

The background of the top half of the page features several large, light gray geometric shapes: a square at the top center, a circle on the left, and a large curved shape on the right.

# RPA Design and Development V3.0

STUDENT MANUAL – Lesson 2

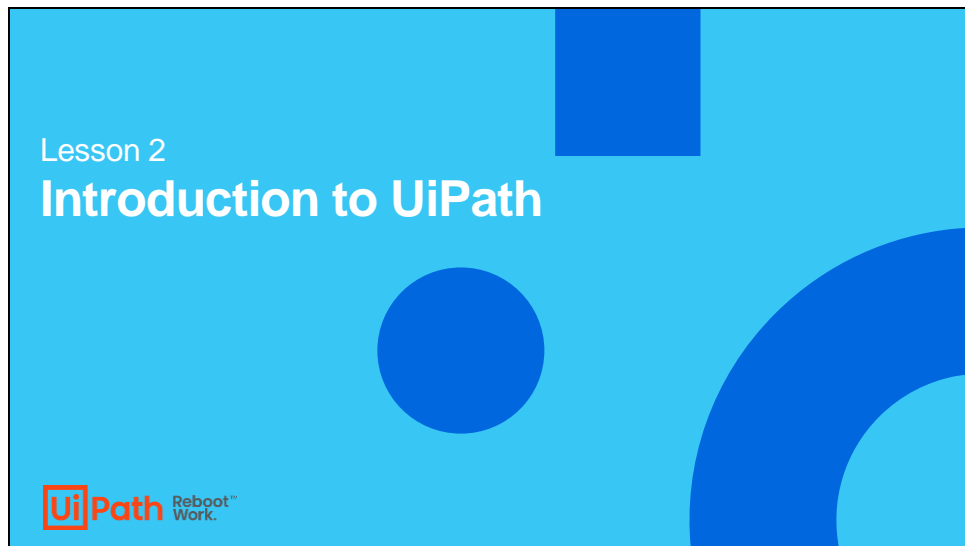
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Slide 1



Welcome to 'RPA Design and Development Course'.

Slide 2



The second lesson of this course is Introduction to UiPath.

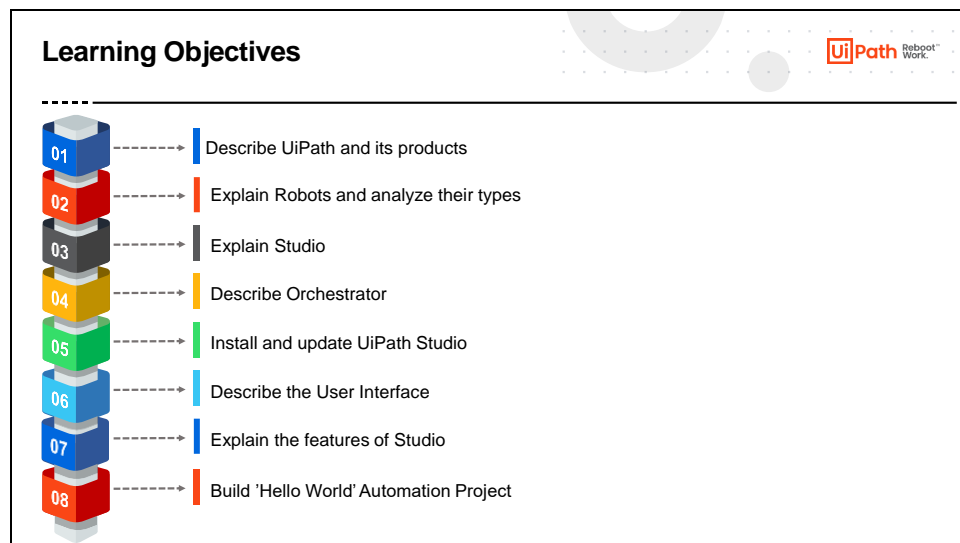
## Slide 3

Agenda	
01	UiPath and its Products
02	Robots and their Types
03	Studio Overview
04	Orchestrator
05	UiPath Studio Installation & Updating
06	The User Interface
07	Features of Studio
08	Building 'Hello World' Automation Project

The agenda of this lesson is:

- UiPath and its Products
- Robots and their Types
- Studio Overview
- Orchestrator
- UiPath Studio Installation & Updating
- The User Interface
- Features of Studio
- Building 'Hello World' Automation Project

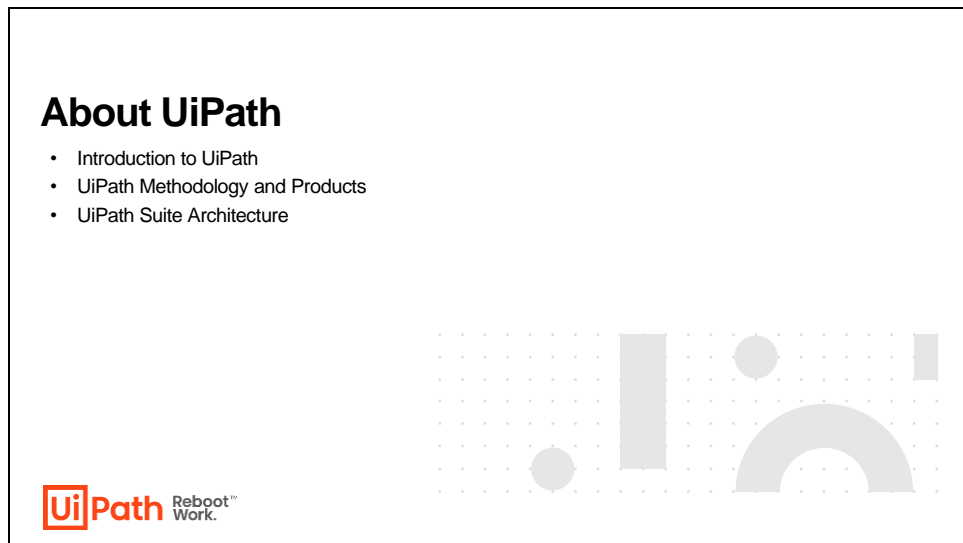
## Slide 4



By the end of this lesson, you will be able to:

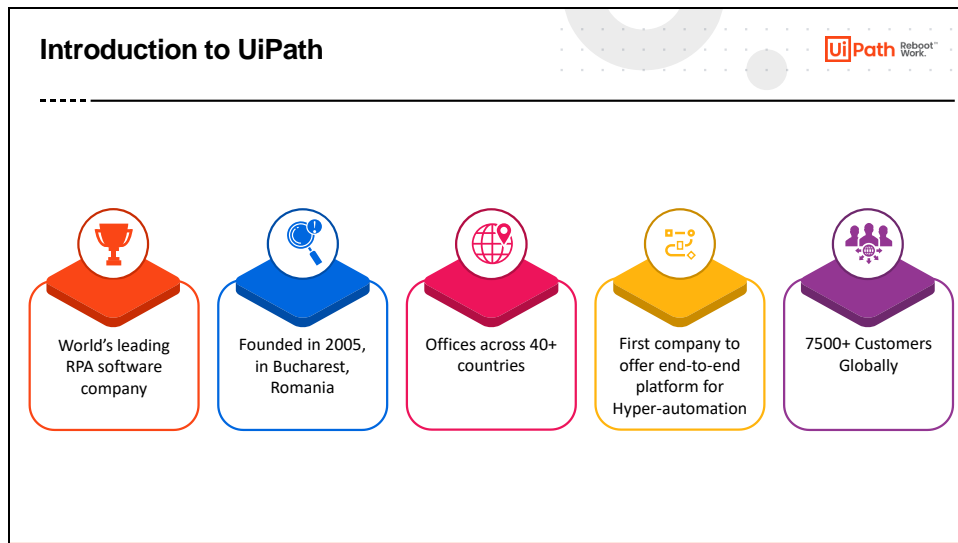
- Describe UiPath and its products
- Explain Robots and analyze their types
- Explain Studio
- Describe Orchestrator
- Install and update UiPath Studio
- Describe the User Interface
- Explain the features of Studio
- Build 'Hello World' Automation Project to check the successful installation of UiPath

Slide 5



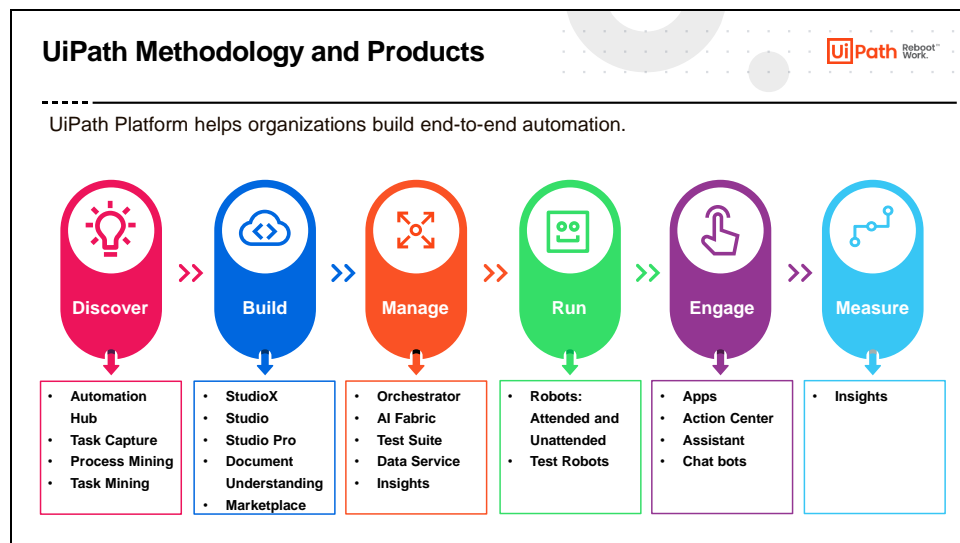
This section gives an overview of UiPath, its products and architecture.

## Slide 6

**About UiPath:**

- UiPath is a global software company that develops a platform for Robotic Process Automation (RPA). It was founded, in 2005 in Bucharest, Romania. UiPath's focus on building the world's best RPA software has made them the world's leading RPA software company. UiPath has its offices across 40+ countries.
- Following its acquisition of 'ProcessGold' and 'StepShot' in 2019, and 'Cloud Elements' in 2021, UiPath has become the first vendor of scale to bring together both process mining and Robotic Process Automation to offer an end-to-end platform for Hyperautomation.
- UiPath has 7,500+ customers globally.
- It debuted in the stock market with one of the largest US software IPOs in history.
- For more information, visit <https://www.uipath.com/company/about-us>

## Slide 7



Methodology and Components of UiPath Platform are:

- **Discover:** Discover automation opportunities powered by AI and your people. Complementary solutions that work together to deliver complete process understanding.
  - **Automation Hub:** It is an online application to share your automation ideas and turn them into real automation. You can also look at the automation ideas posted by others in your organization.
  - **Task Capture:** It is a window application to help you capture your automation requirements. Export the process as PDDs or XAML files so your business analysts and developers can start building right away.
  - **Process Mining:** UiPath Process Mining AppOne is the ready-to-use standard online application for gaining insights on processes and carrying out root-cause analysis and monitoring. With process mining, you can continuously optimize end to end processes with data from your applications.
  - **Task Mining:** With Task Mining, you can analyze the work people do to find everyday, repetitive tasks to automate. Task Mining automatically identifies and aggregates process workflows, then applies AI to map tasks to automation opportunities. That's how you build a high-value automation pipeline across the enterprise.
- **Build:** Build super-smart, robust robots to automate the discovered automation opportunities in the discovery stage.

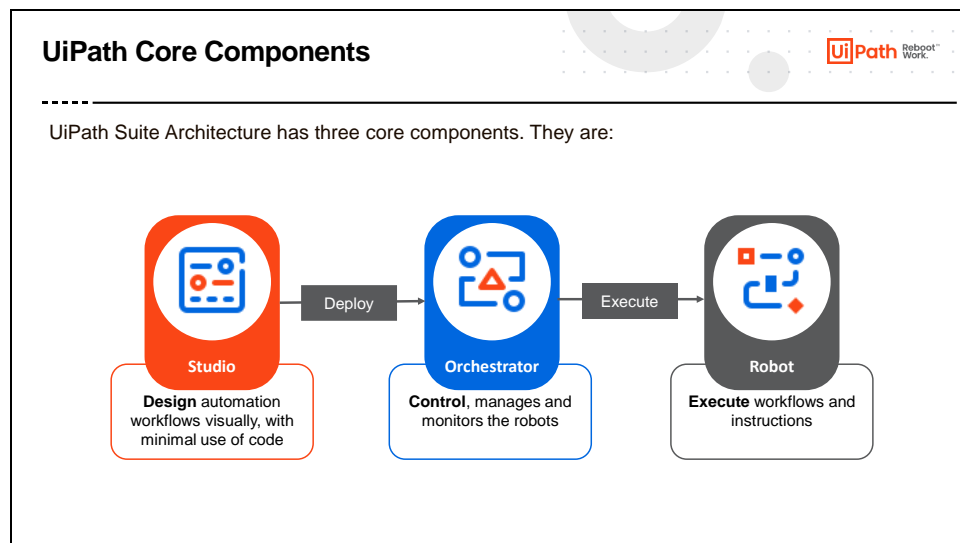


- **StudioX:** For business users to automate simple, everyday tasks for themselves with StudioX.
- **Studio:** For power developers to get a rich development environment with Studio or Studio Pro.
- **Studio Pro:** Studio Pro supports the creation of specialized test cases for automated application testing. In StudioPro, individual test automation projects can be created to verify data.
- **Document Understanding:** It helps your robots understand documents to extract, interpret, and process data for you, even from PDFs, images, handwriting, and scanned documents.
- **Marketplace:** It contains pre-built automation components and templates. Automation makes life easier. The marketplace makes automation easier.
- **Manage:** It helps manage your automation robots productively which you have built.
  - **Orchestrator:** Orchestrator is the heart of your automation management. It gives you the power to provision, deploy, trigger, monitor, measure, track, and ensure every robot's security in your organization. So now you can manage everything from your browser or your mobile device.
  - **AI Fabric:** It helps you orchestrate all moving pieces of AI: deploy, consume, manage, and improve machine learning models. Insert AI into your business processes with drag-and-drop ease. No data science background is required.
  - **Test Suite:** Automate and centralize testing to ensure every automation and application's quality before they go live. Now you'll be able to launch resilient robots and high-quality software without testing your patience.
  - **Data Service:** Ditch the data silos, the security concerns, and one-off data schemas. And give developers simple, easy, productive access to the data, variables, and tools they need across the entire UiPath Platform.
  - **Insights:** UiPath Insights is an RPA analytics solution that tracks, measures, and forecasts the performance of your entire automation program so you can propel your automation journey to the next level.
- **Run:** Whatever process you want to automate, software robots are there to get things done. Whichever you pick, you can be sure they'll be very high performers and integrate into your environment.
  - **Attended and Unattended Robots:** UiPath software robots are intelligent, reliable, flexible, and eager to take on a vast range of tedious tasks. They're also easy to

- build and manage, so you can launch an entire robot workforce to deliver efficiencies, higher performance, and increased ROI quickly.
- **Test Robots:** Test robots are to ensure the quality of every automation and application before they go live.
  - **Engage:** UiPath offers many ways for people to engage with robots. Say, when robots bring them approvals, exceptions, or escalations.
    - **Apps:** Unleash the full potential of your automation by giving them an intuitive, user-friendly interface. Connect with all your apps and systems, even if they don't have APIs. Build apps in a snap, deploy with a click, with no coding.
    - **Assistant:** UiPath Assistant is a desktop launchpad for automation. It gives everyday individuals easy access to selected automation that helps them with their day-to-day tasks. It lets automation leaders manage, distribute, and govern automation centrally. And it lifts automation impact to new heights across the entire enterprise.
    - **Action Center:** When automation includes decisions that a human should make like approvals, escalations, and exceptions, UiPath Action Center makes it easy and efficient to hand off the process from robot to human. And back again.
    - **Chatbots:** With our chatbot capability, your customers and employees can now trigger robots to do things (like checking order status or posting data in your CRM) through chatbots, social messaging apps, or even voice. In plain language. Who knew robots could be such brilliant conversationalists?
  - **Measure:** Gain insights into the performance of a single robot, ROI of your entire program, and anything in between, with analytics from Insights. Not only do you know how you're doing, but you know where to focus on boosting performance even higher.

**Refer:** <https://www.uipath.com/product/> for more information on UiPath Platform.

## Slide 8



UiPath Suite Architecture has three core components, namely Studio, Orchestrator and Robot.

**Studio** helps you design automation workflows visually, quickly, and with only basic programming knowledge. Studio is where the automated processes are built visually using the built-in recorder, drag and drop activities, and templates.


**Orchestrator** is a server application that can be accessed through a browser, for example, Google Chrome. With the help of Orchestrator, you can control, manage, and monitor the robotic workforce.


**Robots** execute the workflows and instructions sent locally or via Orchestrator. There are two types of Robots: Attended and Unattended Robots, which we already discussed in the first module.

Slide 9

## Robots and their Types

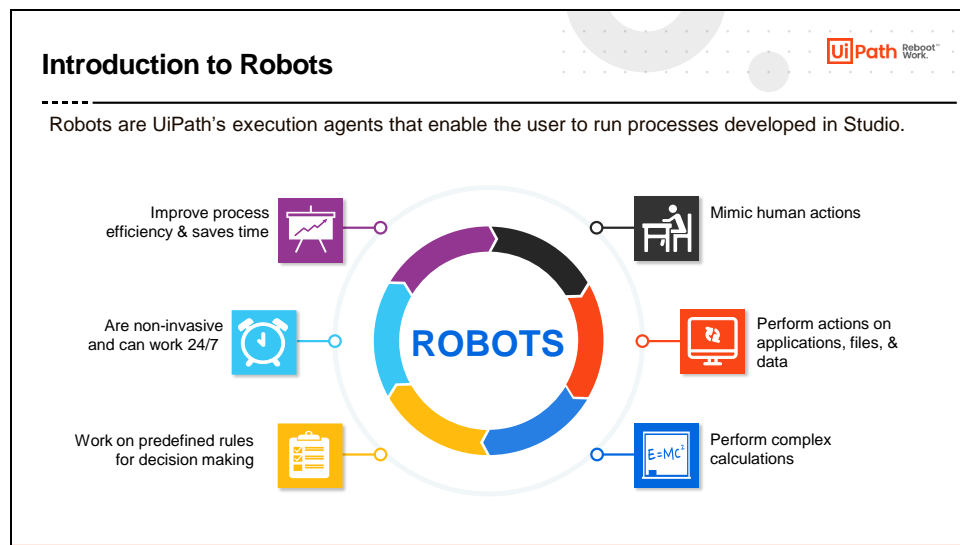
- Introduction to Robots
- Types of Robots
  - Attended Robots
  - Unattended Robots





This section explains Robots and their types with examples.

## Slide 10

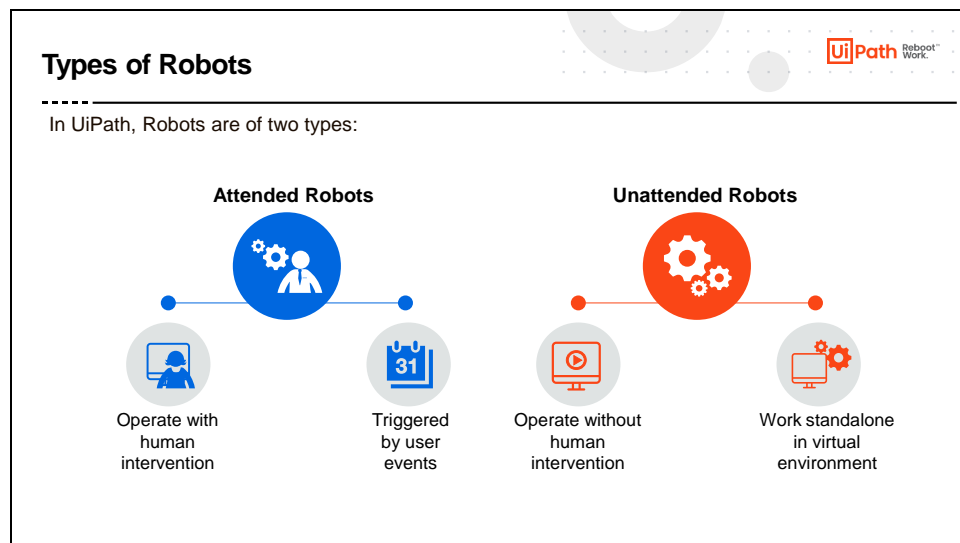


Robots are UiPath's execution agents that enable the user to run processes developed in Studio.

A robot is a software that can be programmed to execute steps done on computers and follow workflows. It can perform multiple steps in multiple applications.

- Robots mimic human actions such as type, click and read data.
- Robots interact with applications. Robots can log into applications, read/move files or folders, and copy/paste data.
- Robots perform complex calculations easily.
- Once trained and programmed, robots can make decisions with precision based on predefined rules.
- They are non-invasive and can work 24/7.
- They help in improving overall process efficiency and saving time and other resources.

## Slide 11



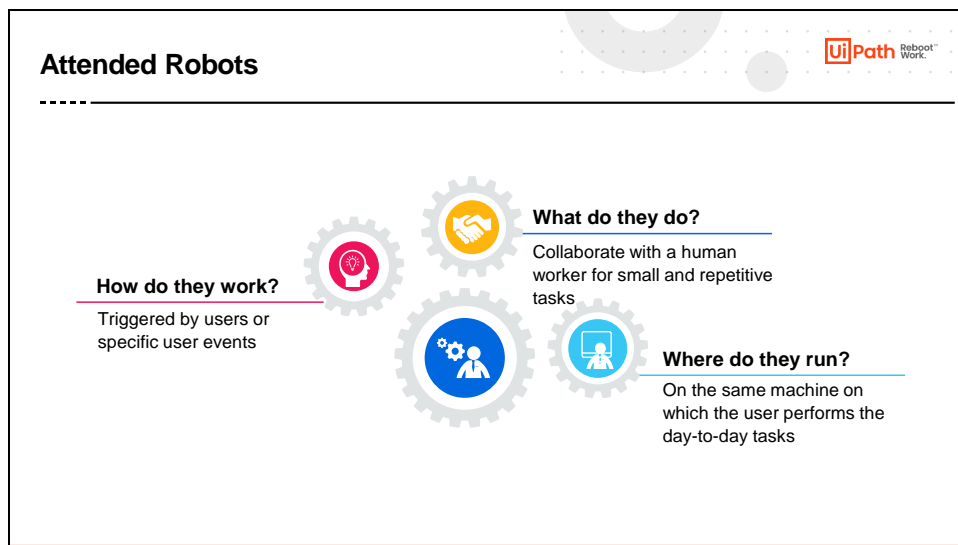
A robot executes the workflows and instructions sent locally or via Orchestrator.

In UiPath, there are two types of robots:

- **Attended Robots:** triggered by user events, and operate alongside a human, on the same workstation.
- **Unattended Robots:** run unattended in virtual environments and can automate any number of processes.

Refer <https://www.uipath.com/product/robots> for more details.

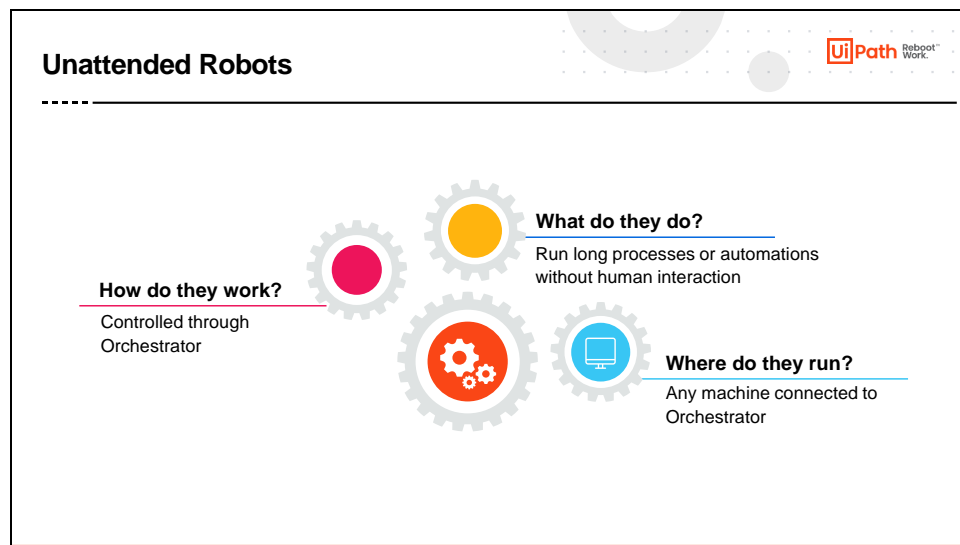
## Slide 12

**Attended Robots:**

- These robots collaborate with human workers on business activities and speed up repetitive front-office tasks.
- They reside on the workstation of the human worker and are perfect collaborators in service desk, helpdesk, and call center activities.
- These robots work in the background and ensure high productivity and low handling times. While the human workers can continue to carry out their tasks unhindered.
- They are best suited for use with smaller, more fragmented tasks.

**Example:** The submission of an expense report. In this task, an Attended Robot is deployed, and the human user provides the login credentials to the system. The Robot then fills in the requisite information and submits the expense report on the behalf of the user by attaching any required details or items.

## Slide 13

**Unattended Robots can:**

- Operate without human intervention on any variety of back-office activities. They can run in both physical and virtual environments.
- Be scheduled to start (and stop) at any time as per the business requirements. They are maintained and guided remotely by the server. These robots are designed to work end to end without any interventions.
- Automate any number of processes efficiently. Tasks to unattended robots are assigned through Orchestrator. They are best suited for complex and highly repetitive tasks.

**Example:** In the example of submission of the expense report, the task of approval of expense reports can be executed using Unattended Robots. Without any human intervention, the Robot can log in to the system and process the expense report submitted for approval. If the report matches a defined rule (set by the administrator), the Robot automatically approves it. As there is no human interaction, the possibility of report approval as per the user's wish is eliminated and the system operates purely based on the rules.

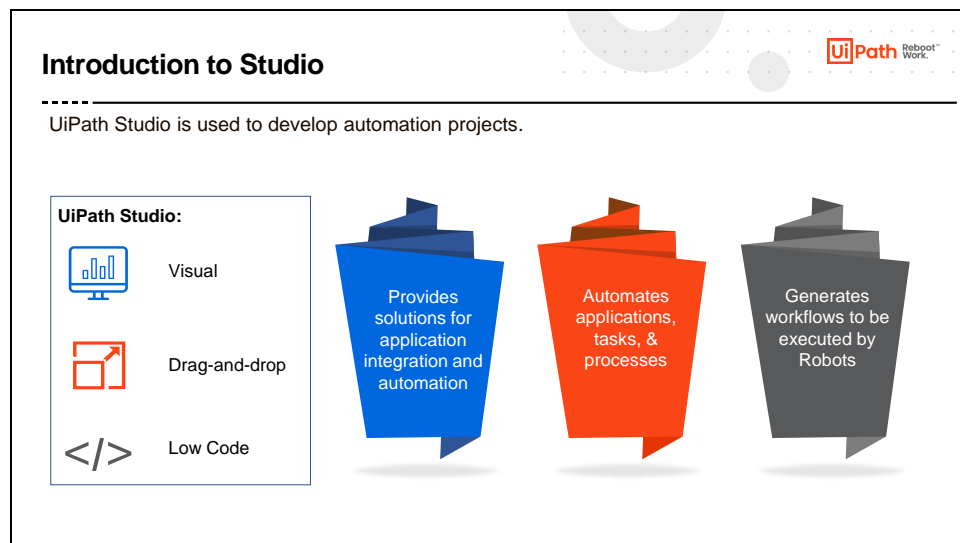


Slide 14



This section gives an overview of UiPath Studio.

