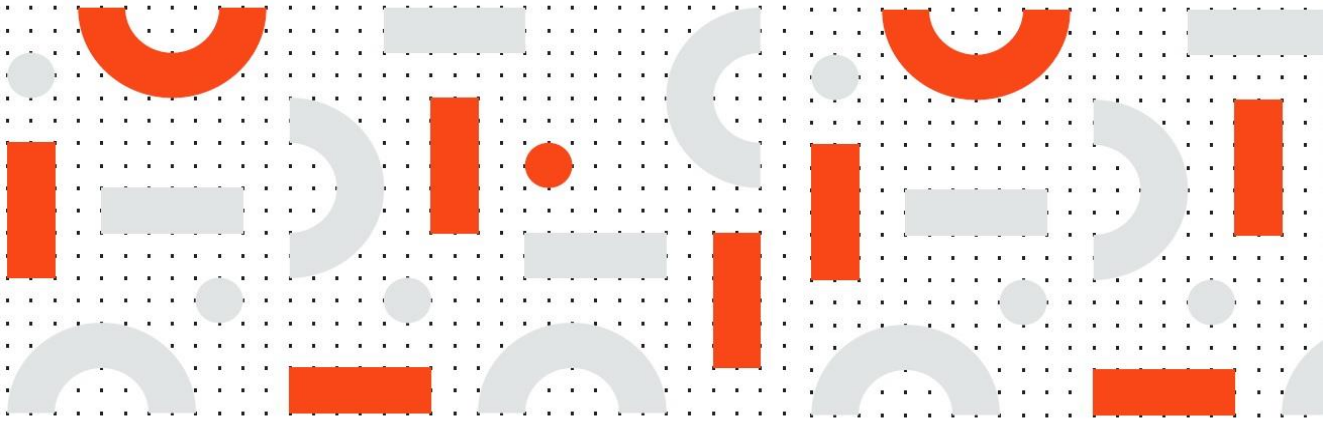

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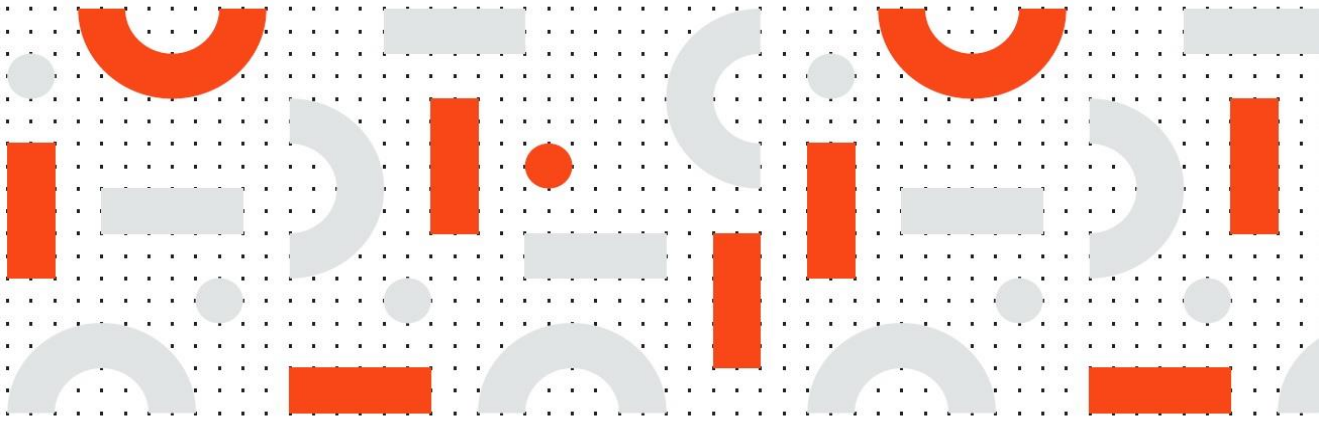
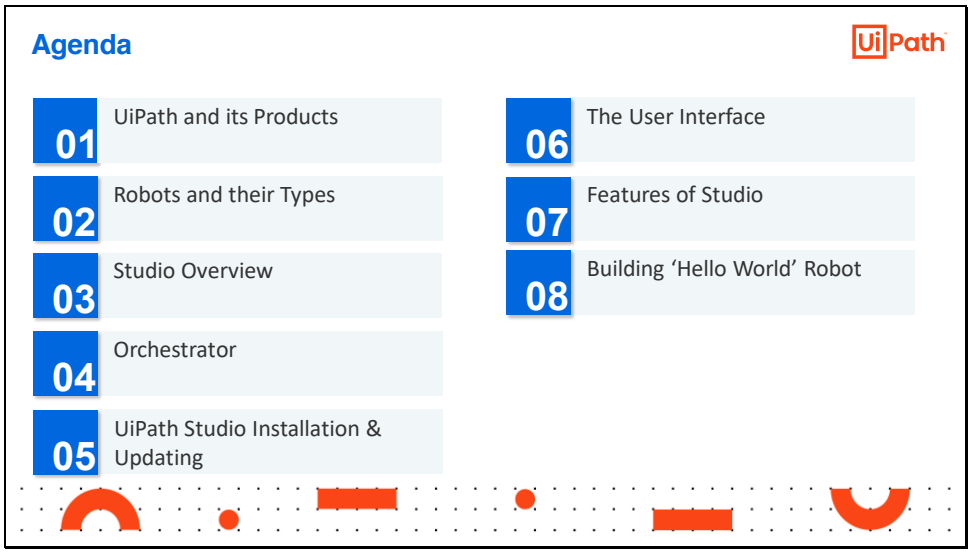


UiPath™ Learning Partner

Welcome to 'RPA Design and Development Course'.

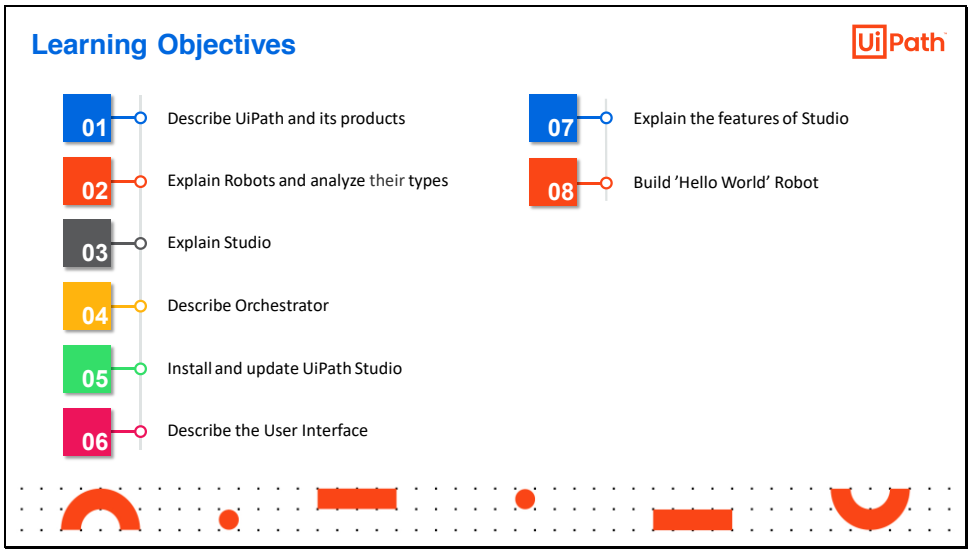
Lesson 2: Introduction to UiPath

The second lesson of this course is Introduction to UiPath.



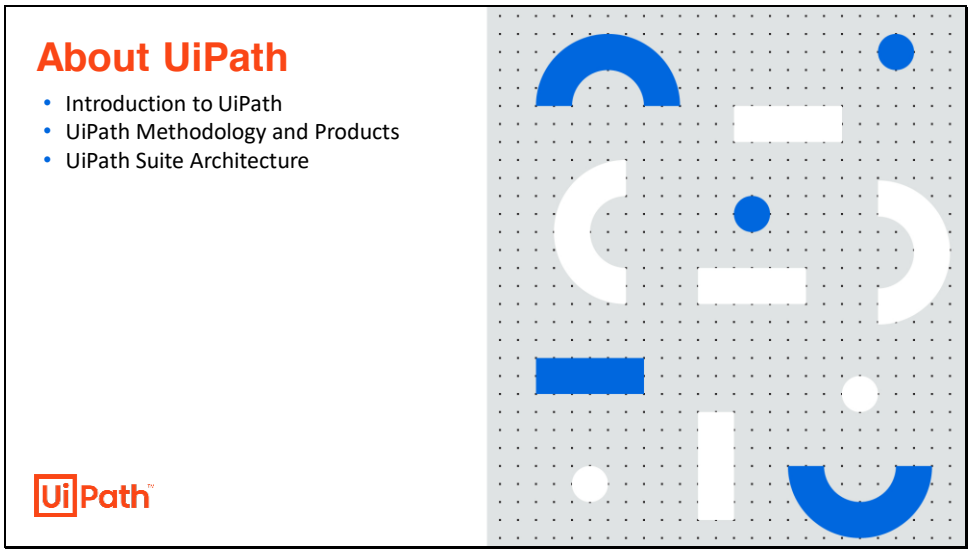
The agenda of this lesson is:

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

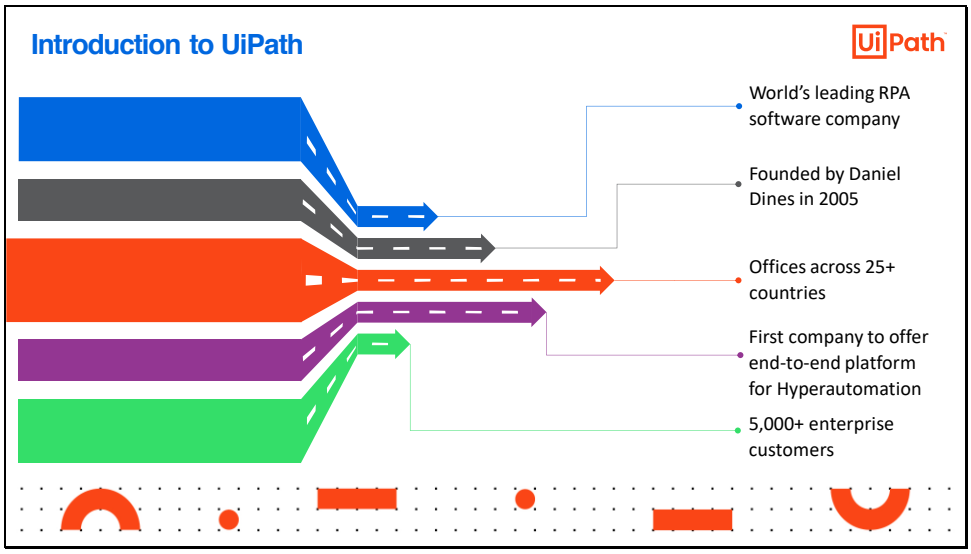


By the end of this lesson, you will be able to:

- 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' Robot to check the successful installation of UiPath

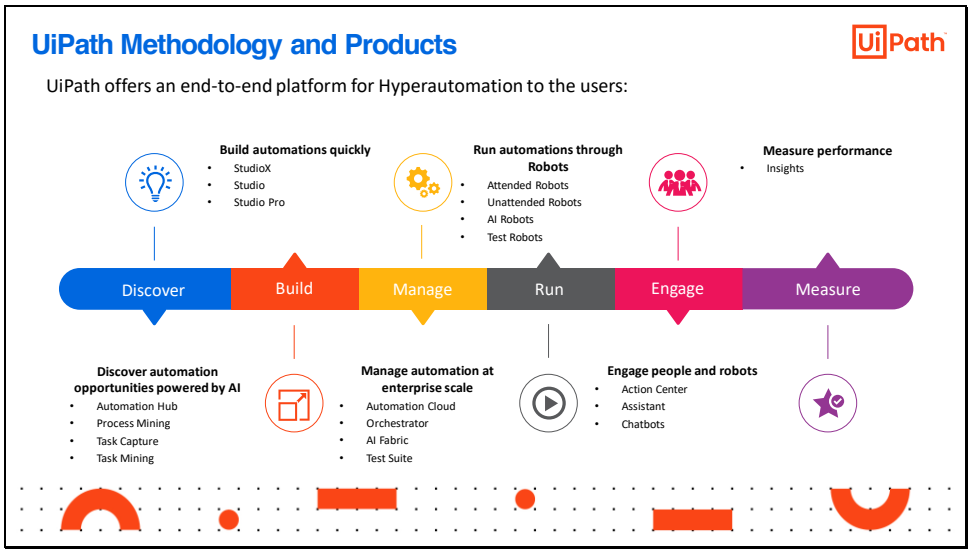


This section gives an overview of UiPath, its products and architecture.



