SB8026 - Robotic Process Automation Development

NAAN MUDHALVAN REPORT

Submitted by

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COMPUTER SCIENCE AND ENGINEERING

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Nov- Dec 2024

BONAFIDE CERTIFICATE

Certified that this report "Dynamic Web Form Data Entry" is the bonafide work of "Karthick Raj T (913322104019)" who carried out the Naan Mudhalvan Course under my supervision .

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Submitted for Viva-Voce/ Practical examination held at Vaigai College of Engineering, Madurai for Anna University held on _____

INTERNAL EXAMINER **EXTERNAL EXAMINER**

ABSTRACT

Manual data entry into web forms is a vital but repetitive task in many organizational processes. It is prone to human errors, consumes significant time, and diverts resources from more strategic activities. This project explores the automation of data entry from a spreadsheet into a web form using UiPath, a leading Robotic Process Automation (RPA) tool. The solution automates the end-to-end process, including reading structured data from a spreadsheet, launching the web form in a browser, filling in data fields, and handling the form submission process. It also addresses dynamic changes in the web form's layout or field positions, ensuring robustness and flexibility. This approach aims to minimize errors, improve efficiency, and reduce the workload on human operators, highlighting the transformative potential of RPA in streamlining data-intensive workflows.

INTRODUCTION

In the era of digital transformation, businesses and organizations are increasingly seeking ways to optimize their workflows. One common bottleneck is manual data entry, a repetitive task often required to transfer information from one system to another. Manual processes are time-intensive, susceptible to errors, and can lead to inefficiencies.

Robotic Process Automation (RPA) offers a scalable solution to these challenges by simulating human interactions with software systems. This project employs UiPath to automate the process of transferring data from a spreadsheet to a web

form. The web form might represent a customer portal, government registry, or any other system requiring structured inputs.

The solution leverages UiPath's capabilities, such as Excel integration, browser automation, and dynamic element identification. Additionally, the automation incorporates error-handling mechanisms to ensure uninterrupted operation. By implementing this system, organizations can enhance accuracy, save time, and allocate human resources to highervalue tasks.

OVERVIEW

The system operates as follows:

1. **Reading Data from the Spreadsheet**
   - The input file is an Excel spreadsheet containing structured data fields that match the web form's requirements. UiPath's *Excel Activities* are used to read data from this file row by row.
   - Data validation logic ensures the spreadsheet's structure is correct before proceeding. For example:
     - Are all required columns present?
     - Are there missing or invalid data entries?
2. **Launching the Web Form**
   - Using UiPath's *Browser Activities*, the robot opens the specified URL for the web form in a pre-configured browser.

- If the form requires authentication, the bot inputs login credentials stored securely in UiPath Orchestrator or Windows Credential Manager.

3. **Mapping and Entering Data**
   - The robot identifies fields on the web form using UiPath's *Selector Framework*. These selectors dynamically adapt to variations such as changes in field IDs, labels, or positions.
   - For each row in the spreadsheet, the bot maps the data to the appropriate fields and inputs the data.
   - Validation steps are included to ensure all required fields are filled before moving forward.
4. **Form Submission**
   - After filling in all fields, the bot submits the form by triggering the submission button.
   - The bot waits for confirmation (e.g., success message or form reload) before processing the next row of data.
   - In case of failure (e.g., server error or missing data), the bot logs the error and retries based on pre-defined rules.
5. **Handling Dynamic Field Changes**
   - Web forms can change over time, with fields being rearranged or added. To address this:
     - The robot uses anchor-based selectors or label-text matching to locate fields dynamically.
     - If a new field is detected that was not in the original mapping, the bot logs this for manual

review or adapts by appending the new field to a dynamic data structure.

6. **Error Handling and Logging**
   - Comprehensive error-handling mechanisms are implemented to manage:
     - Network connectivity issues.
     - Browser crashes.
     - Unexpected form changes or missing fields.
   - All errors are logged with relevant details, such as the record being processed and the type of error encountered. These logs are stored in a central repository for review.

REQUIREMENTS

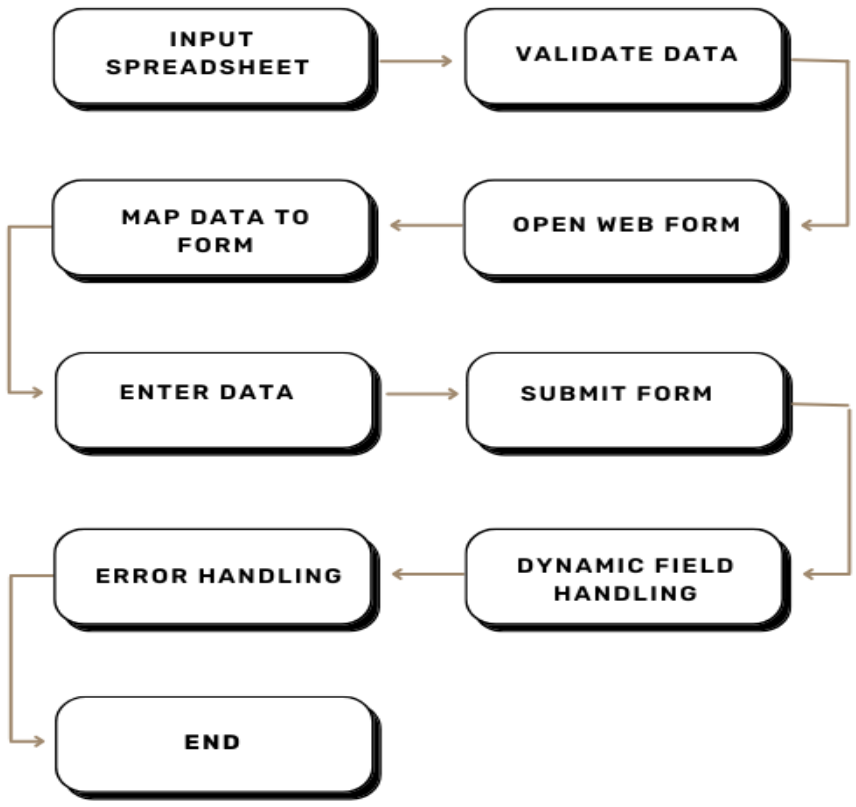
1. **Software Tools**
   - UiPath Studio: To design and deploy the automation workflow.
   - Browser Extensions: UiPath's Microsoft Edge extensions to enable browser automation.
   - Excel: For data input.
2. **Input Data**
   - A structured spreadsheet (Excel format) containing:
     - One row per record.
     - One column per form field.