## Slide 15



UiPath Studio is used to develop automation projects. UiPath Studio is the canvas for automation where the automation projects are designed visually. Studio is visual, drag-and-drop, and low code. Studio provides solutions for application integration and automating applications, tasks, and processes. It comes with pre-built components for creating automation. The solutions offered can be simple or complex. It caters to the automation needs of administrative IT and business IT.

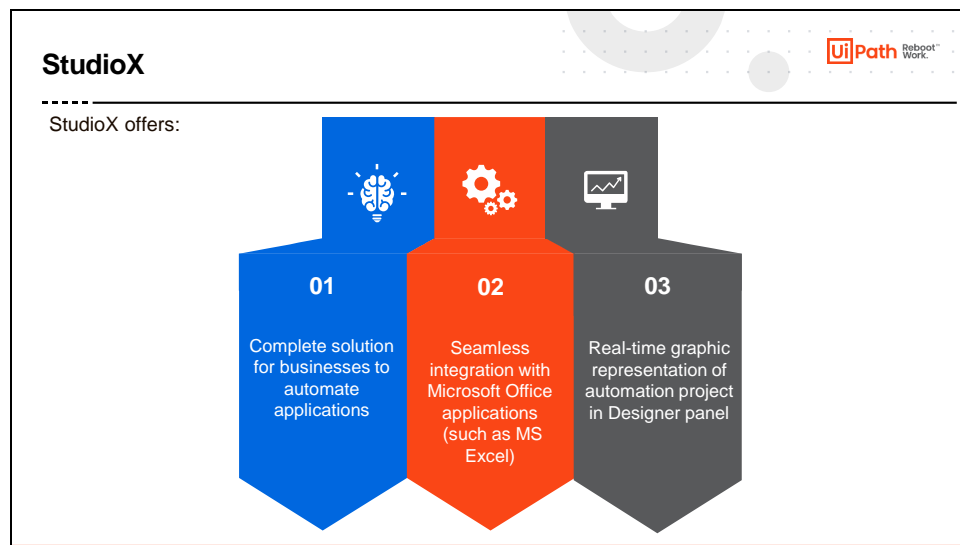
Studio lies at the heart of automation with UiPath products. In Studio, comprehensive workflows are generated from activities, and these are published locally or to Orchestrator and executed by the Robots.

UiPath Studio is easy to use even by a non-technical user. It offers an automation platform for all which is accessible, friendly, smart, and collaborative. With Studio, the user can automate faster, more, and together.

Note: Studio comes with two types of available profiles for developers and business users:

- **Studio:** This type offers a plethora of tools for designing complex and large workflows.
- **StudioX:** This is especially for business users and is a complete solution for automating business applications. It aims to enable every business user to automate repetitive tasks by offering seamless integration with Microsoft Office applications.

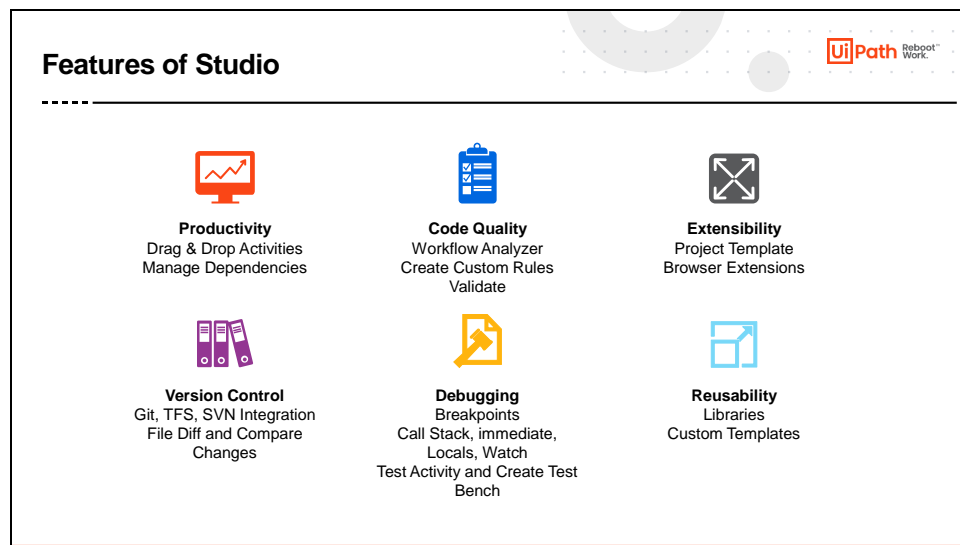
## Slide 16



StudioX offers seamless integration with Microsoft Office applications such as MS Excel to enable businesses to automate repetitive tasks. It uses an intuitive user interface for creating automation easily. It is an easy solution for businesses to automate their processes.

Refer <https://docs.uipath.com/studiox/v2020.10/docs> for more details on StudioX.

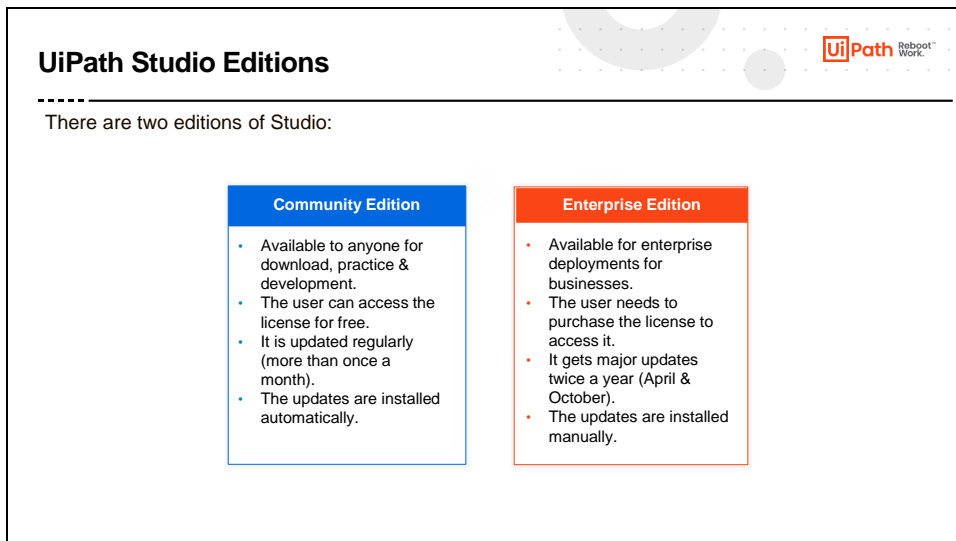
## Slide 17



The features of Studio include :

- **Productivity:** By using Drag & Drop activities, Manage dependencies, available in Studio, the productivity of the process can be improved.
- **Code quality:** The quality of the code can be controlled by using the Workflow Analyzer, Creating Custom Rules, and Validate.
- **Extensibility:** Studio is extensible with the help of Project templates, Browser Extensions, Automate SAP, and Citrix Technologies.
- **Debugging:** Options like Breakpoints, Call Stack, Immediate, Locals, Watch, Test Activity, and Create Test Bench make debugging easy in Studio.
- **Version Control:** Studio can collaborate with systems via Git, TFS, SVN Integration, File Diff, and Compare Changes.
- **Reusability:** With the Libraries and Custom Templates available in Studio, components can be reused by the user for designing automation.

## Slide 18



**UiPath Studio Editions**

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There are two editions of Studio:

Community Edition	Enterprise Edition
<ul style="list-style-type: none"><li>• Available to anyone for download, practice &amp; development.</li><li>• The user can access the license for free.</li><li>• It is updated regularly (more than once a month).</li><li>• The updates are installed automatically.</li></ul>	<ul style="list-style-type: none"><li>• Available for enterprise deployments for businesses.</li><li>• The user needs to purchase the license to access it.</li><li>• It gets major updates twice a year (April &amp; October).</li><li>• The updates are installed manually.</li></ul>

There are two available editions of Studio:


- **Community Edition:**
  - Available to anyone for download, practice & development.
  - The user can access the license for free.
  - It is updated regularly (more than once a month).
  - The updates are installed automatically.
- **Enterprise Edition:**
  - Available for enterprise deployments for businesses.
  - The user needs to purchase the license to access it.
  - It gets major updates twice a year (April & October).
  - The updates are installed manually.

The users also get free access to the Academy courses and the largest community of RPA Developers through the UiPath forum, Marketplace, and UiPath Connect!

Slide 19

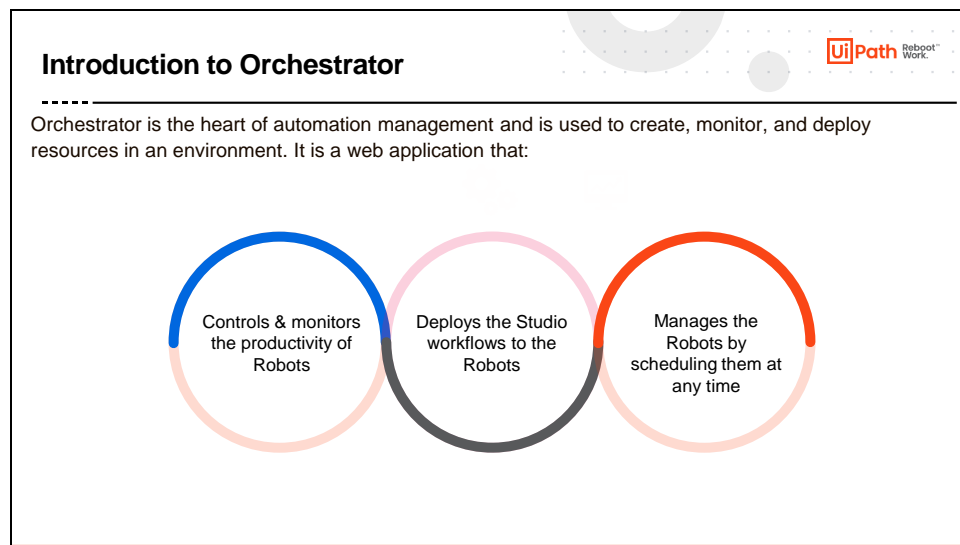
## Orchestrator

- Introduction to Orchestrator
- Primary functions of Orchestrator



This section gives an overview of the next basic component of UiPath: Orchestrator and its primary functions. Orchestrator is discussed in detail in Lesson 8 of this course.

## Slide 20

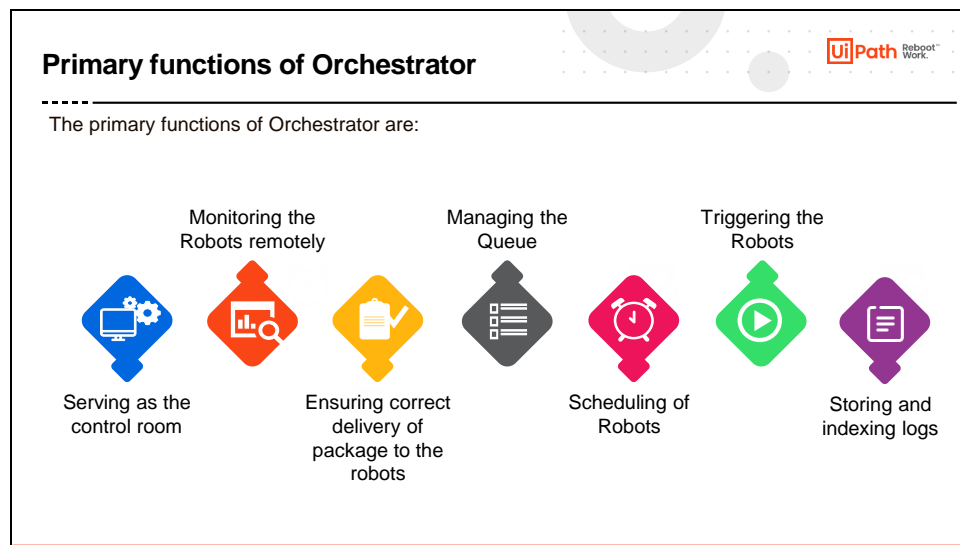


Orchestrator is the heart of automation management and is used to create, monitor, and deploy resources in an environment. It enables the user to manage the automation from a browser or mobile device.

It is a web application that:

- Controls and monitors the productivity of robots
- Deploys the Studio workflows to the robots
- Manages the robots by scheduling them at any time

## Slide 21



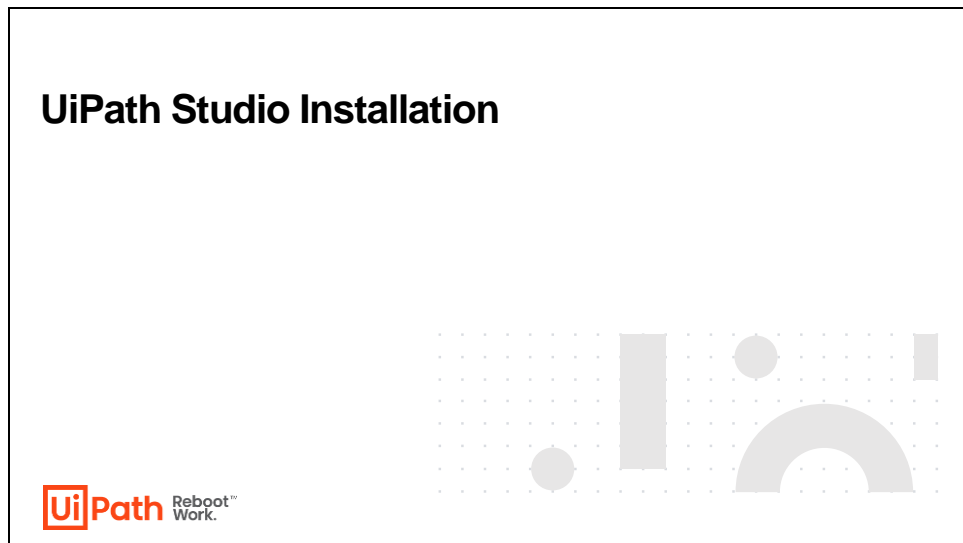
Orchestrator acts as the control room and is responsible for handling resources, queues, scheduling, generating logs, and execution of Robots. It is a server-based application that regulates and monitors the activities and functionalities of the Robots attached to the network remotely.

The primary functions of Orchestrator are:

- Serving as the control room
- Monitoring the Robots remotely
- Ensuring correct delivery of a package to the robots
- Managing the Queue
- Scheduling of Robots
- Triggering the Robots
- Storing and indexing logs



Slide 22




This section explains how to install UiPath Studio.

Slide 23

### Demo

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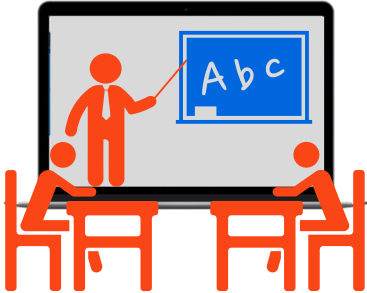
Download and Install UiPath Academic Alliance Edition 2020.10.

Download and Install UiPath Academic Alliance Edition 2020.10.


Slide 24

### Practice Exercise

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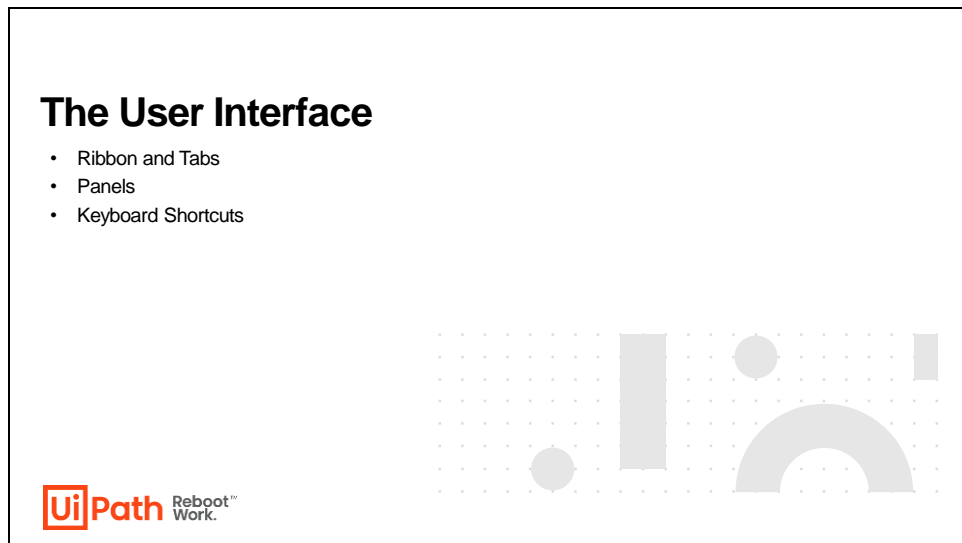


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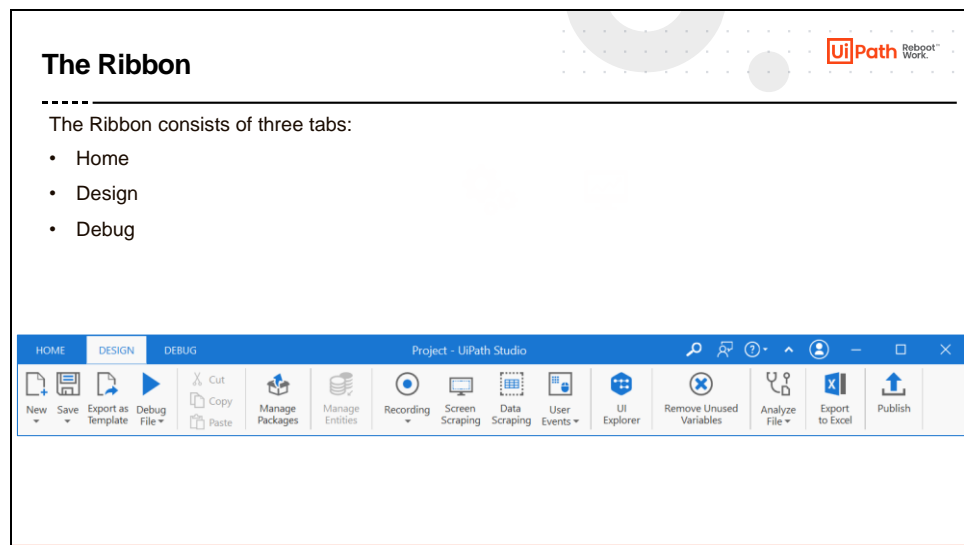
Download and Install UiPath Academic Alliance Edition 2020.10.

## Slide 25



This section explains the UiPath Studio User Interface. Multiple panels are available in UiPath Studio for easier access to its functionalities. This section covers the different tabs, panels, and keyboard shortcuts.

## Slide 26



## The Ribbon

The Ribbon consists of three tabs:

- Home
- Design
- Debug

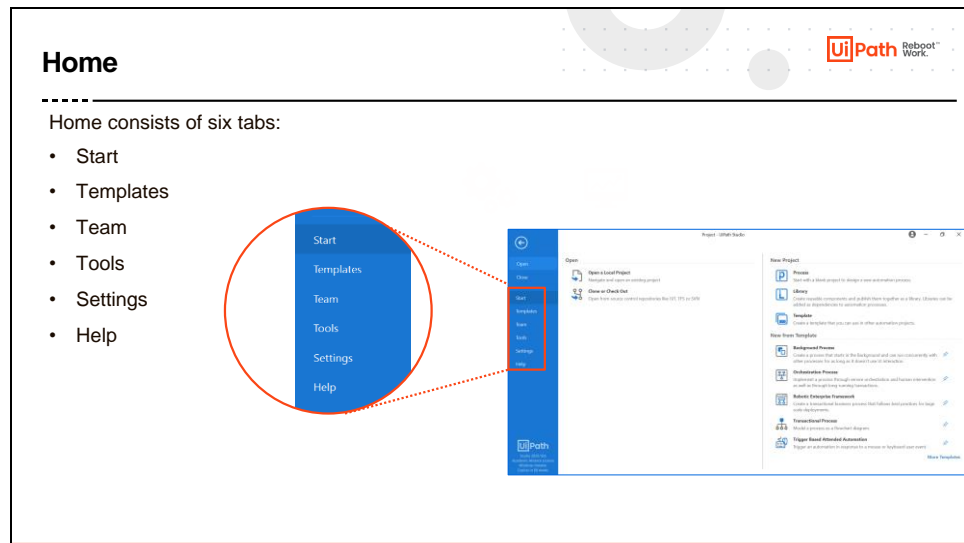
The Ribbon is straightforward and consists of three tabs.

- Home
- Design
- Debug

It can be expanded or minimized by clicking the Expand/Minimize button.

The next slides explain these tabs in detail.

## Slide 27

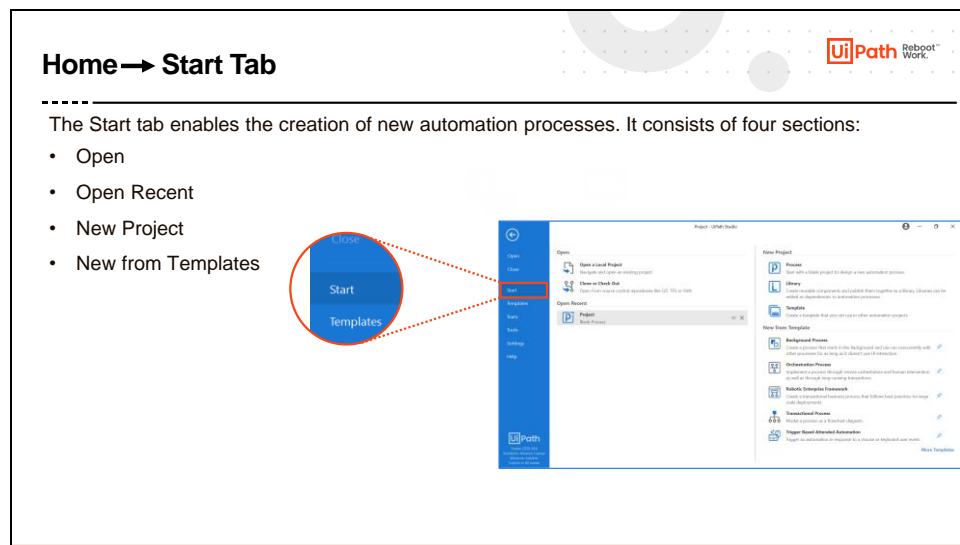


Home consists of six tabs:

- Start
- Templates
- Team
- Tools
- Settings
- Help

These tabs are explained in detail in the subsequent slides.

## Slide 28



The first tab in Home is the **Start tab**. Start tab enables the creation of new automation processes, reusable components, and specific types of projects. This is the window that appears when Studio is opened. It consists of four sections. These are:

### 1. Open

The Open section consists of two options, which are Open a Local Project and Clone or Check Out. The Open a Local Project option is used to open existing projects and the Clone or Check Out option is used to open projects from source control repositories like GIT, TFS, or SVN.

### 2. Open Recent

The Open Recent section displays the recent projects opened or created in Studio. The projects can be pinned or removed from the Open Recent section. Hovering over the project items in this section displays the path to the project.json file and the project description.

### 3. New Project

The New Project section consists of three options. These are:

- **Process:** Start with a blank project to design a new automation process. For this, click on the Process option to open the New Blank Process popup window, specify a custom name and description, select a location, and click “Create”.
- **Library:** Create reusable components and publish them together as a library. Libraries can be added as dependencies to automation processes.
- **Template:** Create a template that you can use in other automation projects.

### 4. New from Templates

The New from Templates section consists of five options. These are:

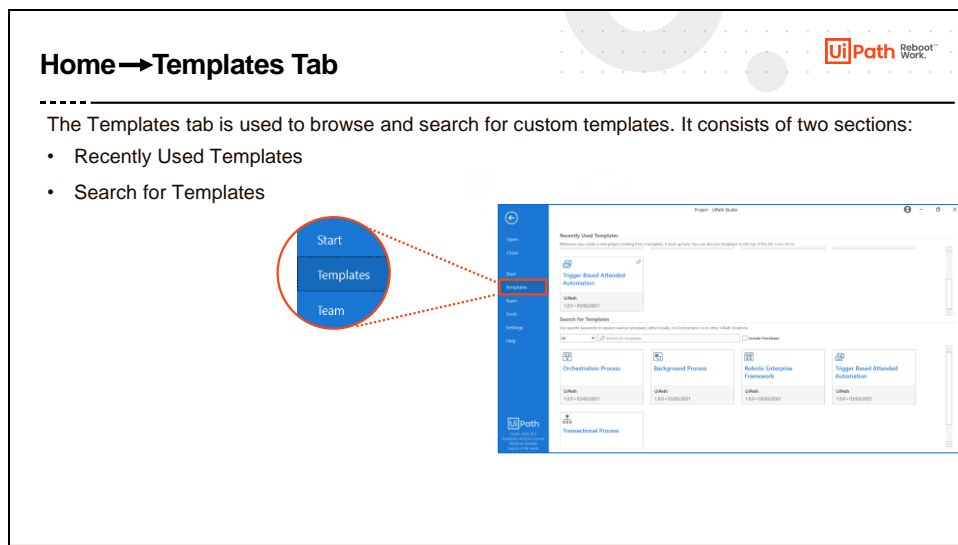
- **Background Process:** Create a process that does not require UI interaction and can run as a background process. Multiple background processes can run concurrently on a machine.

- **Orchestration Process:** Implement a process through service orchestration and human intervention as well as through long-running transactions.
- **Robotic Enterprise Framework:** Create a transactional business process that follows best practices for large scale deployments.
- **Transactional Process:** Model a process as a flowchart diagram.
- **Trigger Based Attended Automation:** Trigger automation in response to a mouse or keyboard user event.

This section also has a [More Templates](#) link at the bottom, which you can click to browse more templates.