About UiPath:

- UiPath is a global software company that develops a platform for Robotic Process Automation (RPA). It was founded by Daniel Dines, a Romanian entrepreneur, in 2005 in Bucharest, Romania.
- UiPath's focus on building the world's best RPA software has made them world's leading RPA software company. UiPath has its offices across 25+ countries.
- Following its acquisition of ProcessGold and StepShot in 2019, UiPath has become the first vendor of scale to bring together both process mining and Robotic Process Automation to offer end-to-end platform for Hyperautomation.
- With 50% of the top 50 Global Fortune 500 companies as its customers, UiPath has 5,000+ enterprise customers.

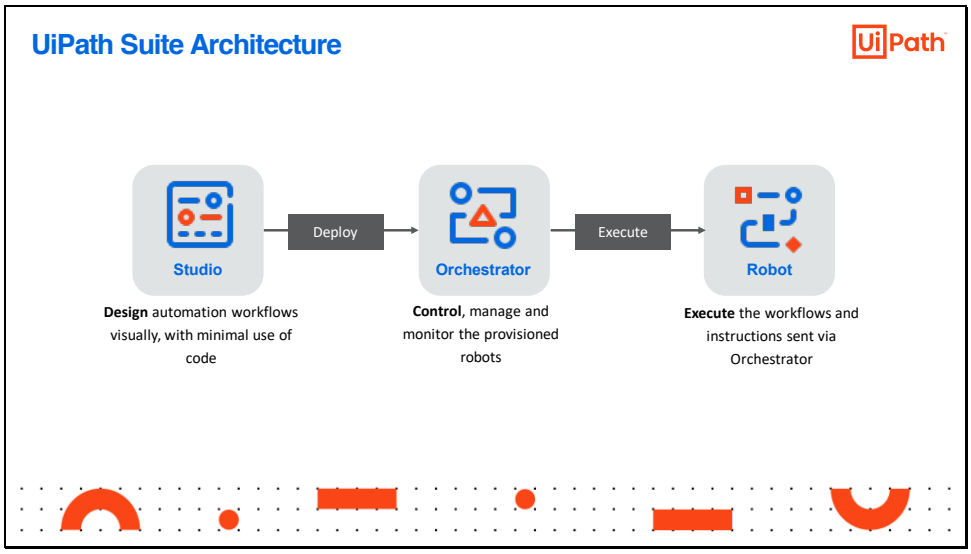


UiPath follows a unique methodology to offer an end-to-end platform for Hyperautomation to the users:

- **Discover**: Identify the automation opportunities powered by AI and the people using:
  - Automation Hub
  - Process Mining
  - Task Capture
  - Task Mining
- **Build**: The automations can be built quickly, from the simple to the advanced levels using:
  - StudioX
  - Studio
  - Studio Pro
- **Manage**: The automations are managed, deployed and optimized at enterprise scale using:
  - Automation Cloud
  - Orchestrator
  - AI Fabric
  - Test Suite
- **Run**: The automations are run through Robots that work with the applications and data. Different types of available Robots are:
  - Attended Robots
  - Unattended Robots
  - AI (Artificial Intelligence) Robots
  - Test Robots

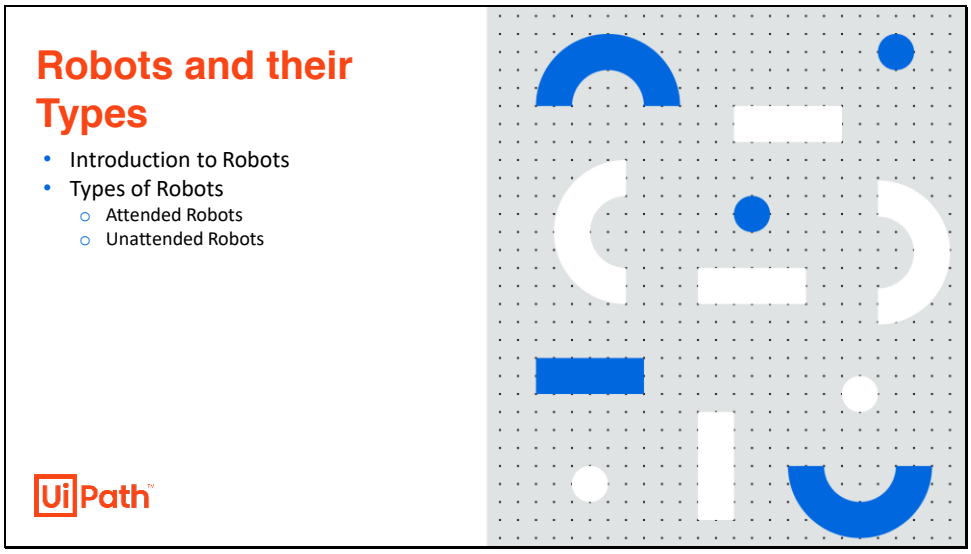
- **Engage**: People and robots work as one team for seamless process collaboration using:
    - Action Center
    - Assistant
    - Chatbots
- **Measure**: Meet the business outcomes by measuring the performance of operations and aligning them with the goals using:
    - Insights

Refer https://www.uipath.com/ for more details.

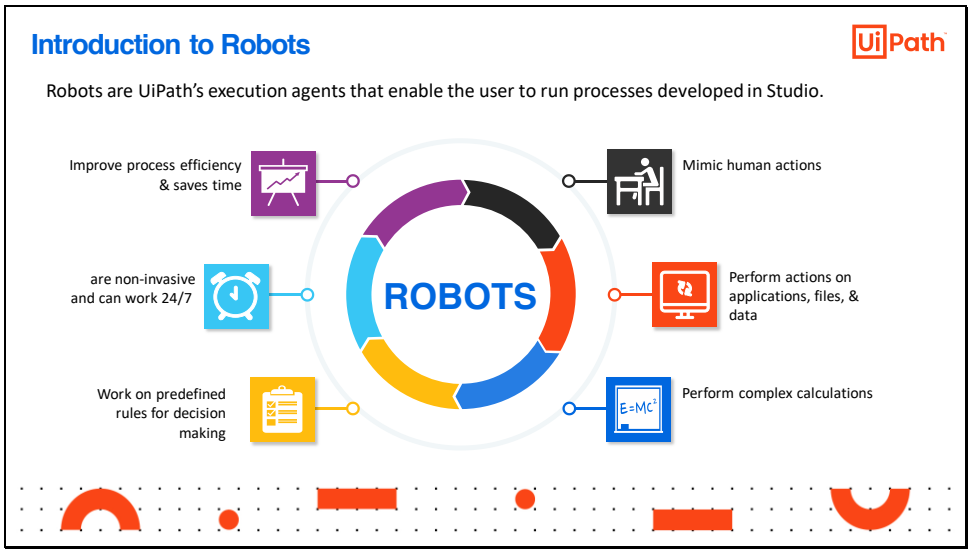


UiPath Suite Architecture has three major components namely Studio, Orchestrator and Robot.

- The **Studio** is where the automated processes are built in a visual manner, using the built-in recorder, drag & drop widgets, and best-practice templates.
- The **Orchestrator** is a server application that can be accessed through a browser, for example, Google Chrome. With the help of Orchestrator, the user can control, manage, and monitor the digital workforce (Robots).
- The **Robots** execute the workflows, steps, and instructions received from the Orchestrator or the code generated. Robots are of two types: Attended and Unattended.



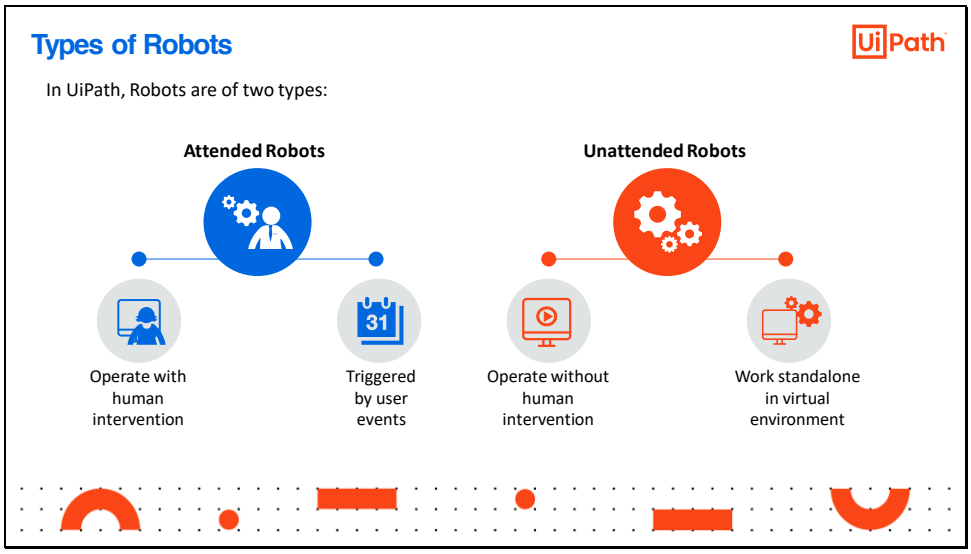
This section explains Robots and their types with examples.



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

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

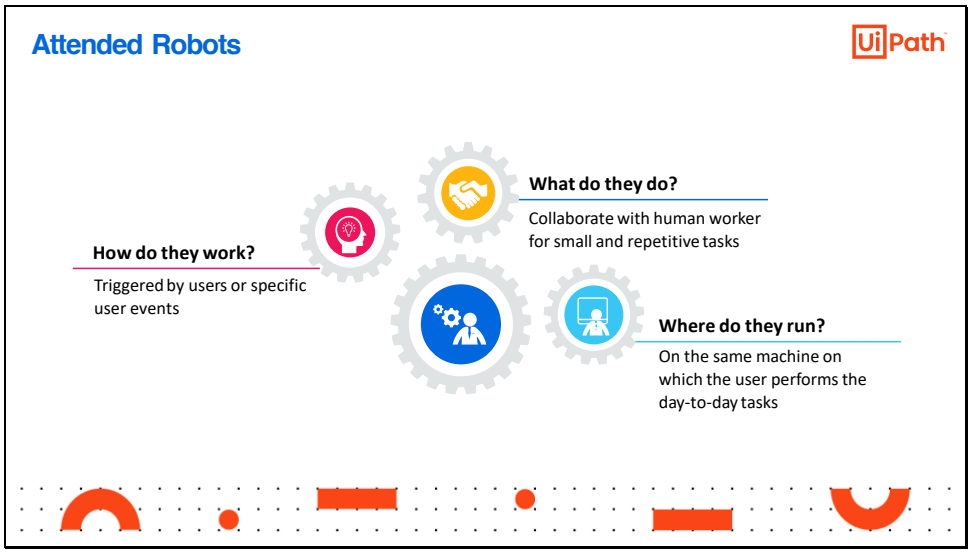
- Robots basically mimic human actions such as type, click and read data.
- Robots interact with applications. Robots can log into applications, read/move files or folders, and copy/paste data.
- Robots perform complex calculations easily.
- Once trained and programmed, robots can make decisions with 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.



