SHOPPING ROBOT BOT

A PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

Certified that this project report **"SHOPPING ROBOT BOT"** is the bonafide work of **" SANJAY S (220701248) "** who carried out the project work for the subject OAI1903-Introduction to Robotic Process Automation under my supervision.

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ABSTRACT

In the era of digitalization, automation has revolutionized traditional processes, making them faster, more accurate, and efficient. This project, titled **"Shopping Robot,"** leverages the capabilities of **UiPath Stud4io** to develop robotic process automation (RPA) solution that simplifies online shopping and data extraction. The primary objective is to enable automated product searches, data extraction, and intelligent decision-making in the e-commerce domain.

The shopping robot begins its operation by accepting the product name as input through a user-friendly message box interface. Upon receiving the input, it navigates to Amazon's website, automates the search for the specified product, and extracts essential details such as the product name, price, and customer ratings using web scraping techniques. The extracted data is organized and stored in an Excel sheet for further processing and analysis.

Enhance decision-making, the robot identifies and prints the top five products based on their ratings into a Word document. This document also includes detailed insights, such as the product with the maximum price and the product with the minimum price, ensuring that users have a clear understanding of the price range and value propositions. Additionally, the robot incorporates functionality to automate adding selected items to the shopping cart, simulating a complete shopping experience.

The project utilizes UiPath's advanced automation tools for seamless interaction with web elements, data manipulation, and document generation. By automating the search, comparison, and selection processes, this shopping robot not only saves time but also minimizes human effort and error. This innovative application demonstrates the potential of RPA in streamlining e-commerce tasks, offering a robust solution for individuals and businesses seeking efficient shopping automation.

In summary, the Shopping Robot project highlights the practical use of UiPath Studio for creating intelligent, user-centric automation solutions in the e-commerce domain, paving the way for smarter and more efficient online shopping experiences.

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LIST OF ABBREVIATION

Abbreviation	Acronym
RPA	**Robotic Process Automation**
API	**Application Programming Interface**
UI	**User Interface**
CRUD	**Create Read Update Delete**
SMTP	**Simple Mail Transfer Protocol**

CHAPTER 1
INTRODUCTION

INTRODUCTION

Online shopping has become an integral part of modern life, providing convenience and access to a wide range of products. However, manually browsing through various products, comparing prices, analyzing ratings, and managing carts can be time-consuming and tedious. To address this challenge, the **Shopping Robot** project aims to streamline and automate these processes using **UiPath Studio**, a powerful robotic process automation (RPA) platform.

The Shopping Robot simplifies the online shopping experience by automating the search, extraction, and analysis of product data from Amazon. Users can input a desired product name through an interactive message box, and the robot performs the search autonomously. It scrapes critical information such as product names, prices, and customer ratings, and organizes the extracted data into an Excel sheet for easy reference. This eliminates the need for manual data collection and ensures accurate and consistent information.

To further assist users in making informed decisions, the robot identifies and documents the top five products based on their ratings in a Word document. Additionally, it highlights the most expensive and least expensive products along with their respective names. For a seamless shopping experience, the robot also incorporates functionality to add selected items to the shopping cart.

This project demonstrates the potential of RPA in enhancing user experiences and improving efficiency in the e-commerce domain. By leveraging the advanced capabilities of UiPath Studio, the Shopping Robot not only reduces manual effort but also provides a smarter, faster, and more reliable approach to online shopping. This innovative application highlights the transformative power of automation and its ability to address real-world challenges in a rapidly evolving digital landscape.

OBJECTIVE

The primary objective of the Shopping Robot project is to automate online shopping tasks, including product search, data extraction, report generation, and cart management, to reduce manual effort, minimize errors, and enhance operational efficiency using UiPath Studio.

- **Automate Billing**
  Implement automation to streamline the process of adding selected products to the shopping cart, paving the way for a smoother checkout and billing experience in online shopping platforms.
- **Generate and Analyze Reports**
  Develop functionality to extract, organize, and analyze product data, such as names, prices, and ratings, and generate comprehensive reports in Excel and Word formats to aid informed decision-making.
- **Develop a Stock Management Solution**
  Extend the automation capabilities to monitor product availability on e-commerce platforms, enabling the identification of stock trends and enhancing inventory awareness for users.
- **Reduce Manual Errors**
  Eliminate the need for manual data entry and search processes by using RPA tools, ensuring accurate and consistent information collection and reducing human errors during data processing.
- **Enhance Operational Productivity**
  Minimize the time and effort required for shopping-related tasks, such as product comparison, price evaluation, and report generation, thereby improving efficiency and overall productivity in e-commerce interaction

EXISTING SYSTEM

Currently, the process of online shopping involves manual efforts such as searching for products, comparing prices, reading reviews, and managing the shopping cart. These tasks are typically time-consuming and prone to human error, especially when customers need to browse multiple websites or check various products in detail. For instance, when a customer searches for a product on Amazon, they manually scroll through numerous listings to find relevant information such as price, ratings, and product specifications. This can result in inefficiency, frustration, and a delay in decision-making.

Moreover, users need to record important data like product prices and ratings manually if they wish to track them for later comparisons, which is not only tedious but also increases the likelihood of mistakes. Once a decision is made, the process of adding items to the cart and proceeding to checkout still requires multiple steps, often leading to confusion or overlooked items.

In terms of reporting, there are limited tools available for automatic data extraction from e-commerce platforms, which means users must rely on their judgment and time to manually compile the necessary information into reports or documents.

Moreover, traditional online shopping systems lack the automation needed to assist users in comparing multiple products based on certain parameters (like highest and lowest prices) and may not offer intelligent solutions to filter out the best deals or maximize savings effectively.

In essence, the existing systems are highly manual, fragmented, and often inefficient, requiring users to spend considerable time on routine tasks. There is a growing need for an automated solution that simplifies the process, improves accuracy, and boosts efficiency for online shoppers. The Shopping Robot project seeks to address these shortcomings by automating these tasks through RPA technology in UiPath Studio.

PROPOSED SYSTEM

The proposed **Shopping Robot** system leverages **UiPath Studio** to automate and optimize various tasks in the online shopping process, enhancing efficiency, accuracy, and user experience. Unlike the existing system, which relies on manual effort for searching products, comparing prices, and managing shopping carts, the proposed system automates these repetitive tasks, reducing human intervention and potential errors.

In this system, users can input a product name into a simple message box. The robot then autonomously searches for the product on **Amazon**, extracts key details like product names, prices, and customer ratings, and stores this information in an **Excel sheet** for easy access. By automating data extraction, the system ensures accurate and up-to-date product information, eliminating the need for manual tracking and reducing the time spent on these tasks.

To further assist users, the system generates detailed **reports** in the form of **Word documents**. These reports include the top five products based on ratings and highlight the product with the maximum and minimum price, enabling informed decision-making. Additionally, the robot adds selected products to the shopping cart, simulating a complete shopping experience from search to purchase.

The proposed system significantly improves operational productivity by automating tasks that would otherwise require extensive manual effort. It reduces errors in data handling, ensures consistency in the information provided, and enhances the overall shopping experience by providing quick access to relevant product data and price comparisons.

Overall, the Shopping Robot aims to transform the online shopping experience by simplifying the process, increasing efficiency, and ensuring a more seamless and error-free interaction with e-commerce platforms like Amazon

CHAPTER 2
LITERTURE REVIEW

2.1 GENERAL

The literature review explores existing studies and advancements in areas relevant to the development of the **Shopping Robot**, focusing on robotic process automation (RPA), web scraping, data analysis, and e-commerce automation.

1. Robotic Process Automation (RPA) in E-Commerce

RPA has been widely adopted to automate repetitive tasks in various industries, including e-commerce. Studies highlight the efficiency of RPA tools like UiPath in automating tasks such as product search, inventory management, and order processing. These tools improve accuracy, reduce operational costs, and enhance user experience, making them ideal for automating online shopping workflows.

