

Robotic Process Automation

Course Objectives	<ul style="list-style-type: none">• Developing RPA Solutions• Programming for RPA• Process Analysis and Mapping• Implementing RPA Best Practices• Monitoring and Managing RPA Operations
Course Outcomes	<ul style="list-style-type: none">• Design, build, and deploy RPA solutions using industry-leading RPA tools such as UiPath, Automation Anywhere, or Blue Prism. Workflow design, bot creation, task automation, and process optimization.• Programming to customize and enhance RPA bots• Analyse and map business processes to identify opportunities for automation. Process mapping, workflow analysis, identifying automation potential, and documentation• Apply best practices for RPA implementation, including governance, security, and maintenance. Setting up RPA governance frameworks, ensuring bot security, maintaining and scaling RPA solutions• Monitor, troubleshoot, and manage RPA operations to ensure optimal performance and continuity. Monitoring RPA performance, troubleshooting bot issues, managing bot workloads, and continuous improvement.

Course Duration: 45 Hours

Course Content:

UNIT I: Robotic Process Automation and Industry opportunities:

Detailed presentation of the publishing process to Orchestrator and learn to run the process with Assistant- The key components of the UiPath Studio user interface (UI). -Accessing of the ACME System; web application to receive a set

of invoices in your mailbox. - steps of the process to be built based on the business needs. - UiPath Studio activities - publishing options for a process in Studio - Run a published process from the UiPath Assistant. Variables & Arguments in Studio

UNIT II: UI Automation:

UI automation with UiPath – Key elements of UI Automation with UiPath Studio - Differentiation between the modern and the classic design - Changing the design experience in Studio based on the automation requirements.

UI Automation with the Modern Design Experience Indication and selection the target required for UI Automation using the Selection Option window – Configuration of the key container Activity in the modern experience - correct input activities used in the modern design experience - input methods used in modern design experience - suitable input methods based on the requirements of an automation - input mode works - key output activities used in the modern design experience - output methods used in modern design experience

UNIT III: Project Organization in studio

Choose a suitable project layout for each workflow - Splitting a complex automation project into functional workflows - Creation and sharing of project template - Reusable components across projects and store them as libraries - exception handling techniques - versioning capabilities of UiPath

UNIT IV: Orchestrator Overview for RPA developers

Creation, configuration, and provision of unattended robots through Orchestrator in UiPath, publish and managing of automation projects, and execution of jobs using an unattended robot - purpose and main capabilities of Orchestrator - Orchestrator entities - differentiate between the tenant context and the folder context - Creation, configuration and provision unattended robots from Orchestrator

UNIT V: RPA testing

RPA testing in the overall automation process and features for testing in UiPath Studio - unit testing for RPA workflows and best practices from projects implemented by the UiPath development teams- Causes that affect the robot stability and how they can be tackled - Build the case for RPA testing - levels of RPA testing – Creation of basic and data-driven test cases for RPA workflows – Dedicated verification features for RPA Testing - Test Explorer to group tests together, perform debugging - mock testing simulation of real objects in RPA

testing scenarios - good case practices identified by RPA developers from real automation projects.

Test Projects:

Use Cases

1. Random User API

Manually creating diverse user profiles for testing purposes is time-consuming and doesn't reflect real-world scenarios accurately.

Description

You're tasked with developing a social media website prototype for your college project. To ensure the platform's functionality and user experience are tested comprehensively, you need a reliable method to generate and manage realistic user profiles with varying attributes such as demographics, interests, and network connections.

Solution

To address this challenge effectively using UiPath, you can integrate the Random User Generator API.

<https://randomuser.me/api/>

This integration will allow you to automate the generation and management of diverse user profiles, enhancing the complexity of your automation project.

1. **UiPath Integration:** Utilize UiPath Studio to create automation workflows that interact with the Random User Generator API. Use HTTP Request activities to fetch user profiles dynamically in JSON format.

2. **Data Management in UiPath:** Implement data parsing and manipulation activities within UiPath to extract relevant user information from the API response. Store this data in variables or DataTables for further use in your automation workflows.

Relevant fields: name, gender, address. street. number, address.street.name, address. city, address. state, address. country, address. postcode, dob. age, email

- 0. **Write to Excel:** Extracted data to be written to an excel file.
- 0. **Country filter:** Creating separate sheets based on country from your randomly generated user profiles data in Excel.
- 0. **Sort based on age:** Sort whole data based on age of the person.