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

In UiPath, there are two types of robots:

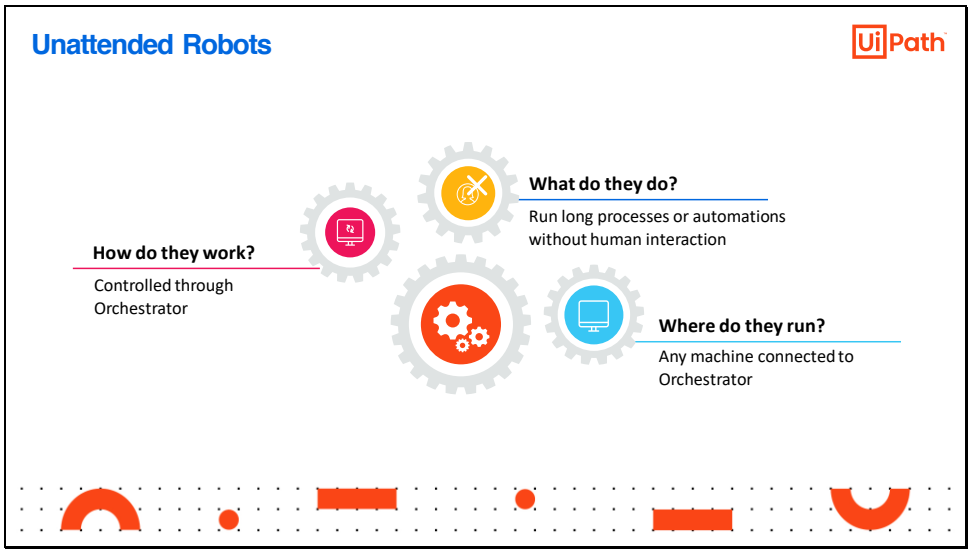
- Attended Robots: triggered by user events, and operate alongside a human, on the same workstation.
- Unattended Robots: run unattended in virtual environments and can automate any number of processes.



Attended Robots:

- These robots collaborate with human workers on business activities and speed up the 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.

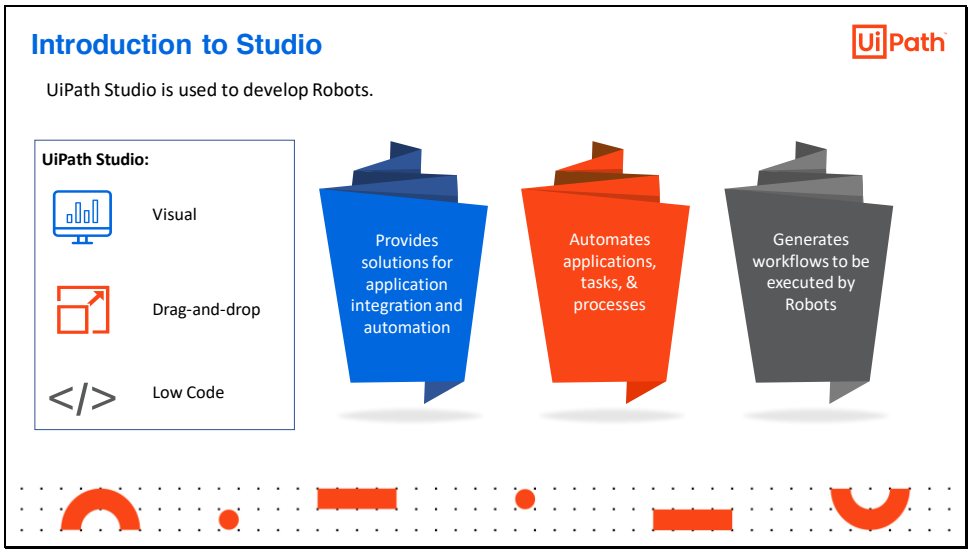


Unattended Robots can:

- 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 expense report, the task of approval of expense reports can be executed using Unattended Robots. Without any human intervention, the Robot can login 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.

This section gives an overview of UiPath Studio.



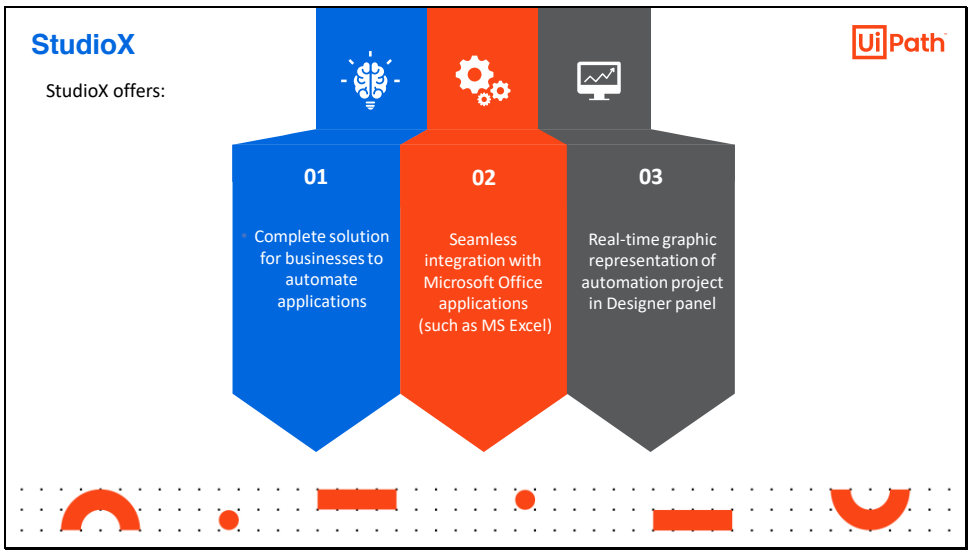
UiPath Studio is used to develop Robots. UiPath Studio is the canvas for automation where the Robots are designed visually. Studio is visual, drag-and-drop, and low code. Studio provides solutions for application integration and automating applications, tasks, and processes. It comes with pre-built components 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 executed by the Robots and then the Orchestrator publishes these workflows.

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 by collaborating with integrations and workflow analyzers.

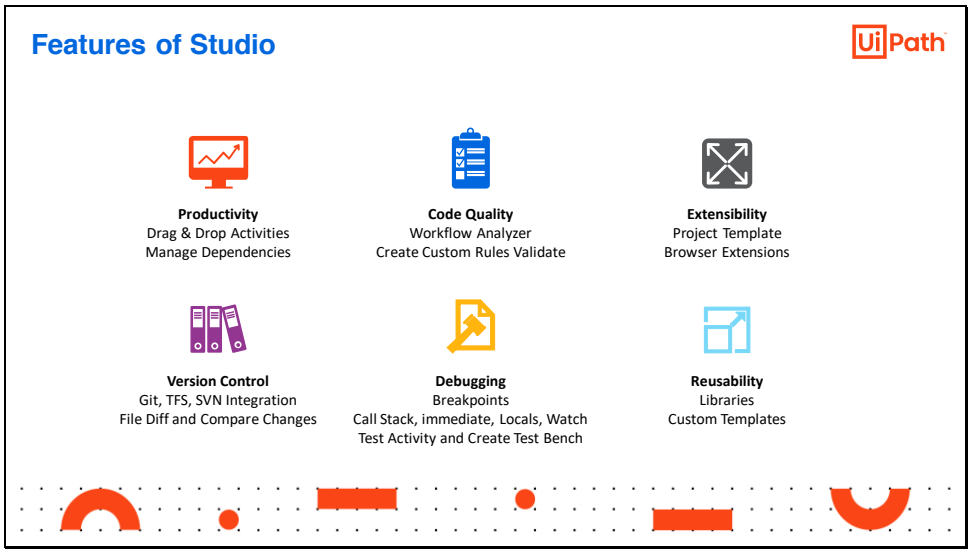
Note: Studio comes with two types of available profiles for developers and business users:

- **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.



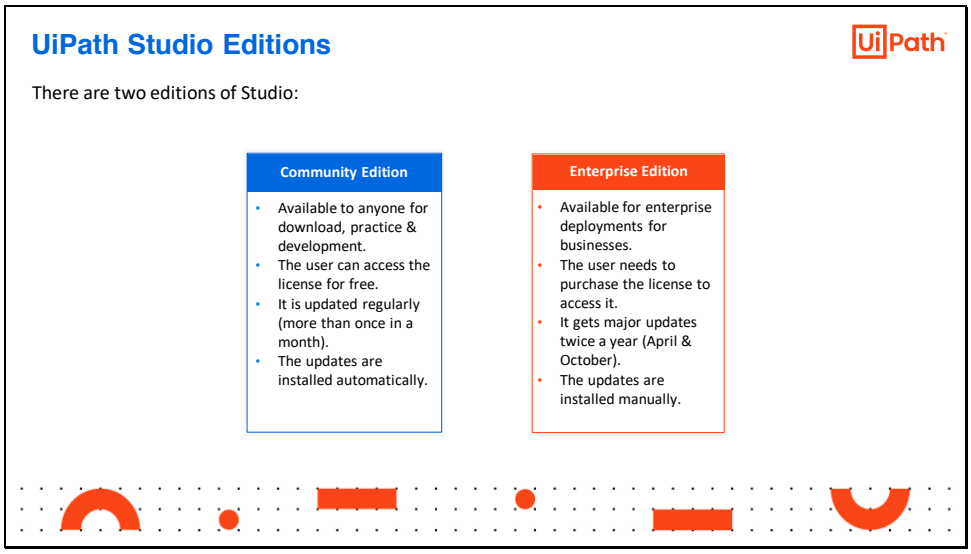
StudioX offers seamless integration with Microsoft Office applications such as MS Excel to enable businesses to automate repetitive tasks. It uses an intuitive user interface for creating automations easily. It is an easy solution for businesses to automate their processes.

Refer https://docs.uipath.com/studiox/v2019/docs for more details on StudioX.



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 automations.

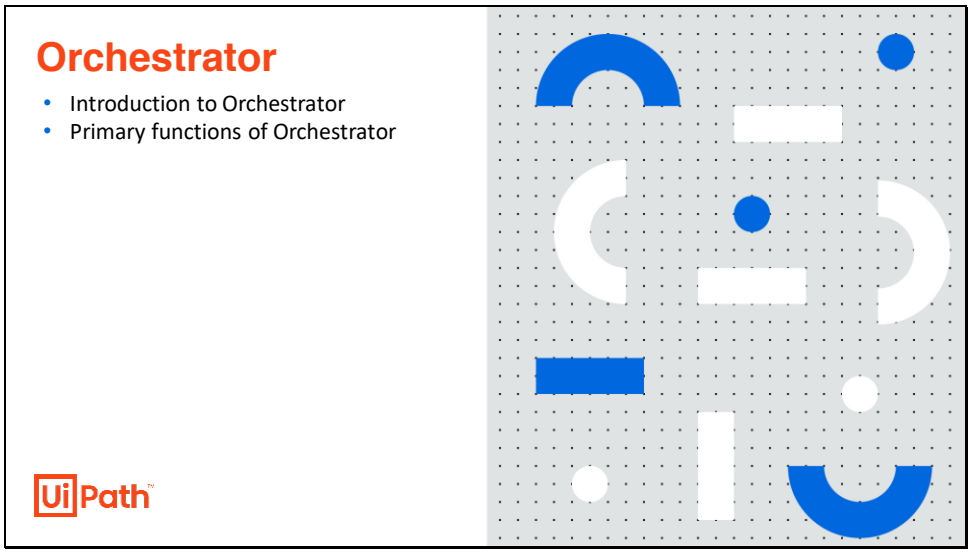


There are two available editions of Studio:

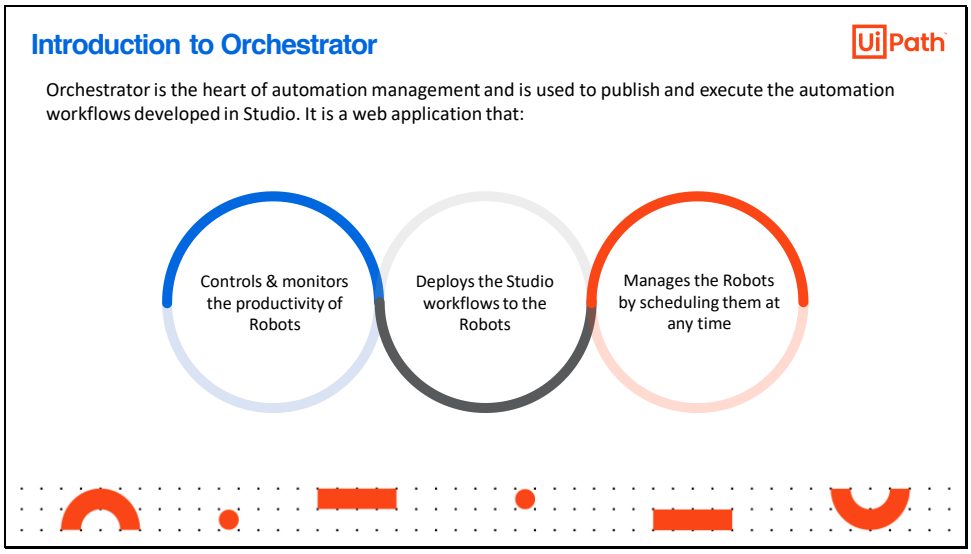
- **Community Edition:**
    - Available to anyone for download, practice & development.
    - The user can access the license for free.
    - It is updated regularly (more than once in a month).
    - The updates are installed automatically.