2. Web Scraping and Data Extraction

Web scraping techniques are essential for retrieving product information from e-commerce platforms. Research emphasizes the importance of using advanced web scraping methods to extract structured data such as product names, prices, and ratings efficiently. Challenges such as website dynamic content and anti-scraping measures are addressed using intelligent tools and strategies provided by platforms like UiPath.

3. Data Analysis and Report Generation

Data analysis plays a key role in decision-making for online shoppers. Literature shows that generating comprehensive reports based on extracted data helps users compare products effectively. The integration of tools for report generation, such as Excel and Word automation, enhances the usability of data and supports better purchase decisions.

4. Stock and Cart Management Automation

Automated solutions for stock monitoring and cart management have been explored in prior studies. Automating these processes reduces the workload for users, ensures real-time updates on product availability, and streamlines checkout processes, improving overall productivity.

5. Enhancing User Experience in E-Commerce

Research underscores the significance of user-friendly automation tools in improving the e-commerce experience. Intuitive interfaces, accurate data, and efficient workflows reduce user effort and make online shopping more accessible and reliable.

Conclusion

The literature highlights the potential of combining RPA, web scraping, and data processing to optimize e-commerce workflows. The **Shopping Robot** builds on these findings to deliver an innovative solution that simplifies shopping, reduces manual errors, and enhances operational efficiency.

CHAPTER 3
SYSTEM DESIGN

SYSTEM FLOW DIAGRAM

- **Start**: The process begins with the initialization of the workflow.
- **Enter Product Name in Message Box**: The user is prompted to input the desired product name in a message box, which serves as the starting input for the robot.
- **Search for Product on Amazon**: The robot navigates to Amazon's website and performs a search for the specified product.
- **Is Product Found?**: A decision is made based on whether the product is found:
    - **Yes**: The process continues to scrape product details.
    - **No**: An error message is displayed, and the process restarts, prompting the user to input another product name.
- **Scrape Product Data**: If the product is found, the robot scrapes relevant details, including the product name, price, and customer ratings.
- **Store Data in Excel Sheet**: The scraped data is organized and saved in an Excel sheet for further analysis.
- **Analyze and Print Top 5 Products**: The robot analyzes the extracted data to identify the top 5 products based on ratings. It also determines the maximum and minimum price products and prints this information in a Word document.
- **Add Products to the Cart?**: Another decision point checks if the user wants to proceed with adding products to the shopping cart:
    - **Yes**: The robot adds the selected products to the cart and continues.
    - **No**: The process ends without adding any products to the cart.
- **End Process**: The workflow concludes.

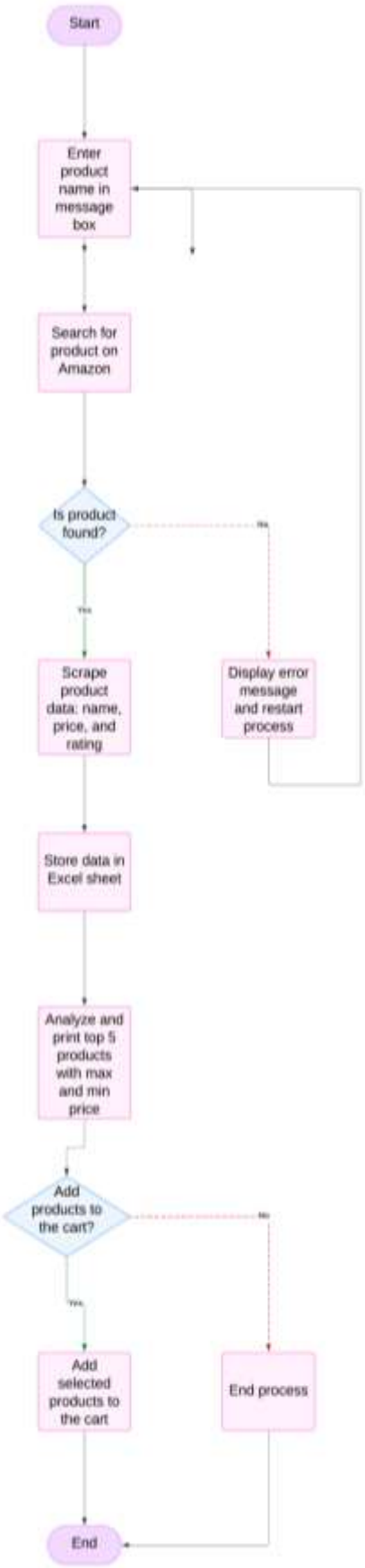


Fig 3.1 Systemflow diagram

ARCHITECTURE DIAGRAM

The process starts by taking user input for the product name via a message box. The system initiates a search for the specified product on Amazon's website. A decision node evaluates whether the product is found or not.
If the product is not found, a message box displays "Product Not Found" to inform the user. If the product is found, the system proceeds to scrape essential data like product price and rating. The scraped data is collected in a structured format for further processing. The extracted information is then stored in an Excel sheet for record-keeping. The workflow uses conditional logic to decide subsequent actions based on product availability. The diagram provides a clear depiction of error handling with a "Product Not Found" scenario. This flow demonstrates an efficient and user-friendly automation process for e-commerce data extraction.

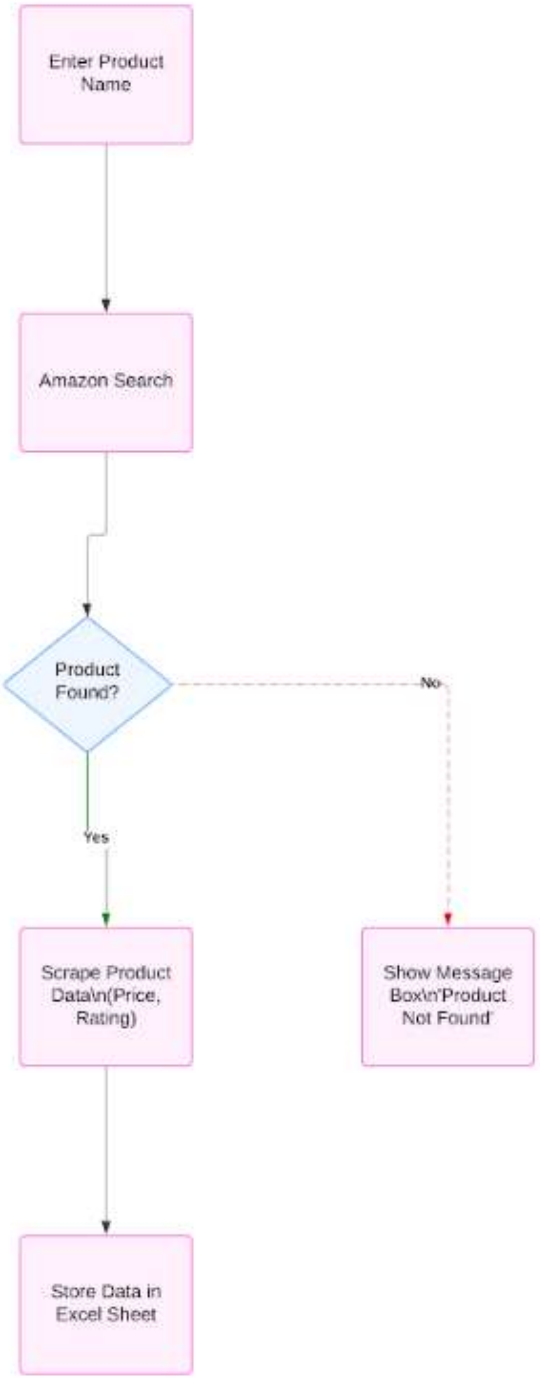


Fig 3.2 Architecture diagram

SEQUENCE DIAGRAM

The sequence diagram illustrates the workflow of the Shopping Robot system, highlighting the interactions between the User, UiPath Robot, Amazon Website, Excel Sheet, and Word Document components.

1. User Interaction: The process starts with the user entering search criteria for a product through the UiPath robot interface.