## Slide 29



The **Templates tab** is used to browse and search for custom templates from all available sources. It consists of two sections. These are:

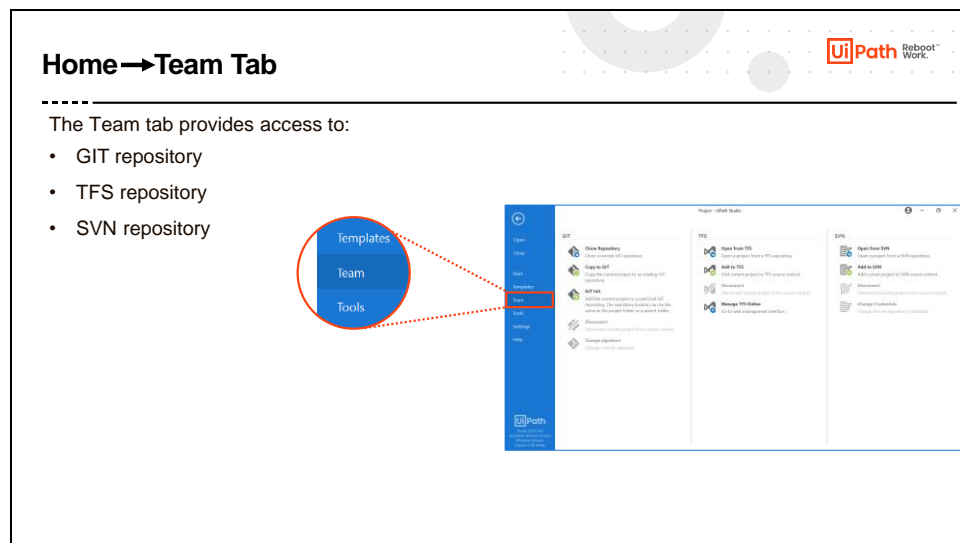
### 1. Recently Used Templates

This section displays the recently used templates. Whenever you create a new project starting from a template, it gets displayed here. You can also pin the templates to the top of the list.

### 2. Search for Templates

This section is used to explore various templates, either locally, on Orchestrator, or in other UiPath locations. You can use specific keywords in the search box given in this section to search for desired templates.

## Slide 30



The **Team tab** is very useful when version control is necessary. UiPath Studio can be used together with GIT, TFS, or SVN standards. This tab provides access to

- GIT repository
- TFS repository
- SVN repository

The repositories are briefly explained hereunder:

**1. GIT:** Git is a distributed version control system for tracking changes in source code during software development.

Here, the options are:

- Clone Repository: Clone a remote GIT repository.
- Copy to GIT: Copy the current project to an existing GIT repository.
- GIT Init: Add the current project to a new local GIT repository. The repository location can be the same as the project folder or a parent folder.
- Disconnect: Disconnect current project from source control.
- Change signature: Change commit signature.

**2. Team Foundation Server (TFS)** is the source code management established by Microsoft, used for the project and release management.

Here, the options are:

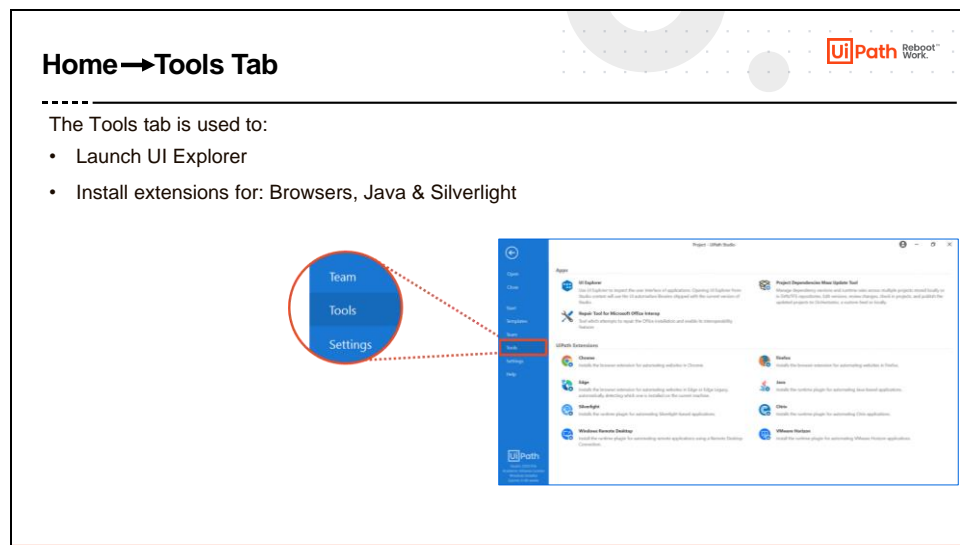
- Open from TFS: Open a project from a TFS repository. It contains two blocks: Team Project Collection & Team Project.
- Add to TFS: Add current project to TFS source control.
- Disconnect: Disconnect current project from source control.
- Manage TFS Online: Go to the web management interface.

**3. Apache Subversion (SVN)** is a software versioning and revision control system distributed as open source.

Here, the options are:

- Open from SVN: Open a project from an SVN repository.
- Add to SVN: Add current project to SVN source control.
- Disconnect: Disconnect current project from source control.
- Change Credentials: Change remote repository credentials.

## Slide 31



The **Tools tab** is used to access the UI Explorer and Project Dependencies Mass Update Tool.

- **UI Explorer:**

Use UI Explorer to inspect the user interface of applications. Opening UI Explorer from Studio context will use the UI automation libraries shipped with the current version of Studio.

- **Project Dependencies Mass Update Tool:**

Manage dependency versions and runtime rules across multiple projects stored locally or in SVN/TFS repositories. Edit versions, review changes, check-in projects, and publish the updated projects to Orchestrator, a custom feed, or locally.

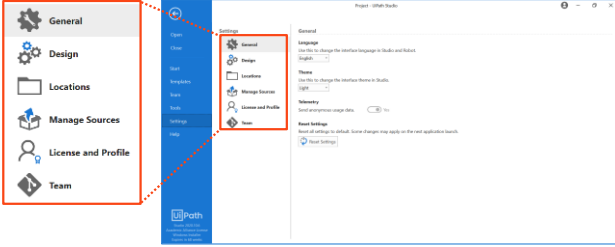
It also enables the user to install the Chrome, Firefox, Edge, Java and Silverlight, Citrix, Windows Remote Desktop, and VMware Horizon extensions. These extensions are provided to ensure that they don't act as a blocker to the automation.

## Slide 32

### Home→Settings Tab

Allows the user to change the interface language, theme, set global preferences, and manage activity feeds. It consists of six sub-tabs:

- General
- Design
- Location
- Manage Sources
- License and Profile
- Team



The **Settings tab** allows the user to change the interface language, theme, set global preferences, and manage activity feeds.

This tab has six sub-tabs:

- General
- Design
- Locations
- Manage Sources
- License and Profile
- Team

These sub-tabs are discussed in the subsequent slides.

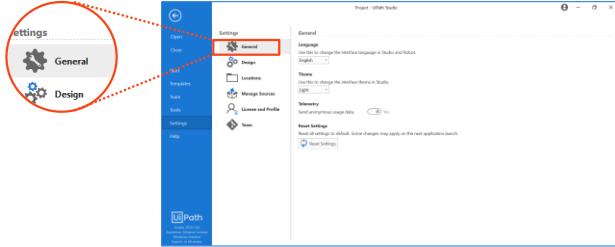
## Slide 33

**Home→Settings Tab→General**

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The General sub-tab contains following options:

- Language
- Theme
- Telemetry
- Reset Settings



The first sub-tab, **General**, contains the following options:

- Language: To change the interface language in Studio and Robot.
- Theme: To change the interface theme in Studio.
- Telemetry: To enable or disable sending anonymous usage data.
- Reset Settings: To reset all settings to default.

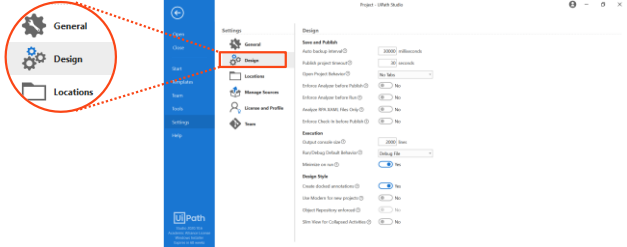
## Slide 34

### Home → Settings Tab → Design

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The Design sub-tab contains following options:

- Save and Publish
- Execution
- Design Style



The screenshot shows the 'Settings' window in UiPath Studio. The left sidebar has a red circle around the 'Design' sub-tab. The main panel displays the 'Design' sub-tab settings, which are categorized into 'Save and Publish', 'Execution', and 'Design Style'. The 'Save and Publish' section includes 'Auto backup interval' (set to 3000 milliseconds), 'Publish project timeout' (set to 30 minutes), 'Open Project Behavior' (set to No), 'Enforce Analyzer before Publish' (set to No), 'Enforce Analyzer before Run' (set to No), 'Enforce WPS after Run' (set to No), and 'Enforce Check to before Publish' (set to No). The 'Execution' section includes 'Output console size' (set to 2000 lines) and 'Minimize on run' (set to Yes). The 'Design Style' section includes 'Create docked annotations' (set to Yes), 'Use Windows for new projects' (set to No), 'Filter Reporting workflow' (set to No), and 'Show icons for collapsed activities' (set to No).

The **Design** sub-tab of the Settings tab contains a set of global settings that apply to all projects opened in this version of Studio. It contains the following options:

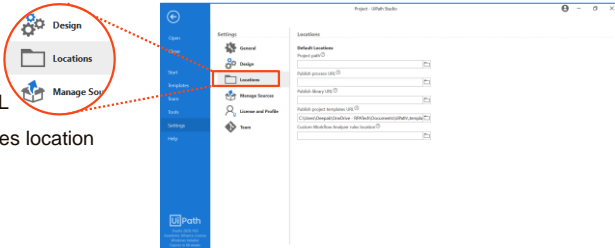
- **Save and Publish:** This allows the user to set values for an Auto backup interval, Publish project timeout, Open Project Behavior, Enforce Analyzer on Publish.
- **Execution:** This allows the user to set values for Output console size and Minimize on run.
- **Design Style:** This allows the user to create docked or floating annotations for activities.

## Slide 35

**Home → Settings Tab → Locations**

The Locations sub-tab contains options to define the:

- Project Path
- Publish Process URL
- Publish Library URL
- Publish Project Templates URL
- Custom Workflow Analyzer rules location



The Locations sub-tab contains options to define the:

- **Project Path:** The user can change the default location for creating projects by adding the new path in this box.
- **Publish Library URL:** The user can add a default location in this box for publishing all the libraries (when the custom feed option is selected).
- **Publish Process URL:** The user can add a default location in this box to publish the processes (when the custom feed option is selected).
- **Publish Project Templates URL:** The user can add a default location in this box to publish the project templates (when the custom feed option is selected).
- **Custom Workflow Analyzer rules location:** The user can add a default location of the folder wherein custom Workflow Analyzer rules are located. DLL files containing the custom rules are placed in this folder.



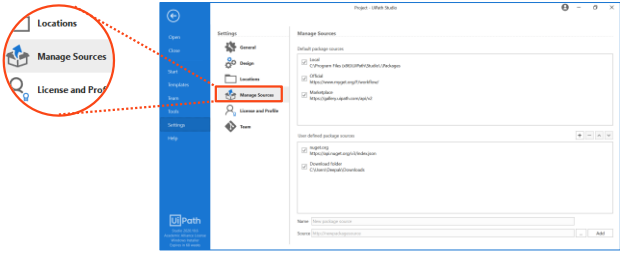
## Slide 36

**Home→Settings Tab→Manage Sources**

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The Manage Sources sub-tab contains the following options:

- Default package sources
- User defined package sources



The **Manage Sources** sub-tab of the Settings tab allows the user to manage feeds for activities packages from the Studio Backstage view without having to open a project. This sub-tab contains the following options:

- Default package sources
- User defined package sources

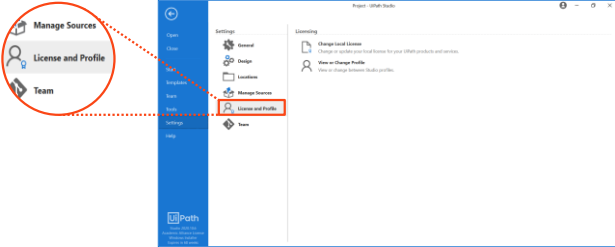
## Slide 37

**Home→Settings Tab→License and Profile**

-----

The License and Profile sub-tab contains the following options:

- Change Local License
- View or Change Profile



The screenshot shows the 'License and Profile' sub-tab of the Settings window. The left sidebar has three options: 'Manage Sources', 'License and Profile', and 'Team'. The 'License and Profile' option is highlighted with a red circle. The main content area shows the 'License and Profile' sub-tab with two options: 'Change Local License' and 'View or Change Profile'. The 'View or Change Profile' option is highlighted with a red rectangle.

The License and Profile sub-tab of the Settings tab contains the following options:

**Change Local License:** Change or update the license for the UiPath products and services.

**View or Change Profile:** View or change between the Studio profiles (i.e., between Studio and StudioX).

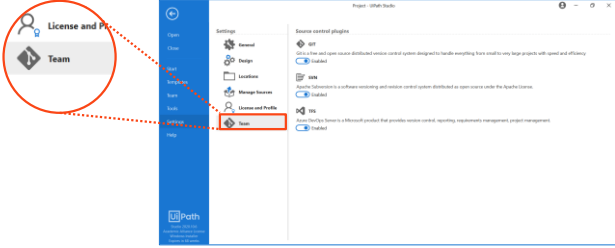
## Slide 38

**Home → Settings Tab → Team**

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The Team sub-tab contains the following options:

- GIT
- SVN
- TFS

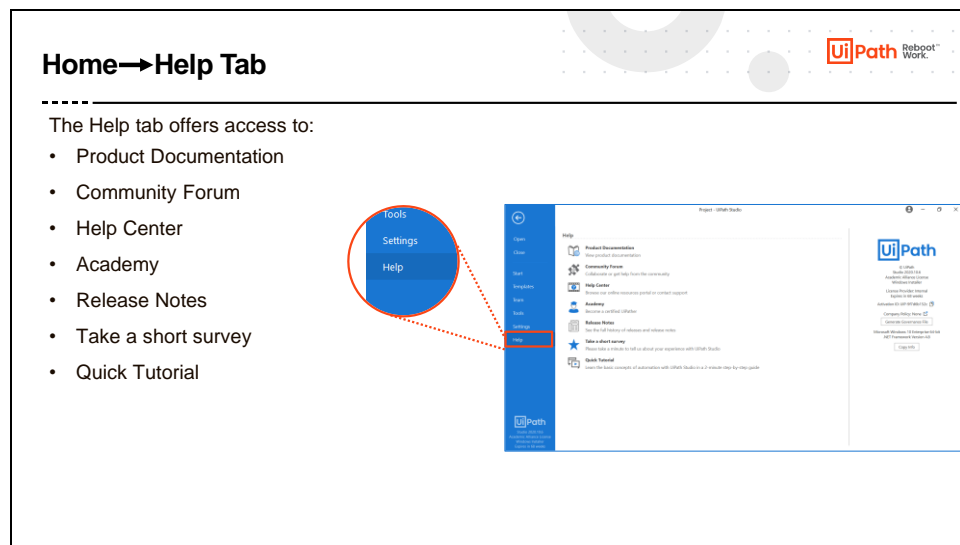


The screenshot shows the UiPath Settings application. On the left, there is a sidebar with various settings categories. The 'Team' category is highlighted with a red circle. A red arrow points from this circle to the 'Team' sub-tab in the main content area. The 'Team' sub-tab is also highlighted with a red box. The main content area shows the 'Team' sub-tab with options for GIT, SVN, and TFS.

The **Team** sub-tab of the Settings tab is used to manage source control integration for the automation project. It contains the following options:

- GIT: Used to integration for GIT repository.
- TFS: Used to integration for TFS repository.
- SVN: Used to integration for SVN repository.

## Slide 39



The **Help tab** allows the user to access:

- **Product Documentation:** Here, the user can view the product documentation.
- **Community Forum:** Through the forum, the user can collaborate or get help from the community.
- **Help Center:** By accessing the Help Center, the user can browse UiPath's online resources portal or contact support
- **Academy:** The RPA Academy offers various certifications to become a certified UiPather.
- **Release Notes:** The user can see the full history of releases and release notes.
- **Take a short survey:** This allows the user to share his experience of UiPath Studio.
- **Quick Tutorial:** The user can learn basic concepts of automation with UiPath Studio in a 2-minute step-by-step guide.

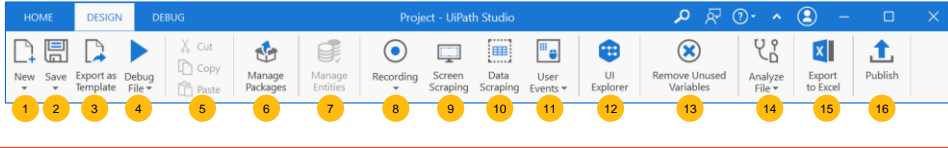
The Help Tab also displays the information regarding product version, license details, and activation ID. The **Copy Info** button allows the user to copy these details to the clipboard.

## Slide 40

## Design

Design allows the user to:

1. Create new workflows	9. Scrape data from a UI element
2. Save the project	10. Extract structured data
3. Export project as template	11. Execute activities at a user event
4. Run project directly or in debug mode	12. Build custom selectors
5. Cut, copy and paste activities and workflows	13. Remove unused variables in a project
6. Install and manage activities packages	14. Analyze files for errors and rule violations
7. Manage entities for a project	15. Export workflows in an Excel file
8. Record and translate user actions into sequences	16. Publish a project to Orchestrator



The **Design** allows the user to:

- Create new workflows
- Save the project
- Export project as a template
- Run the project directly and in debug mode
- Cut, copy and paste activities and workflows
- Install and manage activities packages
- Manage entities for a project
- Record and translate user actions into sequences
- Scrape data from a UI element
- Extract structured data
- Execute activities at a user event
- Build custom selectors
- Remove unused variables in a project
- Analyze files for errors and rule violations
- Export workflows in an Excel file
- Publish a project to Orchestrator

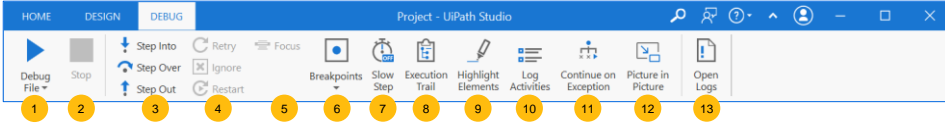
## Slide 41

## Debug

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Debug allows the user to:

<ol style="list-style-type: none"> <li>1. Run the project directly or in debug mode</li> <li>2. Stop project execution</li> <li>3. Monitor and manage step by step execution of activities</li> <li>4. Retry, ignore and restart project execution</li> <li>5. Set breakpoints</li> <li>6. Adjust debugging speed</li> <li>7. Return to a current breakpoint or the activity causing the error</li> </ol>	<ol style="list-style-type: none"> <li>8. View exact execution path at debugging</li> <li>9. Highlight elements while debugging</li> <li>10. Log debugging activities</li> <li>11. Log exception and continue execution</li> <li>12. Start process in a separate session</li> <li>13. Open logs to view execution details</li> </ol>
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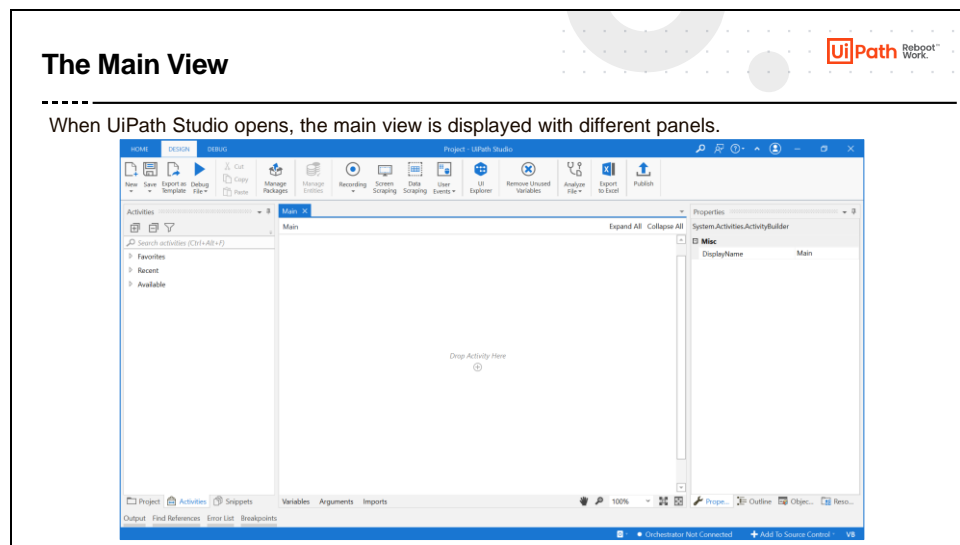


**Debug Menu** allows the user to:

- Run the project directly or in debug mode
- Stop project execution
- Monitor and manage step by step execution of activities
- Retry, ignore and restart project execution
- Set breakpoints
- Adjust debugging speed
- Return to a current breakpoint or the activity causing the error
- View exact execution path at debugging
- Highlight elements while debugging
- Log debugging activities
- Log exception and continue execution
- Start the process in a separate session
- Open logs to view execution details

The fields are discussed in detail later.

## Slide 42

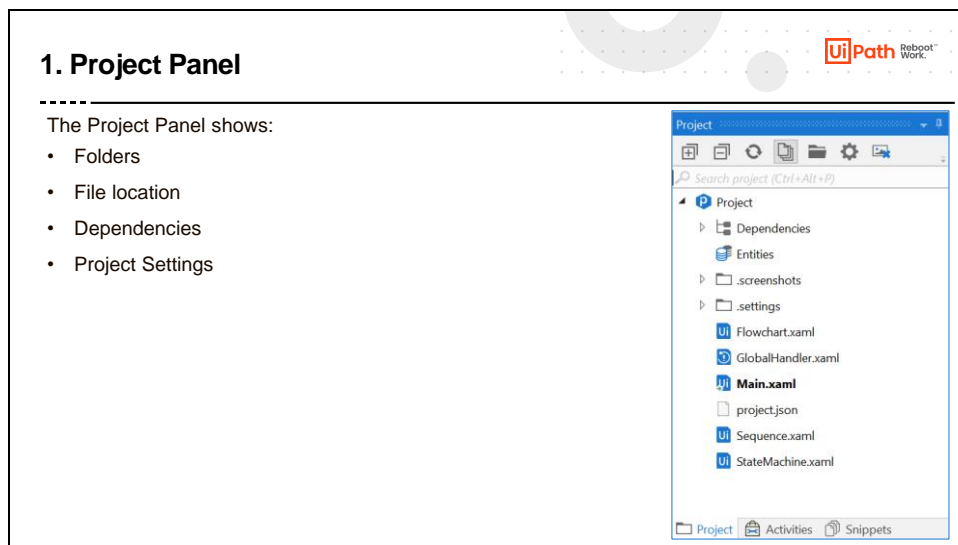


When UiPath Studio opens, the main view is displayed with different panels. This view contains:

- The Designer Panel
- Activities Panel
- Other panels (visible simultaneously or alternatively):
- On the left, the Project Panel can be switched with the Activities Panel and the Snippets Panel, using a navigation bar on the bottom of the panel.
- In the center, the Designer panel is available, where the automation projects are designed.
- At the bottom of the Designer panel, the Variables, Arguments, and Imports panels can be accessed.
- On the right, the Properties Panel can be switched with the Outline, Object Repository, and Resources Panel.
- The Output, Find References, Error List, and Breakpoints panels can be accessed at the bottom-left of the main view.

The **Designer Panel** is the largest area in the middle of the Main View. This is the area where the automation projects are built. Once the business processes are mapped and split into simple operations, workflows are built in the designer panel using the activities available in UiPath Studio.

## Slide 43



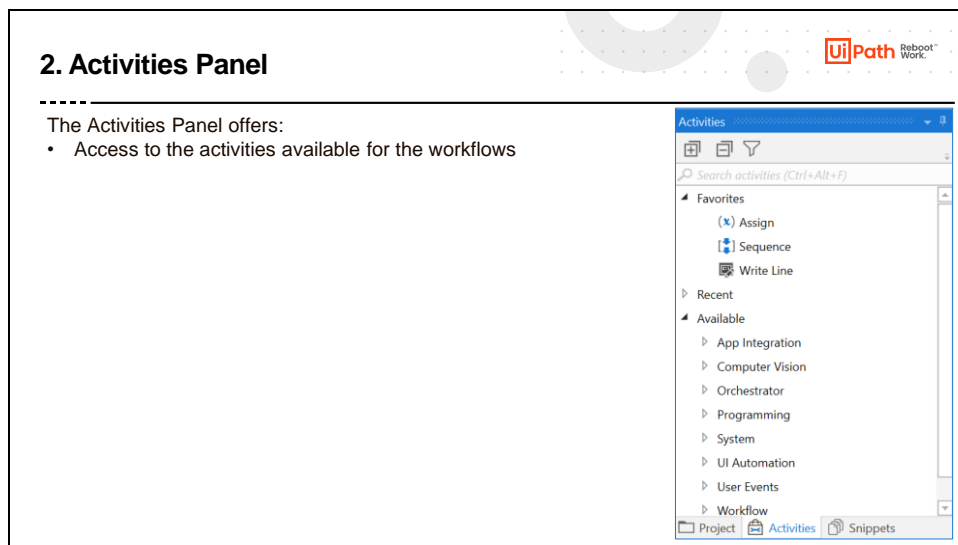
The **Project Panel** enables the user to view the current state and contents of the current project. It assists the user in project organization and enables the user to add folders, open the file location, manage dependencies, and adjust project settings.

It offers the following options:

- Expand all: Used to expand all nodes in the current project
- Collapse all: Used to collapse all nodes in the automation project
- Refresh: Used to refresh the project and update any changes done in the main window
- Show all files: Used to display all files belonging to the project that are not shown in the default view (for example, the project.json file)
- File Explorer: Used to open the project's location on the computer
- Project Settings: Used to open Project Settings window for libraries or processes
- Remove Unused Screenshots: Used to remove the screenshots not used while running the project



## Slide 44



The **Activities Panel** offers access to the activities that can be used to build the automation project. This panel consists of predefined activities that can be used to automate the process. It includes:

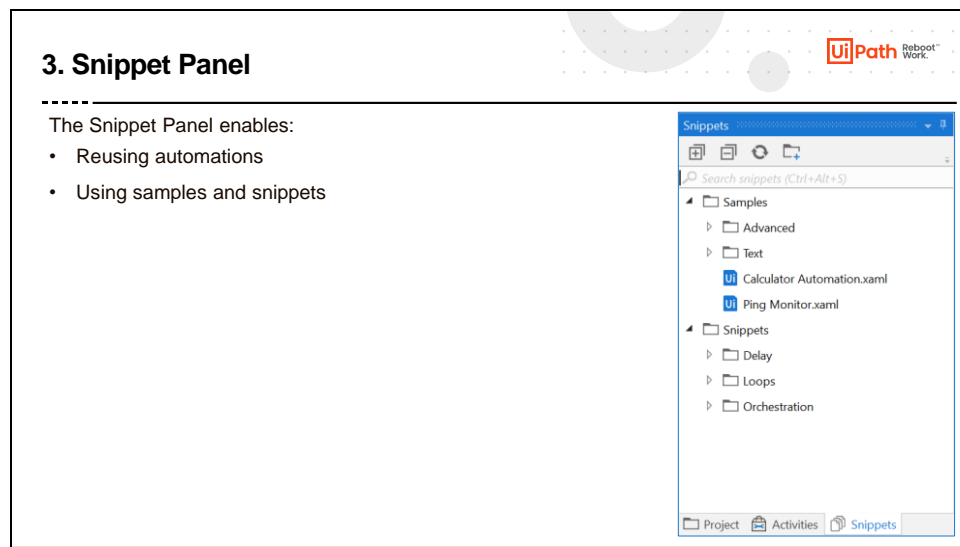
- A search box: Use it to find activities, navigate through them and add an activity to the current project.
- Expand All and Collapse All buttons: Visible above the search box, these two buttons can be used to collapse or expand Favorites, Recent, and Available activities.
- View Options button: Visible above the search box, it allows you to enable or disable a particular view option. Available options are:
  - show favorites, recently used, available, and compatible activities.
  - show activities designed for the StudioX profile.
  - show modern UI Automation activities in projects using the classic design experience or classic activities in projects using the modern experience.
  - group activities by the packages they belong to.
  - search by description, rather than only by name.
  - pin favorites to keep favorite activities always visible in the panel.