- **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 UiPath forum, Marketplace and UiPath Connect!



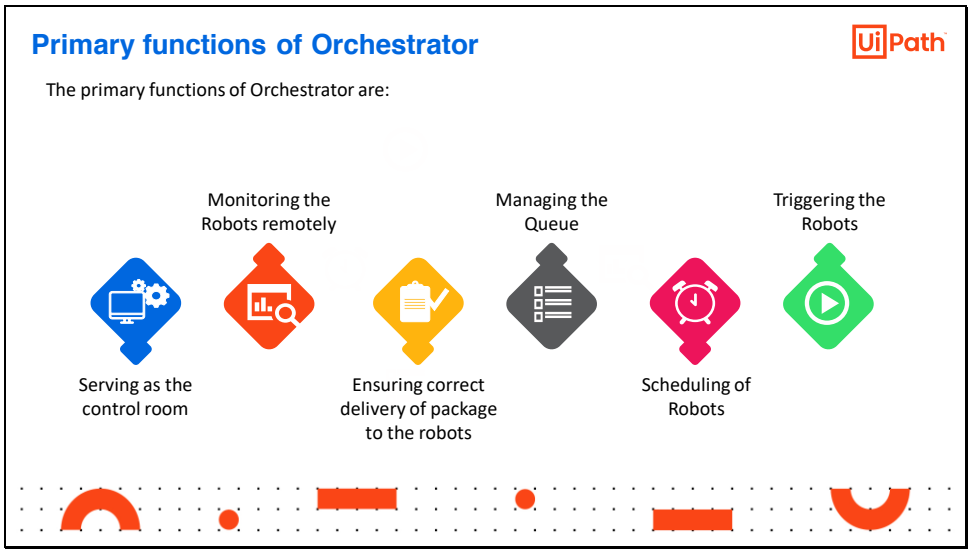
This section gives an overview of the next basic component of UiPath- Orchestrator and its primary functions. Orchestrator is discussed in detail in Lesson 8 of this course.



Orchestrator is the heart of automation management. It gives a user the power to provision, deploy, trigger, monitor, measure, track, and ensure the security of every robot in the organization. It enables the user to manage the automation from browser or mobile device.

Orchestrator is used to publish and execute the automation workflows developed in Studio. It is a web application that:

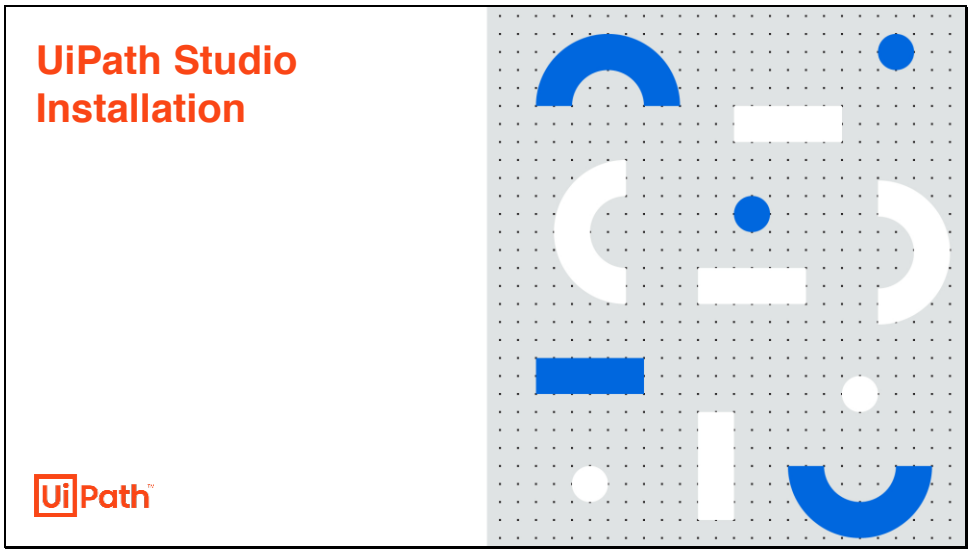
- Controls and monitors the productivity of robots
- Deploys the Studio workflows to the robots
- Manages the robots by scheduling them at any time



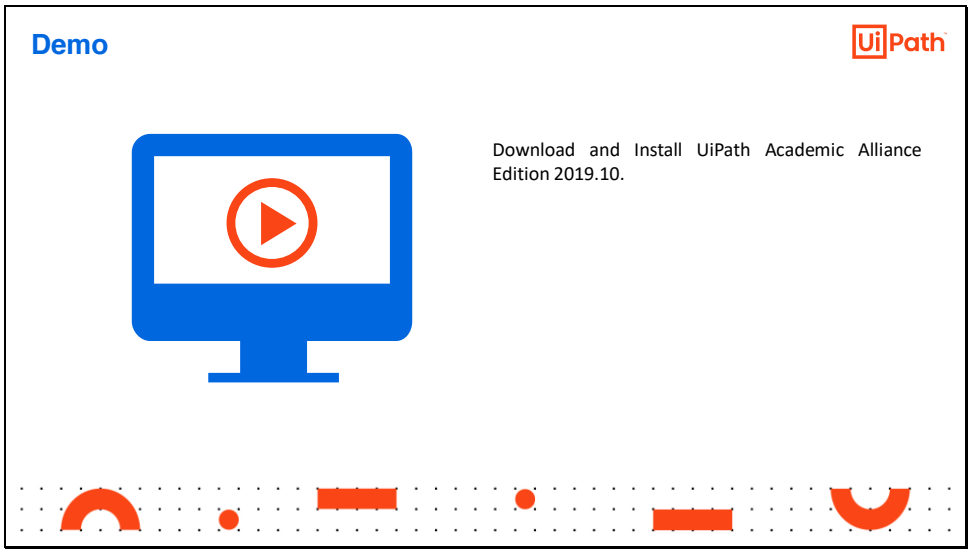
Orchestrator acts as the control room and is responsible for handling resources, queues, scheduling, generating logs and execution of Robots. It is a server-based application that regulates and monitors the activities and functionalities of the Robots attached within the network, remotely.

The primary functions of Orchestrator are:

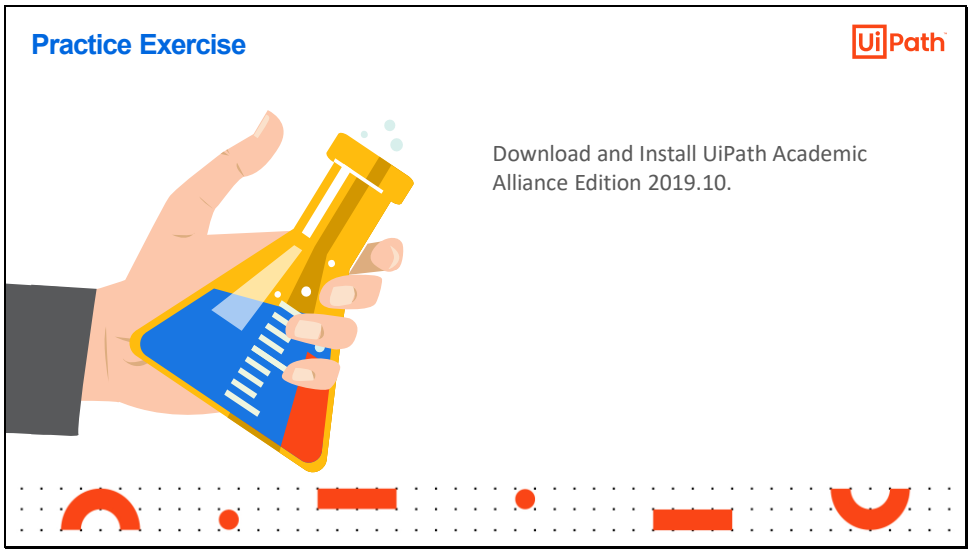
- Serving as the control room
- Monitoring the Robots remotely
- Ensuring correct delivery of package to the robots
- Managing the Queue
- Scheduling of Robots
- Triggering the Robots



This section explains how to install UiPath Studio.



Download and Install UiPath Academic Alliance Edition 2019.10.



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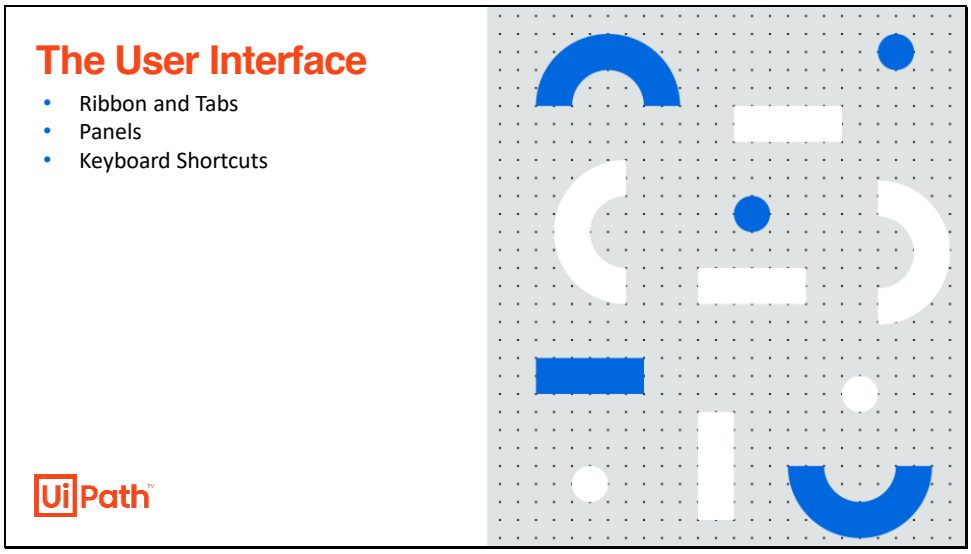
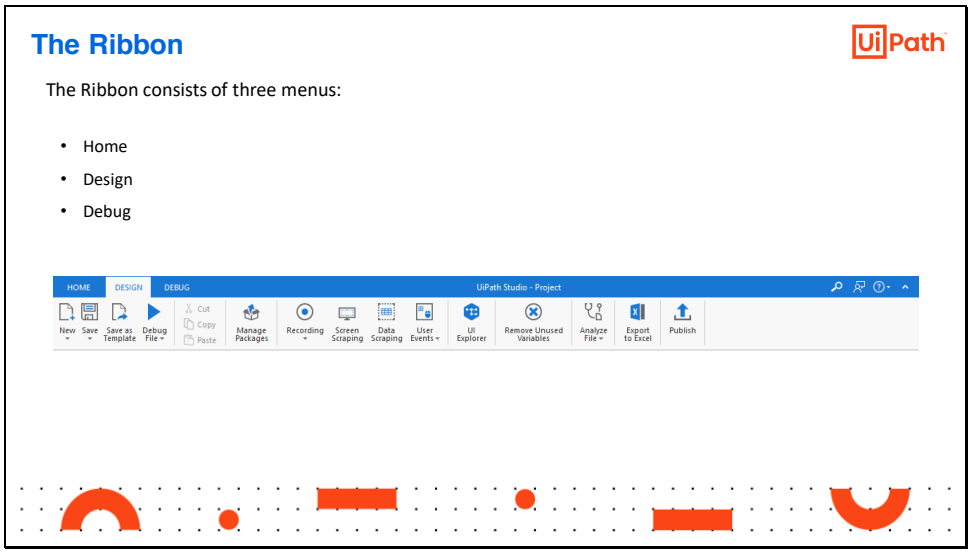


This section explains the UiPath Studio User Interface. Multiple panels are available in UiPath Studio for easier access to its functionalities. This section covers the different tabs, panels and keyboard shortcuts.