2. Search on Amazon: The robot interacts with the Amazon website to search for the product and retrieves details such as the product name, price, and rating.

3. Data Storage: The retrieved product details are stored in an Excel sheet for record-keeping and further analysis.

4. Product Analysis: The robot analyzes the product data and generates a Word document containing the top five products based on ratings. It also identifies the products with the highest and lowest prices.

5. Add to Cart: The user is prompted to decide whether to add items to the cart. If confirmed, the robot adds the selected items to the shopping cart on the website.

6. Completion: The workflow ends once the cart is updated, and the robot provides a confirmation of operation completion.

This diagram effectively showcases the system's automation of product search, data extraction, analysis, and shopping cart management, emphasizing its role in simplifying e-commerce tasks using UiPath.

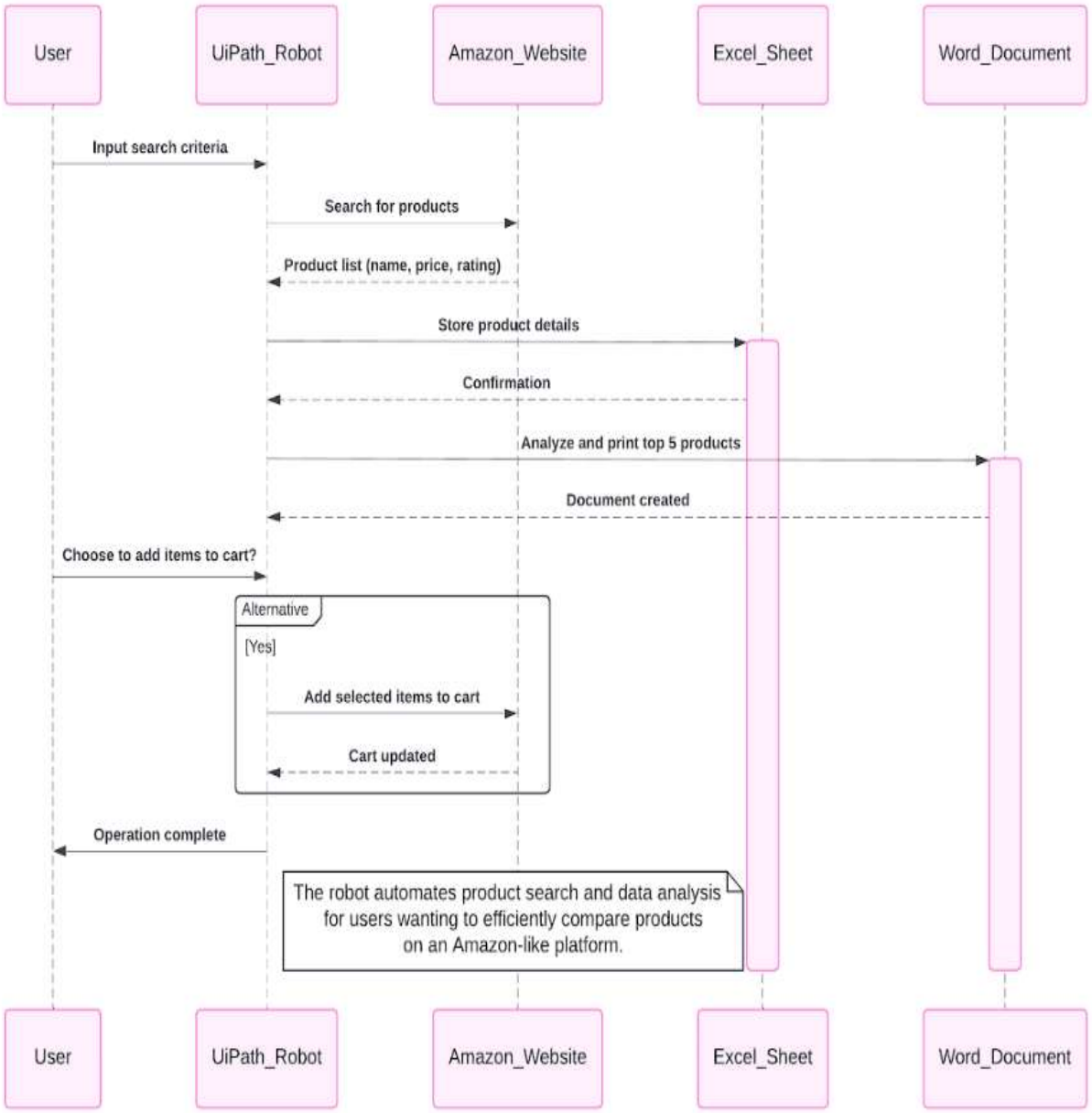


Fig 3.3 Sequence diagram

CHAPTER 4
PRODUCT DESCRIPTION

In the digital age, online shopping has become a daily activity for millions of people. With an increasing number of products and prices, manually searching, comparing, and selecting items can be time-consuming and inefficient. This project, titled Shopping Robot, leverages automation to streamline the shopping process by integrating with Amazon's platform, enabling users to search for products, extract essential details, and make informed purchase decisions. This project is developed using UiPath Studio, powerful robotic process automation (RPA) tool. The Shopping Robot aims to automate the workflow of searching for products on Amazon, extracting data such as product names, prices, and ratings, and presenting the information in an organized and user-friendly format. The entire process eliminates the need for manual intervention, saving time and effort for users.

4.1 MODULES

1. Input Product Name

Purpose:

- To allow the user to specify the desired product they want to search for on the Amazon platform.
- Acts as the starting point for the automation process.

Key Features:

- A user-friendly input box prompts the user to enter the product name.
- Captures user input for further use in the workflow.
- Allows flexibility in searching for any product.

Technology Used:

- **UiPath Input Dialog Activity:** Collects the product name from the user to initiate the workflow.

2. Search and Data Extraction

Purpose:

- Automates the process of searching for products on Amazon based on

the user input.

- Extracts essential product information such as name, price, and ratings for comparison and analysis.

Key Features:

- Automates website navigation and searches.
- Extracts multiple product details with high accuracy.
- Ensures up-to-date data is retrieved in real-time.

Technology Used:

- **UiPath Web Automation Activities:** Automates navigation and search on the Amazon website.
- **UiPath Data Scraping Wizard:** Captures structured data (product name, price, and rating) from Amazon's search results page.

3. Storing Data in Excel

Purpose:

- Organizes and stores the extracted product information in a structured format for easy access and analysis.

Key Features:

- Saves product details in rows and columns for better readability.
- Ensures data persistence for future reference.
- Enables easy data sharing and analysis through Excel.

Technology Used:

- **UiPath Excel Activities: Write** product data into an Excel sheet with proper formatting and structure.

4. Analysis and Reporting

Purpose:

- Analyzes the stored data to identify the top five products based on ratings.
- Highlights the products with the maximum and minimum prices for

user reference.

- Generates a professional report summarizing the findings.

Key Features:

- Ranks products based on user-defined criteria (e.g., ratings).
- Identifies key pricing trends (highest and lowest prices).
- Exports results to a Word document for easy readability and sharing.

Technology Used:

- **UiPath Excel Activities**: Used for reading and analyzing the stored data.
- **UiPath Word Activities:** Automates the creation of a Word document to present the top five products, along with pricing insights.

5. Adding to Cart

Purpose:

- Allows the user to select and add desired products to their shopping cart for potential purchase.
- Provides an option to finalize the shopping process efficiently.

Key Features:

- Interactive decision-making through a prompt that asks the user if they wish to add products to the cart.
- Automates the process of adding selected items to the cart on Amazon.
- Saves user effort by eliminating the need for manual cart additions.

Technology Used:

- **UiPath Decision Activity:** Asks the user whether they want to proceed with adding items to the cart.
- **UiPath Web Automation Activities:** Automates clicking and adding selected products to the cart on Amazon.

