.Basic Meeting Notes

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03-10-2022.

What is RPA (Robotic Process Automation)?

•Robotic process automation (RPA) is a software technology.

•(RPA) allows organizations to automate tasks just like a human does them across applications and systems.

•That makes it easy to build, deploy, and manage software robots that emulate human's actions interacting with digital systems and software.

•RPA robots can capture data, run applications, trigger responses, take decisions based on predefined rules and communicate with other systems

•RPA primarily targets processes which are highly manual, repetitive, rule-based, with low exceptions rate and standard electronic readable input.

What are RPA Tools?

•**Blue Prism**: It is the most convenient to use since people can access it through mobile applications. The execution speed is also an impressive one

•**UiPath**: It is another user-friendly RPA tool that does not require any programming knowledge. So, it is suitable for critical sectors that need emergency responses to anything like the healthcare and finance sectors.

•**Automation Anywhere**: It has Microsoft technology as the base that employees worldwide know, understand, and use. It can deploy robots on large scales, too. Such traits make                                                                                                                                                                             Automation Anywhere compatible with various social platforms

Components of UiPath?

**UiPath Orchestrator:** Orchestrator is a cloud based UiPath management and storage drive

•Orchestrator manages the creation, monitoring, scheduling, and controlling of automated bots and processes.

•It manages Queues, triggers, Assets, Project etc.

•Orchestrator also functions as a repository for libraries, reusable components assets and processes used by robot or developer

**UiPath Studio**

•UiPath Studio helps you design automation workflows visually, quickly and with basic programming knowledge

•In UiPath studio, automated processes are built in a visual way using the built-in recorder, drag & drop activities

• Activities form into comprehensive workflows in Studio, which are then executed by the Robot and published to Orchestrator.

**UiPath Robots**

•The Robot is UiPath’s execution agent that enables to run processes developed in Studio.

•It executes workflows/instructions sent either locally or through Orchestrator

Type of BOTs

**Attended BOT**

• Attended BOT is triggered by user events and operates alongside a human on the same workstation

•An attended bot will “attend to” or assist a human with a task and are activated by the user by the click of a button

•Help individual users with small and repetitive tasks

**Unattended BOT**

•Unattended BOT operates on a preset schedule, or as triggered by logic in the process flow.

•An Unattended BOT is not dependent on users to trigger processes as they are controlled through Orchestrator

•Helps in Running long processes or automations without the need of human interaction

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How many types of Layouts do we have in UiPath?

There are three Layouts we have:

**Sequence**:

One of the most important activities in UiPath is that it connects several activities in a sequence. Each sequence acts as an individual container which can be named as per their function in the workflow for better understanding.

It allows executing activities inside each sequence to run separately as well as for easy segregation for each task clarity.   
   
**Flowchart**:

This activity allows an individual to contain various activities inside it; however, the pattern of executing each activity can be customized according to the requirement

The user can connect each activity as their required flow of execution

Overview of Studio:

**What are Variables in UiPath?**

Variables are containers that can hold multiple data entries (values) of the same data type.

. For Example, Email Address can be a variable that holds the values like ABC@Gmail.com,XYZ@outlook.com etc. one at a time execution.

Variables help us to pass data from one activity to another. 

**What are the Arguments?**

1. Arguments are like variables

2. Arguments store data dynamically

3. Arguments have the same data types

4. Arguments support the same methods and properties

5. Difference between variable and Arguments is that they pass data between workflows, and they have an additional property for this – the direction

07-10-2022.

Arguments have specific directions:

- In, Out, In/Out, Property

- These tell the Robot where the information stored in them is supposed to go.

**Most Used activities in UiPath**

1. Text/String Variable

2. Number Variable

3. Boolean Variable

4. Array Variable

5. Date and Time Variable

6. Data Table Variable

7. Generic Value Variable

Text/String Variable

We Use this Variable to store Text

Sequence Task: Based on the input we should get the welcome message

Step:1 Add Input Dialog Box and give the input

Step 2: Add Message box to display a message

Cond: Should display a message based on input

Boolean Variable FLOW CHART

Flow chart: Used to create Complex and business process as it allows us to do multiple branching of logical operators

Boolean Value stores the two values TRUE AND False. Whenever we have the condition in UiPath we will use this Boolean

Task:

Step:1: Add an Input dialogue box

Step2: Add a Logic to Flow decision box (Year Mod 4 = 0)

Step3: Add Message boxes on both sides of flow decision

Number Variable

We will Use this Variable to store the information

Task: Take user input for Marks for two subjects and display a total mark

Hint: we need to create three Variables here Sub+Sub

Date and Time Variable

The date and time variable are a type of variable that enables you to store information about any date and time

Task: Assign Date and time to one variable and write in Excel

10-10-2022 and 11-10-2022.