- Columns should be labeled clearly to match web form fields.

3. **System Configuration**
   - A computer or virtual machine with UiPath installed and adequate permissions to access the web form and spreadsheet.

4. **User Skills**
   - Knowledge of UiPath functionalities such as Excel Activities, Browser Automation, and Error Handling.
   - Understanding of web development basics, including HTML and element identification.

BLOCK DIAGRAM



PROBLEM STATEMENT:

1.Use UiPath to read data from the spreadsheet.

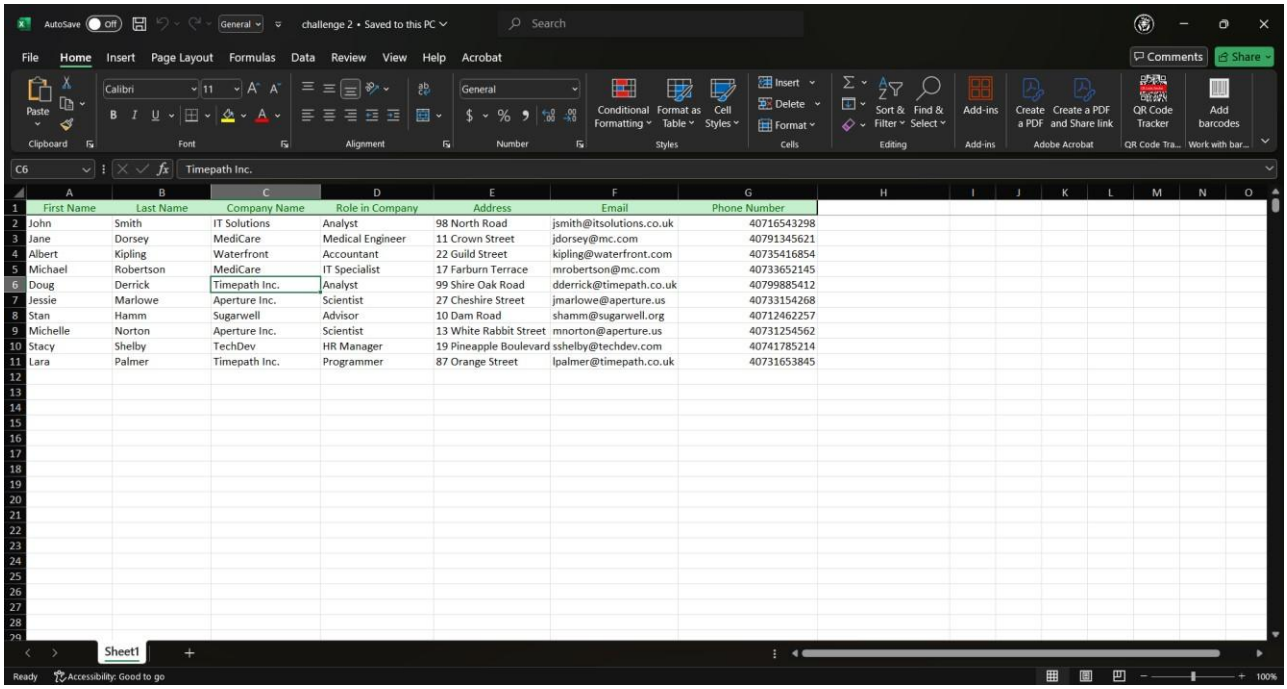
2.Automate opening the web form in a browser.

3.Write logic to input data from the spreadsheet into the web form fields.

4.Automate the submission of the form.

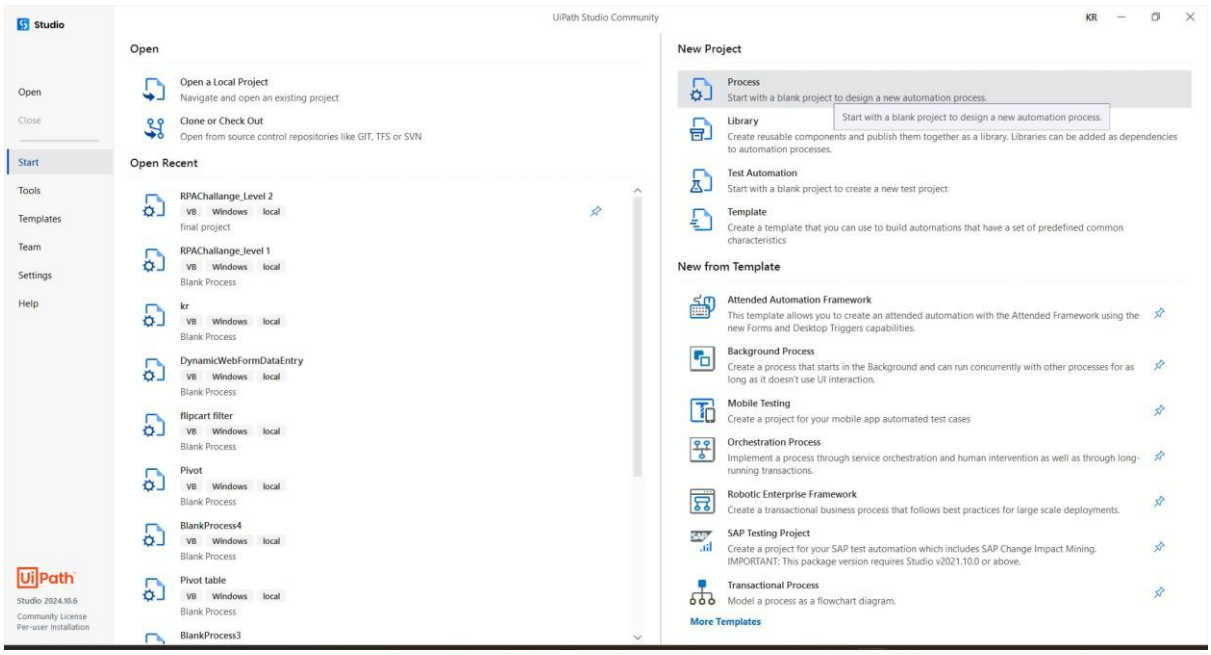
5.Implement logic to handle changes in field positions after each submission