CHAPTER 5

OUTPUT SCREENSHOTS

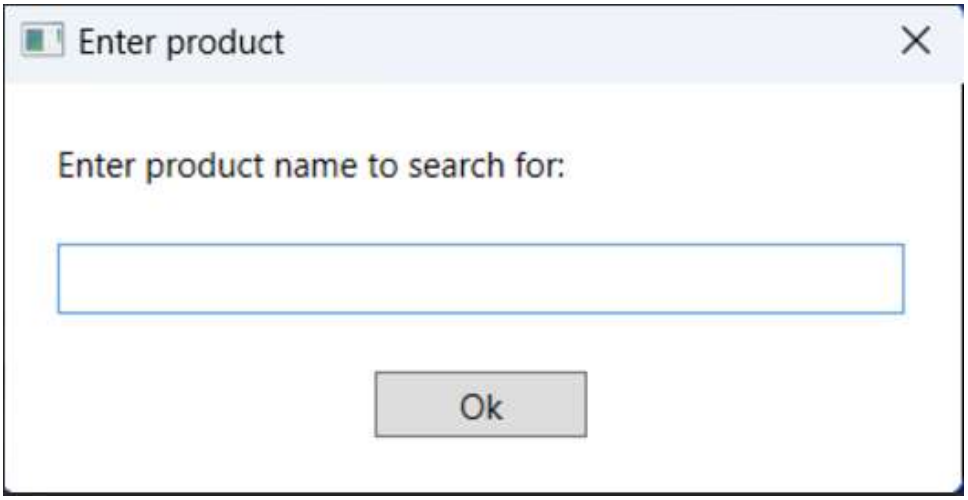


Fig 5.1 Input dialog

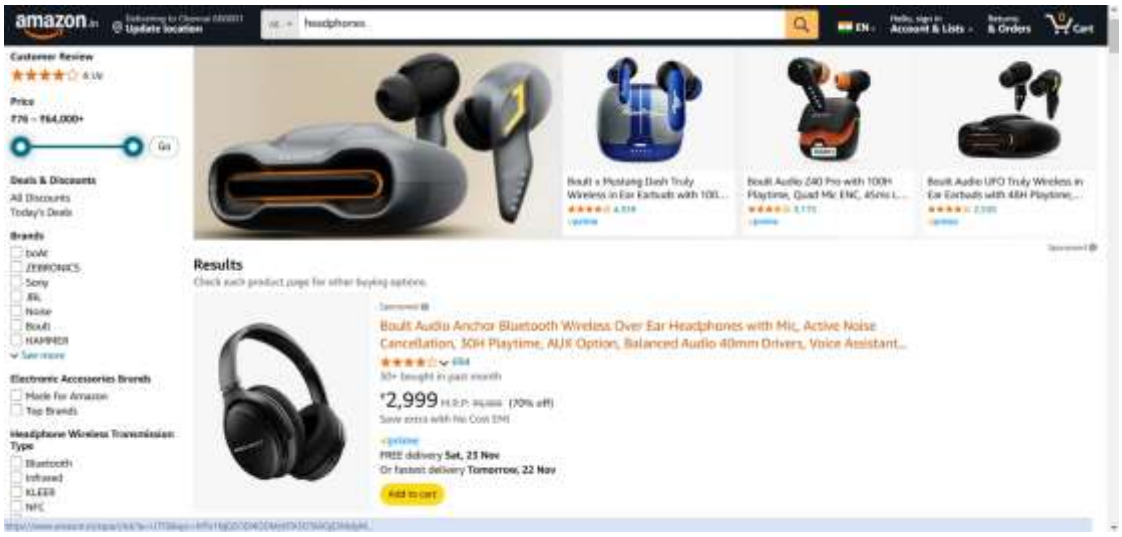
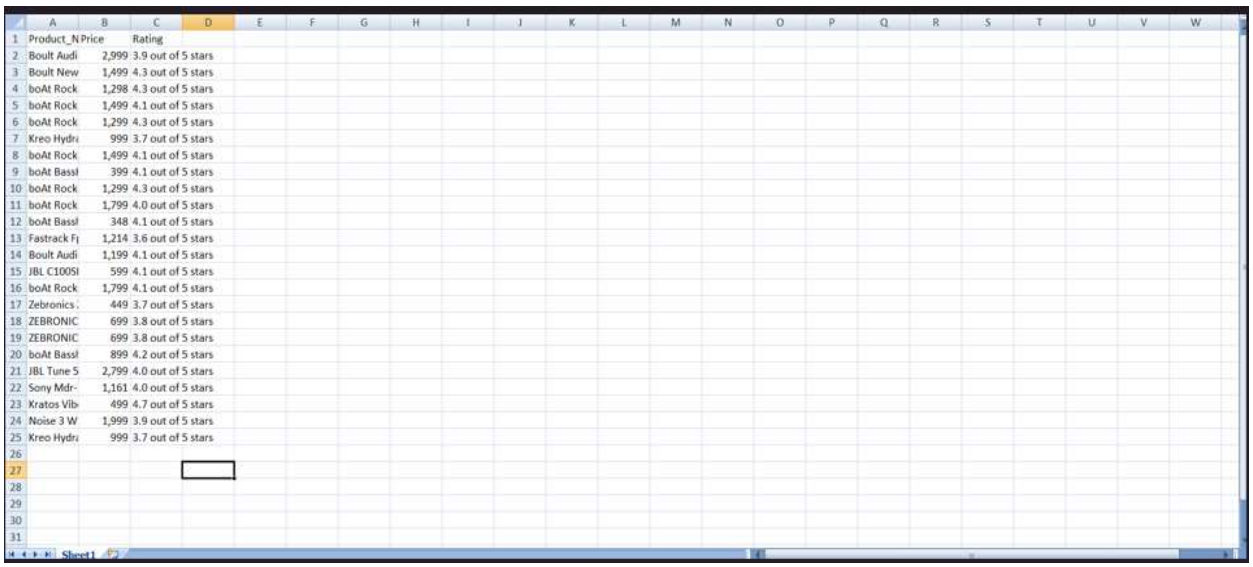


Fig 5.2 Amazon website



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	Product_N	Price	Rating																				
2	Boult Audi	2,999	3.9 out of 5 stars																				
3	Boult New	1,499	4.3 out of 5 stars																				
4	boAt Rock	1,298	4.3 out of 5 stars																				
5	boAt Rock	1,499	4.1 out of 5 stars																				
6	boAt Rock	1,299	4.3 out of 5 stars																				
7	Kreo Hydr	999	3.7 out of 5 stars																				
8	boAt Rock	1,499	4.1 out of 5 stars																				
9	boAt Bassl	399	4.1 out of 5 stars																				
10	boAt Rock	1,299	4.3 out of 5 stars																				
11	boAt Rock	1,799	4.0 out of 5 stars																				
12	boAt Bassl	348	4.1 out of 5 stars																				
13	Fastrack F	1,214	3.6 out of 5 stars																				
14	Boult Audi	1,199	4.1 out of 5 stars																				
15	JBL C100SI	599	4.1 out of 5 stars																				
16	boAt Rock	1,799	4.1 out of 5 stars																				
17	Zebronics	449	3.7 out of 5 stars																				
18	ZEBRONIC	699	3.8 out of 5 stars																				
19	ZEBRONIC	699	3.8 out of 5 stars																				
20	boAt Bassl	899	4.2 out of 5 stars																				
21	JBL Tune 5	2,799	4.0 out of 5 stars																				
22	Sony Mdr-	1,161	4.0 out of 5 stars																				
23	Kratos Vib	499	4.7 out of 5 stars																				
24	Noise 3 W	1,999	3.9 out of 5 stars																				
25	Kreo Hydr	999	3.7 out of 5 stars																				
26																							
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31																							

Sheet1

Fig 5.3 Excel sheet

Product_Name: Boult Audio Anchor Bluetooth Wireless Over Ear Headphones with Mic, Active Noise Cancellation, 30H Playtime, AUX Option, Balanced Audio 40mm Drivers, Voice Assistant Sweatproof Gaming ANC Headphones