**Array Variable:**

The array variable is a type of variable which enables you to store multiple values of the

same type. array of numbers, one of strings, one of Boolean values and so on. We need to Access each element of Array through Index

Task 1: Store some values (Numbers) in arrays and find min and Max

Task 2: Store a few string values in (Eg: Names) and print the Names one by one

**Data Table Variable**

Data Table variables represent a type of variable that can store big pieces of information, and act as a database or a simple spreadsheet with rows and columns

 These variables can be useful to migrate specific data from one database to another, extract information from a website and store it locally in a spreadsheet and many others

Task: Read excel and print the results in another sheet

Use Some excel and workbook activities

**Generic Value Variable**

The Generic Value variable is a type of variable that can store any kind of data, including text, numbers, dates, and arrays, and is particular to UiPath Studio.

Generic Value variables are automatically converted to other types, to perform certain actions. However, it is important to use these types of variables carefully, as their conversion may not always be the correct one for your project.

Task: Assign two different values and like Int and strings and do the Addition or Subtraction

**Control Flow Statements**

**If Cond:**

The Condition is verified with 2 potential outcomes – True or False

The Then branch is the set of actions to be executed when the condition is True.

The Else branch is the set of actions to be executed when the condition is False

Based on the chosen type of layout, there are 2 corresponding activities that fulfill the

If statement role:

- The If activity in sequences.

- The Flow Decision activity in flowcharts

Task: Number should be divisible by 2

**For Each:**

**For each Loop:** It performs an activity or a series of activities on each element of an input collection

Task: Read the Entire Array and Display Max and Min Value

**Switch** :

* Executes a set of activities based on the value of a specific expression.
* Can be used in place of an If statement when we need at least 3 potential courses of action.
* This is done through the condition, which is not Boolean like in the case of If statement, but multiple.

Task: Print the output based on the options

**Parallel**

Enables two or more child activity branches to execute at the same time. In UiPath Studio, the Parallel activity can be found in the Activities panel, under Workflow > Control > Parallel.

The Parallel activity finishes only after all child activities are complete or when its Completion Condition property evaluates to true.

It is beneficial when there are one or more blocking activities in the branches, because it executes all child activities simultaneously and asynchronously, thus saving time and being very efficient

Task:  Create a Multiple sequences and test the result by adding delays and True Condition

**Data Table and Excel Automation**

**What is Data Table?**

Data Table variable represents a type of variable that can store big pieces of information and act as a database or a simple spreadsheet with rows and columns.

In Data Tables individual cells can be identified by using the Column name or zero-based index and the row index.

Data Column starts with index 0 and increment by 1 to the next column

Data Row Starts with index 0 and increment by 1 with next row.

**Differences Between Excel and Workbook Activities?**

* **Excel**: To use “Excel Application Scope”, Excel should be Install on the system.
* To use Excel services even if Excel is not installed then you can use "Workbook related separate activities.
* And the other things are with Excel Activities you will not be able to access the chart and diagram related data with Excel Related activities, you will get an error

**Workbook Activities:**

* For Workbook Related Activity the Excel workbook file should be closed at the time of robot run otherwise it will give error like it is being used by other process.
* with Excel Application Scope not able to access the password protected excel and same case was with a pop was again asking to enter the credential
* but with Workbook Activities it was working fine.F
* All you need to do is read in a range then you can use this.

**Read Range Activity**    
This activity gets the content of a worksheet (or a selection from that worksheet) and stores it in a Data Table variable, which can be created from the Properties panel using Ctrl + K

**Build Data Table Activity**    
- By using this activity, choose the number of columns and the data type. Moreover, you can configure each column with specific options like allow null values, unique values, auto-increment (for numbers), default value and length (for strings).    
   
- In the Build Data Table activity click on Data Table to create a new Data Table 

Task: Generate Data Table using the Text File.

**Add Data Row** adds a new row to an existing Data Table variable. The input data can be of Data Row type or can be entered as an Array Row, by matching each object with the data type of each column

Task: Fetch the result in Web Application Based on Input Excel and Write the result with Status in Excel

**Table Extraction:**

Table Extraction, part of the Modern Experience in Studio, enables you to use the UIAutomation activities pack to automatically extract structured data from applications and save it as a Data Table object that can then be further used in your automation processes.