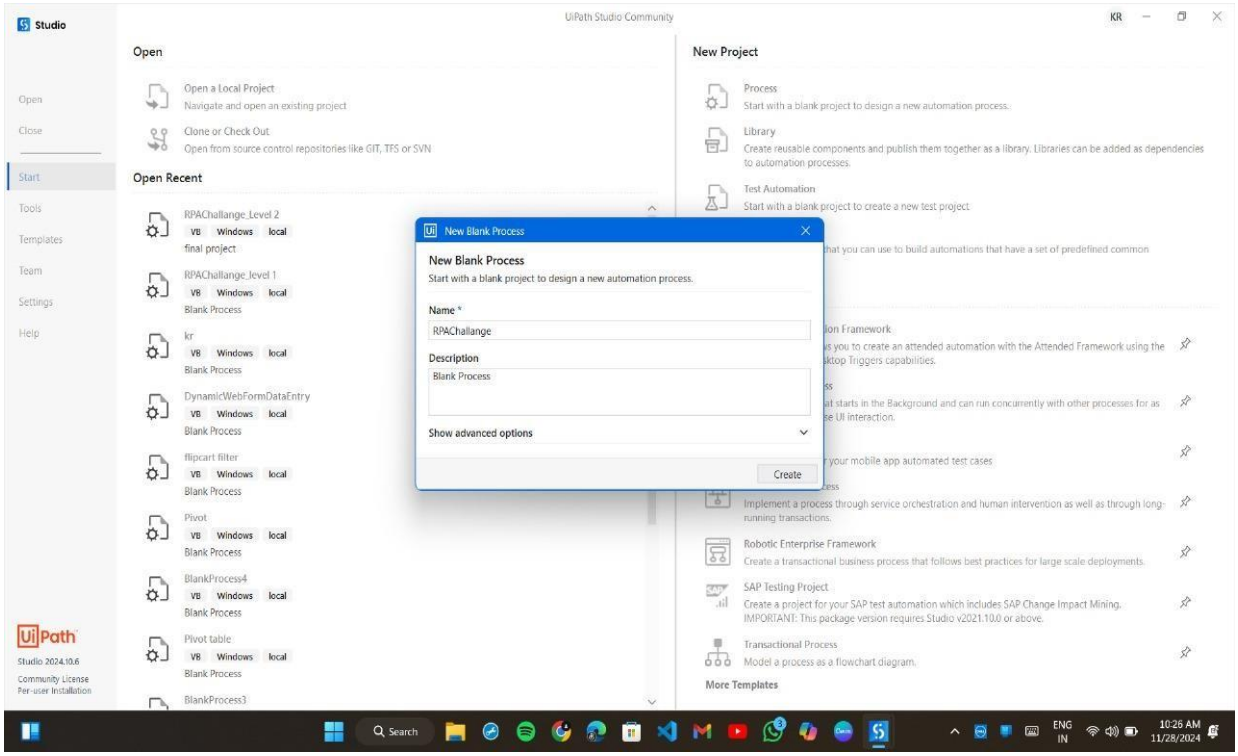
INPUT:

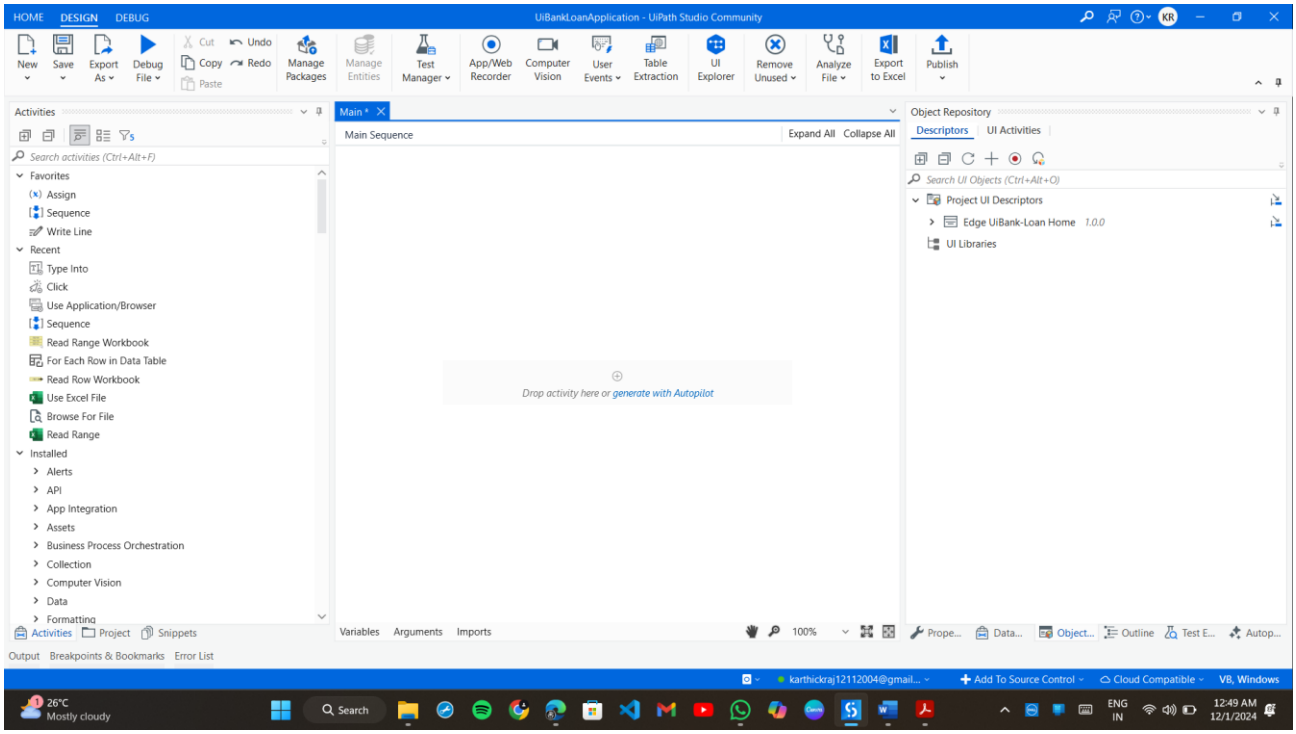


First Name	Last Name	Company Name	Role in Company	Address	Email	Phone Number
John	Smith	IT Solutions	Analyst	98 North Road	jsmith@itsolutions.co.uk	40716543298
Jane	Dorsey	MediCare	Medical Engineer	11 Crown Street	jdorsey@mc.com	40791345621
Albert	Kipling	Waterfront	Accountant	22 Guild Street	kipling@waterfront.com	40735416854
Michael	Robertson	MediCare	IT Specialist	17 Farburn Terrace	mrobertson@mc.com	40733652145
Doug	Derrick	Timepath Inc.	Analyst	99 Shire Oak Road	dderrick@timepath.co.uk	40799885412
Jessie	Marlowe	Aperture Inc.	Scientist	27 Cheshire Street	jmarlowe@aperture.us	40733154268
Stan	Hamm	Sugarwell	Advisor	10 Dam Road	shamm@sugarwell.org	40712462257
Michelle	Norton	Aperture Inc.	Scientist	13 White Rabbit Street	mnorton@aperture.us	40731254562
Stacy	Shelby	TechDev	HR Manager	19 Pineapple Boulevard	sshelby@techdev.com	40741785214
Lara	Palmer	Timepath Inc.	Programmer	87 Orange Street	lpalmer@timepath.co.uk	40731653845

WORKING FLOW:



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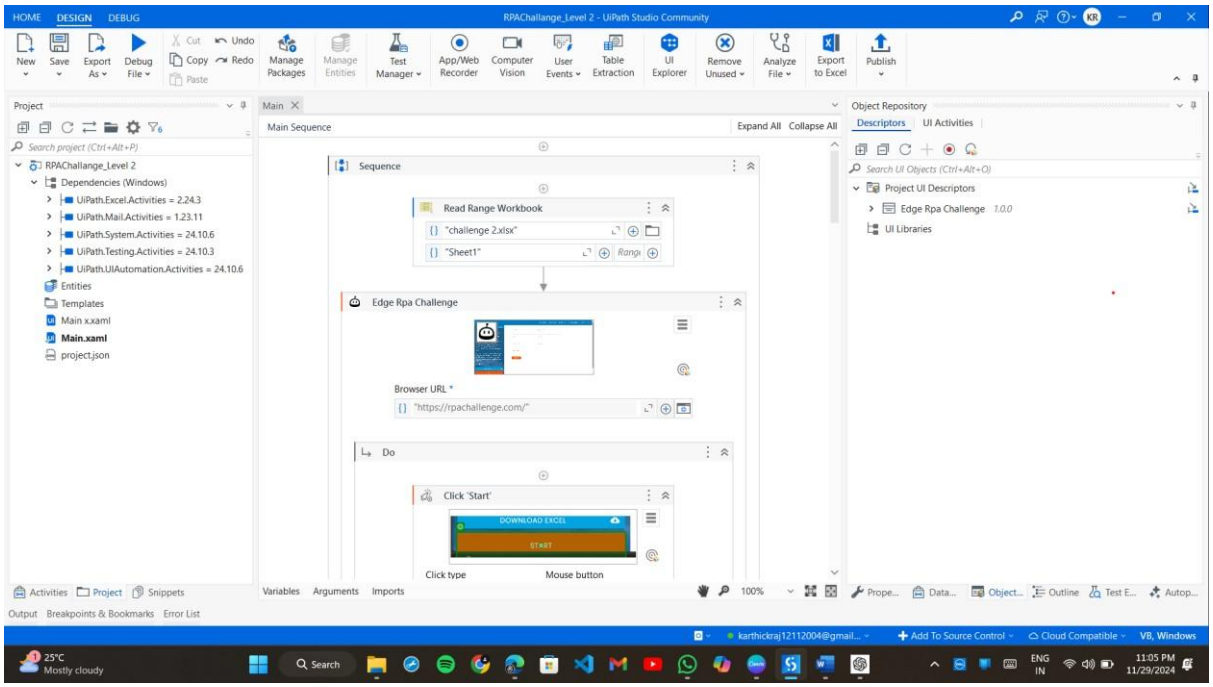
DESIGN
DEBUG
UiBankLoanApplication - UiPath Studio Community
Activities
Main
Main Sequence
Expand All
Collapse All
Object Repository
Descriptors
UI Activities
Favorites
Assign
Sequence
Write Line
Recent
Type Into
Click
Use Application/Browser
Sequence
Read Range Workbook
For Each Row in Data Table
Read Row Workbook
Use Excel File
Browse For File
Read Range
Installed
Alerts
API
App Integration
Assets
Business Process Orchestration
Collection
Computer Vision
Data
Formatting
Drop activity here or generate with Autopilot
Project UI Descriptors
Edge UiBank-Loan Home 1.0.0
UI Libraries
Variables
Arguments
Imports
Output
Breakpoints & Bookmarks
Error List
Add To Source Control
Cloud Compatible
VB, Windows