Price: 2,999

Rating: 3.9 out of 5 stars

Product_Name: Boult Newly Launched Q Over Ear Bluetooth Headphones with 70H Playtime, 40mm Bass Drivers, Zen™ ENC Mic, Type-C Fast Charging, 4 EQ Modes, Bluetooth 5.4, AUX Option, IPX5 Wireless Headphones (Black)

Price: 1,998

Rating: 4.3 out of 5 stars

Product_Name: boAt Rockerz 430 w/ 40mm Drivers, Beast Mode w/ 40ms Latency, 40hrs Playback, ENx Tech, Voice Assistant, BTv5.4, Adaptive Fit & Easy Access Controls, Bluetooth Headphones(Black Sabre)

Price: 1,298

Rating: 4.4 out of 5 stars

Product_Name: boAt Rockerz 450 Bluetooth On Ear Headphones with Mic, Upto 15 Hours Playback, 40MM Drivers, Padded Ear Cushions, Integrated Controls and Dual Modes(Luscious Black)

Price: 1,499

Rating: 4.1 out of 5 stars

Product_Name: boAt Rockerz 430 w/ 40mm Drivers, Beast Mode w/ 40ms Latency, 40hrs Playback, ENx Tech, Voice Assistant, BTv5.4, Adaptive Fit & Easy Access Controls, Bluetooth Headphones(Bold Blue)

Price: 1,299

Rating: 4.4 out of 5 stars

Fig 5.4 Word document

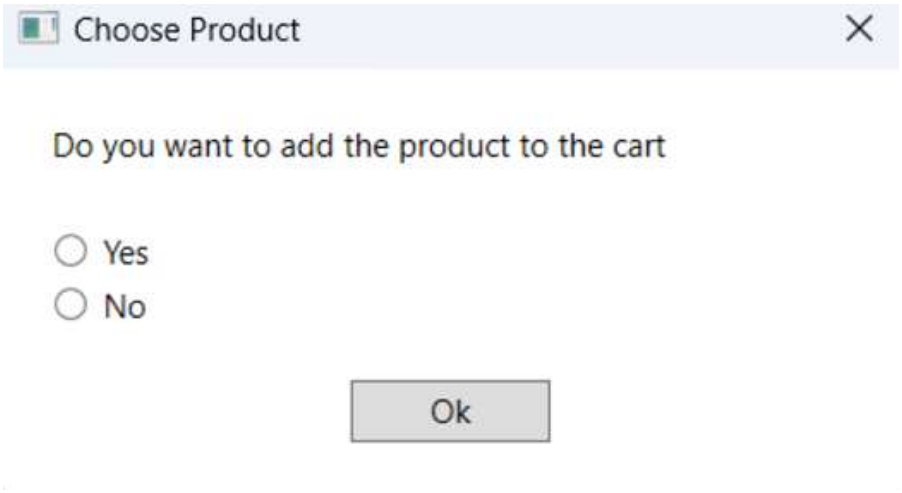


Fig 5.5 Input dialog

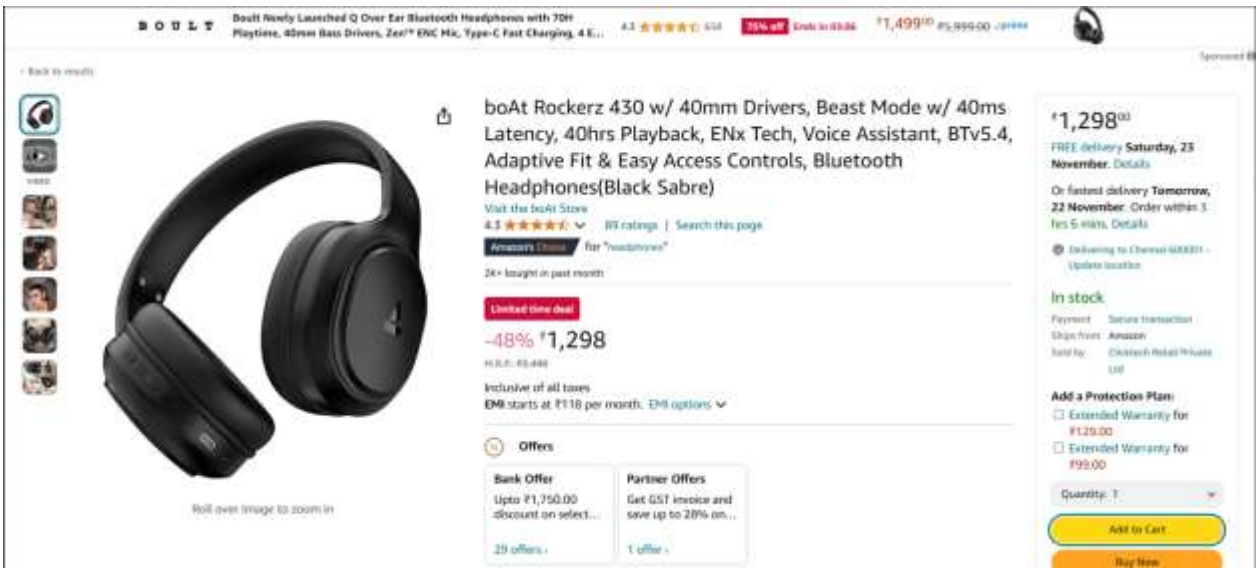


Fig 5.6 Amazon website

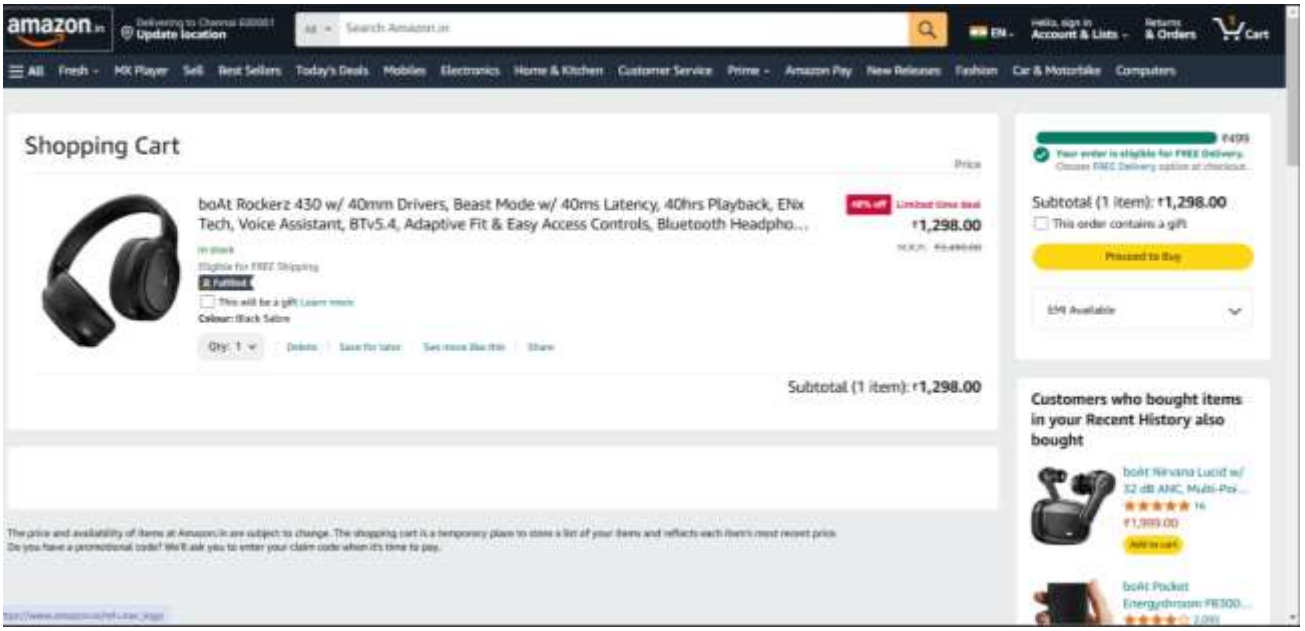


Fig 5.7 Added to cart page

CHAPTER 6
CONCLUSION

The **Shopping Robot** project, implemented using UiPath Studio, demonstrates the powerful capabilities of robotic process automation (RPA) in streamlining mundane and repetitive tasks such as product search, data extraction, analysis, and reporting. By integrating multiple automation workflows, this project provides a user-friendly and efficient way to interact with e-commerce platforms like Amazon.