You can right-click on an activity to access a context menu that gives you the options to:

- Add to Favorites: Add an activity to the Favorites list.
- Remove from Favorites: Remove an activity from the Favorites list.
- Help: Visit UiPath Studio documentation for an activity.
- Find References: View all the places where an activity is referenced in the project.
- Create Test Bench: Test an activity before adding it to the project.

Refer <https://docs.uipath.com/studio/v2020.10/docs/the-user-interface> to know more.

ide 45

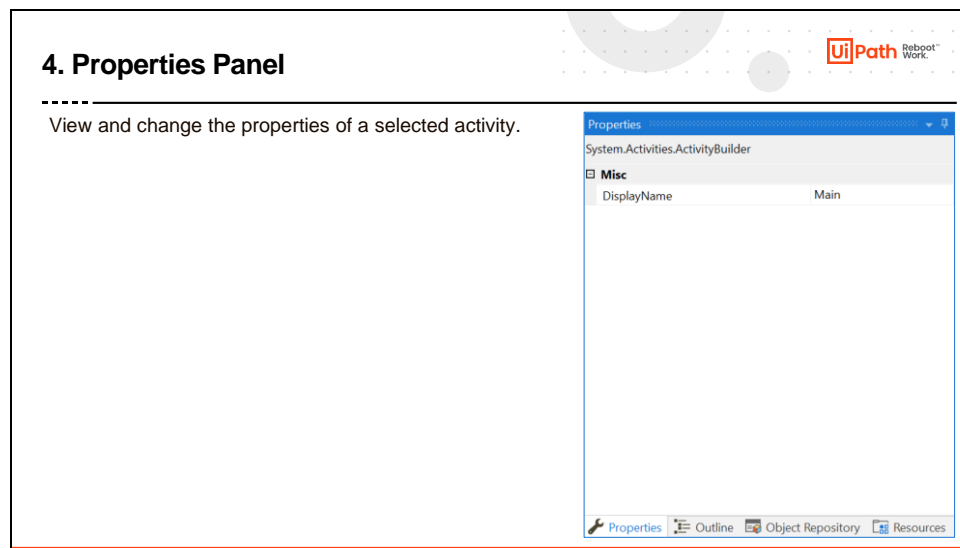


The **Snippets panel** enables the user to reuse automation. It includes, by default, multiple samples and snippets for various generic activities. For example, delays or loops, which are already configured. The panel is used to reuse a code or workflow that is already present thereby saving time. The user can also add a snippet from the local folder. A folder can be removed by selecting Remove.

The panel offers four buttons:

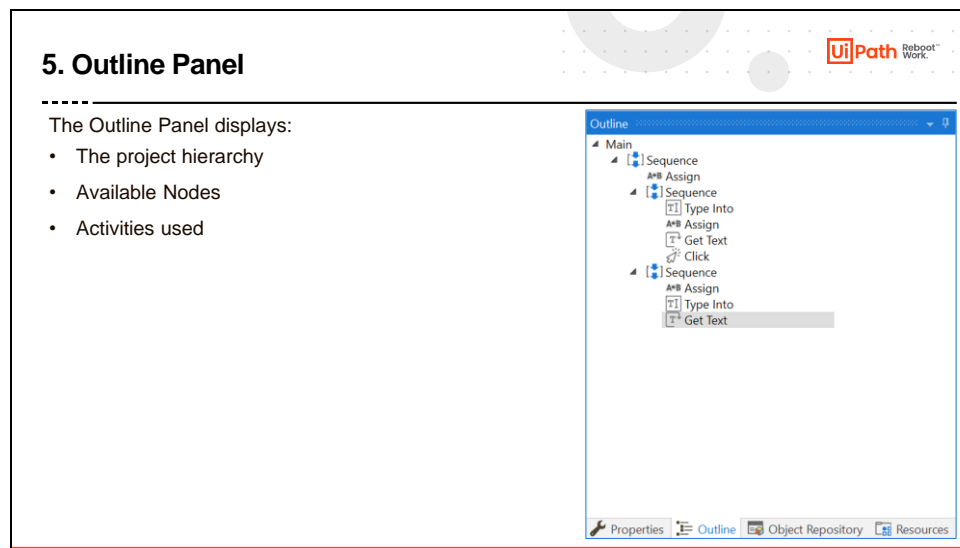
- Expand all
- Collapse all
- Refresh
- Add folder

## Slide 46



The **Properties panel** displays the properties of a selected activity. It enables the user to change the properties of the activity. Here, the user can modify the common properties of the two activities selected simultaneously, provided they are in the same workflow.

## Slide 47

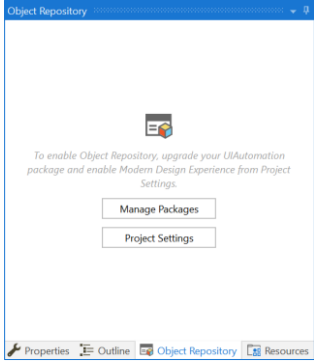


The **Outline Panel** shows the project hierarchy, all the available nodes (points where an activity splits the flow in at least two paths), and the activities used. The user can go to a specific activity by selecting it in the Outline panel.

## Slide 48

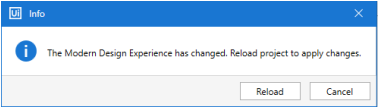
## 6. Object Repository Panel

Create and reuse UI taxonomies inside and across projects.



To use the Object Repository tool, click on Project Settings in screenshot 1 and switch on Modern Design Experience and click Reload in the popup.

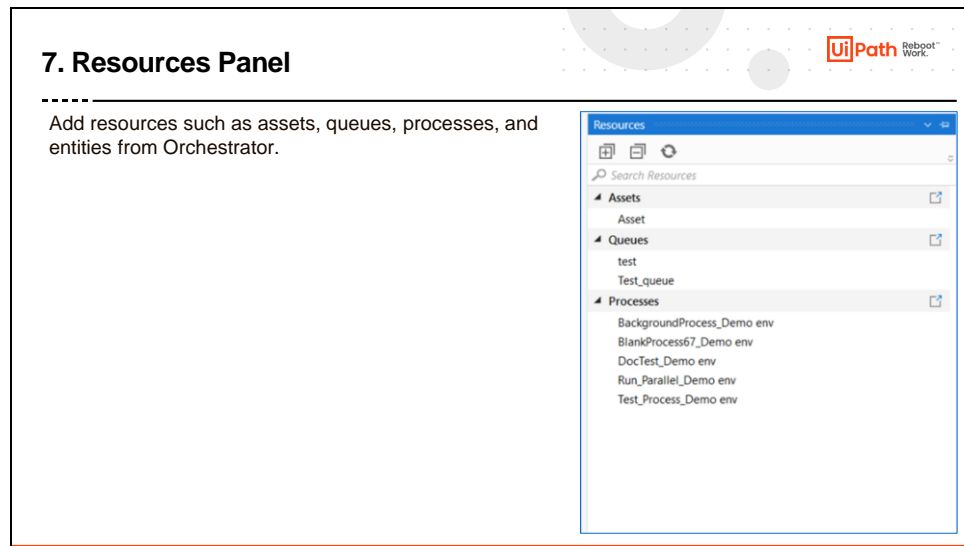
Disable Pause ⓘ	<input type="checkbox"/> No
Starts in Background ⓘ	<input type="checkbox"/> No
Supports Persistence ⓘ	<input type="checkbox"/> No
PIP Ready ⓘ	<input type="checkbox"/> No
Starts in PIP ⓘ	<input type="checkbox"/> No
Modern Design Experience ⓘ	<input type="checkbox"/> No



The **Object Repository panel** can be used to manage and reuse UI elements by capturing them as objects. It allows for creating and reusing UI taxonomies inside and across automation projects. The Object Repository works with UiPath.UIAutomation.Activities package versions 2020.10 and above in projects that use the Modern Design Experience.

For more details, visit: <https://docs.uipath.com/studio/v2020.10/docs/about-object-repository>

## Slide 49



The **Resources panel** can load assets, queues, processes, and entities from Orchestrator, provided that the Robot is connected to Orchestrator.

## Slide 50

## 8. Variables Panel

Allows viewing, modifying and creating variables.

Name	Variable type	Scope	Default
intMarketRate	Int32	Sequence	Enter a VB expression
CostPrice	String	Sequence	Enter a VB expression
SellingPrice	String	Sequence	Enter a VB expression
<a href="#">Create Variable</a>			

Variables Arguments Imports

100%

The **Variables panel** displays the existing variables in a project and allows the user to modify them. The user can also create new variables. When the user renames a variable, it is automatically updated in the current file. For both the existing and new variables, it offers the following defining and redefining options:

- Name: Name of the variable. If not defined, the name is automatically generated
- Type: Choose the type of variable (Boolean, String, Object, Array, etc.)
- Scope (local or general): The area in which a variable is available
- Default value: The default value of a variable

## Slide 51

## 9. Arguments Panel

Allows viewing, modifying and creating arguments.

Name	Direction	Argument type	Default value
in_CostPrice	In	String	Enter a VB expression
out_SellingPrice	Out	String	Default value not supported
io_MarketRate	In/Out	Int32	Default value not supported
<a href="#">Create Argument</a>			

Variables Arguments Imports

100%

Arguments are used to transfer data from one project to another. The **Arguments Panel** enables the user to create arguments and modify them. When the user renames an argument, it is automatically updated in the current file. This panel offers similar fields and operations as the Variables Panel. However, there is one exception – direction. The direction for the arguments can be specified as:

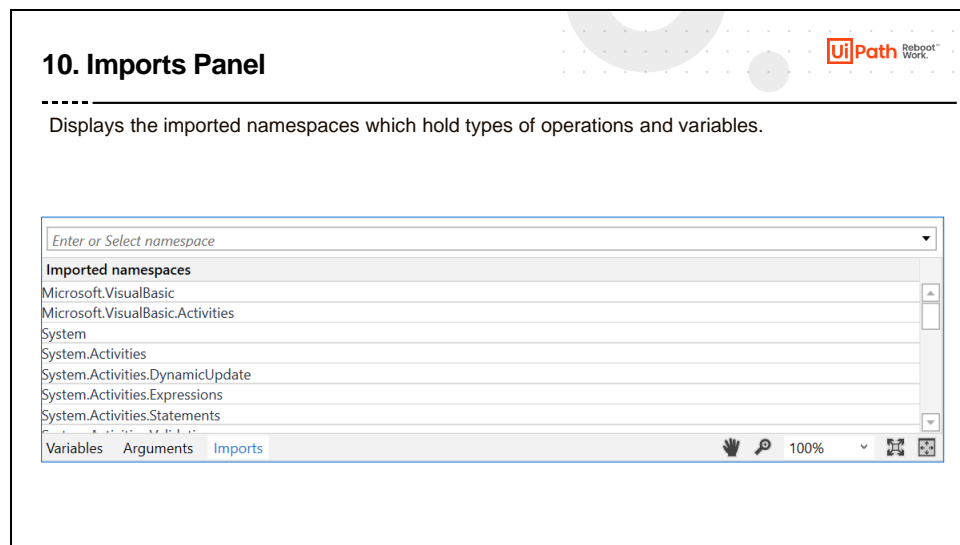
- In: Data transferred from another project to the current (open) project
- Out: Data transferred from the current project to another
- In/Out: Data transferred both ways

The available fields are:

- Name: Name of the argument. If not defined, the name is automatically generated.
- Direction: The direction for the argument (In, Out, In/Out).
- Argument Type: Choose the type of value in argument (Boolean, String, Object, Array, etc.).
- Default value: The default value of an argument can be entered here.



## Slide 52



The **Imports Panel** displays all the namespaces that are imported for the project. Namespaces in UiPath Studio represent containers that store different types of data.

## Slide 53

## 11. Output Panel

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The Output Panel displays the output of the Log Message or Write Line activities, as well as the logs when the debug mode is activated.

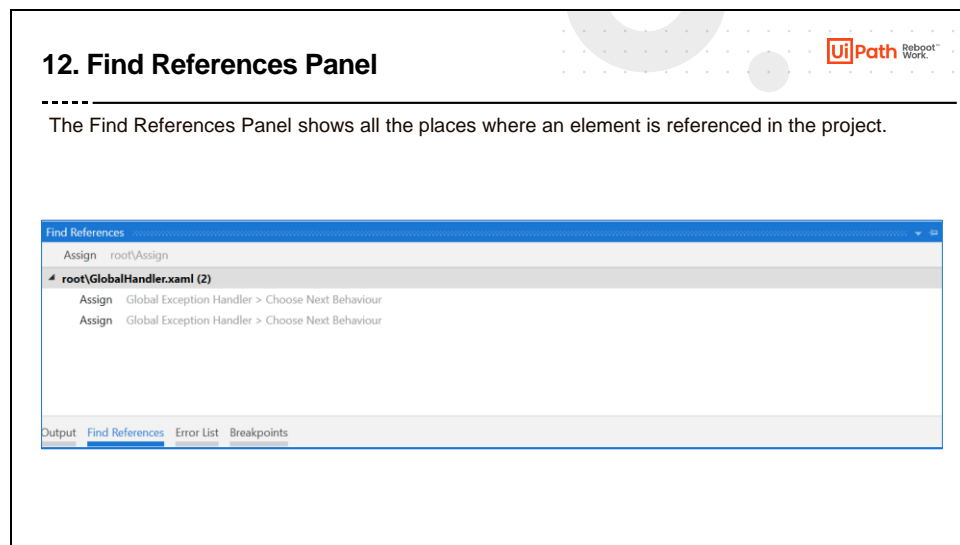


When a Write Line or Log Message activity is used and the workflow is run, the **Output Panel** shows the output of these activities. It also displays the exceptions for packages. The user can show or hide messages with different log levels in this panel. The user can also search for a log in this panel.

The Output Panel offers the below options:

- **Show Timestamps:** To show the timestamps of the executions in the project.
- **Error:** Displays errors in the file during the validation process.
- **Warning:** Displays warnings related to the project.
- **Information:** Displays the information about the project.
- **Trace:** The panel shows logs for an activity from the start of its execution till it ends while debugging by enabling the Log Activities option in Debug tab.
- **Export Logs:** To export logs into a .txt file. The user can also filter the logs and then export them.
- **Clear All:** Erases the information displayed in Output Panel.

## Slide 54

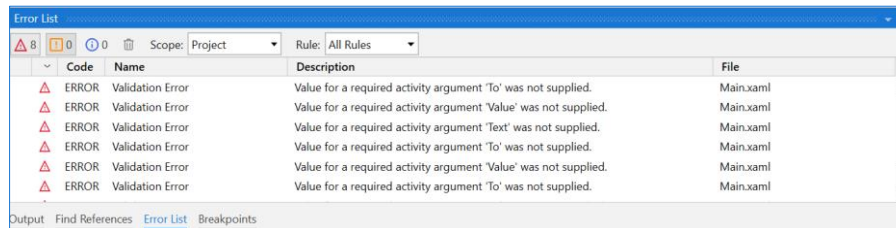


The **Find References Panel** displays results for references you search for in your project. To find every place in the project where an element is referenced, right-click it and select Find References.

## Slide 55

### 13. Error List Panel

The Error List Panel displays all the errors generated when running Workflow Analyzer.

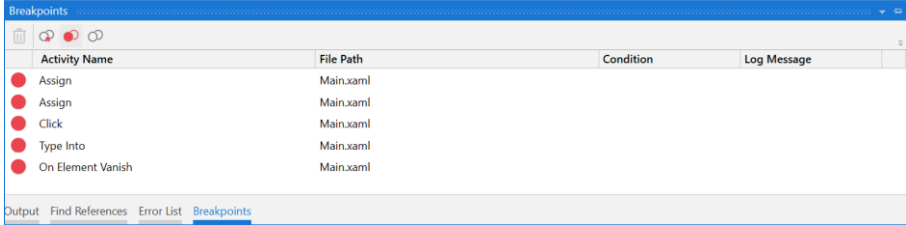


The **Error List Panel** displays all the errors generated when running Workflow Analyzer. The Error List panel filters items by Errors, Warnings, and Messages. The scope drop-down menu is useful for filtering errors by project, current file, or a specific file in the automation. In addition, items can be filtered by rule ID. Click a found warning or error to display the rule's recommendation and a link to the documentation page for each rule. In addition to rule violations, the Error List panel also displays errors that may occur in the execution of workflow analysis.

## Slide 56

## 14. Breakpoints Panel

The Breakpoints Panel helps in managing breakpoints added to the project.



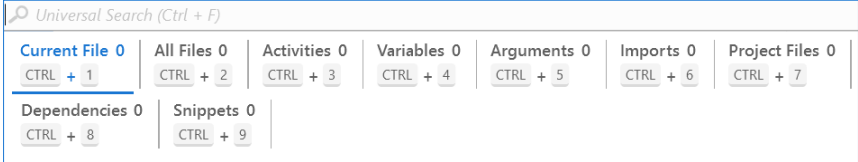
Activity Name	File Path	Condition	Log Message
Assign	Main.xaml		
Assign	Main.xaml		
Click	Main.xaml		
Type Into	Main.xaml		
On Element Vanish	Main.xaml		

The **Breakpoints Panel** helps in managing breakpoints added to the project. A breakpoint can be placed on an activity by right-clicking on it and selecting Toggle Breakpoint from the context menu. Each breakpoint receives a specific icon based on its state. The icon is set on the activity and visible in the Breakpoints panel. A breakpoint can be deleted by selecting the activity in the Breakpoints panel and clicking Delete.

## Slide 57

### Universal Search Bar

Enables the search of the elements used in the project, such as activities, snippets, files, variables, and arguments.




**Universal Search Bar** enables the user to search for the elements used in the project such as snippets, activities, variables, arguments, imports, project dependencies, and files. Universal Search can be displayed by pressing Ctrl + F on your keyboard. It searches within the current project and returns results from all workflow files, including closed ones.


Slide 58

### Classroom Exercise

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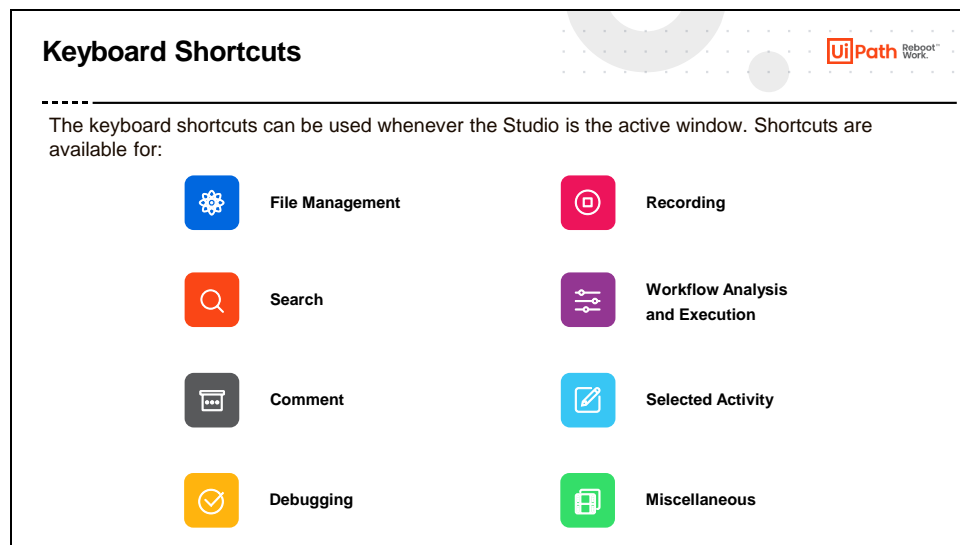


Overview of UiPath Studio User Interface.



Give an overview of UiPath Studio User Interface.

## Slide 59



The keyboard shortcuts can be used whenever the Studio is the active window.


Shortcuts are available for:

- File Management
- Search
- Comment
- Debugging
- Recording
- Workflow Analysis and Execution
- Selected Activity
- Miscellaneous

For more details, visit: <https://docs.uipath.com/studio/v2020.10/docs/keyboard-shortcuts>



Slide 60

Keyboard Shortcuts			
File Management		Selected Activity	
Ctrl + Shift + N	Creates a new Blank Process	Ctrl + T	Places the selected activity inside the Try section of a Try Catch activity
Ctrl + O	Opens a previously created workflow	Ctrl + N	Creates a new Sequence Diagram in the current project
Ctrl + L	Opens the folder where the Log files are stored	Ctrl + C	Copies the selected activities to the clipboard
Ctrl + S	Saves the currently opened workflow	Ctrl + V	Pastes the copied activities
Ctrl + Shift + S	Saves all the workflows currently open	Ctrl + K	Creates a variable of the same type as the required type of the activity
Ctrl + Tab	Moves focus between workflows opened in the Designer panel	F2	Allows for renaming the selected activity
		Shift+F2	Adds an annotation to a selected activity
		Enter	Saves the data added in the activity input field

File Management shortcuts are:

- Ctrl + Shift + N - Create a new Blank Process.
- Ctrl + O - Open a previously created workflow, either the .xaml or project.json file.
- Ctrl + L - Open the folder where the Log files are stored.
- Ctrl + S - Save the currently opened workflow.
- Ctrl + Shift + S - Save all the workflows that are currently open.
- Ctrl + Tab - Move focus between workflows opened in the Designer panel.

Selected Activity shortcuts are:

- Ctrl + T - Place the activity inside the Try section of a Try Catch activity.
- Ctrl + N - Create a new Sequence Diagram in the current project.
- Ctrl + C - Copy the selected activity or activities to the clipboard.
- Ctrl + V - Paste the copied activity or activities inside the selected item.
- Ctrl + K - Create a variable of the same type as the required type of the activity.
- Ctrl + Space - Open the IntelliPrompt window.
- F2 - Allow for renaming the selected activity.
- Shift + F2 - Add an annotation to a selected activity.
- Shift + Tab - Navigate to the previous activity or node in the Activities panel.
- Enter - Save the data added in the activity input field.
- Shift + Enter - Add a new line under the inputted text in an activity field.
- Ctrl + Enter - Add a new line above the inputted text in an activity field.


## Slide 61

Keyboard Shortcuts			
Search			
F3 or Ctrl + Shift + P	Opens the Command Palette	Ctrl + 2	Switches to the All Files tab in the Universal Search bar
Ctrl + Shift + T	Opens the Add an Activity search bar	Ctrl + Alt + A	Opens and focuses the search bar in Properties panel
Ctrl + Shift + F	Opens the Go to file search bar	Ctrl + Alt + F	Sets the focus to the search box in the Activities panel
Ctrl + F	Opens the Universal Search bar	Tab	Navigates to the next item in the panel or the next element in the activity
Ctrl + J	Opens the Jump to activity search bar		
Ctrl + 1	Switches to the Current File tab in the Universal Search bar		

Search shortcuts are:

- F3 or Ctrl + Shift + P - Opens the Command Palette.
- Ctrl + Shift + T - Opens the Add an Activity search bar.
- Ctrl + Shift + F - Opens the Go to file search bar.
- Ctrl + F - Opens the Universal Search bar.
- Ctrl + J - Opens the Jump to activity search bar.
- Ctrl + 1 - Switches to the Current File tab in the Universal Search bar.
- Ctrl + 2 - Switches to the All Files tab in the Universal Search bar.
- Ctrl + 3 - Switches to the Activities tab in the Universal Search bar.
- Ctrl + 4 - Switches to the Variables tab in the Universal Search bar.
- Ctrl + 5 - Switches to the Arguments tab in the Universal Search bar.
- Ctrl + 6 - Switches to the Imports tab in the Universal Search bar.
- Ctrl + 7 - Switches to the Project Files tab in the Universal Search bar.
- Ctrl + 8 - Switches to the Dependencies tab in the Universal Search bar.
- Ctrl + 9 - Switches to the Snippets tab in the Universal Search bar.
- Ctrl + Alt + A - Opens and focuses the search bar in Properties panel.
- Ctrl + Alt + F - Sets the focus to the search box in the Activities panel.
- Ctrl + Alt + O - Sets the focus to the search box in the UI Objects Browser panel.
- Ctrl + Alt + P - Opens and focuses the search bar in the Project panel.
- Ctrl + Alt + S - Opens and focuses the search bar in the Snippets panel.
- Tab - Navigates to the next item in the panel or the next element in the activity.

## Slide 62

Keyboard Shortcuts			
Debugging		Recording	
F9	Marks the selected activity with a breakpoint	Ctrl + Alt + W	Opens the Web Recording toolbar
Ctrl + Shift + B	Opens the Breakpoints panel	Ctrl + Alt + B	Opens the Basic Recording toolbar
Ctrl + Alt + E	Opens the Error List panel	Ctrl + Alt + C	Opens the Citrix Recording toolbar
F10	When debugging, steps over the execution of a block of activities in the currently selected workflow	Ctrl + Alt + D	Opens the Desktop Recording toolbar
F11	When debugging, enables you to step into a block of activities and executes the first one	F2	Adds delay during a recording activity
Shift + F11	When debugging, steps out of the current container after its last activity is executed	F3	Lets you specify a custom recording region
		F4	Let's you choose the UI Framework to record, which can be Default, AA, or UIA

## Debugging shortcuts are:

- F9 - Mark the selected activity with a breakpoint.
- Ctrl + Shift + B - Open the Breakpoints panel.
- Ctrl + Alt + E - Opens the Error List panel.
- F10 - When debugging, step over the execution of a block of activities in the currently selected workflow.
- F11 - When debugging, step into a block of activities and executes the first one.
- Shift + F11 - When debugging, steps out of the current container after its last activity is executed.

## Recording shortcuts are:

- Ctrl + Alt + B - Open the Basic Recording toolbar.
- Ctrl + Alt + C - Open the Citrix Recording toolbar.
- Ctrl + Alt + D - Open the Desktop Recording toolbar.
- Ctrl + Alt + W - Open the Web Recording toolbar.
- F2 - Add delay during a recording activity.
- F3 - Specify a custom recording region.
- F4 - Choose the UI Framework to record, which can be Default, AA, and UIA.