HOME
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RPAChallange_Level 2 - UiPath Studio Community
Project
Main
Main Sequence
Expand All
Collapse All
Object Repository
Descriptors
UI Activities
RPAChallange_Level 2
Dependencies (Windows)
UiPath.Excel.Activities = 2.24.3
UiPath.Mail.Activities = 1.23.11
UiPath.System.Activities = 24.10.6
UiPath.Testing.Activities = 24.10.3
UiPath.UIAutomation.Activities = 24.10.6
Entities
Templates
Main x.xaml
Main.xaml
project.json
Sequence
Read Range Workbook
"challenge 2.xlsx"
"Sheet1"
Edge Rpa Challenge
Browser URL *
"https://rpachallenge.com/"
Do
Click 'Start'
Click type
Mouse button
Project UI Descriptors
Edge Rpa Challenge 1.0.0
UI Libraries
Variables
Arguments
Imports
Output
Breakpoints & Bookmarks
Error List
Add To Source Control
Cloud Compatible
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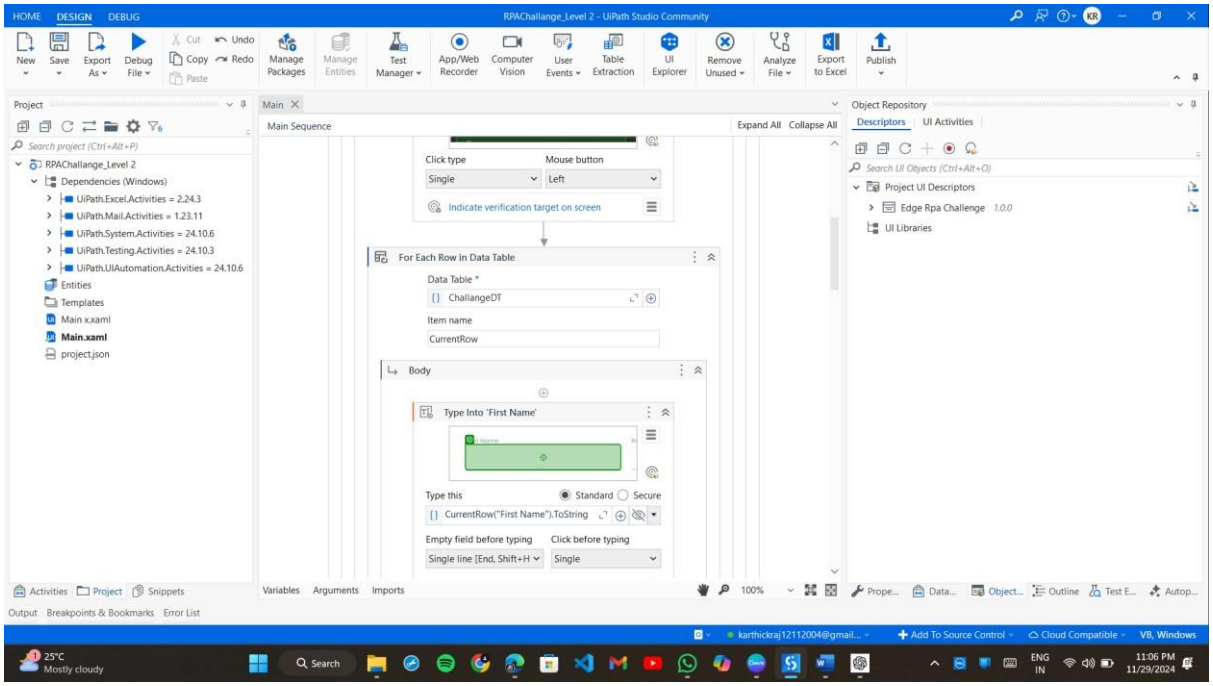
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Entities
Templates
Main x.xaml
Main.xaml
project.json
Click type
Single
Mouse button
Left
Indicate verification target on screen
For Each Row in Data Table
Data Table *
ChallangeDT
Item name
CurrentRow
Body
Type Into 'First Name'
Type this
Standard
Secure
CurrentRow("First Name").ToString
Empty field before typing
Single line [End, Shift+H
Click before typing
Single
Project UI Descriptors
Edge Rpa Challenge 1.0.0
UI Libraries
Activities
Project
Snippets
Variables
Arguments
Imports
Output
Breakpoints & Bookmarks
Error List
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Mostly cloudy