Through its intuitive interface, the Shopping Robot allows users to enter a product name in a message box, triggering an automated search on Amazon. The robot efficiently scrapes essential product data, including the product name, price, and ratings, and organizes the information into a structured Excel sheet. This functionality not only saves time but also ensures accuracy and consistency in data collection, eliminating the chances of manual errors.

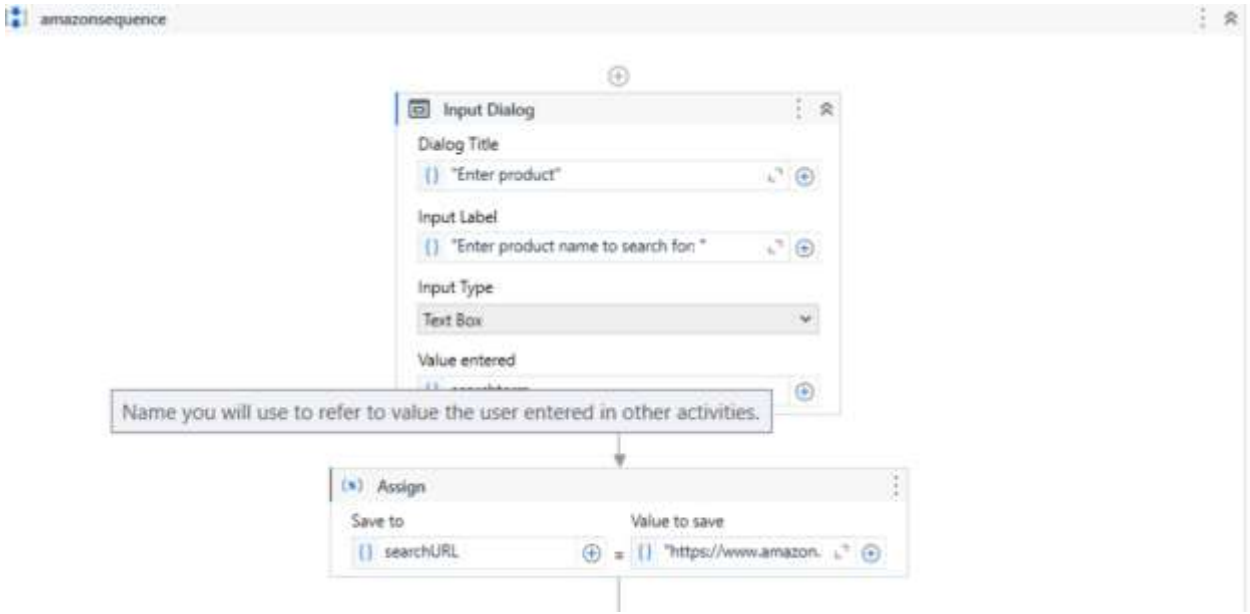
The project's analytical capabilities further enhance its utility by ranking the top five products based on user-defined criteria. Moreover, by identifying the maximum and minimum priced items and presenting this information in a professionally generated Word document, the Shopping Robot equips users with valuable insights for informed decision-making. The seamless integration of the "add to cart" functionality ensures that the shopping experience is not only automated but also highly interactive and personalized.

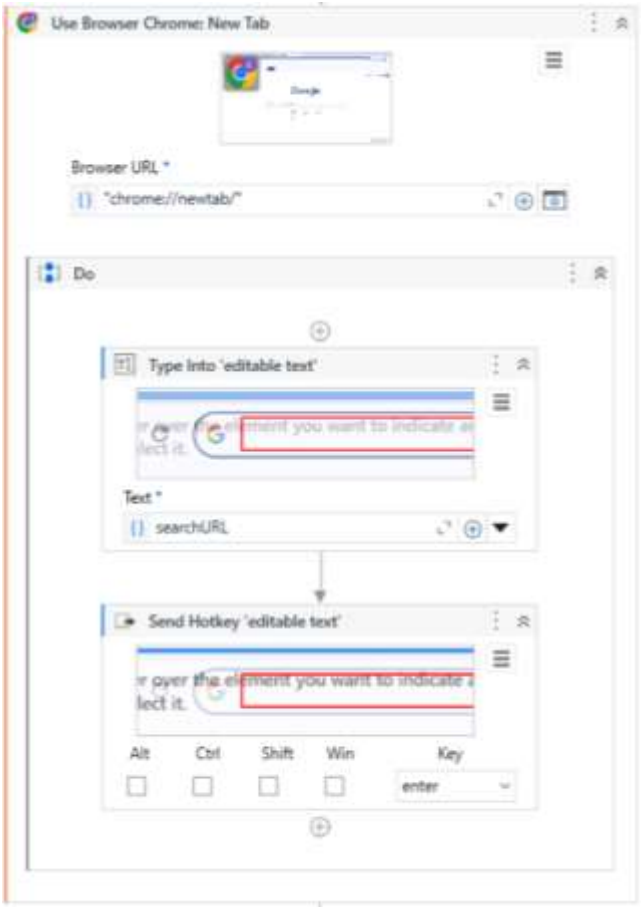
This project showcases the vast potential of RPA in automating real-world scenarios and highlights UiPath Studio as a robust and versatile tool for building automation workflows. By reducing manual effort, minimizing errors, and enhancing productivity, the Shopping Robot stands as a testament to the transformative power of automation in e-commerce. Future extensions to this project could include integration with other e-commerce platforms, advanced filtering options, and even real-time price tracking to further enrich the user experience.

