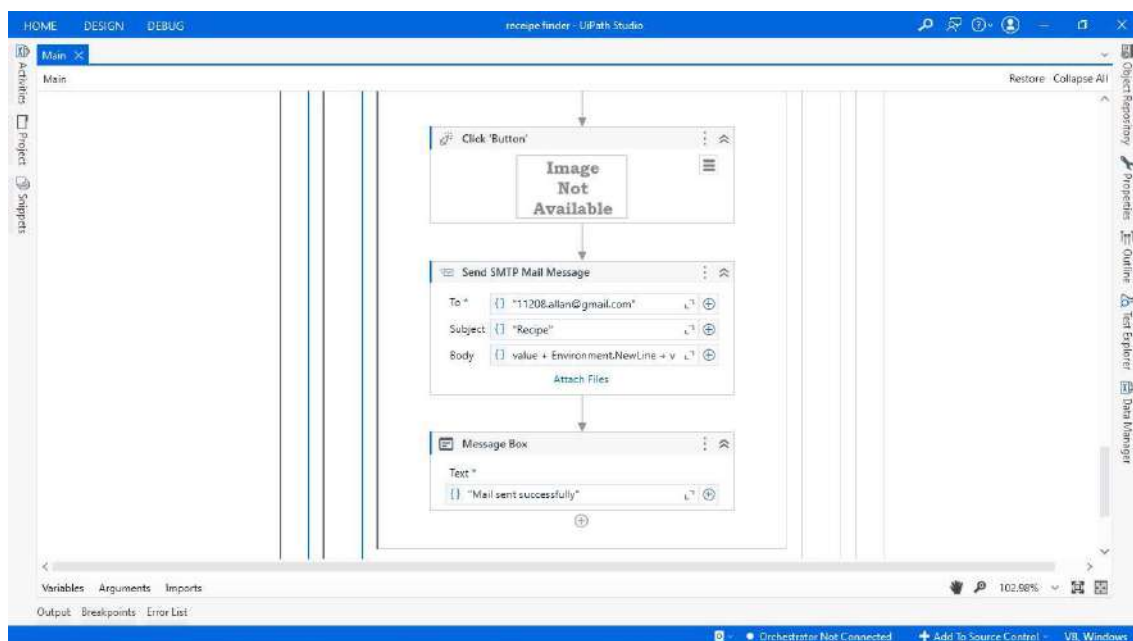
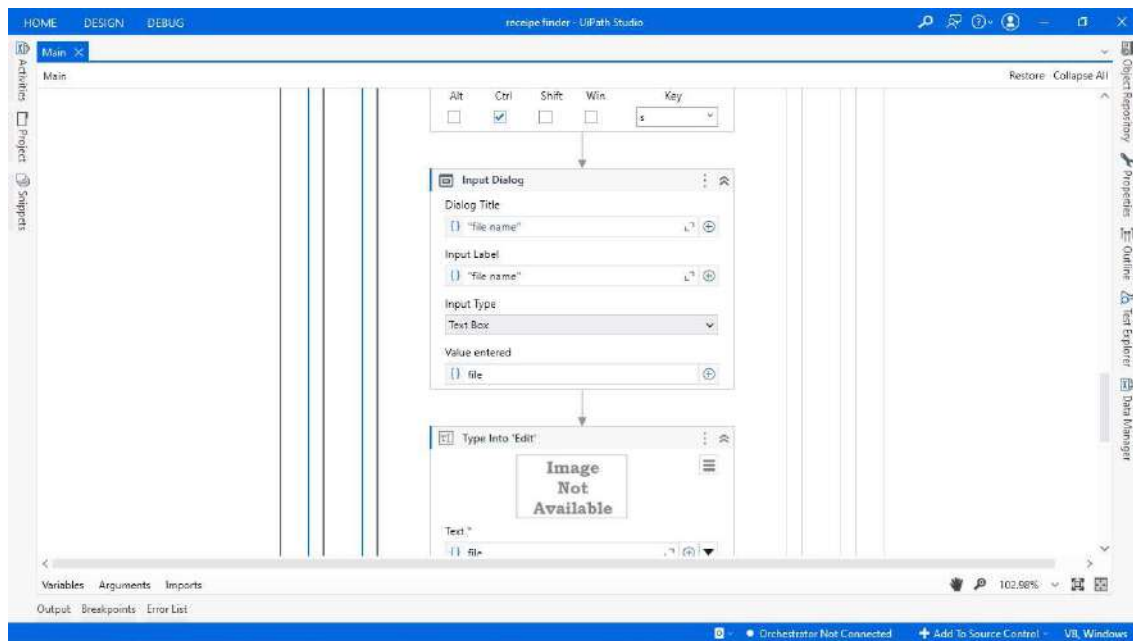
CHAPTER 5