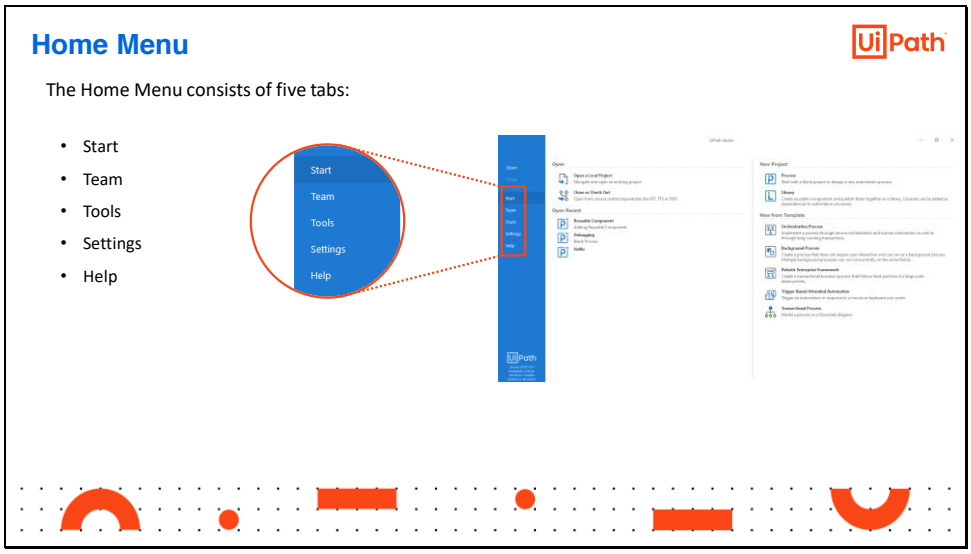


The Ribbon is straightforward and consists of three menus.

- Home
- Design
- Debug

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

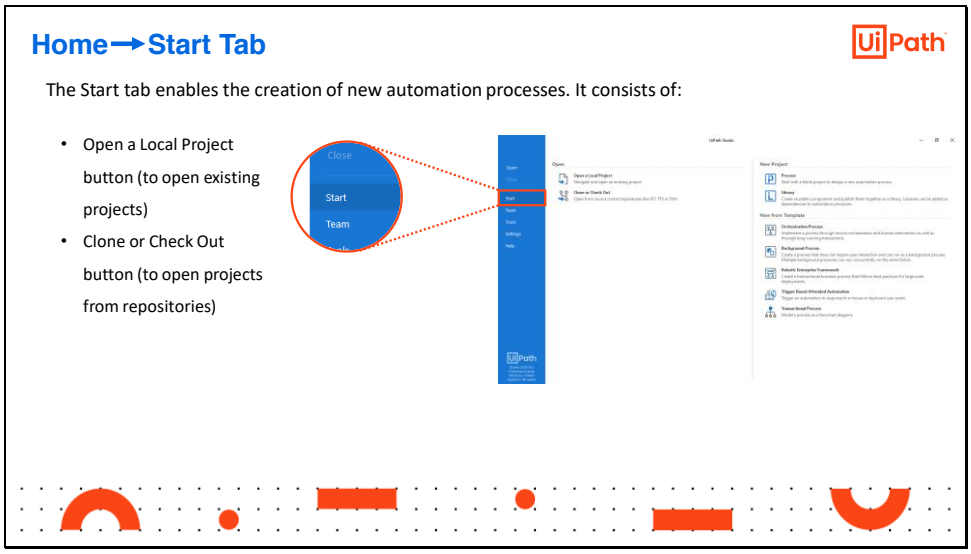
The next slides explain these tabs in detail.



The Home Menu consists of five tabs:

- Start
- Team
- Tools
- Settings
- Help

These tabs are explained in detail in the subsequent slides.



The first tab in the Home tab is Start tab. This is the window which appears when we open UiPath Studio. It further consists of a couple of tabs and Open a Local Project button to open existing projects and Clone or Check Out button to open from repositories like GIT, TFS or SVN. The Start tab enables the creation of new automation processes, reusable components, and specific types of projects.

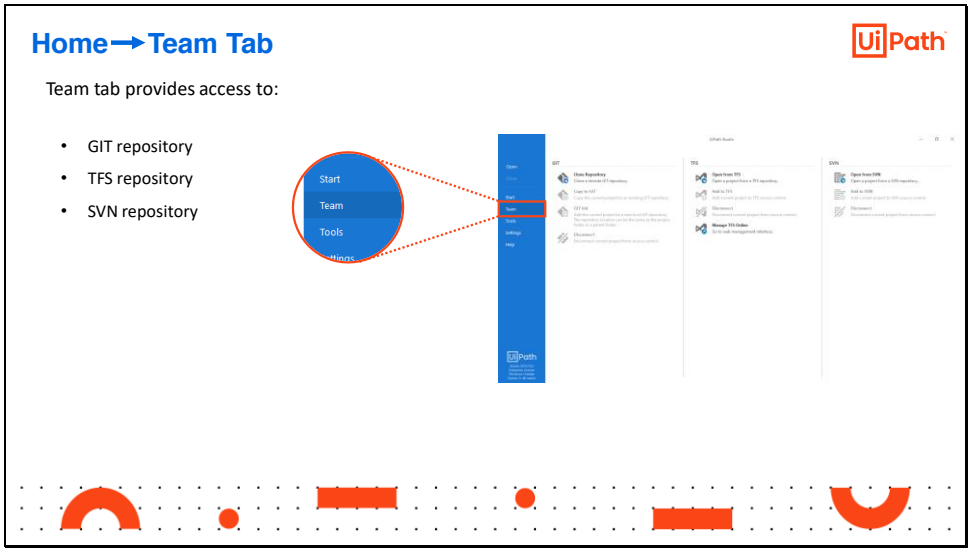
The options in the **Start tab** are:

New Project

- Process: Start with a blank project to design a new automation process. For this, click on the button, 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.

New from Templates

- Orchestration Process: Implement a process through service orchestration and human intervention as well as through long-running transactions.
- Background Process: Create a process that does not require user interaction and can run as a background process. Multiple background processes can run concurrently on the same Robot.
- Robotic Enterprise Framework: Create a transactional business process that follows best practices for large scale deployments.
- Trigger Based Attended Automation: Trigger an automation in response to a mouse or keyboard user event.
- Transactional Process: Model a process as a flowchart diagram.



Team tab is very useful when a version control is necessary. UiPath 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:

- **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.

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

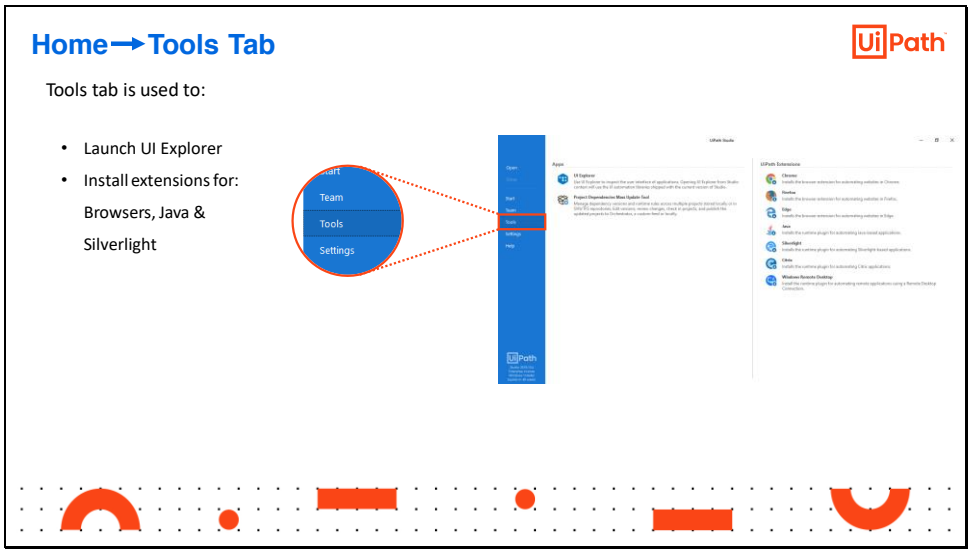
Here, the options are:

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



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

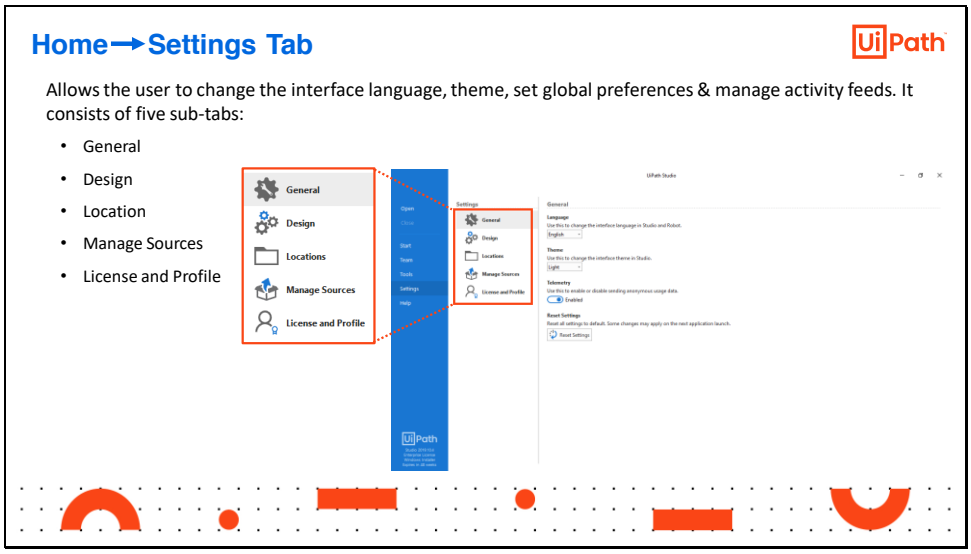
- **UI Explorer:**

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 extensions. These extensions are provided to ensure that they don't act as blocker to the automation.

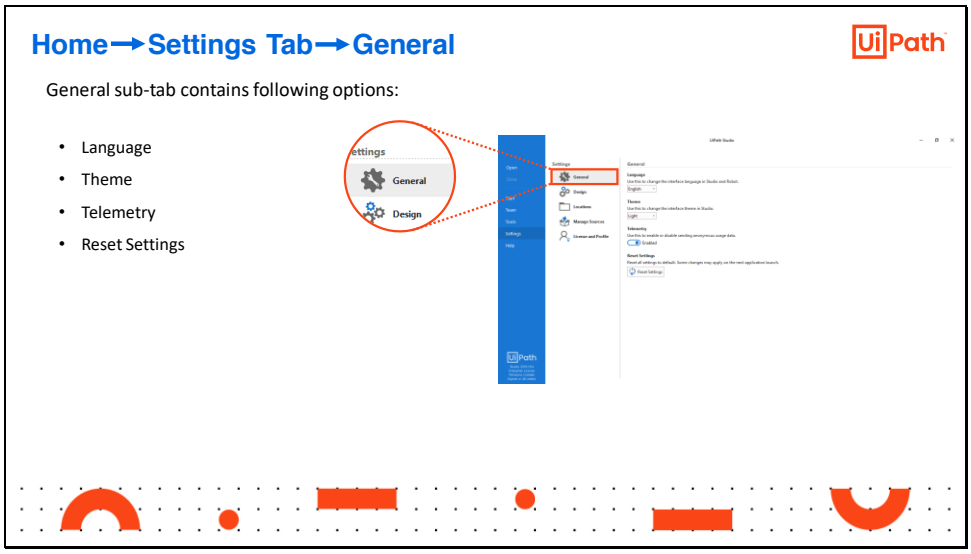


Settings tab allows the user to change the interface language, theme, set global preferences, and manage activity feeds.