## Slide 63

Keyboard Shortcuts	
Workflow Analysis and Execution	
F5	Runs the current project in debugging mode, starting with the .xaml file set as Main
Pause	Pauses the execution of the current workflow, in both normal and debug mode
F12	Stops the execution of the current workflow, in both normal and debug mode
Ctrl + F5	Runs the current project
Shift + F7	Checks the whole project for validation errors and Workflow Analyzer violations
F8	Checks the currently opened workflow for validation errors
Shift + F8	Checks all project files for validation errors

Workflow Analysis and Execution shortcuts are:

- F5 - Run the current project in debugging mode, starting with the .xaml file set as Main.
- Ctrl + F5 - Run the current project.
- F6 - Run the currently opened .xaml file in debugging mode.
- Ctrl + F6 - Run the currently opened .xaml file.
- F7 - Check the file for validation errors and Workflow Analyzer violations.
- Shift + F7 - Check the whole project for validation errors and Workflow Analyzer violations.
- F8 - Check the currently opened workflow for validation errors.
- Shift + F8 - Check all project files for validation errors.
- Pause - Pause the execution of the current workflow, in both normal and debug mode.
- F12 - Stop the execution of the current workflow, in both normal and debug mode.

## Slide 64

Keyboard Shortcuts	
Miscellaneous	
F1	Enables you to access a help topic associated with the currently selected element
Ctrl + P	Opens the Manage Packages window
Esc	Closes the Publish, Manage Packages, File Diff windows
Ctrl + F1	Minimizes or expands the ribbon
Ctrl + Shift + R	Removes all unused project dependencies.
Ctrl + Z	Undo the last action.
Ctrl + Y	Redo the last action you've undone.
Comment	
Ctrl + D	Ignores the activity that is currently selected by placing it into a Comment Out container
Ctrl + E	Removes the activity from the Comment Out container it was placed in
Argument	
Ctrl + M	Ignores the activity that is currently selected by placing it into a Comment Out container
Ctrl + Shift + M	Removes the activity from the Comment Out container it was placed in

Miscellaneous shortcuts are:

- F1 - Access a help topic associated with the currently selected element.
- Ctrl + P - Open the Manage Packages window.
- Esc - Close the Publish, Manage Packages, File Diff windows.
- Ctrl + F1 - Minimize or expand the ribbon.
- Ctrl + Shift + R - Removes all unused project dependencies.
- Ctrl + Z - Undo the last action.
- Ctrl + Y - Redo the last action you've undone.

Comment shortcuts are:

- Ctrl + D - Ignore the activity that is currently selected by placing it into a Comment Out container.
- Ctrl + E - Remove the activity from the Comment Out container it was placed in.

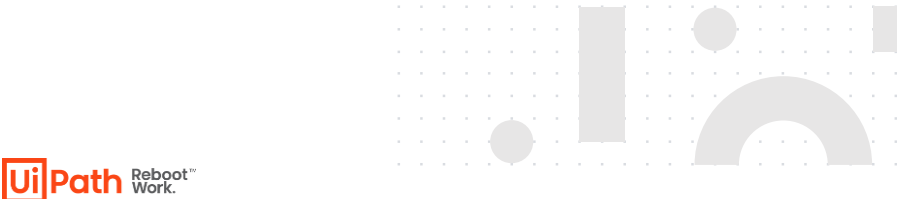
Argument shortcuts are:

- Ctrl + M - Create an In argument of the same type as the required type of the activity.
- Ctrl + Shift + M - Create an Out argument of the same type as the required type of the activity.

Slide 65

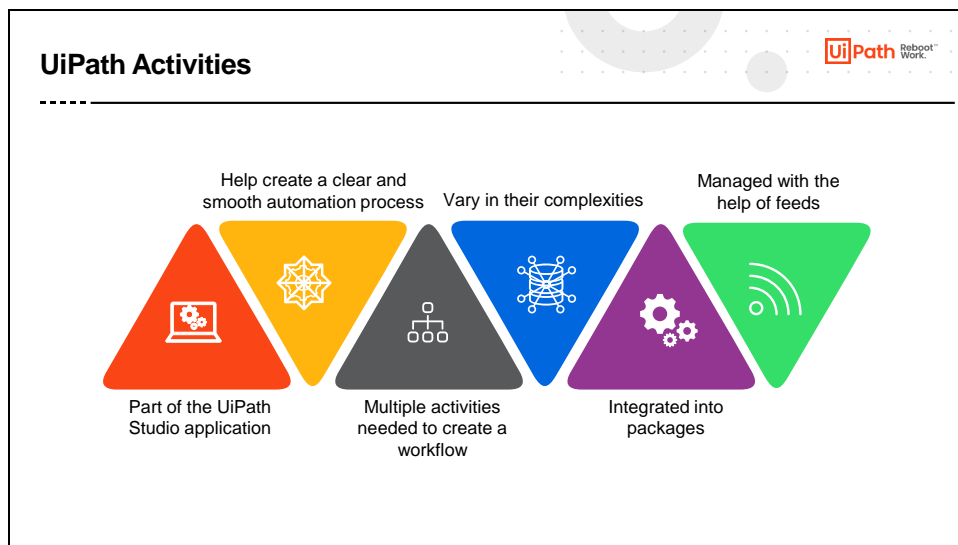
## Activities Packages

- UiPath activities
- Activities packages
- Activity feeds
- Managing activities packages



This section gives an overview of activities, activity packages, activity feeds, and managing activity packages.

Slide 66



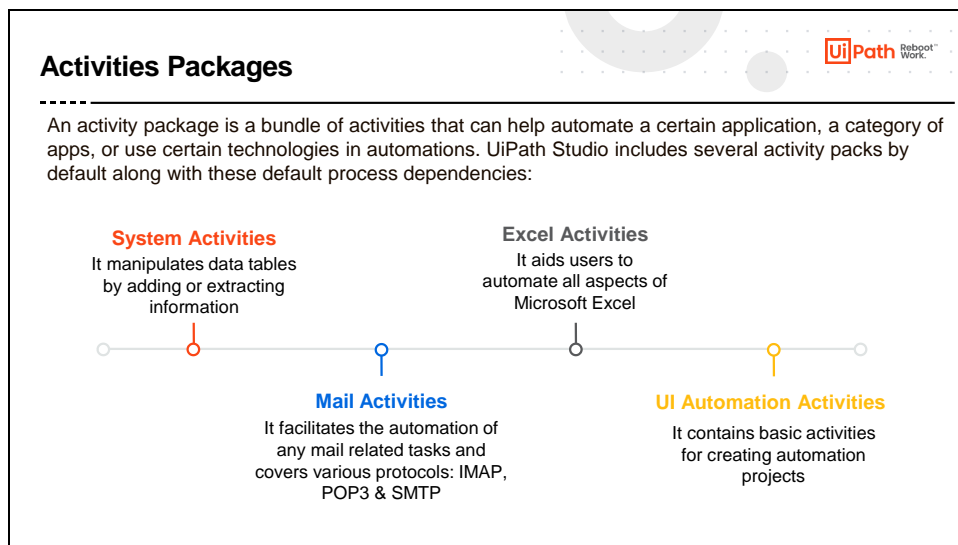
**UiPath Activities** are part of the **UiPath Studio** application and are designed to help create a clear and smooth automation process. Multiple activities are needed with connections between them to create a workflow.

The complexity of activities varies from simply defining a variable to configuring them by using custom wizards.

All activities are integrated into packages that cover certain areas of interest. For example, activities related to manipulating .xlsx or .csv files are organized under the **Excel Activities** package, making it easier to navigate through the list of available packages.

The activities can be managed by using the feeds available at the application level or the project level.

Slide 67



Activities are grouped in packages. An **activity package** is a bundle of activities that can help automate a certain application (Excel Activities, Word Activities), a category of apps (Mail Activities, Terminal Activities), or use certain technologies in automation (OCR Activities, FTP Activities).

UiPath Studio includes several activity packs by default along with these default process dependencies:

- System Activities
- Mail Activities
- Excel Activities
- UI Automation Activities

More packages can be added by using the **Manage Packages** button.



## Slide 68

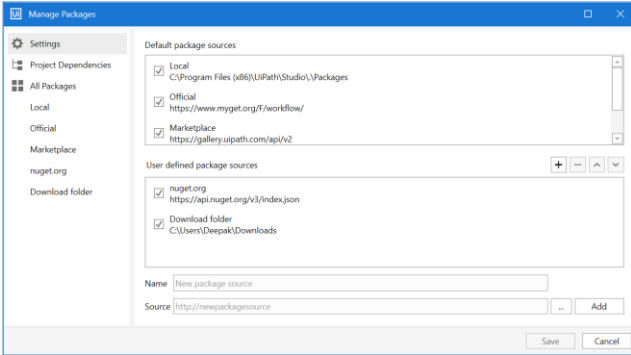
### Managing Activity Feeds

**Adding a Custom feed**

1. Manage Packages window > Click Settings
2. Click "+" to add feed to user defined package sources
3. Fill name of NuGet feed
4. Source field > URL of NuGet feed > Click Add > Save

**Removing a Custom feed**

1. Settings > Choose a feed from User defined package sources
2. Press Remove "-" button (feed removed from All Packages)
3. Click Save



The users can add custom feeds in Studio by following these steps:

- In the **Manage Packages** window, click on the **Settings**. The package sources are displayed.
- Click on the **+** button to add a feed to the **User defined package sources** category.
- Fill in the name of the package source or the name of the NuGet feed.
- In the **Source** field, type the local drive folder pathway, the shared network folder pathway, or the URL of the NuGet feed.
- Click on **Add**. The new feed is automatically added among the **User defined package sources** and in the **All Packages** category of the **Manage Packages** window. The feed is enabled by default.
- Click **Save** to apply all changes.

The users can remove custom feeds in Studio by following these steps:

- In the **Settings** category, click on any of the feeds under the **User defined package sources** section.
- Press the **Remove** button. The feed is removed from the **All Packages** category and the **User defined package sources** section.
- Click on **Save** to apply the changes.
- Please note that feeds are removed on the spot. Clicking the **Close** or **Cancel** button after removing default or custom feeds does not revert changes.

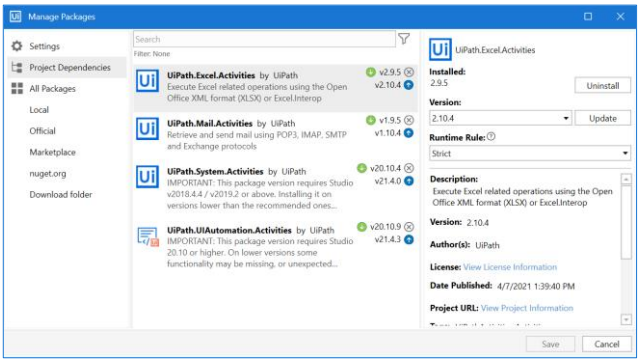
## Slide 69

## Managing Activities Packages

An activity package is a bundle of activities that can help you automate a certain category of applications or use certain technologies in automation.

The package manager functionality is organized by feed and enables:

- Downloading activity packages, libraries, frameworks, wrappers, and others
- Viewing, updating, and removing the ones already installed
- Adding and removing user's own packages



The Package Manager functionality enables us to download activity packages, libraries, frameworks, wrappers, and others, view the ones already installed for the project, and update them, as well as add and remove your own. It shows the list of available packages per feed and the list of dependencies per current project. The Package Manager always opens with the Project Dependencies list. For automating complex business processes, the default packages might not be enough, thus it is essential to know how to use the Package manager. The Package Manager can be accessed by clicking the Manage Packages icon on the Design ribbon or by using the Ctrl + P shortcut.

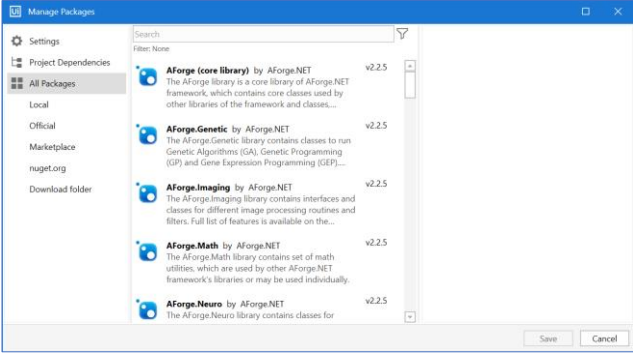
## Slide 70

### Managing Activities Packages (Contd.)

- 1 Open **UiPath Studio**
- 2 Create a new **Process**
- 3 Click the **Manage Packages** button to verify existing activities packages

**Installing a Package**

1. Click **All Packages** option > type name of desired activity pack in the **Search** bar
2. Click the **Install** button
3. Click the **Save** button.
4. Click the **I Accept** button in the **License Acceptance** popup



How to add more packages and customize the list of activities:

- Open **UiPath Studio** and create a new **Process**.
- Verify the existing activities packages by clicking the **Manage Packages** button located in the top ribbon.

#### Installing a Package:

- Click the **All Packages** option and type in the **search** bar the name of the desired activity pack.
- Click the **Install** button.
- Click the **Save** button.
- Click the **I Accept** button in the **License Acceptance** popup.

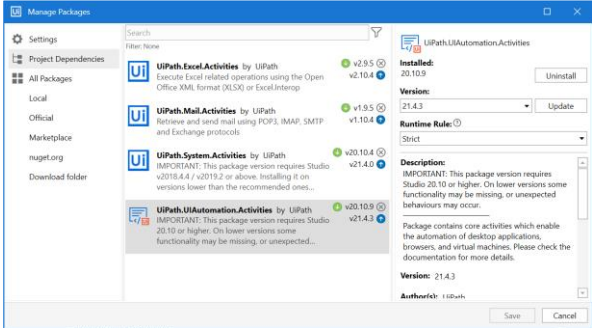
## Slide 71

### Managing Activities Packages (Contd.)

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**Updating a Package**

1. Click the **Manage Packages** button
2. Click **+** button
3. Click the **Save** button
4. Click the **I Accept** button in the **License Acceptance** popup

**Updating a Package:**

Update the activities package to get access to the latest features. Check the version of the packages and if the new version is available, update them by following the next steps:

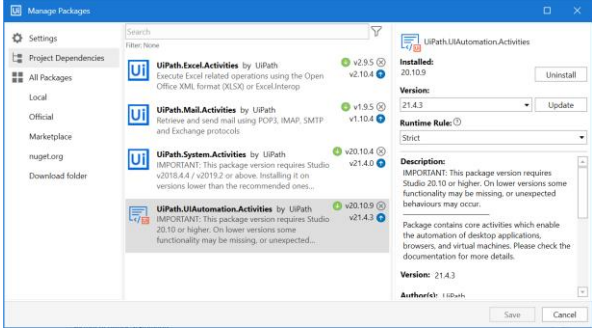
- Click the **Manage Packages** button.
- Click the 'Update this package to the latest version' button.
- Click the **Save** button.
- Click the **I Accept** button in the **License Acceptance** popup.

## Slide 72

### Managing Activities Packages (Contd.)

#### Uninstalling a Package

1. Click the **Uninstall** button
2. Click the **Save** button



**Uninstalling a Package:**


Uninstall a package by one of next steps:

- Click the 'Uninstall this package' and then the **Save** button. OR Click the **Uninstall** button and then the **Save** button.

Slide 73

### Classroom Exercise

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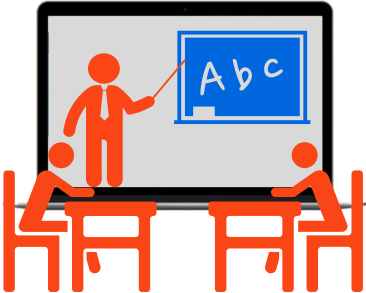
Demonstrate how to install Activity Packages.

Demonstrate how to install Activity Packages.

Slide 74

### Practice Exercise

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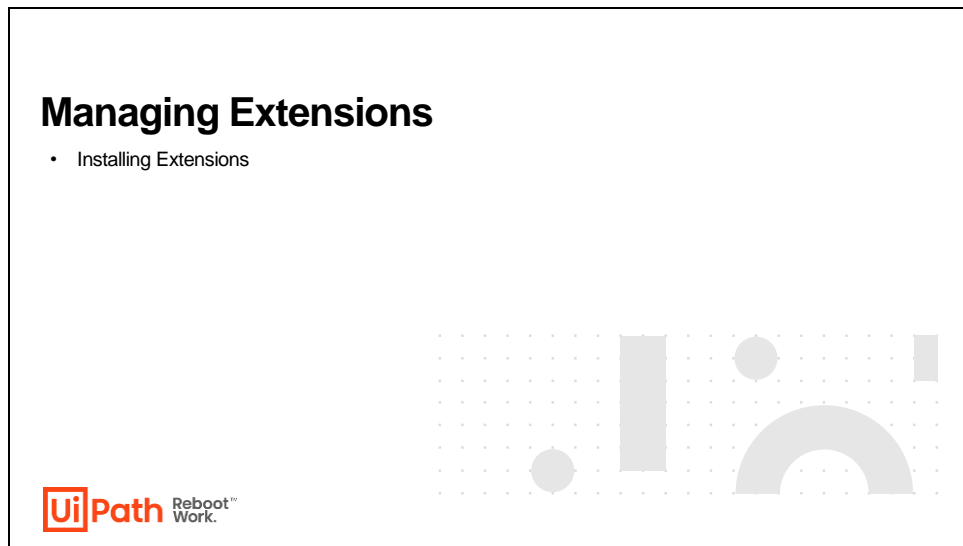
Install the following UiPath Activity Packages:

- Excel
- Email
- PDF

Install the following UiPath Activity Packages:

- Excel
- Email
- PDF

Slide 75



This section explains how to install UiPath Extensions.



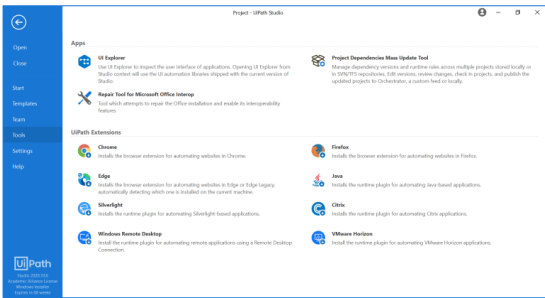
## Slide 76

## UiPath Studio Extensions

The UiPath Studio is built to automate apps that have a user interface.

Extensions broaden the automation capabilities by enabling native detection of UI elements in third party applications

1. Web Browsers (Chrome, Firefox, & Edge)
2. Java Applications
3. Silverlight Applications
4. Citrix Environments
5. Windows Remote Desktop
6. VMware Horizon



## UiPath Extensions:

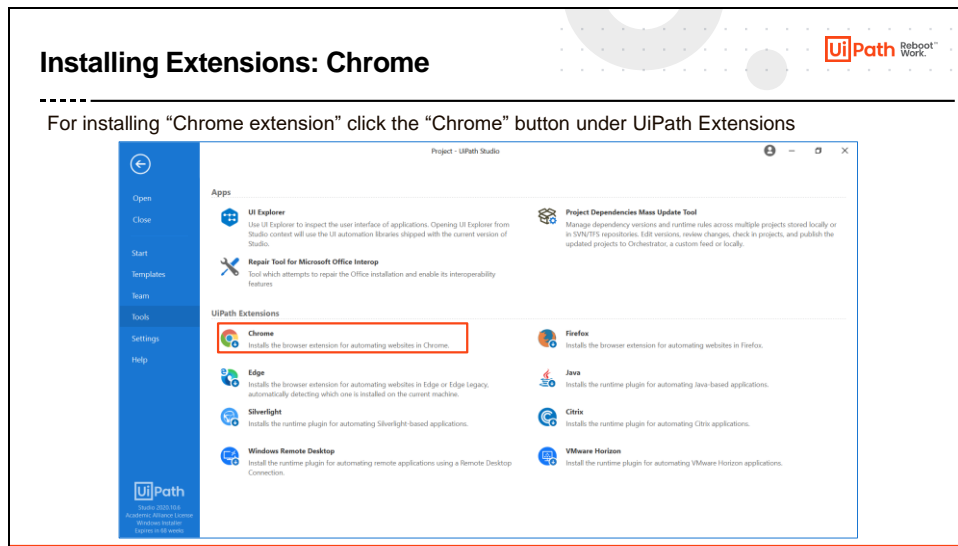
- The extensions are used to extend the automation capabilities to applications like web browsers, Java applications, Silverlight applications, and Citrix Virtual Apps and Desktops, as well as over RDP connections.
- The UiPath Studio is built to automate apps that have a user interface. However, having a dedicated extension for a certain application or environment enables native detection of UI elements, which helps to build the right selectors. Selectors are essential for building more complex automation. They contain information that is essential to identify elements and activities, by including the application, the website, the window, the name of the file, and so on.

At this point, UiPath has extensions for the following applications and environments:

- Chrome
- Firefox
- Edge
- Java
- Silverlight
- Citrix
- Windows Remote Desktop
- VMware Horizon

The UiPath extensions can be installed in several ways, including directly from Studio or using the Command Prompt.

## Slide 77

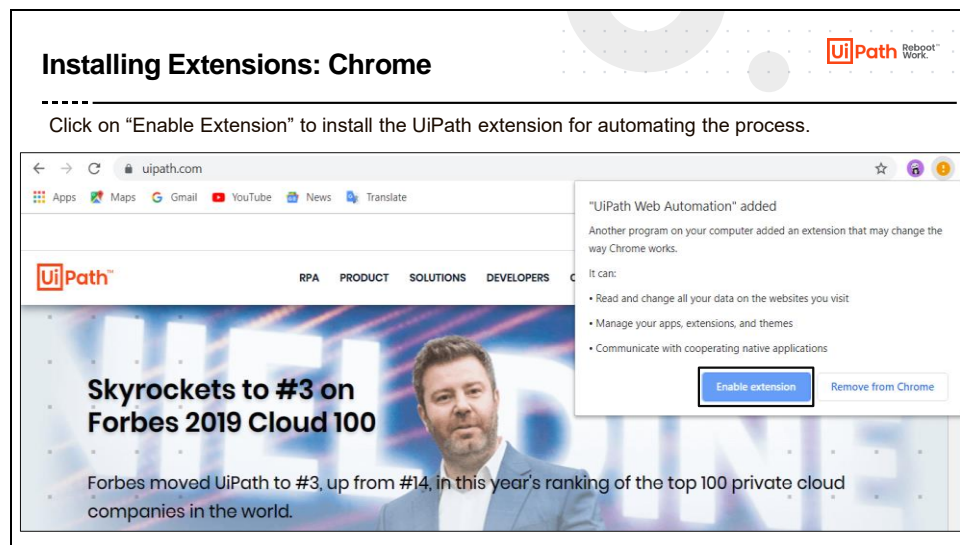


The next step is to install browser extensions. This will enable you to automate web applications. Let us look at demos for installing:

- The Chrome Extension
- The Firefox Extension

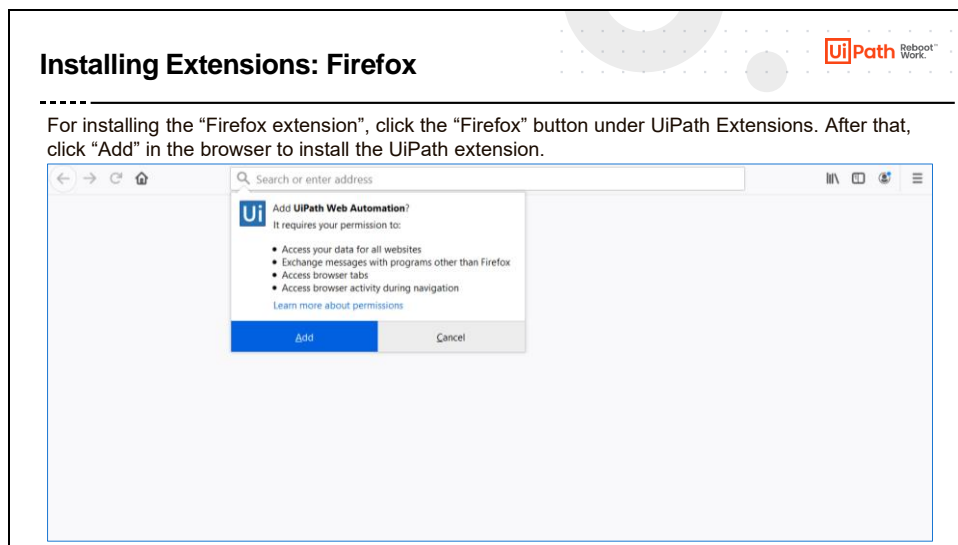
For installing **Chrome extension**, Open UiPath Studio, click on "Tools" in the Start toolbar, and click the "Chrome" button under UiPath Extensions.

## Slide 78



Now open the Chrome browser and click on the notification as shown on the screen. You will get a prompt, click on the “Enable extension” button, and installation of the Chrome extension is complete.

## Slide 79



For installing Firefox extension, Open UiPath Studio, click on “Tools” in the Start toolbar, and click the “Firefox” button under UiPath Extensions. Mozilla firefox opens up, and a confirmation pop-up is displayed. Click the “Add” button and click on “OK” to confirm. This completes the installation of the UiPath Firefox extension.


You don’t need to install the UiPath Internet Explorer extension as UiPath is compatible with Internet Explorer by default.

These extensions enable UiPath to read, change, and manage various activities in the browser.

Slide 80

## Classroom Exercise

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Demonstrate how to install UiPath Browser Extensions.

- Chrome
- Firefox

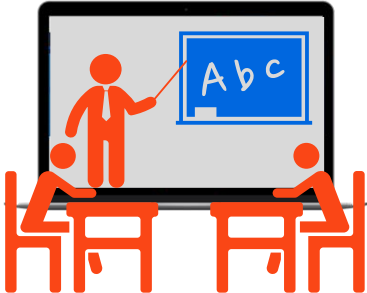
Demonstrate how to install UiPath Browser Extensions.

- Chrome
- Firefox

Slide 81

### Practice Exercise

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Install the following UiPath Browser Extensions.

- Chrome
- Firefox


Install the following UiPath Extensions:


- Chrome
- Firefox Extensions

Slide 82

## Reusing Automation Library

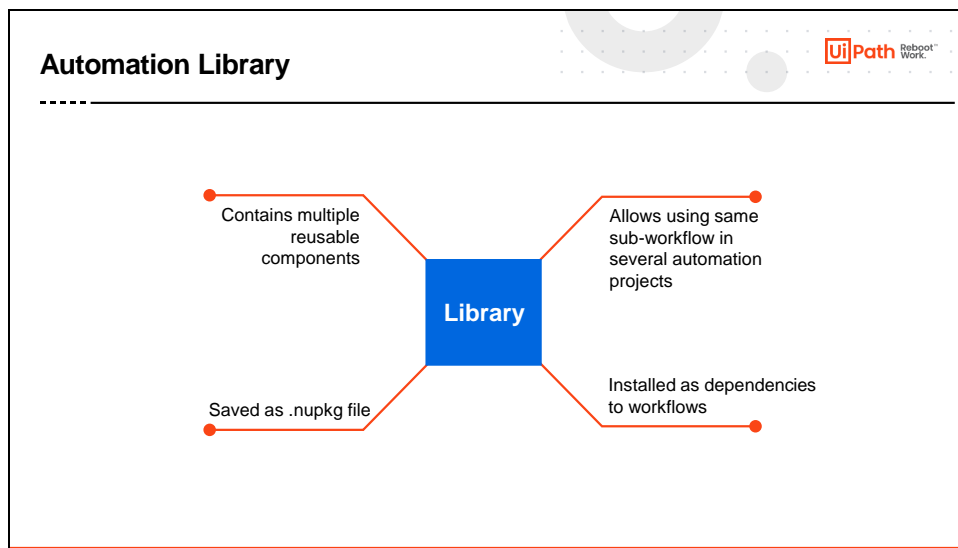
- Automation Library
- Managing Libraries
- Adding reusable components to Automation Projects





This section introduces the Automation Libraries and explains how to add reusable components to the automation projects.