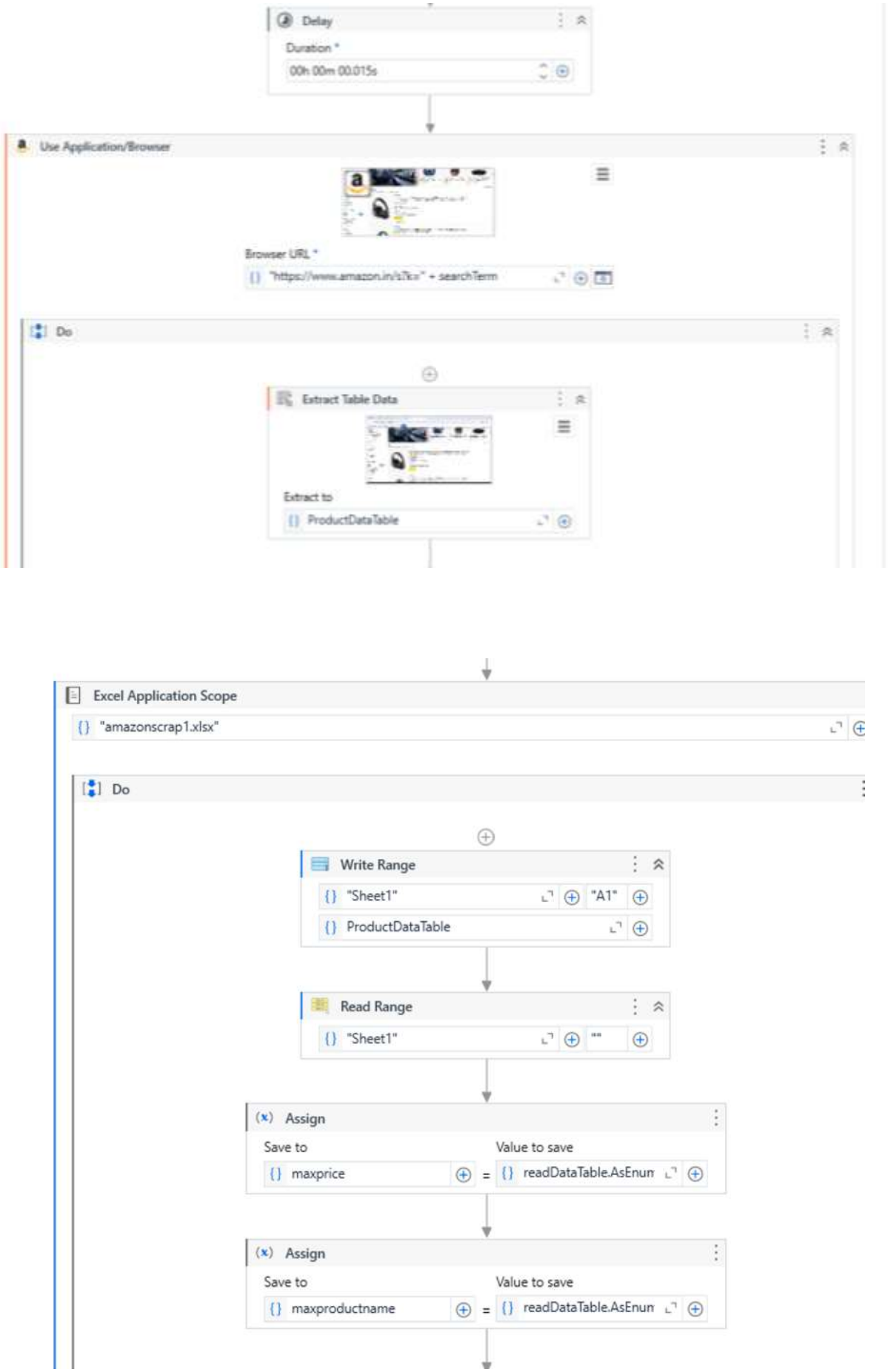
In conclusion, the Shopping Robot represents an innovative approach to leveraging RPA technology for simplifying online shopping, making it faster, smarter, and more convenient for users.