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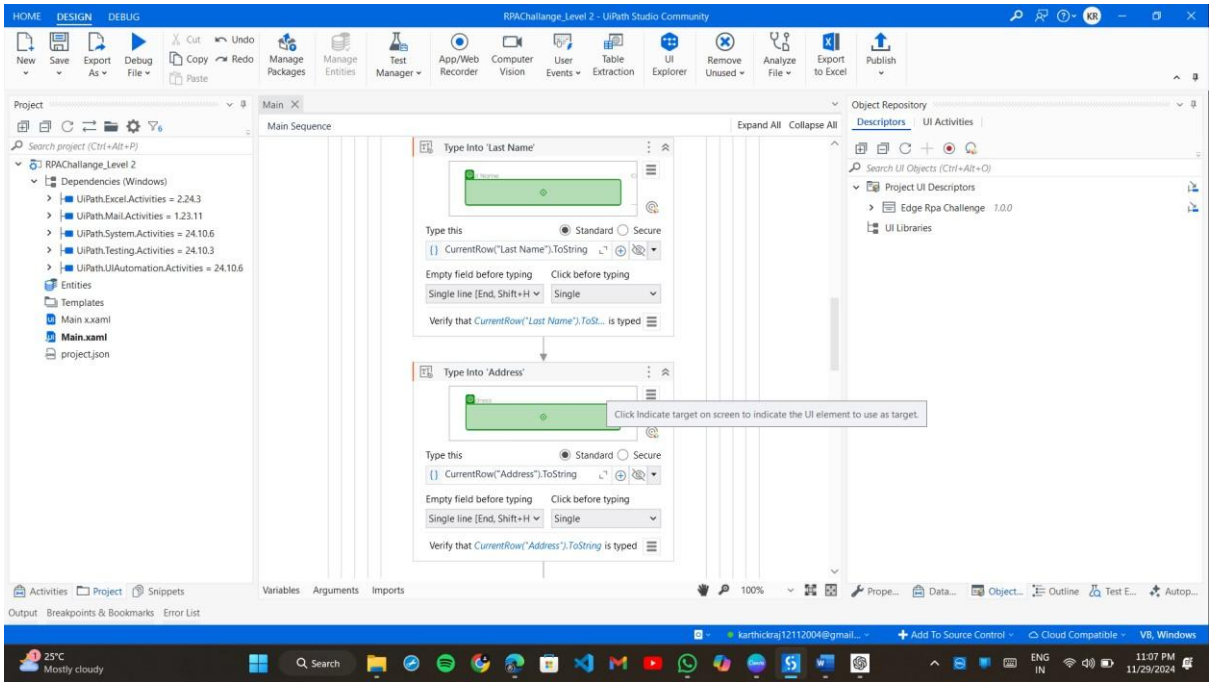
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project.json
Type Into 'Last Name'
Type this
Standard
Secure
CurrentRow("Last Name").ToString
Empty field before typing
Single line [End, Shift+H
Click before typing
Single
Verify that CurrentRow("Last Name").ToSt... is typed
Type Into 'Address'
Click Indicate target on screen to indicate the UI element to use as target.
CurrentRow("Address").ToString
Verify that CurrentRow("Address").ToString is typed
Project UI Descriptors
Edge Rpa Challenge 1.0.0
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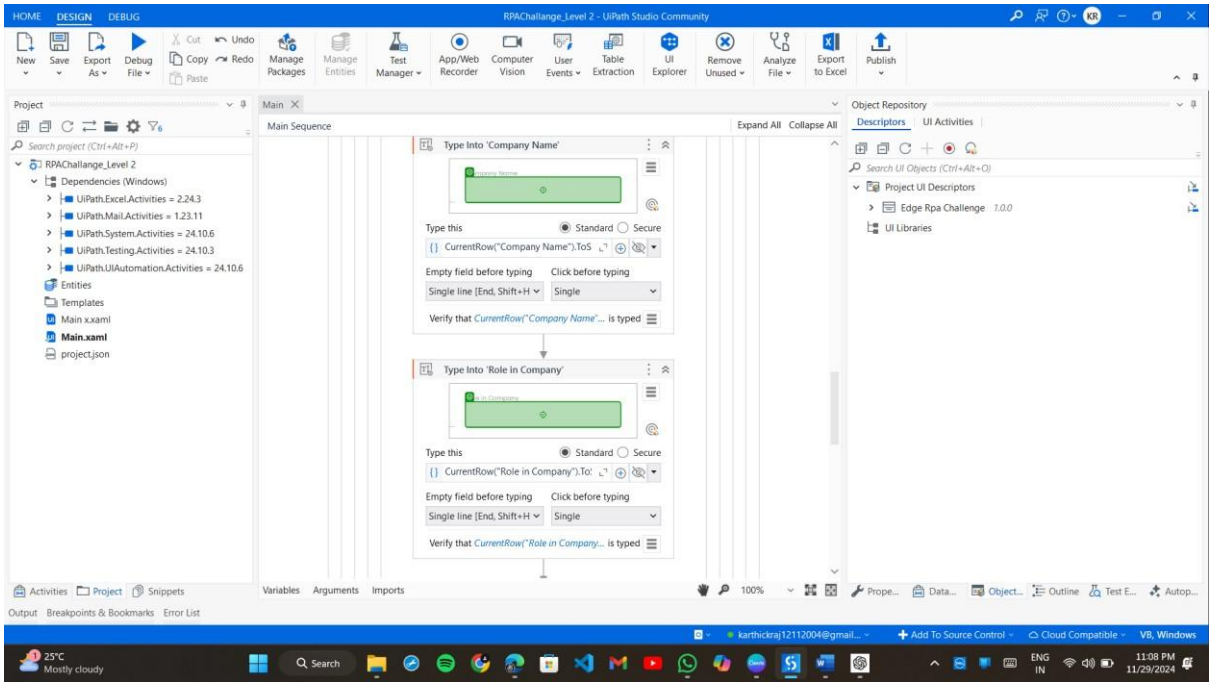
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Expand All
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Type Into 'Company Name'
Type this
Standard
Secure
Empty field before typing
Click before typing
Type Into 'Role in Company'
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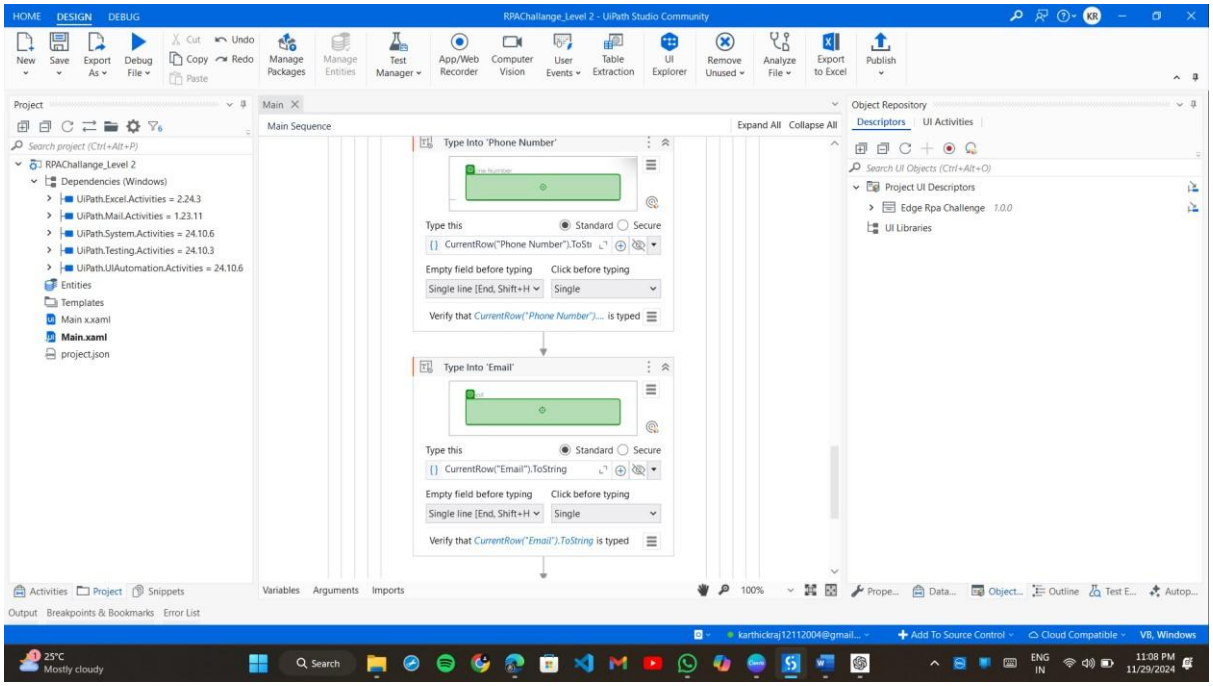
HOME
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RPAChallange_Level 2 - UiPath Studio Community
Project
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Main Sequence
Expand All
Collapse All
Type Into 'Phone Number'
Type this
Standard
Secure
Empty field before typing
Click before typing
Type Into 'Email'
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Project UI Descriptors
Edge Rpa Challenge
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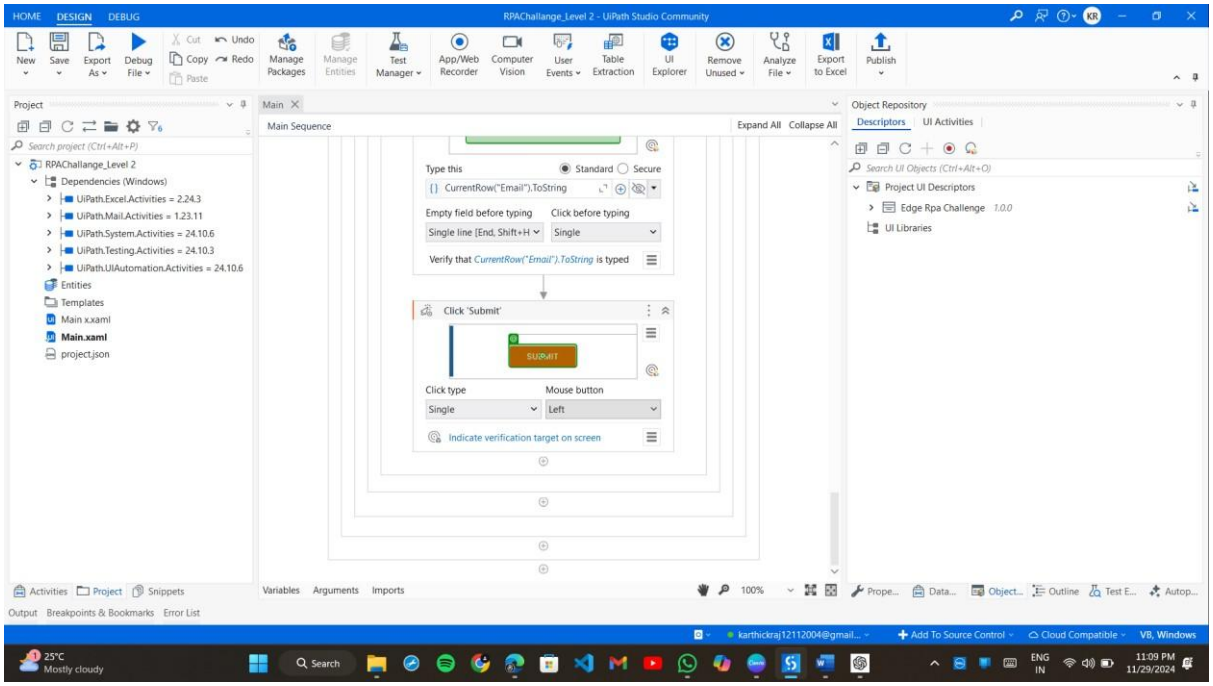
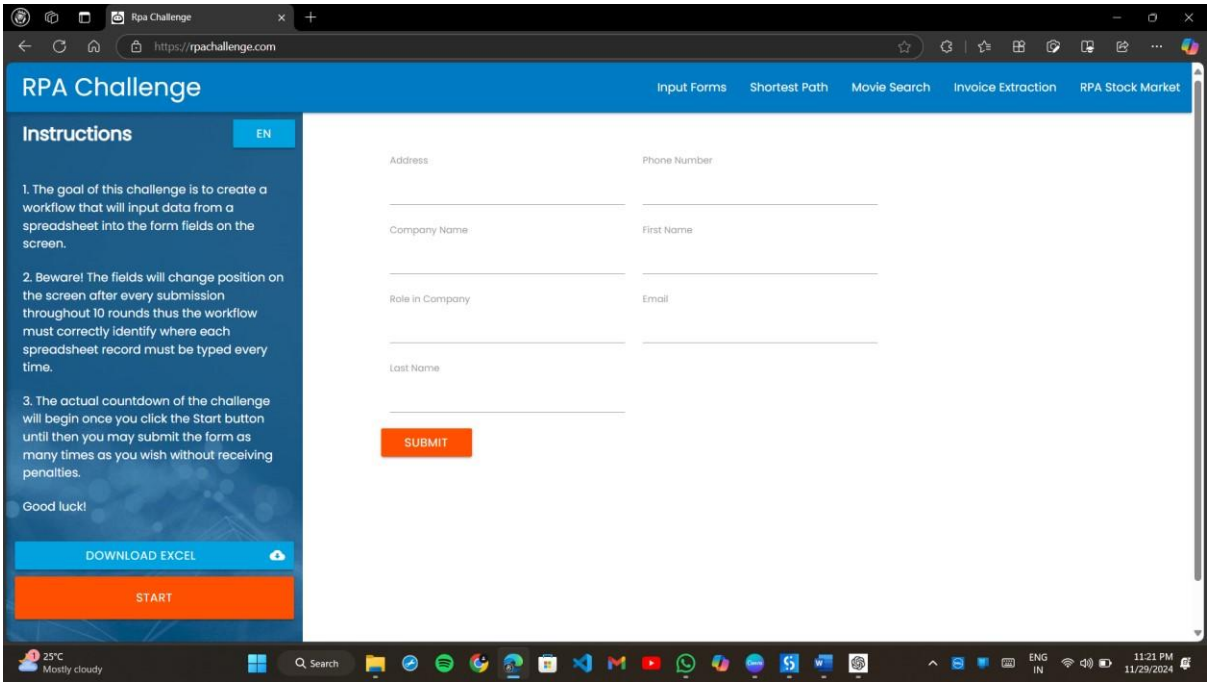
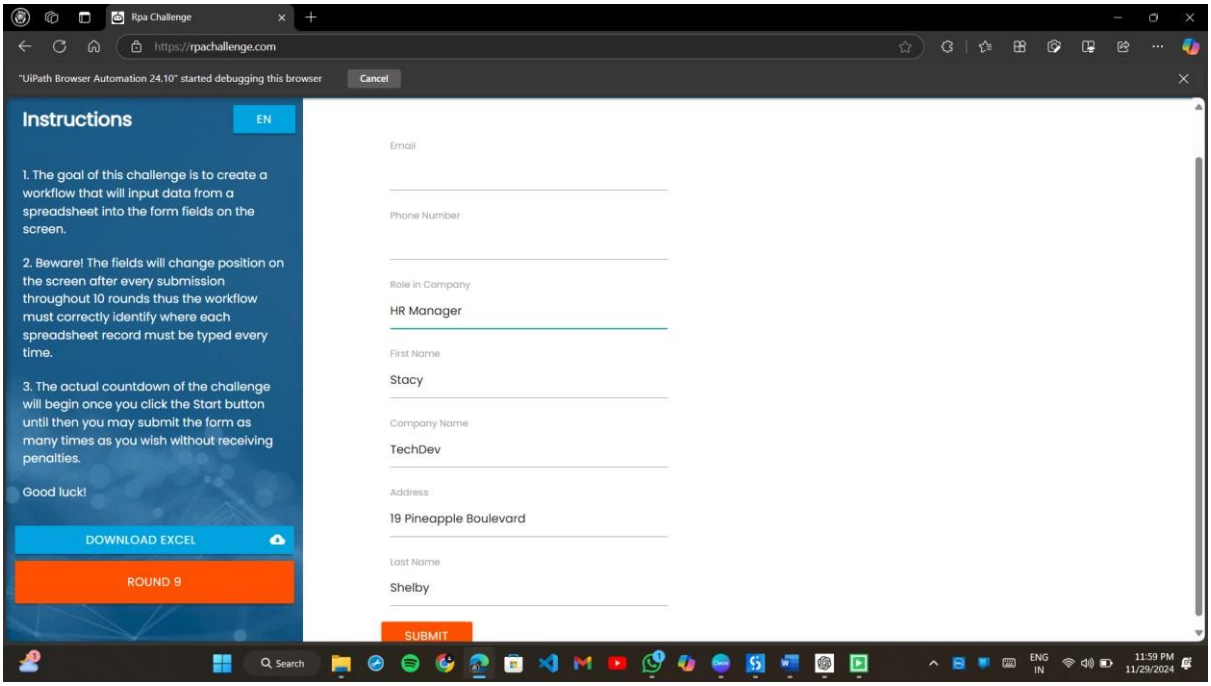