## Slide 83



In many cases, certain pieces of automation (like workflows or activities) can be used again and again in other projects.

For example, a sub-workflow where an invoice is being read using OCR (Optical Character Recognition) can be useful in many projects such as payments, account statements, bank settlements, etc.

For these scenarios, the developer can create the sub-workflow and save it for use in different and separate projects. These sub-workflows are saved as **Libraries** that are created by developers to reuse the components of one project in other automation.

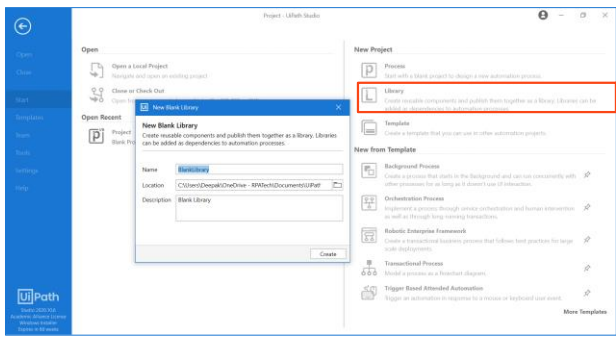
A Library can contain multiple reusable components.

Libraries are saved as .nupkg files. They can be installed as dependencies to workflows using the Package Manager.



## Slide 84

## Managing Libraries



**Creating Libraries**

- Home Ribbon > Start > Library
- Add name & location for Library > Create

From a functional point of view, Libraries are similar to any other activity package:

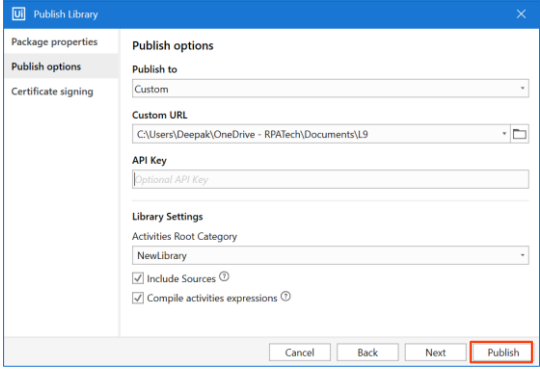
- Libraries can be created using the Library option in the Start Tab of Home Ribbon, once the developer has at least one such reusable component. The rest of the steps are the same as for a regular project. The reusable components can be grouped so that retrieving the components would be easy.

## Slide 85

## Managing Libraries

### Publishing Libraries

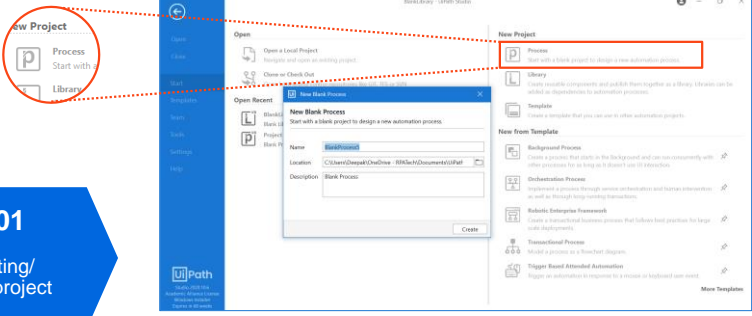
- Design Ribbon > Publish
- Choose the publish location
- Specify the Activities Root Category and check Include Sources



- Publishing Libraries is similar to publishing regular projects – set the feed, input release notes, and set the Activities Root Category and check Include Sources (this is helpful during debugging workflows). The reusable components are available in the Project Panel.

## Slide 86

## Adding reusable components to automation projects



**Step 01**  
Open existing/  
create new project

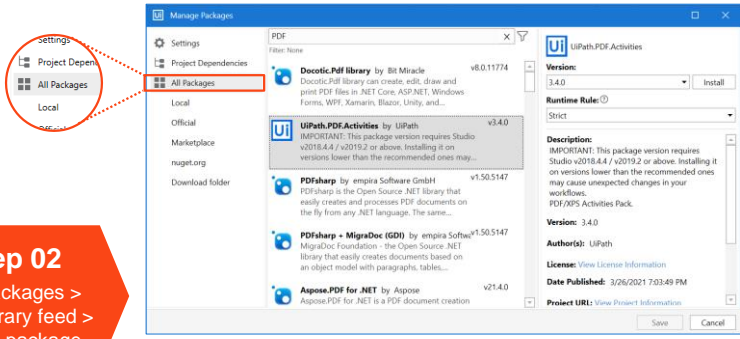
The screenshot shows the UiPath Studio interface. On the left sidebar, the 'New Project' button is circled in red. A red dashed line connects this button to the 'New Project' dialog box in the center. The dialog box has a 'Process' tab selected, and the 'New Blank Process' dialog is open. The 'Name' field is set to 'BlankProcess', and the 'Location' is set to 'C:\Users\Deepak\OneDrive - IBM\Documents\UiPath\'. The 'Description' field is set to 'Blank Process'. The 'Create' button is visible at the bottom right of the dialog box. On the right side of the main window, there is a 'New From Template' section with various templates like 'Background Process', 'Orchestration Process', 'Robotic Enterprise Framework', 'Transactional Process', and 'Trigger Based Automated Automation'.

To add the reusable components to new automation projects, follow the following steps:

- Open or create a new project.

## Slide 87

### Adding reusable components to automation projects

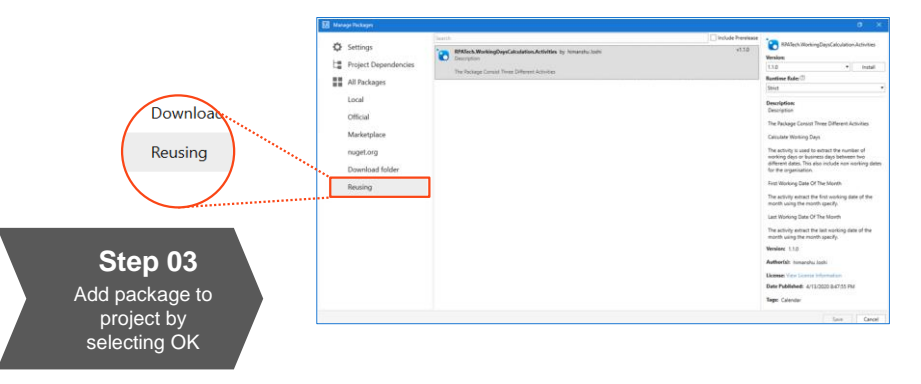


**Step 02**  
All Packages >  
pick library feed >  
install package

2. Under the **All Packages** category, pick the feed under which the library is saved and install the package.

## Slide 88

### Adding reusable components to automation projects



The screenshot shows the 'Package Manager' window in UiPath. The 'Reusing' tab is selected, and the 'Reusing' button is highlighted. A callout box points to the 'Reusing' tab with the text 'Step 03 Add package to project by selecting OK'.

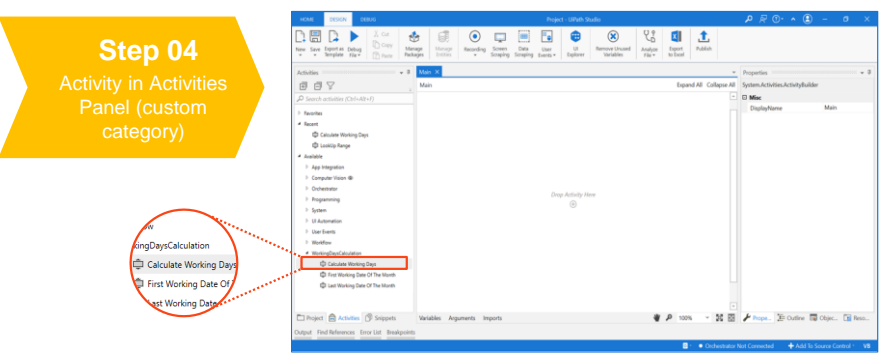
3. Select **OK** to add the package to the project definition.

## Slide 89

### Adding reusable components to automation projects

-----

**Step 04**  
Activity in Activities Panel (custom category)




The screenshot shows the UiPath Studio interface. On the left, the 'Activities' panel is open, displaying a list of activities. A yellow callout box labeled 'Step 04' points to the 'Calculate Working Days' activity, which is highlighted in the 'Custom' category. The activity is also shown in the 'Main' canvas. The 'Calculate Working Days' activity is a custom activity, as indicated by the 'Custom' category label. The activity is also shown in the 'Main' canvas, where it is labeled 'Drop Activity Here'.

4. The activity is found in the **custom category** of the **Activities** panel.

Slide 90

### Classroom Exercise

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Demonstrate how to install and use Automation Library in UiPath.

Demonstrate how to install and use Automation Library in UiPath.

Slide 91

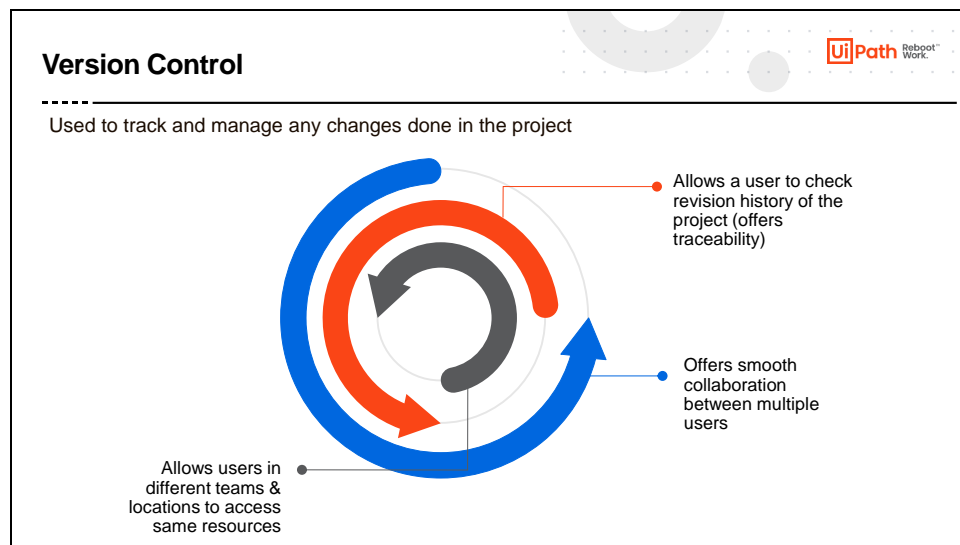
## Version Control

- About Version Control
- Managing projects with GIT
- Managing projects with TFS
- Managing projects with SVN
- Context menu

This section gives a brief about Version Control.



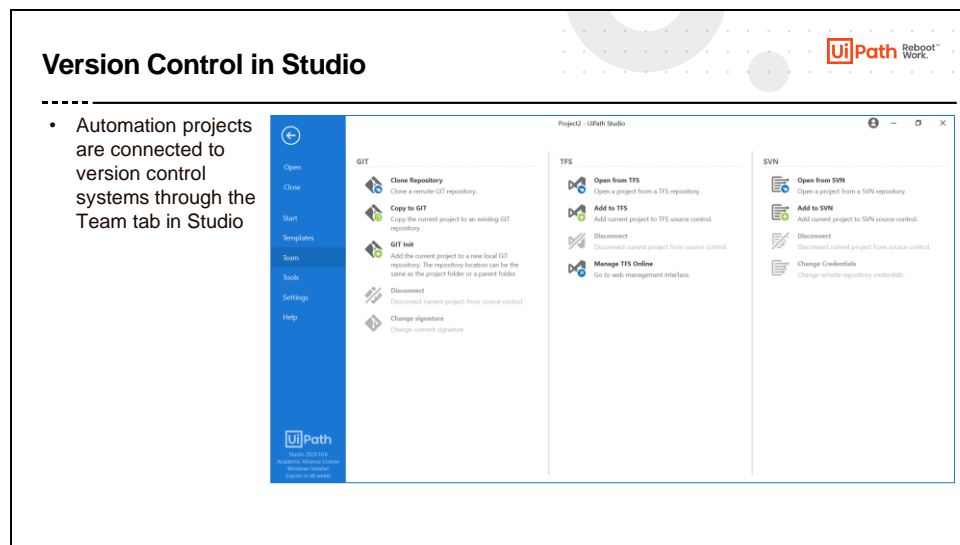
## Slide 92



Version control (or source control) is an important aspect in the development phases of a project. It is used to track and manage any changes done in the project code. Through version control systems, the users can check the history of all revisions done to the project and act as a center for storing all different versions. Thus, it offers traceability.

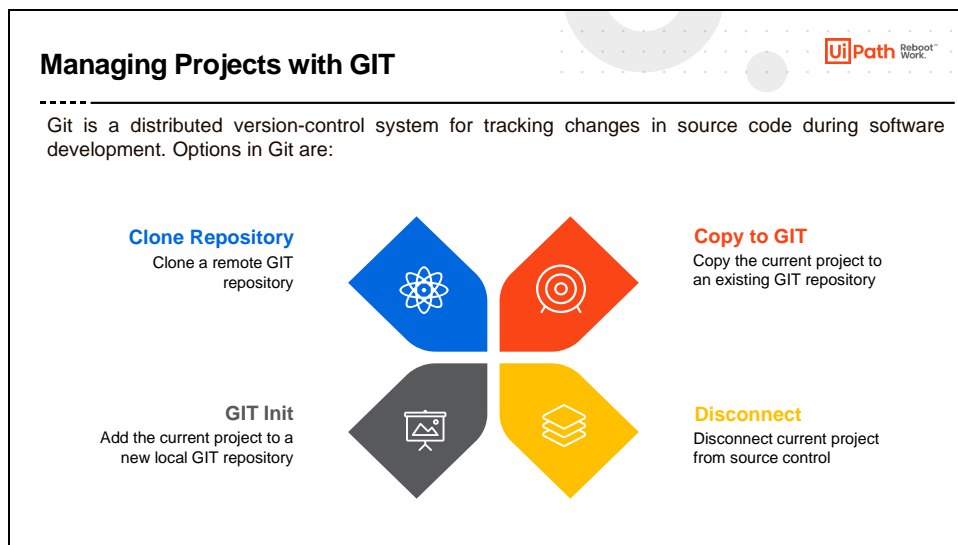
Version control systems are helpful in smooth collaboration between multiple users when developing larger projects. In these projects, it's easy to miss the last version or to go back to a previous version when needed. Source control systems allow users in different teams and locations to access the same resources and work on the same project fields.

## Slide 93



Automation projects are connected to version control systems **GIT, TFS, SVN** through the **Team** tab in the **Home ribbon** in Studio. The user can connect to only one control system at a time.

## Slide 94




1. GIT: Git is a distributed version-control system for tracking changes in source code during software development.

Here, the options are:

- Clone Repository: Clone a remote GIT repository.
- Copy to GIT: Copy the current project to an existing GIT repository.
- GIT Init: Add the current project to a new local GIT repository. The repository location can be the same as the project folder or a parent folder.
- Disconnect: Disconnect current project from source control.
- Change Signature: Used to change commit signature.

Slide 95

## Managing Projects with GIT



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**Cloning a remote repository**

1. Start tab > Team > Clone Repository > Clone with HTTPS or Use SSH
2. Type Repository URL > Choose empty Check out directory
3. Click Use Credentials (Add Git Username & password)
4. Click Open
5. Select project.json to open in Studio

**Copying project to GIT**

1. Team tab > Copy to GIT
2. Pick the existing GIT repository folder
3. Select Yes in Copy to GIT message box

**GIT**

-  **Clone Repository**  
Clone a remote GIT repository.
-  **Copy to GIT**  
Copy the current project to an existing GIT repository.
-  **GIT Init**  
Add the current project to a new local GIT repository. The repository location can be the same as the project folder or a parent folder.
-  **Disconnect**  
Disconnect current project from source control.
-  **Change signature**  
Change commit signature.

## Managing projects with GIT:

### Cloning a Remote GIT Repository

- In the Team tab, select Clone Repository. The Clone a remote GIT repository window is displayed.
- Pick from Clone with HTTPS or Use SSH.
- Type in the Repository URL and choose an empty Check out directory.
- Click the Use Credentials or Use Key checkbox to add your Git username or Private Key Path, and password.
- Click Open, Studio opens the project in the Designer panel.
- In the Open window, select a project.json file to open in Studio.

### Copying project to GIT

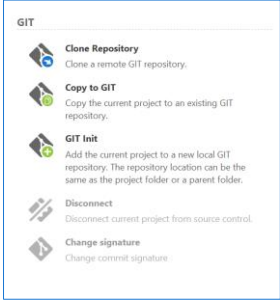
- Team tab > Copy to GIT
- Pick the existing GIT repository folder
- Select Yes in Copy to GIT message box

## Managing Projects with GIT (Contd.)

### Adding a Project

**GIT Init** feature adds the current project to a local GIT repository

1. Create or open a project in Studio.  
Click the Start tab > Team > GIT Init
1. Select the path to initialize repository
2. Select project files to add to repository in the Commit Changes window
3. Click the Commit and Push button
4. Use Copy to GIT button (to copy current project to existing GIT repository)
5. Use the Disconnect option to remove subversion tag (to disconnect from GIT)



The screenshot shows the GIT menu in UiPath Studio. It includes options: Clone Repository (Clone a remote GIT repository), Copy to GIT (Copy the current project to an existing GIT repository), GIT Init (Add the current project to a new local GIT repository. The repository location can be the same as the project folder or a parent folder), Disconnect (Disconnect current project from source control), and Change signature (Change commit signature).


GIT Init feature adds the current project to a local GIT repository. To add a project

- Create or open a project in Studio. Click the Start tab > Team > GIT Init
- Select the path to initialize the repository
- In the Commit Changes window, select project files to add to repository
- Click the Commit and Push button to commit changes & push to the remote repository
- To copy the current project to existing GIT repository, use the Copy to GIT button
- To disconnect from GIT, use the Disconnect option to remove the subversion tag

For more details, visit: <https://docs.uipath.com/studio/v2020.10/docs/managing-projects-git>

Slide 97

## Managing Projects with TFS



---

**Managing a Project**





**Set up TFS in Studio**

1. Team tab > Open from TFS/ Add to TFS
2. Click Servers in Connect to Azure DevOps Server window
3. Click Add in Add/Remove Azure DevOps Server window
4. Fill repository details

**Open a Project from TFS**

1. Team tab > Open from TFS
2. Pick server to access from drop-down menu under the Select a Team Foundation Server (in Connect to Azure DevOps Server window)
3. Pick team project collection & team project > Connect
4. Pick a Check out directory

**TFS**

-  **Open from TFS**  
Open a project from a TFS repository.
-  **Add to TFS**  
Add current project to TFS source control.
-  **Disconnect**  
Disconnect current project from source control.
-  **Manage TFS Online**  
Go to web management interface.

Team Foundation Server (TFS) is the source code management established by Microsoft, used for the project and release management.

Here, the options are:

- **Open from TFS:** Open a project from a TFS repository. It contains two blocks: Team Project Collection & Team Project.
- **Add to TFS:** Add current project to TFS source control.
- **Disconnect:** Disconnect current project from source control.
- **Manage TFS Online:** Go to the web management interface.

### Managing a project with TFS:

#### Set up TFS in Studio:

- Team tab > Open from TFS/ Add to TFS
- Click Servers in Connect to Azure DevOps Server window
- Click Add in Add/Remove Azure DevOps Server window
- Fill repository details

#### Open a Project from TFS:

- Team tab > Open from TFS
- Pick server to access from the drop-down menu under the Select a Team Foundation Server (in Connect to Azure DevOps Server window)
- Pick team project collection & team project > Connect
- Pick a Check out directory

Slide 98

## Managing Projects with TFS (Contd.)

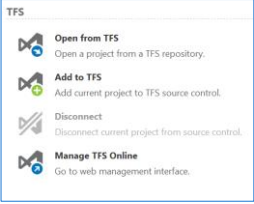
### Managing a Project

#### Add a Project to TFS

1. Create/open project. Click Start > Team > Add to TFS button
2. Pick Server to access, team project collection & team project in Connect to Azure DevOps Server window > Connect
3. Provide path in Remote subfolder > Select .xaml file > Pick Check out directory > Add
4. In the Check in Changes window, select files to check in > Click Check In

#### Editing & Checking in changes

1. Connect project to TFS repository
2. Select Check Out for Edit for an .xaml file
3. Select Check In for the file. Check In window displays
4. Review changes, check Show Unversioned Files box
5. Click Check In
6. Click Start > Team > Disconnect



### Add a Project to TFS

- Create/open project. Click Start > Team > Add to TFS button
- Pick Server to access, team project collection & team project in Connect to Azure DevOps Server window > Connect
- Provide path in Remote subfolder > Select .xaml file > Pick Check out directory > Add
- In the Check in Changes window, select files to check in > Click Check In

### Editing & Checking in changes

- Connect project to TFS repository
- Select Check Out for Edit for a .xaml file
- Select Check In for the file. Check In window displays
- Review changes, check Show Unversioned Files box
- Click Check In. The latest version is now available in the repository.
- Click Start > Team > Disconnect

For more details, refer: <https://docs.uipath.com/studio/v2020.10/docs/managing-projects-tfs>

Slide 99

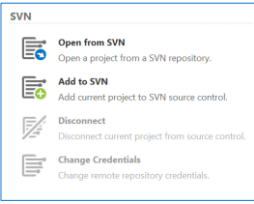
## Managing Projects with SVN

---

### Managing a Project

**Open a Project from SVN**

1. Team tab > Open from SVN
2. Open repository browser, select a file to open.
3. Pick empty Check Out directory, fill Username & Password in Use credentials box
4. Pull main.xaml file from repository by choosing from two options
  - Check out latest and edit
  - Open local as read only



3. Apache Subversion (SVN) is a software versioning and revision control system distributed as open source.

Here, the options are:

- Open from SVN: Open a project from an SVN repository.
- Add to SVN: Add current project to SVN source control.
- Disconnect: Disconnect current project from source control.

Managing a Project with SVN:

Open a project:

- Team tab > Open from SVN to access **Open from SVN Repository** window
- Open repository browser, select a file to open.
- Pick empty Check Out directory, fill Username & Password in Use credentials box. Click Ok. The project is now available in the check out directory.
- Pull main.xaml file from the repository by choosing from two options
  - Check out latest and edit: opens the latest version of the Main.xaml file from the repository, in edit mode.
  - Open local as read only:



## Managing Projects with SVN (Contd.)

### Managing a Project

#### Add a Project to SVN

1. Create/open project. Click Start > Team > Add to SVN button
2. Open repository browser, select a file to open.
3. Pick empty Check Out directory, fill Username & Password in Use credentials box > Click Add
4. In the Check in Changes window, select files to add to repository > Click Check In

#### Editing & Checking in changes

1. Connect project to SVN repository
2. Select Check Out for Edit for an .xaml file
3. Select Check In for the file. Check In window displays
4. Review changes, check Show Unversioned Files box
5. Click Check In
6. Click Start > Team > Disconnect

### SVN

- Open from SVN**  
Open a project from a SVN repository.
- Add to SVN**  
Add current project to SVN source control.
- Disconnect**  
Disconnect current project from source control.
- Change Credentials**  
Change remote repository credentials.

### Add a Project to SVN:

- Create/open project. Click Start > Team > Add to SVN button
- Open repository browser, select a file to open.
- Pick empty Check Out directory, fill Username & Password in Use credentials box > Click Add
- In the Check in Changes window, select files to add to repository > Click Check In. The files are now available in the repository

### Editing & Checking in changes:

- Connect project to SVN repository
- Select Check Out for Edit for an .xaml file
- Select Check In for the file. Check In window displays
- Review changes, check Show Unversioned Files box
- Click Check In
- Click Start > Team > Disconnect

For more details, refer: <https://docs.uipath.com/studio/v2020.10/docs/managing-projects-svn>

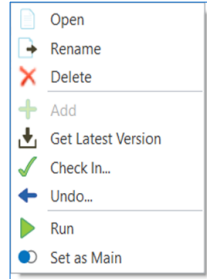
## Slide 101

### Context Menu for TFS & SVN

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The context menu options are:

<b>Open</b>	Opens the selected .xaml file in the Designer panel
<b>Rename</b>	Enables you to rename the selected file or folder, and opens the Rename Item window
<b>Delete</b>	Deletes the selected item (only from your local machine)
<b>Check Out Latest For Edit</b>	Marks the selected file or folder as locked for editing
<b>Finish Editing</b>	Checks in the project.json file in the repository, together with the changes and a commit message
<b>Add</b>	Uploads the selected item to the TFS/SVN server
<b>Get Latest Version</b>	Downloads the latest version of the item from the repository
<b>Show Changes</b>	Compares changes between versioned and locally mapped files
<b>Check In</b>	Displays the Check In Changes window and enables you to upload the selected item to the server as the newest version
<b>Undo</b>	Displays the Undo Pending Changes window and enables you to Revert the changes done to the project
<b>Run</b>	Runs the selected workflow
<b>Set as Main</b>	Sets the selected .xaml file as Main in the project



Once a connection with a TFS or SVN repository has been established, you can access the project files via a project panel, that offers the following context menu options:

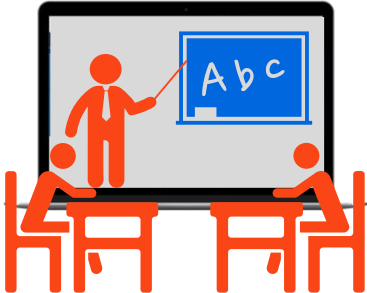
- **Open:** Opens the selected .xaml file in the Designer panel, in read-only mode if it was not checked out for edit from the TFS/SVN repository.
- **Rename:** Enables you to rename the selected file or folder and opens the Rename Item window. When checking in the renamed .xaml file, the previously modified version must also be checked in.
- **Delete:** Deletes the selected item only from your local machine. The latest checked in version of the file is still available in the TFS/SVN repository.
- **Check Out For Edit:** Marks the selected file or folder as locked for editing. Checking out a file locks it on the server so that no one else can edit it.
- **Finish Editing:** Checks in the project.json file in the repository, together with changes and a commit message.
- **Add:** Uploads the selected item to the TFS/SVN server. This option is not available if the item was previously uploaded to the server.
- **Get Latest Version:** Downloads the latest version of the selected item from the TFS/SVN repository.
- **Show changes...:** Opens the File Diff to compare changes between the versioned file and the one mapped locally.
- **Check In:** Displays the Check In Changes window and enables you to upload the selected item to the server as the newest version. The .xaml file must be saved before uploading it. After it's checked in, the file becomes read-only in Studio.
- **Undo:** Displays the Undo Pending Changes window and enables you to Revert the changes done to the project, either revert modified files to previous or unversioned states or retrieve files that were deleted from the local machine. Changes cannot be reverted after the file was checked in.