This process can be done by using the **Table Extraction** Recorder in Studio, which can be accessed from the Ribbon if the **UIAutomation v21.4** or above pack is installed in your current project, and you have selected Modern **Experience**

**Task:**

1. Extract the data Table from Website (Vajrang.org)
2. Use The table extraction activity to extract the Data Table
3. Filter the data table which Contains only TRUE
4. Print the results in excel

* Data Manipulation
* Is the process of Modifying, Structuring, Formatting or Sorting data to facilitate its usage and increase its management capabilities
* Includes dealing with various variables and performing operations with them

**Data Manipulation with Strings**

**String.Concat**

* Concatenates the string representations of two specified objects.
* Expression: STRING.CONCAT (VARNAME1, VARNAME2)

**IndexOf**

* Returns the zero-based index of the first occurrence of a specified Unicode character or string within this instance.
* Expression: VARNAME1.INDEXOF(“A”)

**Substring. Length**

* Var.substring(var.length) and  Var.substring(var.length-3)

**Replace**

* Replaces all the occurrences of a substring in a string.
* Expression: VARNAME.REPLACE (“ORIGINAL”, “REPLACED”)

**Substring**

* Extracts a substring from a string using the starting index and the length.
* Expression: VARNAME1.SUBSTRING(STARTINDEX, LENGTH)

**Some Syntax To initialize the Values as per below**:

1. Array – new int32() {}
2. List new list (of string)
3. Dictionary new Dictionary (of string, string)
4. Data Table – new DataTable

**Table Extraction**

Data scraping enables you to extract structured data from your browser, application, or document to a database, .csv file or even Excel spreadsheet

Task: Extract the Data from the website and Extract the URL

Task: Replace the word with a sentence

* Its UiPath Features which enables identification of Graphical UI (User Interface) elements

**How will it work?**

* When u click on something which is related to a website it captures all the address and Attributes of that website, we can be able to see where the Application is coming from and that’s how the selectors work
* Automatically captures the attributes and addresses stored in XML (Extensible Markup Language) fragments of the element

**Full Selectors** contains detailed information about the element including the description of the outer container or window. These are useful when multiple windows/screens must be identified. The top-level window’s selector is editable.

**Partial Selector** does not contain a description of the top-level window. Activities with partial selectors are enclosed in a container such as Attach window that contains a full selector of the outer window. These are useful when actions need to be performed on a single window. The top-level window’s selector is fixed and not editable.

**26-10-2022**

* A Portable Document Format (PDF) is a file format for capturing and sending electronic documents in exactly the intended format.
* PDF files play a huge role in everyday task(s) and they own significant parts of processes which are similar across industries.
* Creating or reading such files is a crucial part of PDF workflows across different market verticals which can be easily automated by using UiPath.

 Types of PDFs

Generated PDF: PDFs whose content can be copied and pasted into other files directly.

Scanned PDF: PDFs mostly in the form of Images whose content cannot be copied and pasted into other files.

**How to use PDF Automation**

* **Install the PDF packages** from UiPath Studio
* Go to **Manage packages** a select **Official** select **UiPath.PDF.Activities** and install it.

Read PDF Text:

If you want to read “1-2”, or if you want to read in between “1-2, 7-8”, if you want to read one to end “4-End”

Preserve Formatting: it will be in Boolean, and it will correct the formatting of PDF

 Write Text File:

Read PDF with OCR

: If PDF consists of Images, then text won’t read by the Read PDF text, or any document which is consists of Image also it will not allow u to read text

Properties:  Image Dpi: its displays pixel of the image – Default value is 150

**Ocr Engines**: Default Engines are

Google OCR (Optical Character Rigonization)

Microsoft OCR (Take any OCR)

* If we are using Read with OCR so we need to add more activity **Microsoft OCR.** Then Add an Output variable in property panel.

Extract PDF Page Range Activity

Create a PDF File from the Existing PDF file

* Properties:
* File Name: Which file do you want to work with
* Range: “2-3”

Extract Images from PDF

* Extract PDF Images
* Properties: Create output Variable
* Image Extension: PNG

How to export pdf pages as Images

Manage PDF Password: Create a password for the PDF Documents

If you already have a password, give the older password

Join PDF Files

File list property: give the two files link in the form of string

Get PDF Count:

Gives the count of PDF

**27-10-2022**

**Introduction – Error & Exception Handling**

* Error and Exception handling is a mechanism to detect, and handle run time errors so that normal flow of the application can be maintained.