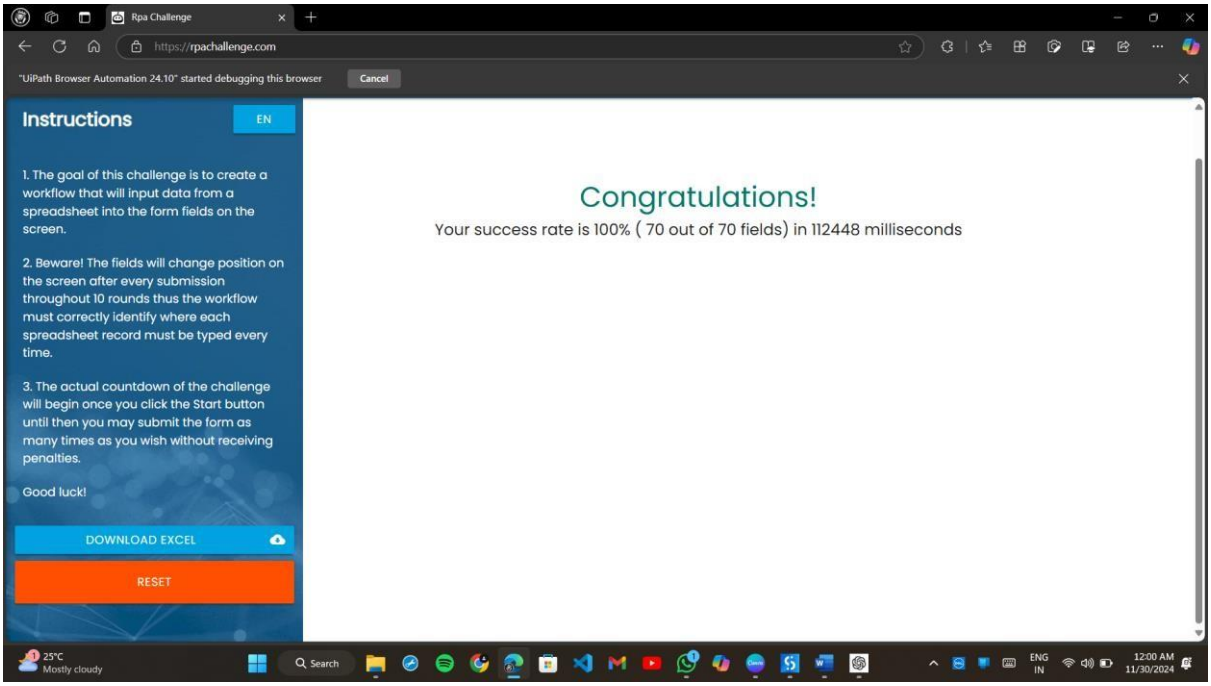
IN WEBSITE:

https://rpachallange.com




Rpa Challenge
https://rpachallenge.com
"UiPath Browser Automation 24.10" started debugging this browser
Cancel
Instructions
EN
1. The goal of this challenge is to create a workflow that will input data from a spreadsheet into the form fields on the screen.
2. Beware! The fields will change position on the screen after every submission throughout 10 rounds thus the workflow must correctly identify where each spreadsheet record must be typed every time.
3. The actual countdown of the challenge will begin once you click the Start button until then you may submit the form as many times as you wish without receiving penalties.
Good luck!
DOWNLOAD EXCEL
ROUND 9
Email
Phone Number
Role in Company
HR Manager
First Name
Stacy
Company Name
TechDev
Address
19 Pineapple Boulevard
Last Name
Shelby
SUBMIT

OUTPUT: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3. The actual countdown of the challenge will begin once you click the Start button until then you may submit the form as many times as you wish without receiving penalties.
Good luck!
DOWNLOAD EXCEL
RESET
Congratulations!
Your success rate is 100% (70 out of 70 fields) in 112448 milliseconds

CONCLUSION:

Automating data entry using UiPath eliminates the inefficiencies and inaccuracies associated with manual processes. The project not only demonstrates the potential of RPA to handle repetitive tasks but also highlights its adaptability to dynamic environments. By incorporating robust error-handling mechanisms and logic to manage changes in field positions, the solution ensures reliable and accurate operation.