This tab has five sub-tabs:

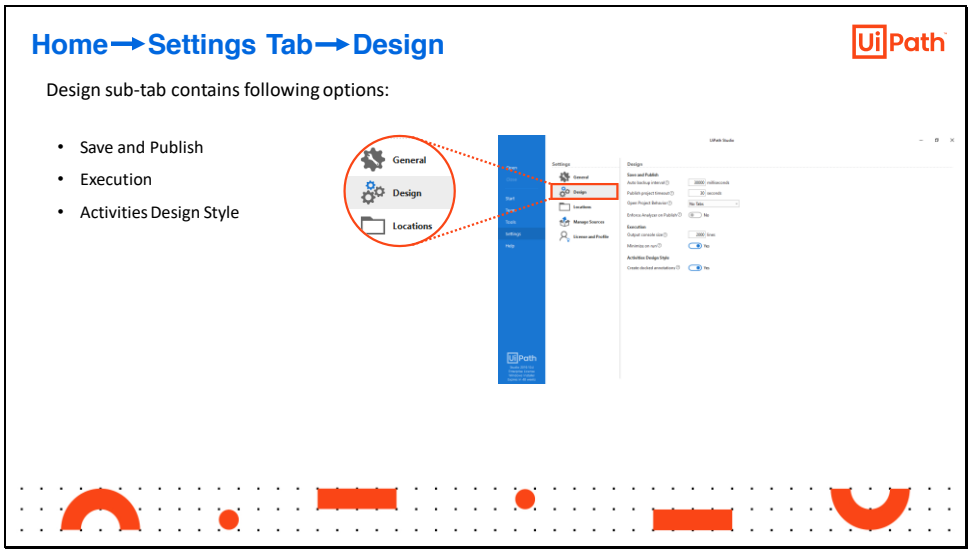
- General
- Design
- Locations
- Manage Sources
- License and Profile

These sub-tabs are discussed in the subsequent slides.



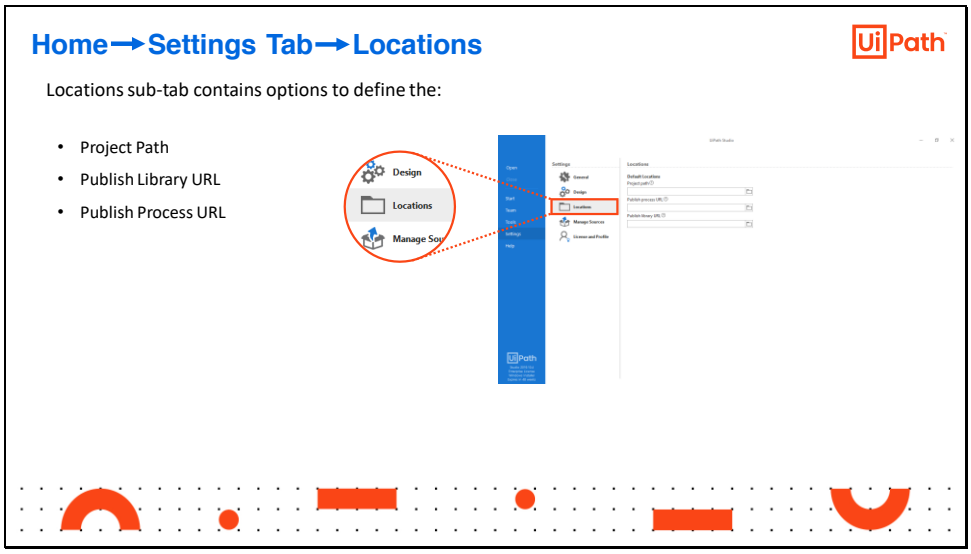
The first sub-tab, **General,** contains following options:

- 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.



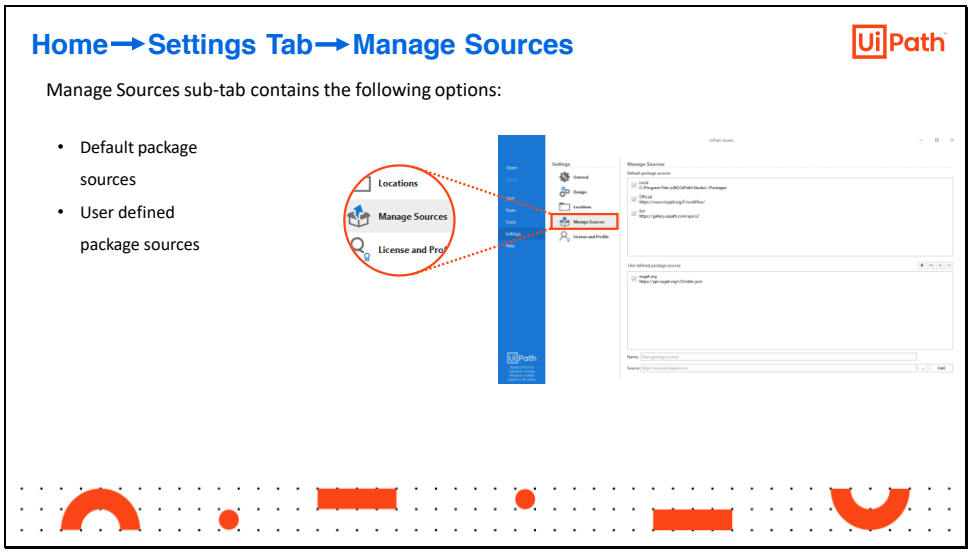
Design sub-tab of Settings tab contains a set of global settings that apply to all projects opened in this version of Studio. It contains following options:

- Save and Publish: This allows the user to set values for 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.
- Activities Design Style: This allows the user to create docked or floating annotations for activities.



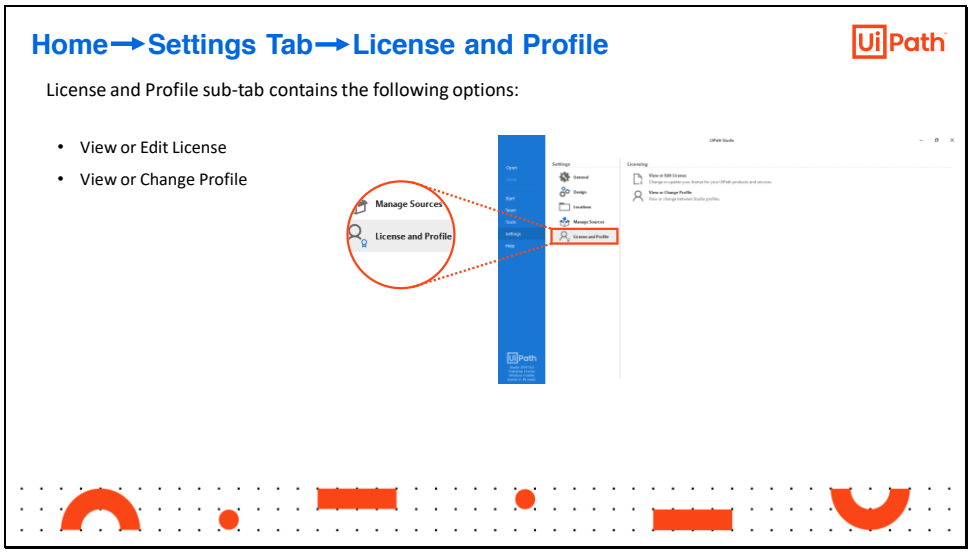
Locations sub-tab of Settings tab allows the user to define:

- 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).



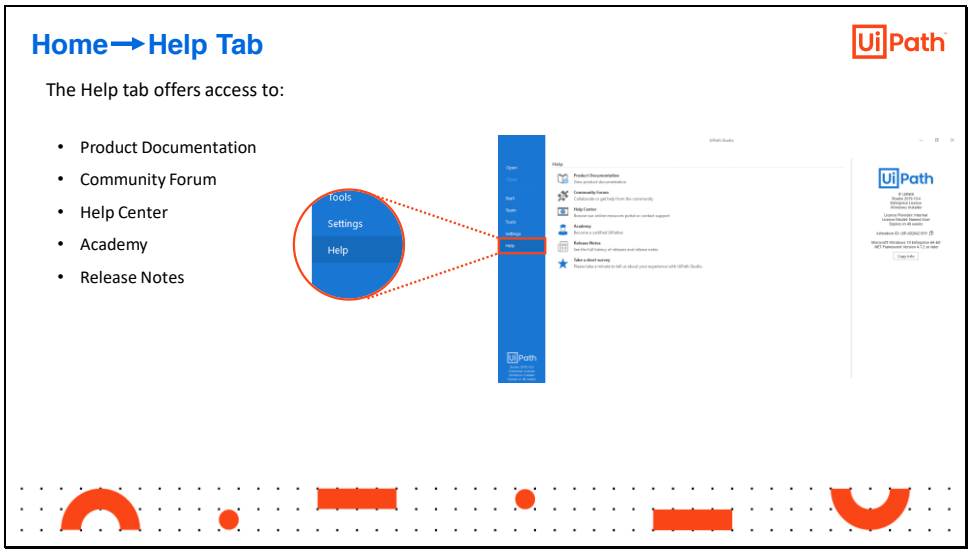
Manage Sources sub-tab of Settings tab allows the user to manage feeds for activities packages from Studio Backstage view without having to open a project. This sub-tab contains following options:

- Default package sources
- User defined package sources



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

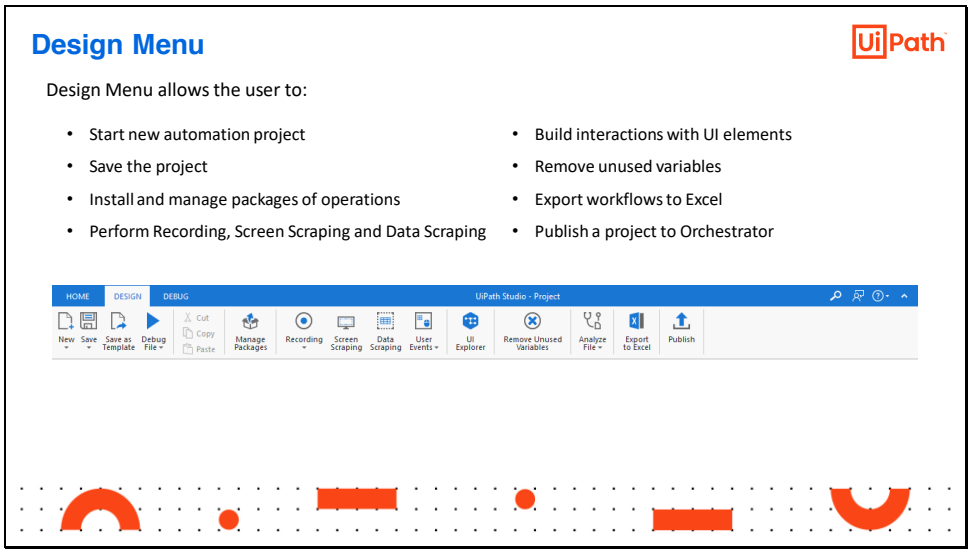
- View or Edit License: Change (Community or Enterprise) or update the license for UiPath products and services.
- View or Change Profile: View or change between Studio profiles (i.e., between Studio and StudioX profiles).