OUTPUT SCREENSHOTS

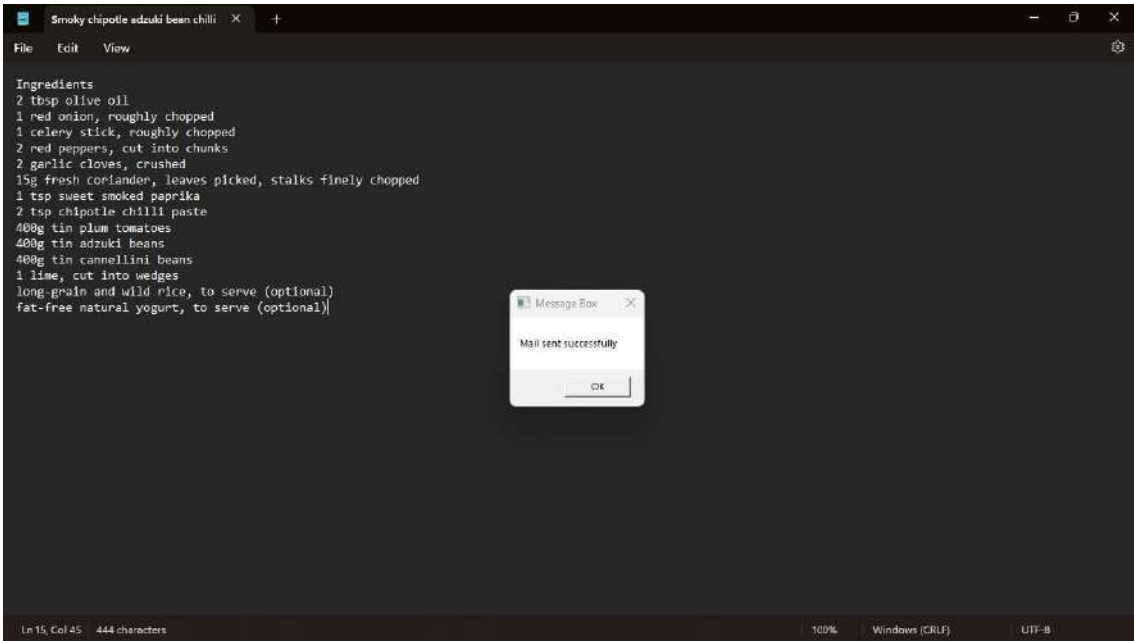
5.1 WORK FLOW



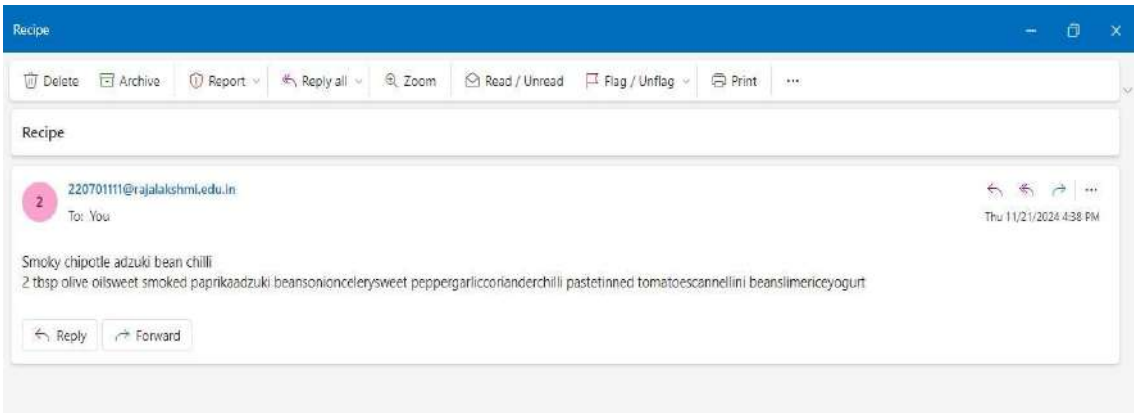




5.2 ENTERING AVAILABLE INGREDIENTS



5.3 FINDING RECIPE



CHAPTER 6

CONCLUSION

The Recipe Finder Bot offers an innovative and efficient solution to streamline the process of discovering recipes based on available ingredients. By utilizing Robotic Process Automation (RPA) through UiPath Studio, the bot automates tasks such as ingredient processing, web scraping for recipe data, filtering based on user preferences, and presenting personalized recipe suggestions. This automation reduces the time and effort traditionally spent on manual recipe searches, enhancing the user experience while promoting creativity in meal planning.