- **Run:** Runs the selected workflow, even if it's not checked out or added to the repository.
- **Set as Main:** Sets the selected .xaml file as Main in the project. The first created .xaml is set as Main by default.


Slide 102

### LAB Exercise

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Connect your project to TFS.





Connect your project to TFS.

Slide 103

## Introduction to Automation Debugging

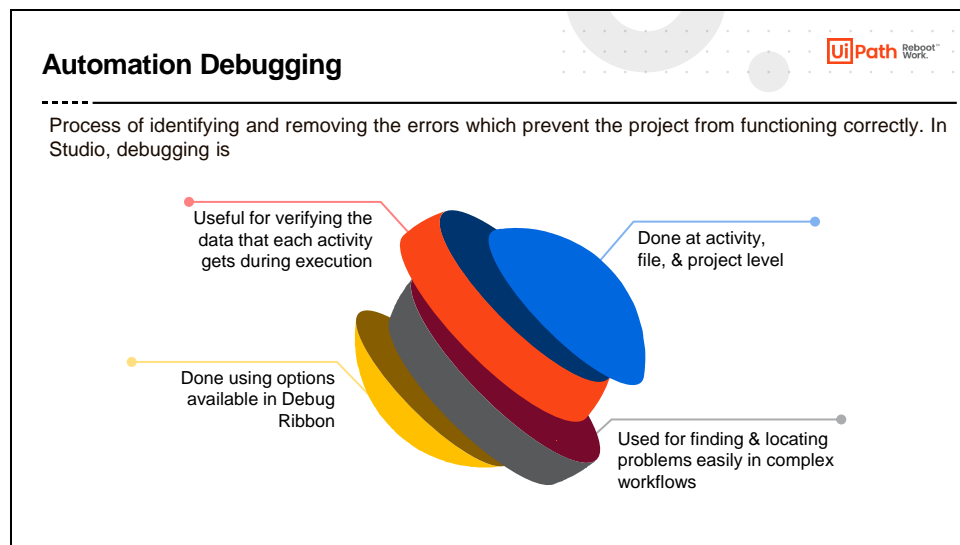
- Automation Debugging
- Debugging Activities
- Debugging Panels
- Common automation issues





This section explains Automation Debugging in detail.

Slide 104



Software development projects will rarely be perfect. There may be errors of various kinds which may hamper the project's execution. Debugging is the process of identifying and removing these errors (which prevent the project from functioning correctly) from a given project.

Debugging is done at the activity, file, and project level during the design stage of the automation project.

Studio offers a debugging component that enables finding and locating problems easily in complex workflows. This is useful for viewing the execution of each activity, verifying what data it gets, and checking if there are errors in producing outputs. It provides a real-time engine that checks for errors while working with the workflow.

There are several options available for performing debugging and these are defined in the Debug Ribbon.

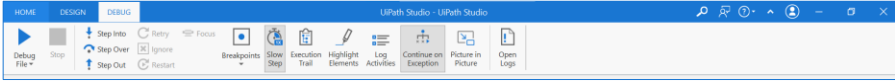
Also, the debugging process can be easily viewed using several available panels which also allow the user to add values and monitor variables and arguments.

The tool encapsulates whenever an activity has errors, UiPath Studio Process Designer notifies and gives you details about the issues encountered.

## Slide 105

## Debugging Activities

The activities for debugging are:



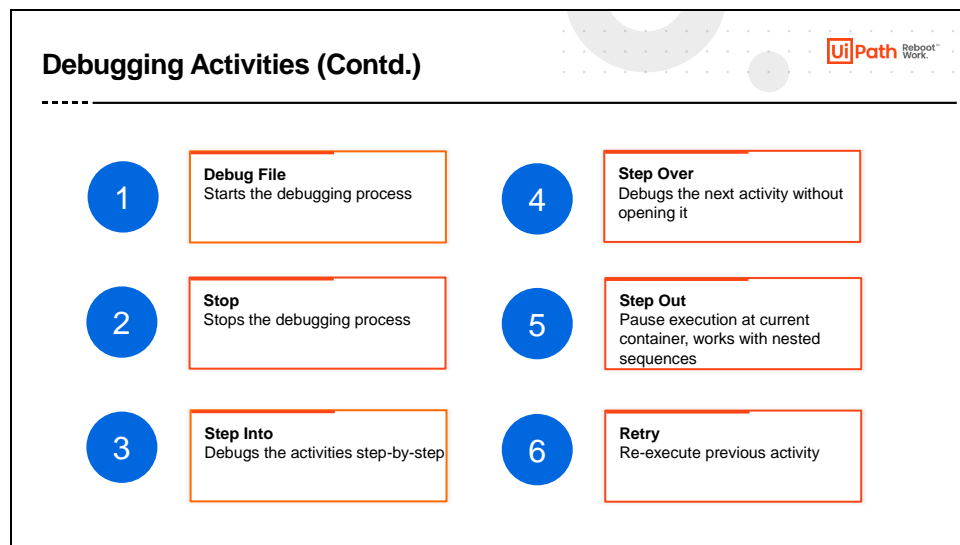
- Debug File
- Stop
- Step Into
- Step Over
- Step Out
- Retry
- Ignore
- Restart
- Focus
- Breakpoints
- Slow Step
- Execution Trail
- Highlight Elements
- Log Activities
- Continue on Exception
- Picture in Picture
- Open Logs

The Debug tabs allow the user to perform debugging of a single file or the whole project. The image shows the Debug ribbon. The ribbon consists of several debugging activities. These are:

- Debug File
- Stop
- Step Into
- Step Over
- Step Out
- Retry
- Ignore
- Restart
- Focus
- Breakpoints
- Slow Step
- Execution Trail
- Highlight Elements
- Log Activities
- Continue on Exception
- Picture in Picture
- Open Logs

These activities are explained in the subsequent slides.

Slide 106



- **Debug File**  
Starts the debugging process.

- **Stop**  
Stops the debugging process.

- **Step Into**  
Step Into is the functionality to be used when the user wants to closely analyze activities while debugging step-by-step. When this action is triggered, the debugger opens and highlights activities in any container in the workflow, such as flowcharts, sequences, or **Invoke Workflow File** activities.  
On using Step Into with Invoke Workflow File activities, it opens the workflow in a new tab in Read Only mode. Then each activity is executed one by one.

- **Step Over**  
Unlike the Step Into action, Step Over does not open the current container. When used, the action debugs the next activity, highlighting containers (such as flowcharts, sequences, or Invoke Workflow File activities) without opening them.  
This action comes in handy for skipping analysis of large containers which are unlikely to trigger any issues during execution.

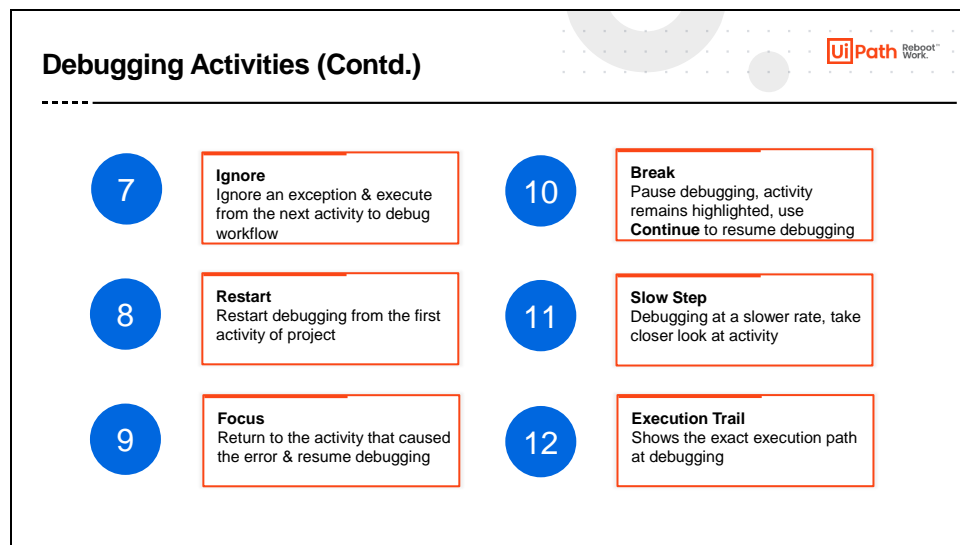
- **Step Out**  
This action is used for stepping out and pausing the execution at the level of the current container. Step Out completes the execution of activities in the current container, before pausing the debugging. This option works well with nested sequences.

- **Retry**



Retry re-executes the previous activity and throws the exception if it's encountered again. The activity which threw the exception is highlighted and details about the error are shown in the Locals and Call Stack panels.

## Slide 107



- Ignore

The Ignore action can be used to ignore an encountered exception and continue the execution from the next activity so that the rest of the workflow can be debugged. This action is useful when jumping over the activity that threw the exception and continuing debugging the remaining part of the project.

- Restart

Restart is available after an exception was thrown and the debug process is paused. The action is used for restarting the debugging process from the first activity of the project. Use Slow Step to slow down the debugging speed and properly inspect activities as they are executed.

Please take into consideration that when using this option after using the Run from this Activity action, the debugging is restarted from the previously indicated activity.

- Focus

Focus Execution Point helps you return to the current breakpoint or the activity that caused an error during debugging. The Focus button is used after navigating through the process, as an easy way to return to the activity that caused the error and resume the debugging process.

It is used for returning to said breakpoint, after navigating through activities contained in the automation process.

- Break

Break allows you to pause the debugging process at any given moment. The activity which is being debugged remains highlighted when paused. Once this happens, you can choose to Continue, Step Into, Step Over, or Stop the debugging process.

- Slow Step

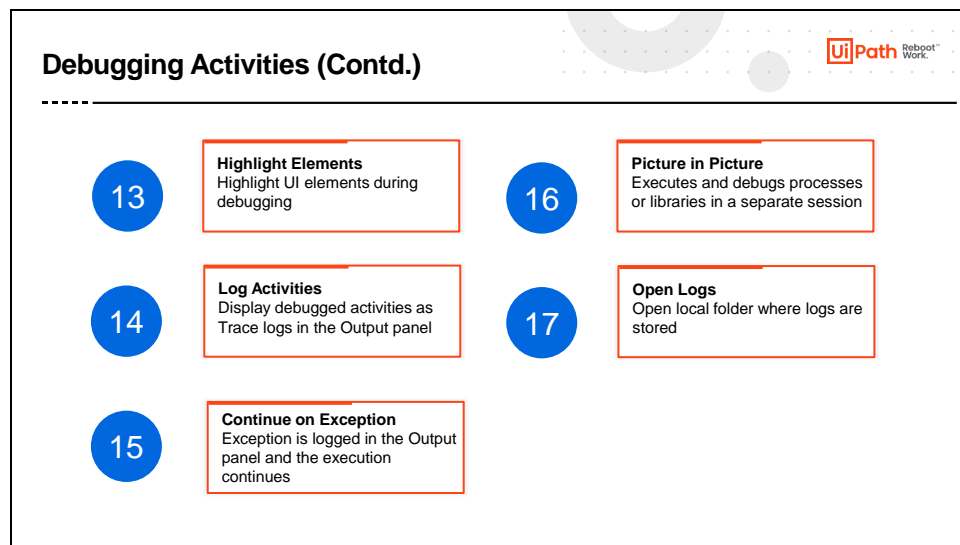
Slow Step enables you to take a closer look at any activity during debugging. While this action is enabled, activities are highlighted in the debugging process. Moreover, containers such as flowcharts, sequences, or Invoke Workflow File activities are opened. This is similar to using Step Into, but without having to pause the debugging process.

Slow Step can be activated both before or during the debugging process. Activating the action does not pause debugging.

Although called Slow Step, the action comes with 4 different speeds. The selected speed step runs the debugging process slower than the previous one. For example, debugging with Slow Step at 1x runs it the slowest, and fastest at 4x. In other words, the speed dictates how fast the debugger jumps from one activity to the next. Each time Slow Step is clicked, the speed changes by one step.

- Execution Trail

It shows the exact execution path at debugging. As the process is executed, each activity is highlighted and marked in the Designer panel, showing you the execution as it happens.



- **Highlight Elements**

If enabled, UI elements are highlighted during debugging. The option can be used both with regular and step-by-step debugging.

- **Log Activities**

If enabled, debugged activities are displayed as Trace logs in the Output panel. Note that Highlight Elements and Log Activities options can only be toggled before debugging and persist when reopening the automation project. This is not applicable for invoked workflows unless these files are opened in the Designer panel.

Logs are automatically sent to Orchestrator if connected, but you can have them stored locally by disabling the Allow Development Logging option from the Settings tab in the Add or Edit Robot window.

Disabling Log Activities can be a way to send smaller log files to Orchestrator.

By default, the debugger logs activities so that each step appears in the Output panel.

- **Continue on Exception**

When enabled, the exception is logged in the Output panel, the execution continues.

- **Picture in Picture**

Executes and debugs processes or libraries in a separate session

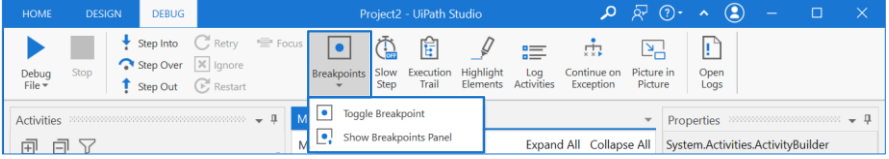
- **Open Logs**

Clicking Open Logs brings up the %localappdata%\UiPath\Logs folder where logs are locally stored. The naming format of log files is YYYY-DD-MM\_Component.log (such as 2018-09-12\_Execution.log, or 2018-09-12\_Studio.log).

For more details visit: <https://docs.uipath.com/studio/v2020.10/docs/debugging-actions#break>

## Slide 109

### Setting Breakpoints



- **Breakpoints**
  - Used when the user wants to pause the debugging process at a specific activity (that causes execution issue)
  - User identifies & corrects the error
  - Resume

**Breakpoints** are used to purposely pause the debugging process on an activity that may trigger execution issues. You can place a breakpoint on any activity as follows:

### Setting Breakpoint

It is used when the user wants to pause the program at a specific location. Once the toggle breakpoint is set to an activity, the program will run till that activity but not execute it. Once the execution is paused, the user can see the current value of the variables, the current state of the workflow, identify and correct the error causing element.

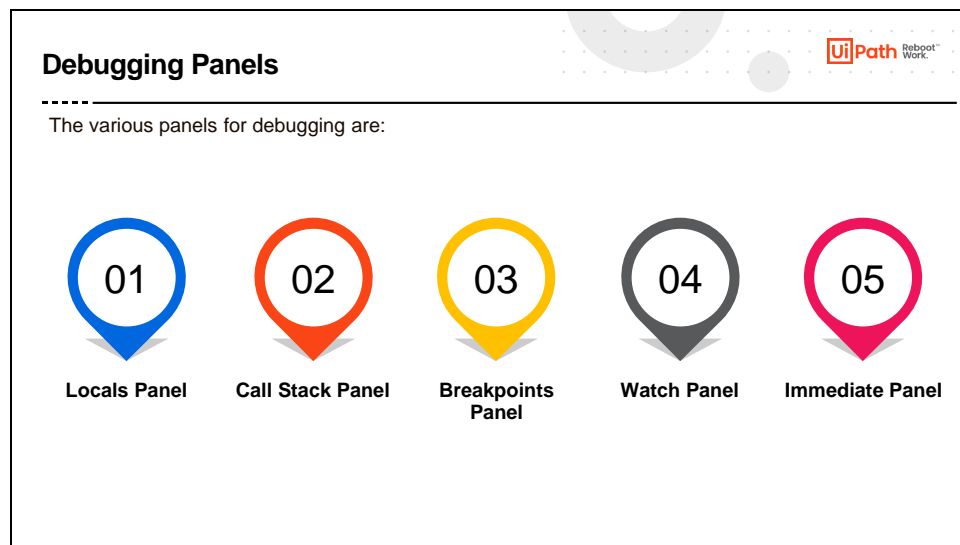
The user can choose to Continue, Step Into, Step Over, or Stop the debugging process.

### Enable Breakpoint

- Select the activity until the point which you don't want to execute in the project.
- Right-click and choose toggle breakpoint.

Resume the activity.

## Slide 110



In Robotic Process Automation, various tools have been provided by UiPath Studio for debugging. These tools are helpful to check the workflow of the programming structure and find the exception. Apart from this, debugging also helps in checking the execution process of each data that is validated or checked.

There are five panels available for debugging in UiPath Studio. These are:

- Locals Panel
- Call Stack Panel
- Breakpoints Panel
- Watch Panel
- Immediate Panel

These panels are explained in the subsequent slides.

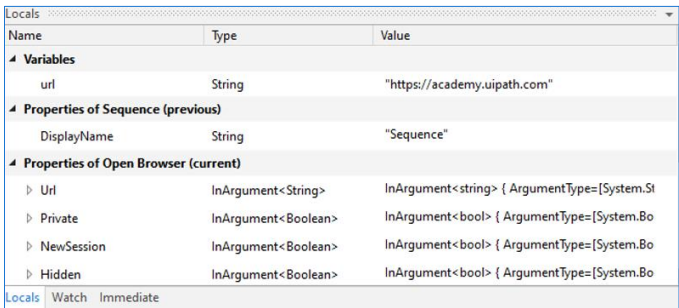
## Slide 111

## Locals Panel

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**The Locals Panel**

- Displays properties or activities & user-defined variables & arguments
- Visible only while debugging



Name	Type	Value
<b>Variables</b>		
url	String	"https://academy.uipath.com"
<b>Properties of Sequence (previous)</b>		
DisplayName	String	"Sequence"
<b>Properties of Open Browser (current)</b>		
Url	InArgument<String>	InArgument<string> { ArgumentType=[System.Si
Private	InArgument<Boolean>	InArgument<bool> { ArgumentType=[System.Bo
NewSession	InArgument<Boolean>	InArgument<bool> { ArgumentType=[System.Bo
Hidden	InArgument<Boolean>	InArgument<bool> { ArgumentType=[System.Bo

**The Locals panel** displays properties or activities and user-defined variables and arguments. The panel shows:

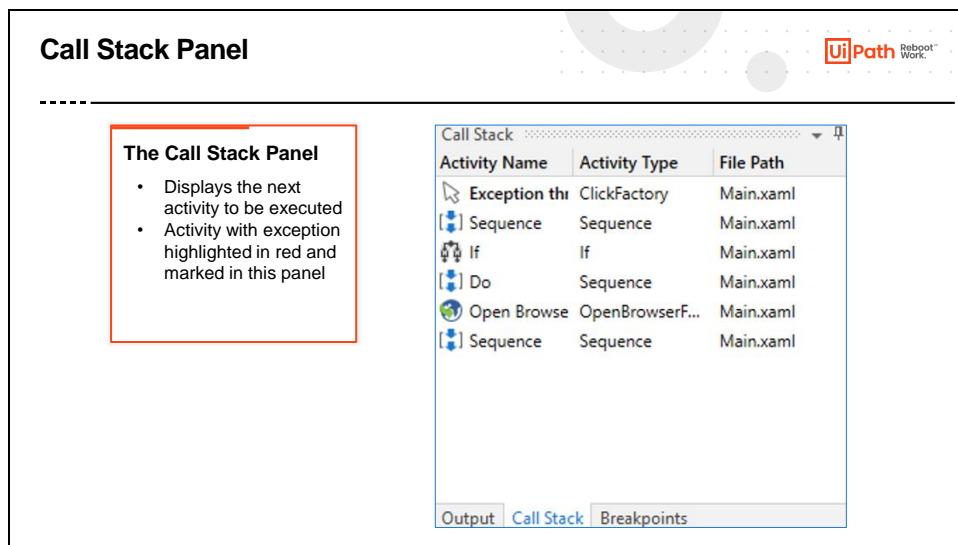
- Exceptions - the description and type of the exception.
- Arguments
- Variables
- Properties of previously executed activity - only input and output properties are displayed.
- Properties of current activity

The panel is only visible while debugging. Right-click an argument, variable or property of the currently executing activity to add it to the Watch panel and monitor its execution throughout the debugging process.

The Arguments, Properties, and Variables categories can be collapsed or expanded. The same is available for complex objects, which are displayed in a tabular way.



## Slide 112



**The Call Stack panel** displays the next activity to be executed and its parent containers when the project is paused in debugging.

The panel is displayed during execution in debug mode and it gets populated after using Step Into, Break, Slow Step, or after the execution was paused because an error or a breakpoint was encountered.

Double-clicking an item in the Call Stack panel focuses and highlights the selected activity in the Designer panel.

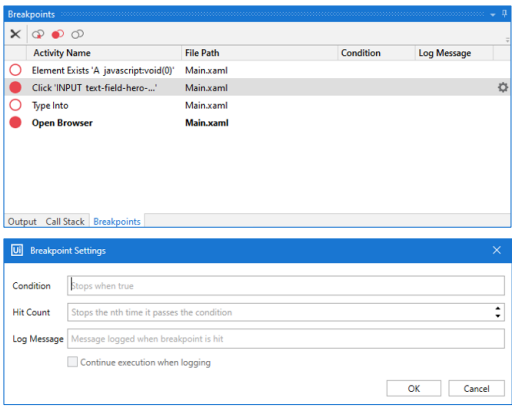
If during debugging, an activity throws an exception, it is marked in the Call Stack panel, and the activity is highlighted in red.

## Slide 113

## Breakpoints Panel

**The Breakpoints Panel**

- Breakpoints pause debugging on activity causing execution issue
- Displays all breakpoints in the current project
- Breakpoint Settings: individually adjusted for each toggled breakpoint part
  - Condition
  - Hit Count
  - Log Message



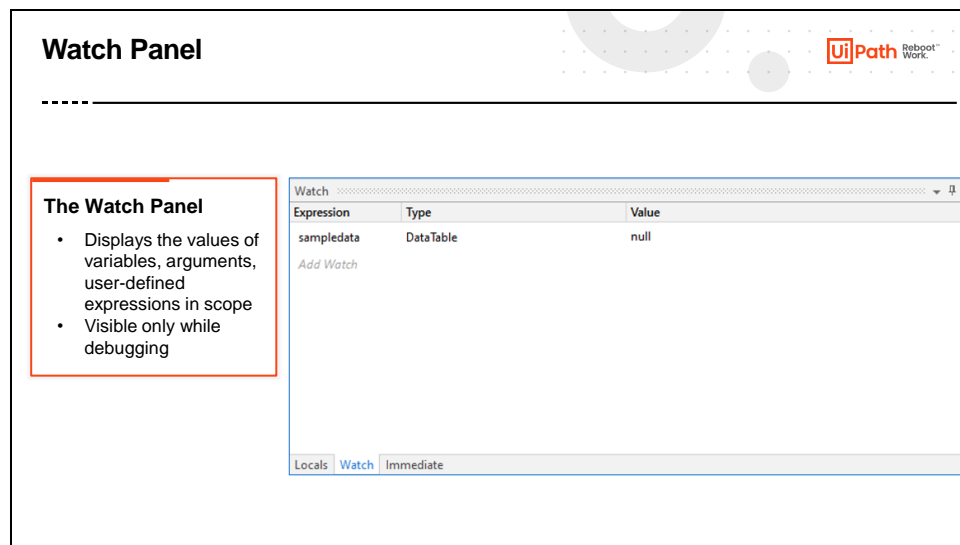
The screenshot shows the 'Breakpoints' panel in the UiPath IDE. It contains a table with columns: Activity Name, File Path, Condition, and Log Message. The table lists four breakpoints: 'Element Exists 'A javascriptvoid(0)'' (Main.xaml), 'Click 'INPUT text-field-hero-...' (Main.xaml), 'Type Into' (Main.xaml), and 'Open Browser' (Main.xaml). Below the table, the 'Breakpoint Settings' dialog is open, showing fields for 'Condition' (set to 'Stops when true'), 'Hit Count' (set to 'Stops the nth time it passes the condition'), and 'Log Message' (set to 'Message logged when breakpoint is hit'). There is also a checkbox for 'Continue execution when logging'.

Breakpoints are used to purposely pause the debugging process on an activity that may trigger execution issues. Setting a condition and/or hit count turns the simple breakpoint to a conditional one. Adding logging results turns the conditional breakpoint in a conditional tracepoint. Adding only a logging message transforms the breakpoint to a simple tracepoint.

**The Breakpoints panel** displays all breakpoints in the current project, together with the file in which they are contained. The Activity Name column shows the activity with the toggled breakpoint, while the File Path column displays the file and its location.

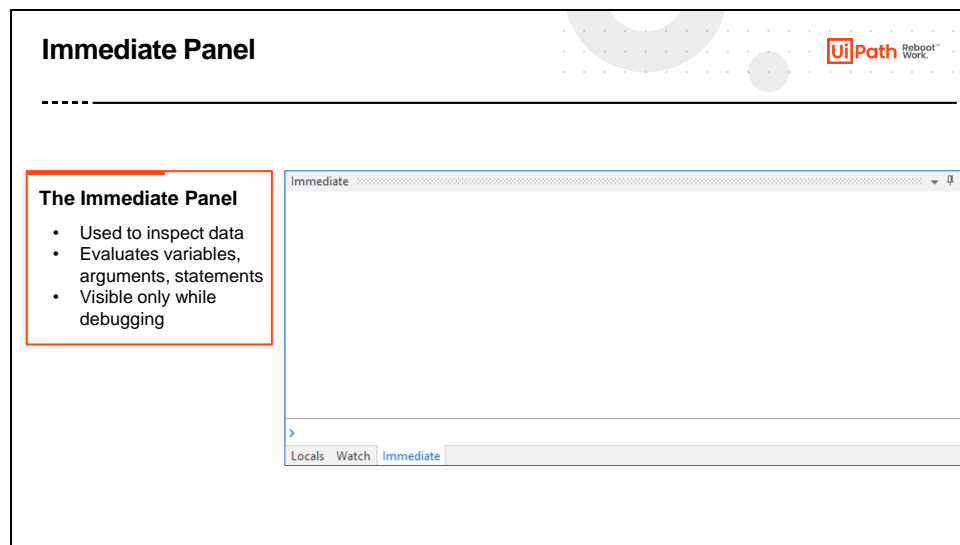
The Condition column displays conditions set to breakpoints. The Log Message column shows messages to be logged if the condition is met. Hover over the breakpoint tag on an activity to view its condition and log message.