Help tab allows the user to access:

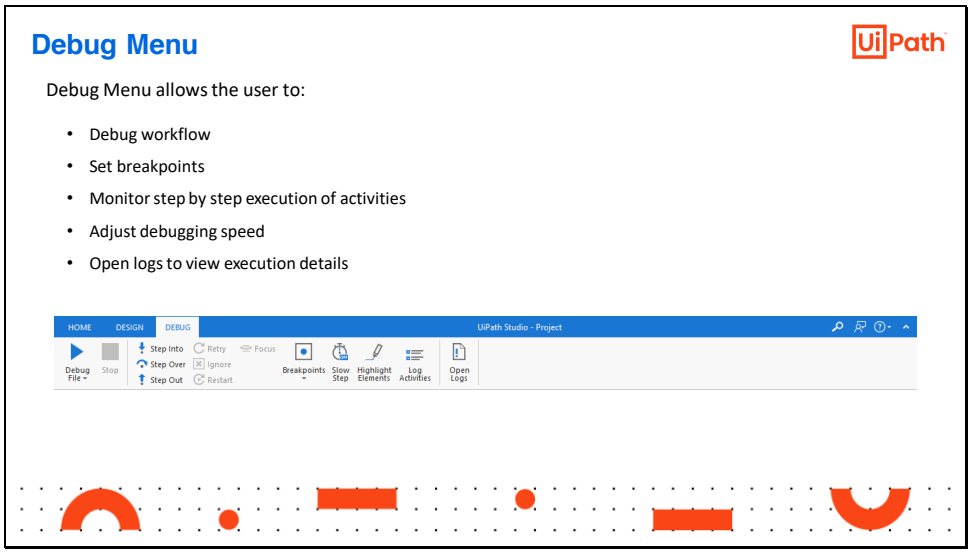
- Product Documentation: Here, the user can view the product documentation.
- Community Forum: Through the forum, the user can collaborate or get help from the community.
- Help Center: By accessing the Help Center, the user can browse UiPath's online resources portal or contact support
- Academy: The 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.

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



Design Menu allows the user to:

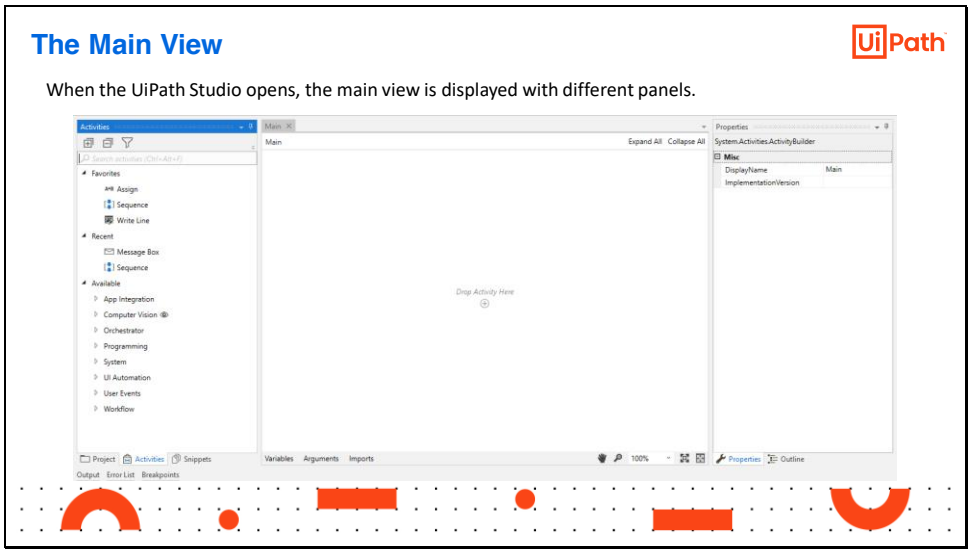
- Start new automation project
- Save the project
- Install and manage packages of operations
- Perform Recording, Screen Scraping and Data Scraping
- Build interactions with UI elements
- Remove unused variables
- Export workflows to Excel
- Publish a project to Orchestrator



Debug Menu allows the user to:

- Debug workflow
- Set breakpoints
- Monitor step by step execution of activities
- Adjust debugging speed
- Open logs to view details regarding execution and any changes made to the project

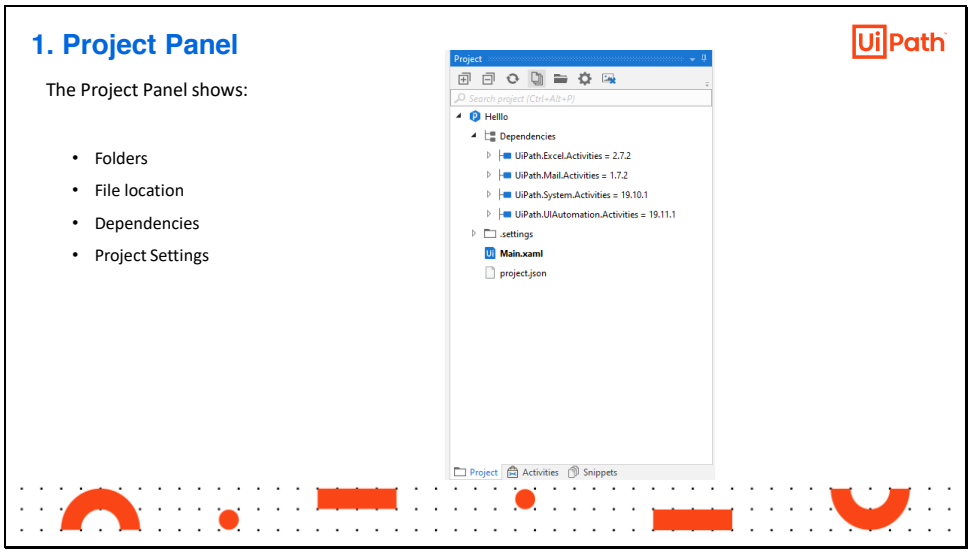
The fields are discussed in detail later.



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

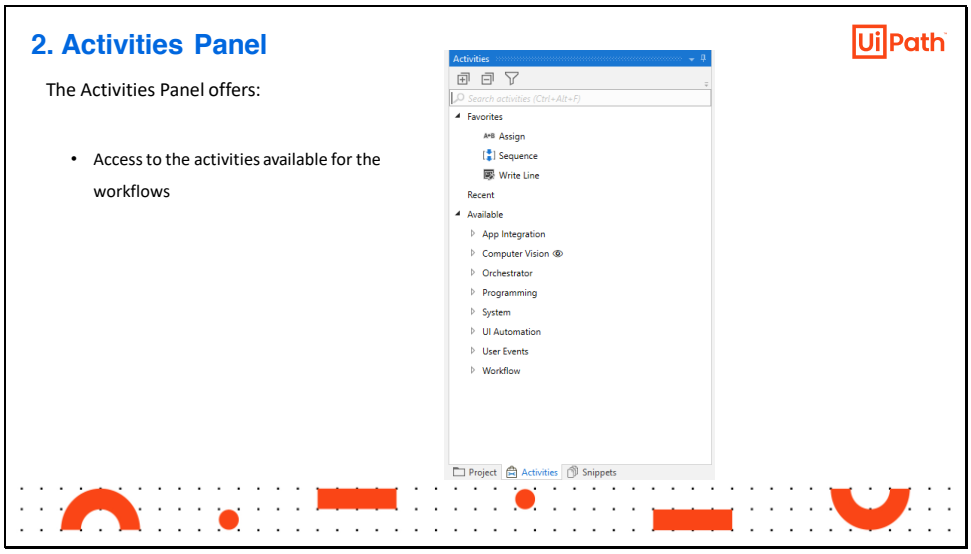
- The Designer Panel
- Activities Panel
- Other panels (visible simultaneously or alternatively):
- On the left, the Project Panel can be switched with the Activities Panel and the Snippets Panel, using a navigation bar on the bottom of the panel.
- In the center, the Designer panel is available, where the automation workflows are being designed.
- Below in the center, the Variables Panel can be switched with the Arguments Panel and the Imports Panel.
- On the right, the Properties Panel can be switched with the Outline Panel.
- At the bottom, the Output Panel is shown when a workflow is run.

The **Designer Panel** is the largest area situated in the middle of the Main View. This is the area where the automations are actually built. Once the business processes have been mapped and split into simple operations, they are rebuilt in the main area as automation projects, using the structures available in UiPath and the specific automation operations. The automation projects are known as workflows.



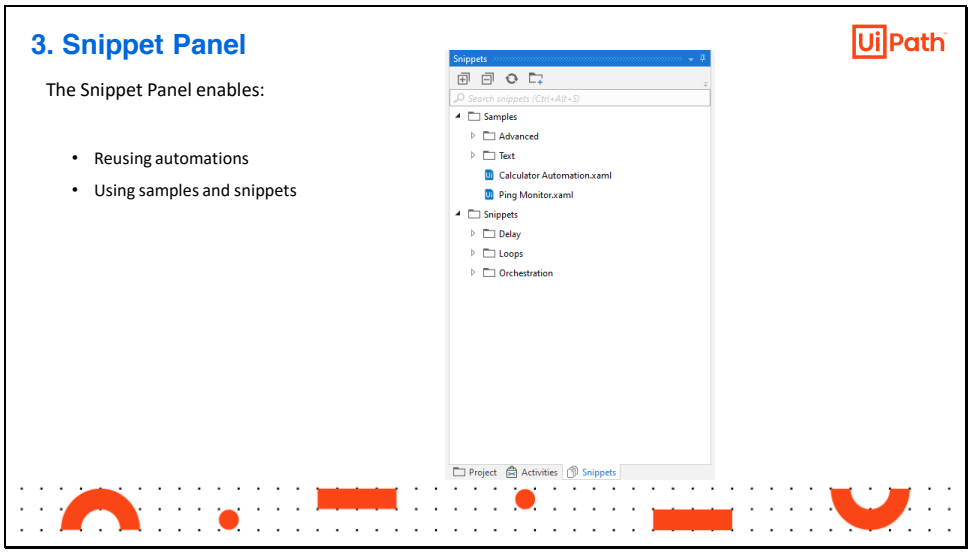
The Project Panel enables the user to view the current state and contents of the current project. It assists the user in project organization and enables user to add folders, open the file location, manage dependencies, and adjust project settings.
It offers the following options:

- 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 the 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



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

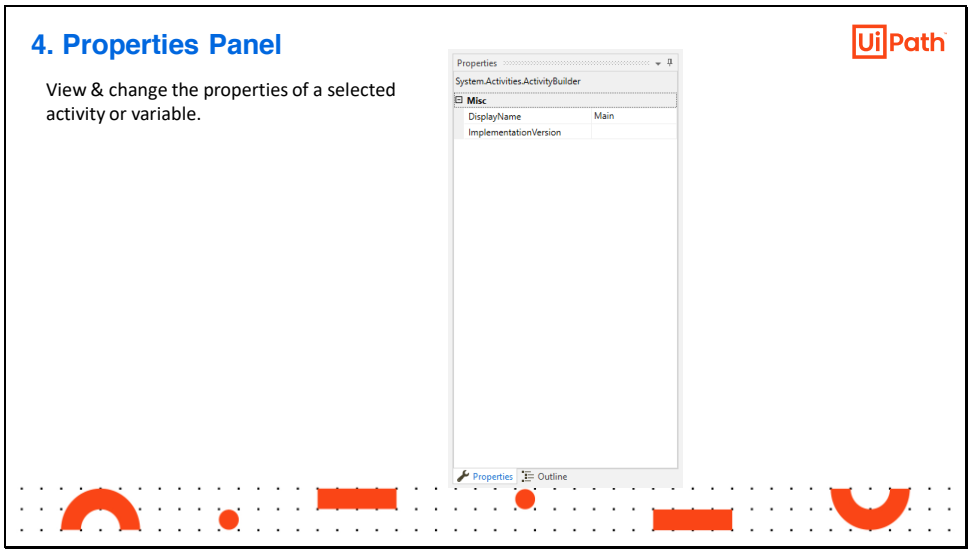
- A search box: Use it to find activities, navigate through them and add an activity to the current project
- Buttons:
    - Show Activities: to open list for showing favorite, available, recently used and compatible activities, expand all, collapse all, and choose between the folders displayed (favorites, recent, available)
    - Pin Favorites: to make favorite activities visible in the panel
    - Group by Packages: to group activities by the package to which they belong
    - Create Test Bench: to test activities before adding them to projects