0. **Testing and Validation:** Execute and validate your UiPath automation workflows using the generated user profiles. Ensure that each workflow handles edge cases and exceptions gracefully, demonstrating robust error handling.

Concepts covered: API, JSON, Deserialize, Data table, Excel

2. Dynamic Web Form Data Entry

Problem Statement

Create a UiPath automation to enter data from a spreadsheet into a web form over 10 rounds. The countdown starts once the "Start" button is clicked.

Challenge: Field positions change after each submission

Description

You need to automate data entry from a spreadsheet into a web form using UiPath. The form fields' positions change after each submission, and you have multiple attempts to submit the form without penalty until the countdown begins. Your goal is to develop a simple yet effective workflow that can adapt to these changes and input data accurately within the given challenge period.

<https://rpachallenge.com/>

Solution

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.
6. Monitor and manage the countdown once the "Start" button is clicked.
7. Test the workflow to ensure it functions correctly under different scenarios.
8. Optimize and refine the workflow based on testing results.

3. Encrypt And Decrypt Files

Problem Statement:

Develop an automated system for encrypting and decrypting files using a secure encryption algorithm. This system should ensure the confidentiality and integrity of the data while being user-friendly and efficient.

Solution:

1. Get the File to Encrypt:

Identify the file path and ensure the file is not in use by other processes.

0. Choose an Encryption Algorithm:

Use AES (Advanced Encryption Standard) with a key size of 256 bits for robust security.

0. **Encrypt the File:**

Read the file contents.

Generate a secure encryption key and IV.

Encrypt the data using AES encryption.

0. **Store in the Required Location:**

Save the encrypted data to a file in the specified location.

Ensure the file name or metadata indicates it is encrypted.

0. **Decrypt the File:**

Read the encrypted file contents.

Use the corresponding decryption key and IV to decrypt the data.

0. **Use it for Down Streaming:**

The decrypted file can now be used as needed for further processing or analysis.

4. **Integrating Python for Monthly Expense Analysis in UiPath**

You have a Python script that calculates monthly expenses and identifies the category with the highest expense from a CSV file (MonthlyExpenses.csv). You want to integrate this Python script into an UiPath workflow to streamline the process. The goal is to:

1. Run the Python script within UiPath.
2. Capture the category with the highest expense identified by the Python script.
3. Send email in uipath

Steps

1. Run the Python Script in UiPath:
 - Use UiPath's Python activities to execute the existing Python script that processes the CSV file and calculates the highest expense category
2. Capture the Output: Retrieve the output from the Python script, which includes the category with the highest expense.

3. Use UiPath activities to send an email with highest expense category

By integrating your Python script within UiPath, you can create a seamless workflow that combines the data processing capabilities of Python with the automation power of UiPath. This approach avoids the need for separate programs, enhancing efficiency and maintainability.

INPUT



4. Integrating
Python in UiPath.xls

5. Invoice Data Extraction

Problem Statement

The goal of this challenge is to create a workflow that will read every table row and download the respective invoices. From the invoices, you will have to extract the Invoice Number, Invoice Date, Company Name and Total Due.

Solution

1. Navigate to the following website:
<https://rpachallengeocr.azurewebsites.net/>
2. Download the invoice from the table from multiple pages
3. Extract the Invoice Number, Invoice Date, Company Name and Total Due.
4. Write the data in extracted csv file
5. Email to CSV file to your own email ID

6. Patient Details Registration

Problem Statement

Create a patient details registration form and enter the data in data service.

Description

Consider the following scenario: At a hospital registration desk a receptionist takes the patient details in a digital UiPath Forms which data is later entered in data service.

Solution

1. Create a UiPath Form for receptionist to enter patient details

The image shows a web browser window titled "PatientDetails". Inside the window, there is a form with the following fields:

- Patient Name**: A text input field.
- Patient Phone Number**: A text input field.
- Patient Gender**: A dropdown menu.
- Patient Age**: A text input field.
- Disease Description**: A text area.
- Submit**: A blue button.

0. Create a data service entity with same columns as mentioned in form
0. On click of submit write the details in data service entity

7.Pivot table for highest and lowest population on Each States

Problem Statement:

Develop an automated system that utilizes pivot tables to extract and report the highest and lowest population figures for each state from a given dataset.

Solution:

1. Read the Dataset:
Load the dataset containing state names and population figures from excel
0. Create Pivot Tables:
Use pivot tables to aggregate the data and calculate the highest and lowest population for each state.
0. Generate the Report:
Compile the results into a clear and concise report format.