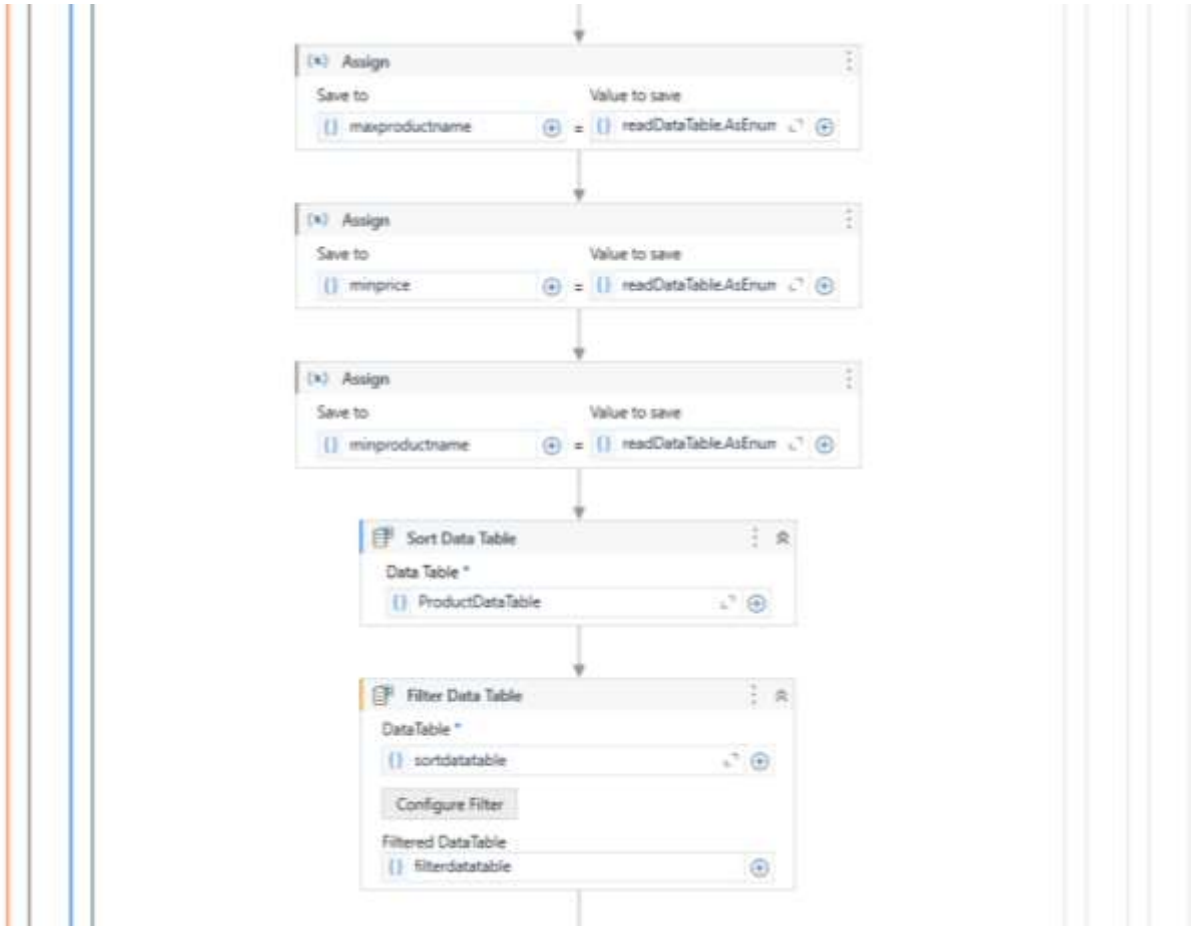
APPENDIX

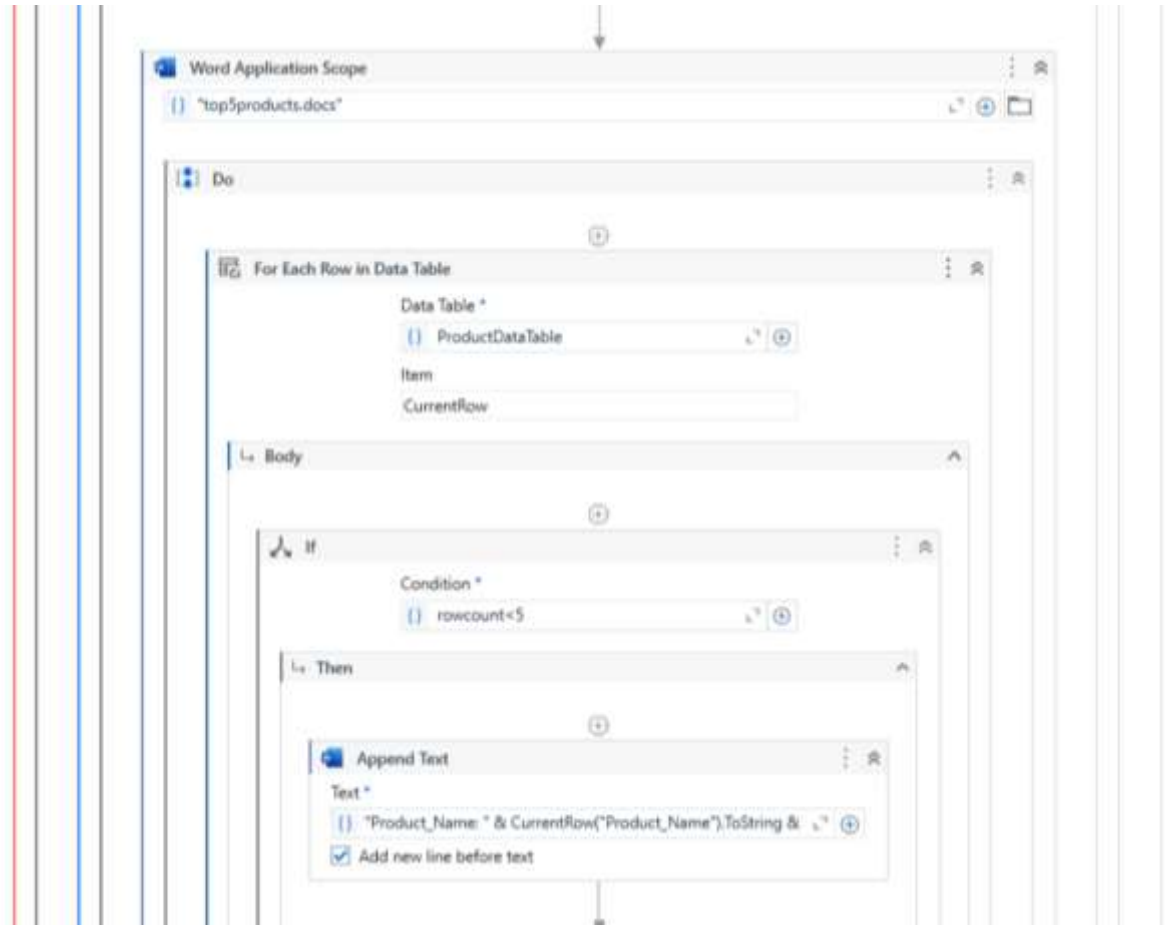
PROCESS WORK FLOW

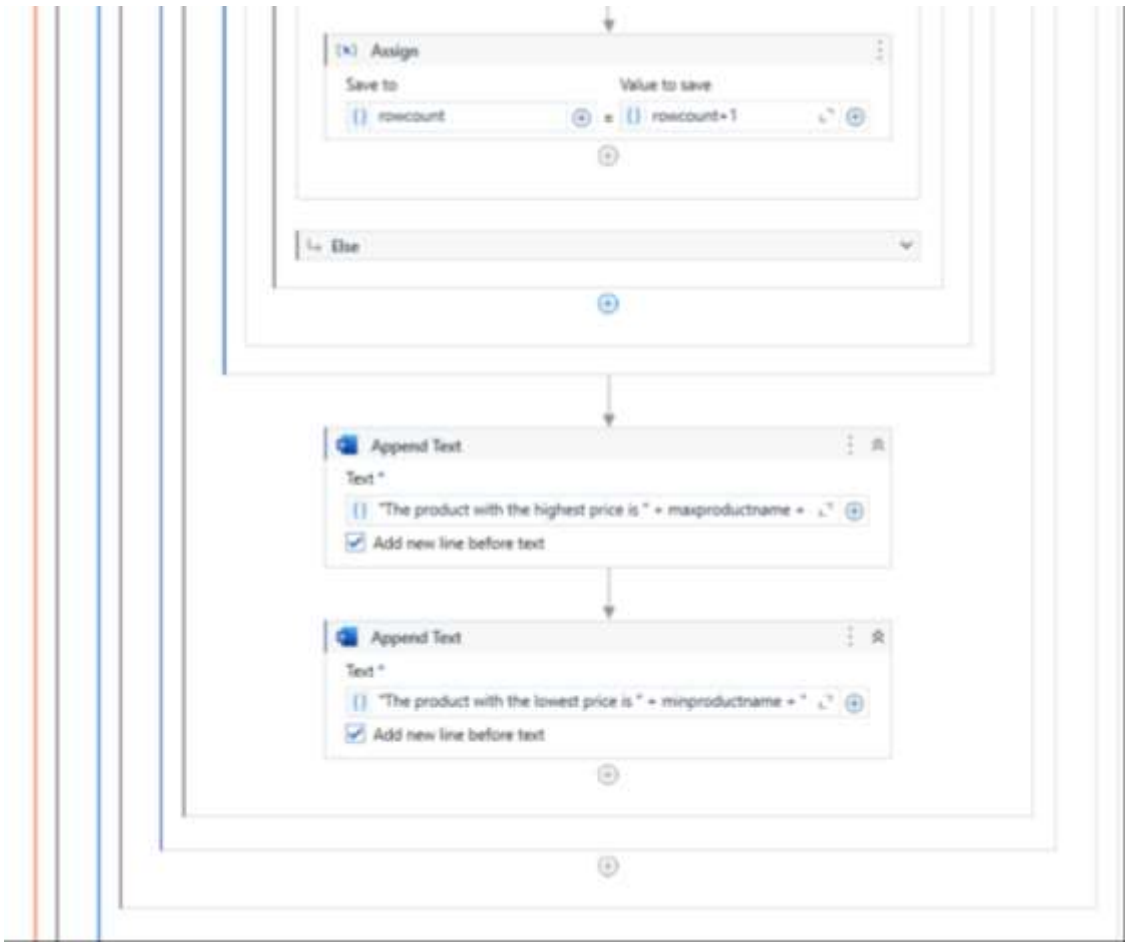





Delay
Duration *
00h 00m 00.015s
Use Application/Browser
Browser URL *
"https://www.amazon.in/s?k=" + searchTerm
Do
Extract Table Data
Extract to
ProductDataTable
Excel Application Scope
"amazonscrap1.xlsx"
Do
Write Range
"Sheet1"
"A1"
ProductDataTable
Read Range
"Sheet1"
""
Assign
Save to
Value to save
maxprice
readDataTable.AsEnum
Assign
Save to
Value to save
maxproductname
readDataTable.AsEnum


Assign
Save to
Value to save
maxproductname
readDataTable.AsEnum
Assign
Save to
Value to save
minprice
readDataTable.AsEnum
Assign
Save to
Value to save
minproductname
readDataTable.AsEnum
Sort Data Table
Data Table *
ProductDataTable
Filter Data Table
DataTable *
sortdatatable
Configure Filter
Filtered DataTable
filterdatatable


Word Application Scope
"top5products.docs"
Do
For Each Row in Data Table
Data Table *
ProductDataTable
Item
CurrentRow
Body
If
Condition *
rowcount<5
Then
Append Text
Text *
"Product_Name: " & CurrentRow("Product_Name").ToString &
Add new line before text


Assign
Save to
Value to save
rowcount
rowcount+1
Else
Append Text
Text *
"The product with the highest price is " + maxproductname +
Add new line before text
Append Text
Text *
"The product with the lowest price is " + minproductname + "
Add new line before text


Delay
Duration *
00h 00m 00.008s

REFERENCES

1. **Avasarala, V. (2020).** *Robotic Process Automation: Guide for Beginners.* Packt Publishing.
    - This book provides a comprehensive guide to RPA concepts, tools, and implementation, which can be useful for understanding the fundamentals of automating business processes.
2. **Lacity, M. C., & Willcocks, L. P. (2018).** *Robotic Process Automation and Cognitive Automation: The Next Phase.* BPTrends.
    - This book offers insights into the impact of RPA on businesses and how cognitive automation can be integrated into existing business processes.
3. **Willcocks, L. P., & Lacity, M. C. (2016).** *Robotic Process Automation: The Next Transformation in Business Process Outsourcing.* Journal of Information Technology Teaching, 33(4), 44-52.
    - A paper discussing the implications of RPA in business process outsourcing, highlighting its benefits for task automation.
4. **Avasarala, V. (2021).** *RPA in Financial Services: Automation of Billing, Stock Management, and Reporting.* International Journal of Applied Research, 8(3), 256-267.
    - Research on how RPA can be applied to financial services for automating tasks like billing and stock management.
5. **Automation Anywhere (2023).** *What is RPA? How Does Robotic Process Automation Work?* Retrieved from www.automationanywhere.com
    - Provides an overview of RPA and its applications across different industries, including billing and stock management.
6. **UiPath (2023).** *Robotic Process Automation in Accounting and Finance.* Retrieved from www.uipath.com
    - An article that covers how RPA can be applied in accounting and finance, relevant to billing and reporting automation.