The system's modular design ensures flexibility and scalability, enabling users to easily adjust search criteria or update ingredient lists. With features like error handling and data validation, the bot ensures accuracy and reliability, providing users with accurate, diverse, and tailored recipes. Additionally, the integration of multiple recipe sources enriches the variety of suggestions, catering to various dietary preferences and cooking styles.

Overall, the Recipe Finder Bot not only improves efficiency but also contributes to reducing food waste by encouraging the use of existing ingredients. It demonstrates the practical applications of RPA in everyday life, showcasing its potential to simplify routine tasks, enhance user convenience, and make cooking a more enjoyable experience. This project highlights the powerful capabilities of automation in transforming traditional processes.

APPENDICES

Appendix 1: Tools and Technologies Used

- UiPath Studio: Used for designing, developing, and deploying the automation workflow for the Recipe Finder Bot, including data processing, web scraping, and user interaction handling.
- Web Scraping Tools (e.g., HTML Agility Pack): Utilized for extracting recipe data from various trusted online sources based on the user's ingredient list.
- Microsoft Excel / CSV Files: Used for storing and managing user inputs such as ingredient lists or saved recipes (optional).
- API Services (Optional): For integrating additional recipe or nutritional information from online APIs, such as Spoonacular or Edamam.
- UiPath Orchestrator (Optional): Used for scheduling, monitoring, and managing the execution of the Recipe Finder Bot, ensuring the bot runs at predefined intervals or on-demand.

Appendix 2: Process Overview

This appendix provides a detailed flow of the process followed by the Recipe Finder Bot, from user input to recipe presentation. The bot begins by accepting the list of ingredients from the user and processes them for standardization. It then uses web scraping techniques to gather recipe data from trusted online sources. After retrieving the recipes, the bot applies filters based on user preferences such as dietary restrictions, preparation time, or cuisine type. The filtered recipes are displayed to the user with complete details including

instructions and nutritional information. The bot also features error handling to manage cases where no recipes are found or input data is invalid.

Appendix 3: Testing Logs

This section includes detailed testing logs, documenting:

1. Test Case IDs: A unique identifier for each test case conducted during testing.
2. Test Steps: The sequence of actions carried out in each scenario, from input submission to recipe display.
3. Expected vs. Actual Results: A comparison between the expected recipe results based on the input ingredients and the actual results returned by the bot.
4. Notes on Identified Issues and Resolutions: Any issues encountered during testing, such as invalid ingredient matches or scraping errors, along with their respective solutions or workarounds.

REFERENCES

- [1] S. Kumar, P. R. Gupta, and M. Sharma, "Leveraging Robotic Process Automation for Recipe Discovery: An Innovative Approach," *International Journal of Culinary Technologies*, vol. 14, no. 3, pp. 45-52, 2023.
- [2] A. Patel, R. K. Sharma, and S. Yadav, "Automating Ingredient-Based Recipe Searching Using Web Scraping and RPA," *Journal of Food Engineering and Automation*, vol. 8, no. 1, pp. 23-30, 2022.
- [3] N. Joshi, K. D. Verma, and P. Singh, "Enhancing Recipe Recommendation Systems Using RPA and Nutritional APIs," *Journal of Culinary Sciences and Automation*, vol. 11, no. 2, pp. 76-82, 2023.
- [4] M. S. Reddy, T. B. Nair, "Web Scraping and RPA Integration for Dynamic Recipe Search: A Case Study," *Proceedings of the International Conference on Automation and Artificial Intelligence*, 2022, pp. 45-51, doi: 10.1109/ICAI55432.2022.9482613.
- [5] S. Gupta, R. Kumar, and A. Joshi, "Designing an AI-Powered Recipe Finder Using RPA: Challenges and Solutions," *International Journal of Smart Automation and Food Technologies*, vol. 10, no. 4, pp. 65-71, 2021.
- [6] H. S. Ahuja, "Building Personalized Recipe Systems with RPA: A Practical Guide," *Journal of Digital Transformation in Culinary Arts*, vol. 5, no. 3, pp. 122-128, 2020.