## Slide 114



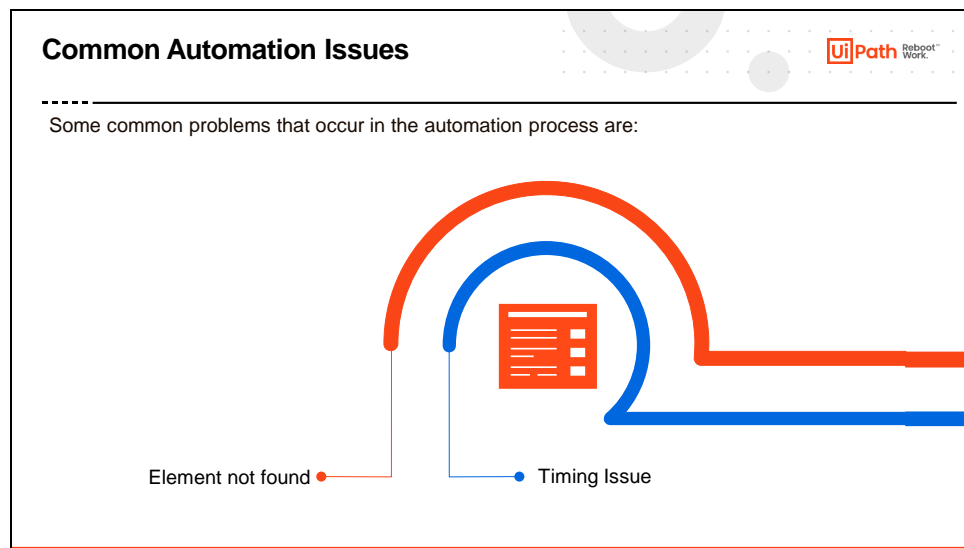
The Watch panel is only visible during debugging. It can be set to display the values of variables or arguments, and values of user-defined expressions that are in scope. It also supports complex object variables like lists of string or dictionary variables. These values are updated after each activity execution while debugging.

## Slide 115



**The Immediate panel** is only visible during debugging, and it can be used for inspecting data available at a certain point during debugging. It can evaluate variables, arguments, or statements. To do so, simply type the variable or argument name in the **Immediate** window and press Enter.

## Slide 116




In the automation process, there are some common problems that occur frequently. Some common listed issues are:

- Element not found
- Timing Issue


Slide 117

## Classroom Exercise

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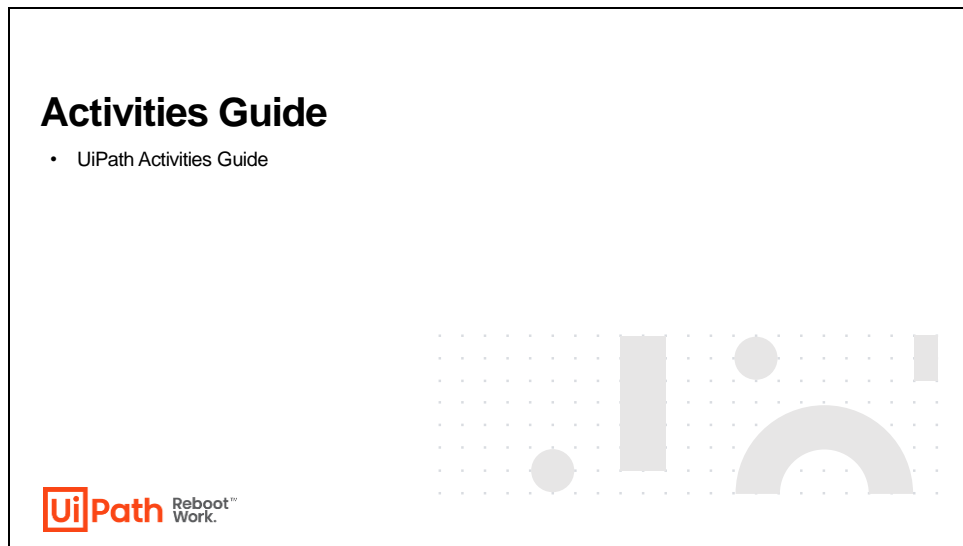


Overview of the Debug panel and different debugging techniques.



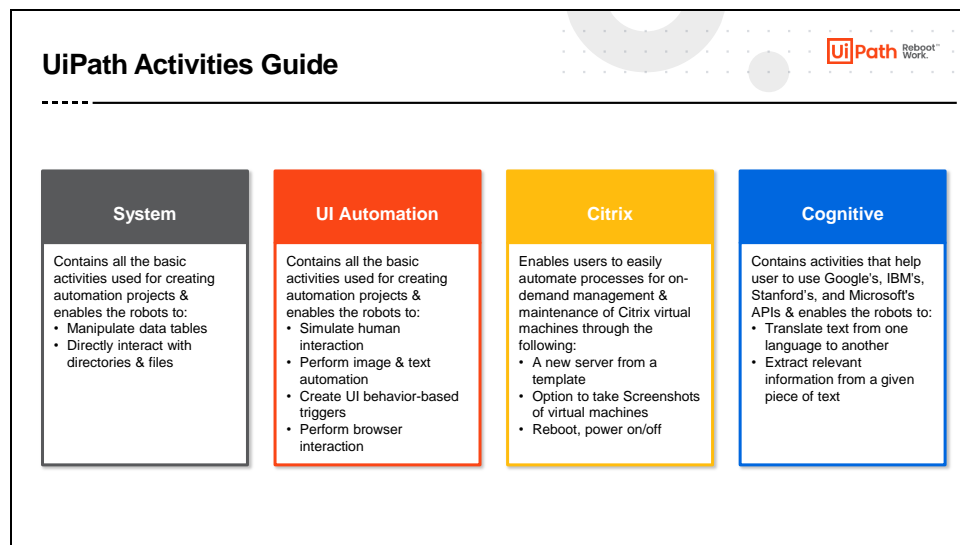
Overview of the Debug panel and different debugging techniques.

Slide 118



This section gives an overview of the UiPath Activities Packs.  
There are several activities packages available in UiPath which are discussed here in brief.

Slide 119



### • **System Activities Pack:**

This package contains all the basic activities used for creating automation projects. The activities in this pack enable the robots to:

- Manipulate data tables by adding or extracting information.
- Directly interact with directories and files on user's machine, performing any action a human user would.

Several activities in this pack help in the creation and execution of the automation projects themselves, such as logical operators and expressions

### • **UI Automation Activities Pack:**

It contains all the basic activities used for creating automation projects.

These activities enable the robots to:

- Simulate human interaction, such as performing mouse and keyboard commands or typing and extracting text, for basic UI automation.
- Use technologies such as OCR or Image recognition to perform image and text automation.
- Create triggers based on UI behavior, thus enabling the Robots to execute certain actions when specific events occur on a machine.
- Perform browser interaction and window manipulation.

### • **Citrix Activities Pack:**

Includes activities that can be used for **XenServer 7.x** and **Citrix Hypervisor 8.0** virtualized infrastructures.

These activities enable IT Departments to easily automate processes for on-demand management and maintenance of Citrix virtual machines, by facilitating the following actions:

- Provision of a new server from a template (e.g. for new application deployment, DevOps, etc.).

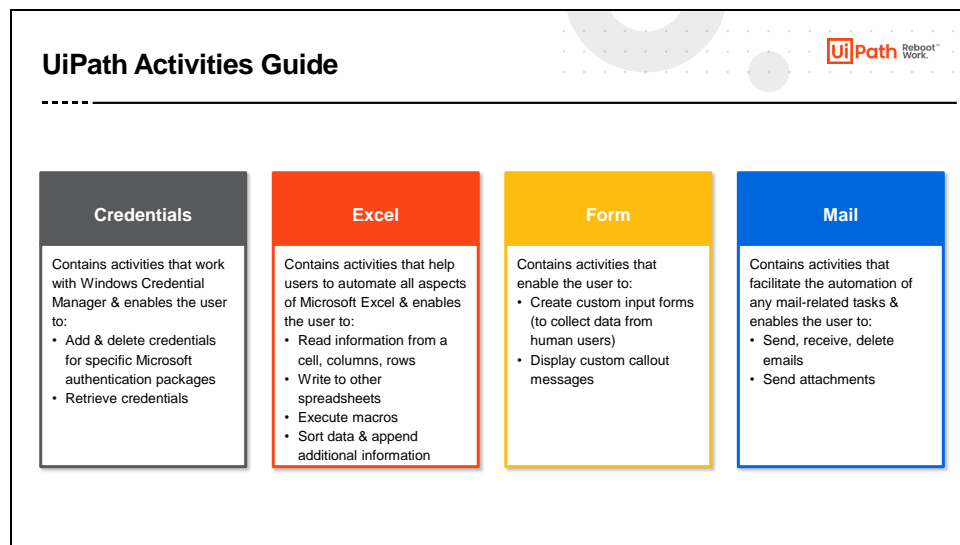


- Take screenshots of the virtual machines before installing update packages or different versions of a program.
- Reboot, power on/off (e.g. for applications and OS updates, resources efficiency).

- **Cognitive Activities Pack:**

Helps the user to use Google's, IBM's, Stanford's and Microsoft's APIs, and automatically process the information that they help extract.

The package enables the user to translate text from one language to another, as well as extract relevant information from a given piece of text such as the overall sentiment, key phrases, possible encountered errors and the language used. All the cognitive activities require an API key in order to be used within workflows.



- **Credentials Activities Pack:**

Contains activities that work with Windows Credential Manager. This pack enables the user to add and delete credentials for specific Microsoft authentication packages, such as NTLM, Kerberos, Negotiate, Schannel, or Passport. Robots can also use these activities to retrieve credentials or simply prompt a human user to introduce his credentials, for later usage.

- **Excel Activities Pack:**

Helps users to automate all aspects of Microsoft Excel, which is an application used by many in all types of businesses. It contains activities that enable the user to read information from a cell, columns, rows or ranges, write to other spreadsheets or workbooks, execute macros, and extract formulas. The users can also sort data, color code it or append additional information.

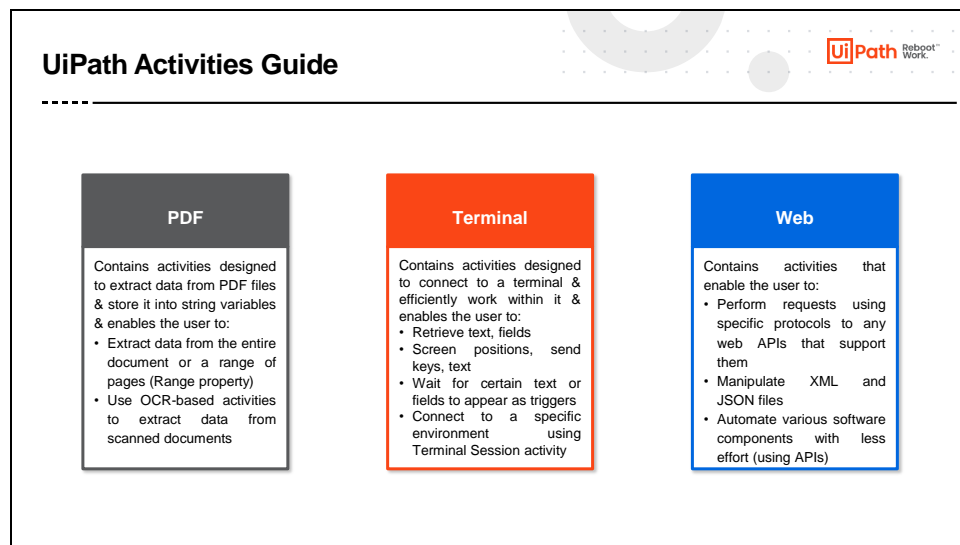
- **Form Activities Pack:**

Enables the user to create custom input forms that can be used to collect data from human users, or display custom callout messages, which can detail different parts of the attended automation.

- **Mail Activities Pack:**

Facilitates the automation of any email-related tasks, covering various protocols, such as IMAP, POP3 or SMTP. UiPath also features activities that are specialized for working with Outlook and Exchange. These include sending emails, receive emails, deleting emails, and sending attachments. This pack is compatible with the Microsoft Outlook versions 2010, 2013, 2016, and Office 365.

## Slide 121



- **PDF Activities Pack:**

Contains activities designed to extract data from PDF and XPS files and store it into string variables. The data can be extracted from the entire document or from a range of pages specified under the Range property found in each of the activities. In the case of scanned documents, data extraction can also be achieved by using OCR-based activities, Read PDF With OCR and Read XPS With OCR.

- **Terminal Activities Pack:**

Contains activities designed to connect to a terminal and efficiently work within it. The user can retrieve text, fields or screen positions, send keys, text, or wait for certain text or fields to appear as triggers. The Terminal Session activity enables the user to connect to a specific environment, such as Attachmate Reflection, Attachmate Extra, etc.

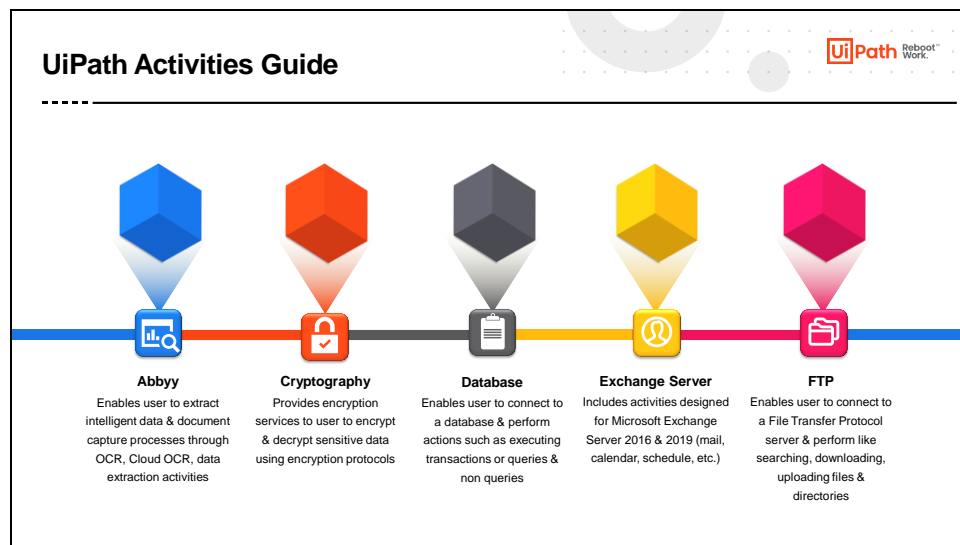
- **Web Activities Pack:**

Enables users to perform SOAP or HTTP requests to any web APIs that support these protocols, including UiPath's Orchestrator API.

The pack also contains activities that enable the user to manipulate XML and JSON files, such as executing XPath queries and deserializing documents, so that data extraction is easier.

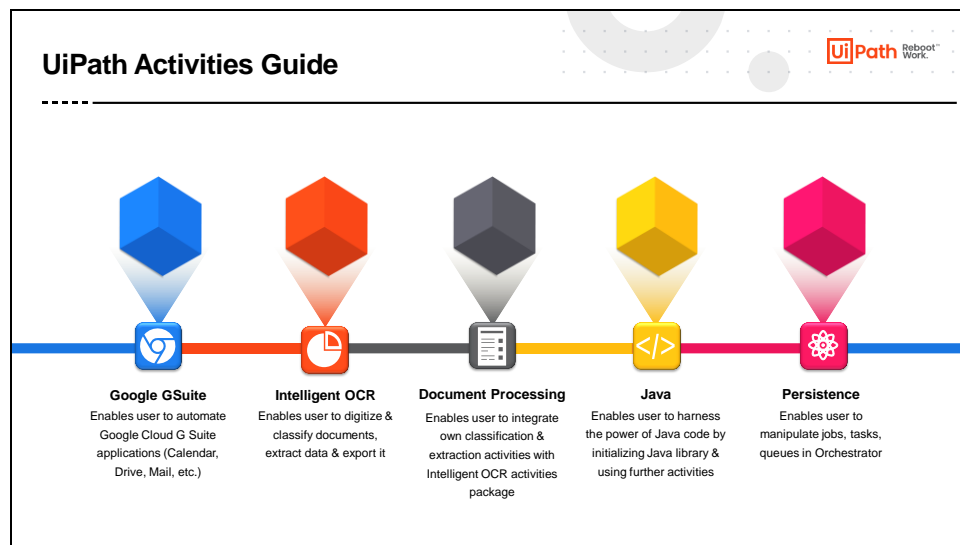
All these activities help the user to automate various software components with less effort by putting their APIs to good use. Information can be extracted with ease and put into a format that is lighter to read or made ready for further processing.

Slide 122

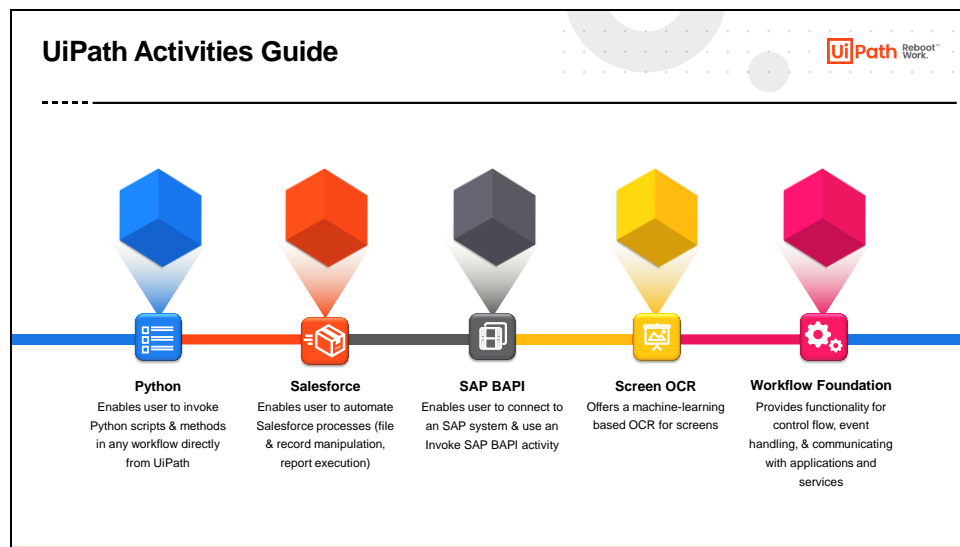


- **Abbyy Activities Pack:** Used for extracting intelligent data and document capture processes from both structured and unstructured documents and it can work with the FineReader and FlexiCapture Abbyy product families. Includes activities for OCR, Cloud OCR, classification, and data extraction.
- **Cryptography Activities Pack:** Provides encryption services to the user. The package enables users to encrypt and decrypt sensitive data by using encryption protocols.
- **Database Activities Pack:** Enables the user to connect to a database and perform actions within it. It enables the user to perform actions in relation to databases, starting with the connection to the database, including data queries (interrogations of data based on a set criterion) and data altering operations (inserting data in the database, updating the data, and so on).
- **Exchange Server Activities Pack:** Includes a list of activities designed for Microsoft Exchange Server 2016 and 2019 (on-premises), which is a mail, calendar, schedule, and collaboration platform developed by Microsoft.
- **FTP Activities Pack:** Enables the user to connect to a File Transfer Protocol server and perform all the fundamental actions within it, such as searching, downloading, uploading, deleting, or creating, both for files and directories.

Slide 123

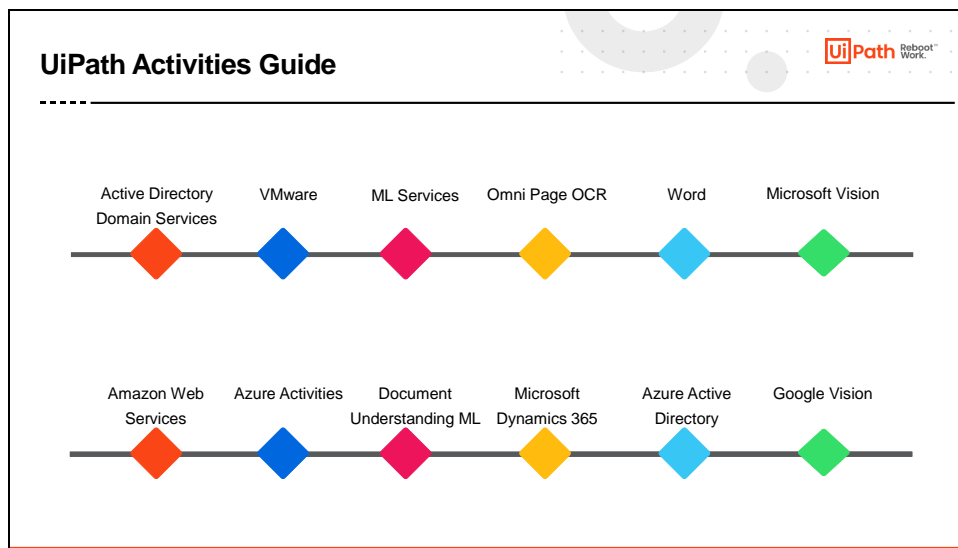


- **Google GSuite Activities Pack:** Helps the user to automate Google Cloud G Suite applications, including Google Calendar, Google Drive, Google Sheets, GMail, and Google Docs. With the Google GSuite Activities Package, the user can create & modify Google Calendar events, manage Google Drive files, read & send GMail messages, create new Google Sheet spreadsheets, and Google Docs documents.
- **Intelligent OCR Activities Pack:** Contains the infrastructure for enabling document processing flows using a complete, open, extensible approach. It allows the user to digitize documents, classify documents, extract data from documents, validate automatic classification and data extraction, and export extracted information.
- **Document Processing Contracts:** A .NET assembly that enables the user to integrate own classification and extraction activities with the Intelligent OCR activities package by exposing all of the interfaces needed to be compatible. By referencing the contracts in the pack enables the user to implement any activities.
- **Java Activities Pack:** Contains several new activities that help the user to harness the power of Java code. With the Java Scope activity, the user can initialize a Java library, thus providing scope for all subsequent activities.
- **Persistence Activities Pack:** Offers several activities that help the user to manipulate Jobs, Tasks, and Queues in Orchestrator, offering a seamless transition between robotic automation and human intervention to enhance the capabilities of RPA.



- **Python Activities Pack:** Enables the user to invoke Python scripts and methods in any workflow directly from UiPath by connecting to the Python environment installed on the computer.
- **Salesforce Activities Pack:** Enables the user to automate Salesforce processes. Using this pack, the user can perform actions such as file manipulation, record manipulation, report execution, and SOQL commands execution.
- **SAP BAPI Activities Pack:** Enables the user to connect to an SAP system and use an Invoke SAP BAPI activity to invoke a specified BAPI.
- **Screen OCR Activities Pack:** Offers a machine-learning based OCR for screens. It can be used as an alternative to the other OCR engines, with any of the available Screen Scraping or Computer Vision activities from the UI Automation package.
- **Workflow Foundation Activities Pack:** Provides functionality for control flow, conditions, event handling, state management, and communicating with applications and services.

Slide 125



Some other Activity Packs available in UiPath are:

- Active Directory Domain Services Activities Pack
- AmazonWebServices Activities Pack
- Azure Active Directory Activities Pack
- Azure Activities Pack
- MLServices
- Document Understanding ML Activities Pack
- OmniPageOCR Activities Pack
- Word Activities Pack
- VMware Activities Pack
- Integrations Microsoft Office 365 Microsoft Dynamics 365
- Microsoft Vision Activities
- Google Vision Activities
- Supported Character Encoding

For more details on the activities guide, please refer:  
<https://docs.uipath.com/activities>

Slide 126




This section explains how to build 'Hello World' automaton project in UiPath Studio.



## Slide 127

## Classroom Exercise

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Demonstrate how to build a workflow that displays 'Hello World' in a message box.

Demonstrate how to build a workflow that displays 'Hello World' in a message box:

Create our first automation project. This automation project is going to display 'Hello World' on the screen.

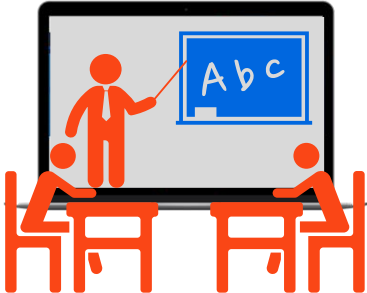
- Open UiPath Studio, click “Start”, click “Process” and enter the name of the project “Hello World”.
- Click “Create” to start the project.
- In the Activities panel search for the “Message Box” activity.
- Double click on the “Message Box” activity and it will automatically appear in the designer panel.
- Within the message box in the designer panel, type “Hello World”. Make sure that it's in double quotes.
- Click ‘Run’ and the “Hello World” message will be displayed on your screen.
- You can click on the “Publish” button to publish the automation project. Now open UiPath Assistant and you will see your automation project by the name of “Hello World”. You can execute the automation project any time from here.

Congratulations on creating your first automation project!

## Slide 128

### Practice Exercise

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Build a workflow that prints 'Hello World' in a message box.

- Use message box activity.
- Enter 'Hello World' text in the message box activity.

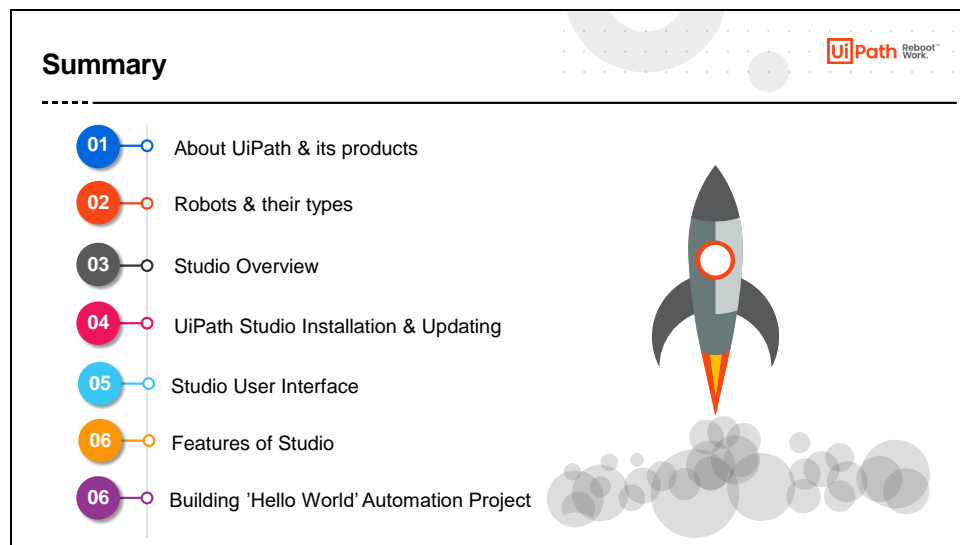
Build a workflow that prints 'Hello World' in a message box.

- Use message box activity.
- Enter 'Hello World' text in the message box activity.

#### Process Overview

- START
- Open UiPath Studio
- Add a Sequence activity
- Add a Message Box activity
- Enter the text "Hello World"
- STOP

## Slide 129



To summarize, this lesson explained:

- About UiPath & its products
- Robots & their types
- Studio Overview
- UiPath Studio Installation & Updating
- Studio User Interface
- Features of Studio
- Building 'Hello World' Automation Project