Error

* An error is an unknown issue that occurs at runtime and cannot be handled since we don’t know when it will come.
* Mostly coding issues will cause these errors while development.
* Example - Syntax Error, User Error, Programming Error.

Exceptions

* Exceptions are known issues that can be handled before running the project.
* This does not occur due to code issues

**System and Business Exceptions**

System Exception

* System Exception describes an error rooted in a technical issue, such as an application that is not responding.

Business Exception

* Errors rooted in the fact that certain pieces of data which the automation project depends on are incomplete, missing, outside of set boundaries (like trying to extract more from the ATM than its daily limit), or do not pass other data validation criteria.
* These exceptions need to be defined by developer using Throw activity and handled inside a try Catch.

**Throw**

* To generate a user defined exception, we can use Throw Activity.

By using Throw activity, you can apply all the business scenario validation in your code.

Task: BRE: Balance should not be less than 100

In IF Condition we need to convert int because it will be in object format

Cond: When the business condition meets here then three Activity will throws an exception

It will exit of the loop

When you are using this throw it will be the end of the activity

**Try Catch Exception**

Try Catch activity catches a specified exception type in a sequence or activity, and either displays an error notification or dismisses it and continues the execution.   

As a mechanism, Try Catch runs the activities in the Try block and, if an error takes place, executes the activities in the Catches block. The Finally block is only executed when no exceptions are thrown or when an exception is caught and handled in the Catches block (without being re-thrown).

Simple Task: Read excel or workbook, Keep excel file open and check the results

It displays the exception message and that exception message you need to handle in Catch Block

**Retry Scope**

The Retry Scope activity is used for catching and handling an error, which is why it’s like try Catch

Task: Open Login Page and try with your credentials close the application manually you will have the error then you need to Retry the login activities with Retry Scope Activity

**Continue on error:**

Usually, each activity under Ui Automation package will have a special property called Continue on error That includes attach window, attach browser, click, type into, etc Where each activity when set with this property as TRUE it will not let that activity to throw exception if it did not work

Task: Get the City temperatures from website and check the results

SMTP : Simple Mail transfer protocol

Pop3:  post office protocol

IMAP : Internet Message Access protocol

Exchange :

IBM : it works only with IBM note only

Task: 1: How to check the Unread emails count through Imap

Task 2: How to read Mail subject in UiPath

Task 3: How to extract Email details to Excel File

* Extract Date
* Extract From
* Extract Subject

And store in one excel

Task 4: Send Emails Using UiPath (Gmail)

Note: Google Accounts> security> less Secure App Access – Turned on

How to send emails Dynamically?

If you want to do any changes to the email then you can maintain Excel, in excel you can make the changes

Task 5

Send All Attachments in particular folder through emails

How to send Specific types of files from a folder

For example, only PDF files or excel files

**23/09/2022:**

**State Machine**: State machine is one of the workflow types in UiPath that uses a finite number of states in the project.

A container for using State Machine specific activities. Contains a Start Node that can be linked to the initial state of the State Machine.

Guess the Random Number

These three logics will be applied to three possible states

Guess Number > Random Number – IT SHOULD RETRY IF THE NUMBER IS NOT SAME

Guess Number < Random Number- IT SHOULD RETRY IF THE NUMBER IS NOT SAME

Guess Number = Random Number – This will be the final state

State machine

State Machine

State

Final state

* State: we have three sections
* Entry – Activity which will execute while entering the state
* Exit – Activity to execute while exiting the state
* Transition – Enables to add conditions to jump from one state to another
* Final state – consists of entry option
* Specifies the action to occur when this state is transition to

Invoke Workflow File & Arguments UiPath

**Invoke workflow files**

Break the complex project into smaller workflows that can be built and testes separately and integrate them later to the main workflow

This will become the project more readable and more maintainable

To integrate the workflows to main workflow, specified workflow is invoked by INVOKKE WORKFLOW File Activity

And

This Invoke workflow File Activity optionally passes a list of arguments to the specified workflow

Arguments: used to pass the data from one workflow to another work flow

Variable

Orchestrator:

What is UiPath Orchestrator?

Why is UiPath Orchestrator required?

How to work on UiPath Orchestrator?

Components of uipath:

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Orchestrator manages the creation, monitoring, scheduling, and controlling of automated bots and processes.

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