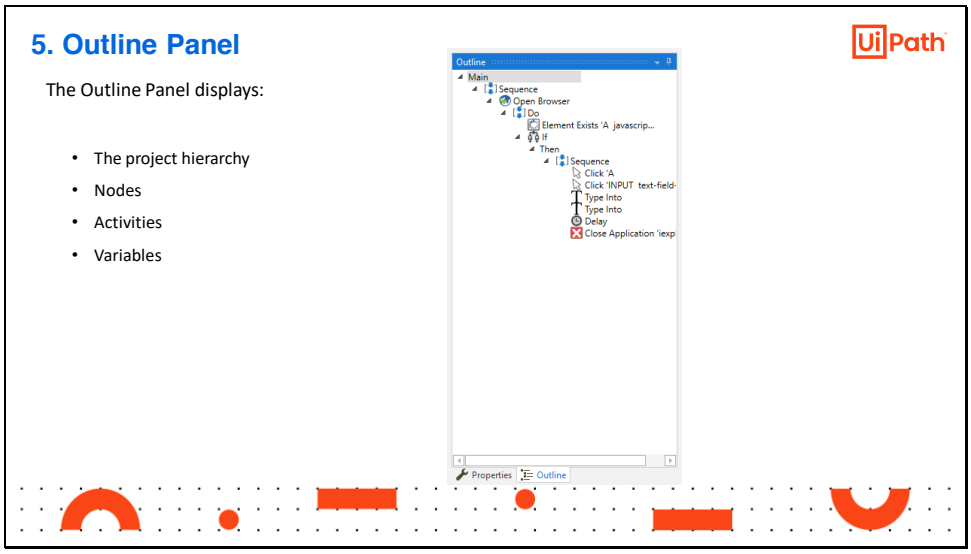
The Snippets Panel enables the user to reuse automations using snippets and samples available for various generic activities (for example, delays or loops which are already configured). The panel is used to reuse a code or activity that is already present thereby saving time on rework. The user can also add a snippet from his computer. A folder can be removed by selecting Remove.

The panel offers four buttons:

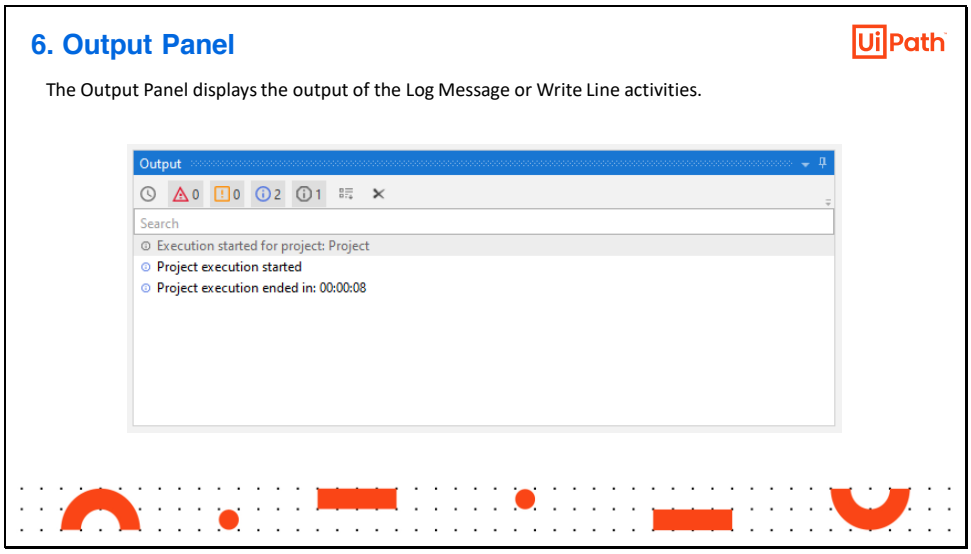
- Expand all
- Collapse all
- Refresh
- Add folder



The Properties panel displays the properties of a selected activity and variable. It enables the user to change the properties of the activity. Here, the user can modify the common properties of two activities selected in the same workflow.



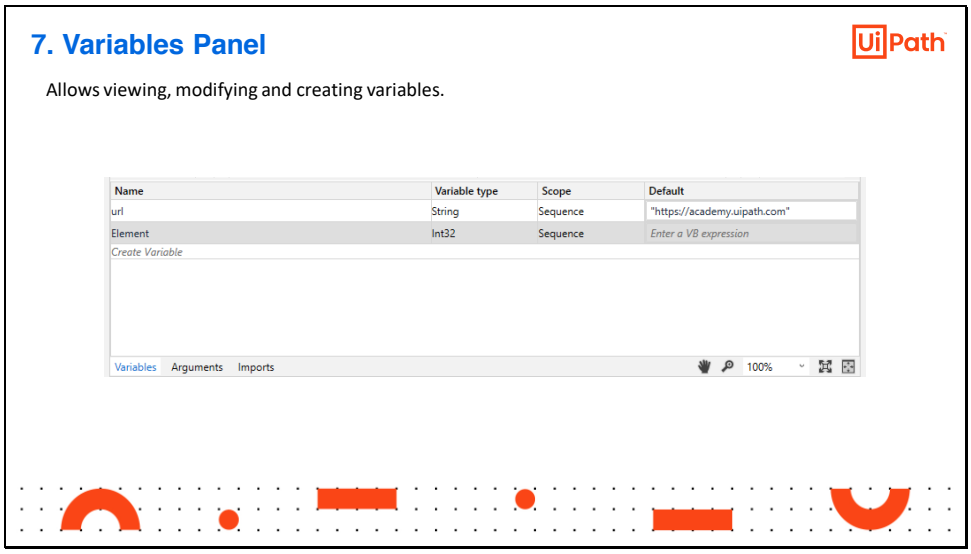
The Outline Panel shows the project hierarchy, including the nodes (points where an activity splits the flow in at least two paths), the activities and the variables used. The user can go to a specific activity by selecting it in the Outline panel.



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:

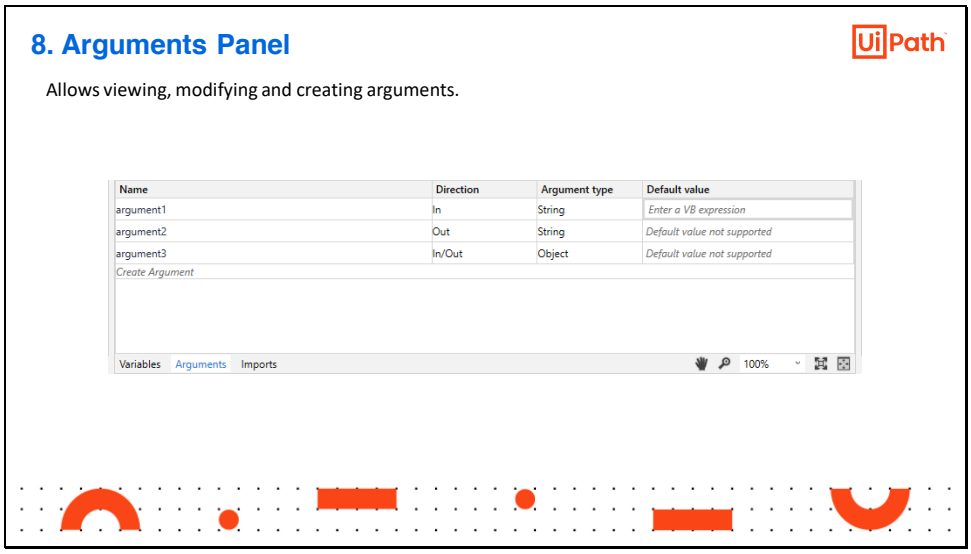
- Export Logs button: To export logs into a .txt file. The user can also filter the logs and then export them.
- Log Activities: The panel shows logs for an activity from the start of its execution till it ends while debugging by enabling the Log Activities option in Debug tab.
- Error List: Displays errors in file during validation process.
- Clear All: Erases the information displayed in Output Panel.



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

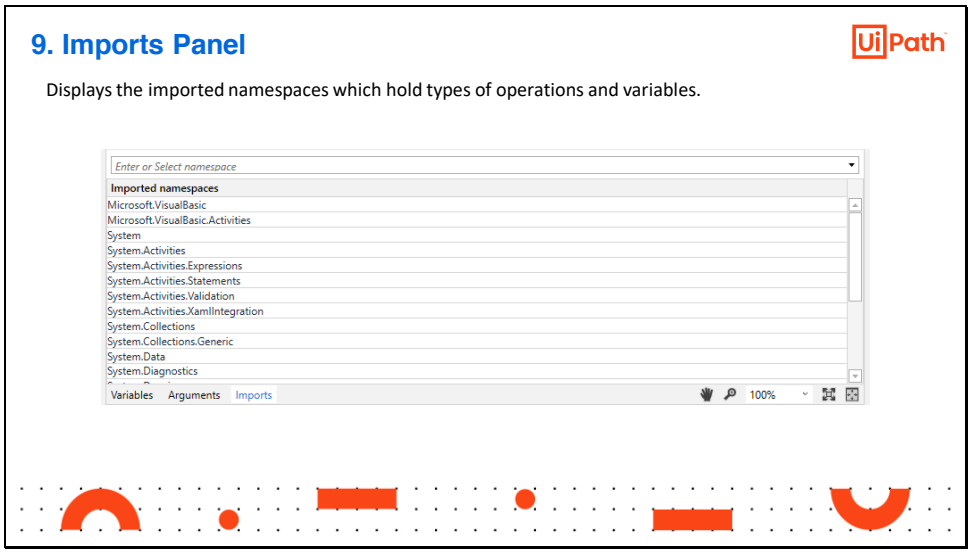


Arguments are variables that can transfer data from one project to another. **The Arguments Panel** enables the user to create arguments and modify them. When the user renames a variable, it is automatically updated in the current file. This panel offers similar fields and operations as the Variable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

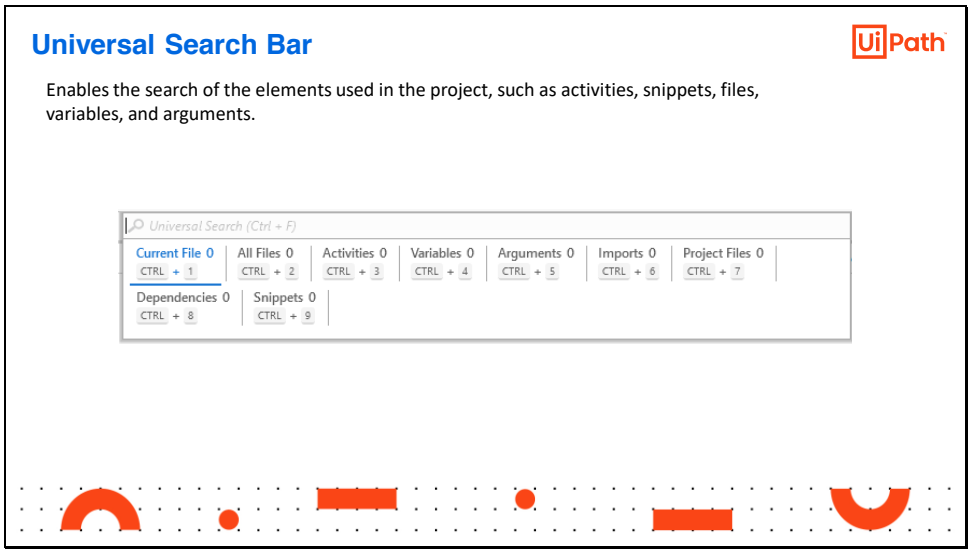
- In: Data transferred from another project to the current (open) project
- Out: Data transferred from the current project to another
- In/Out: Data transferred both ways

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



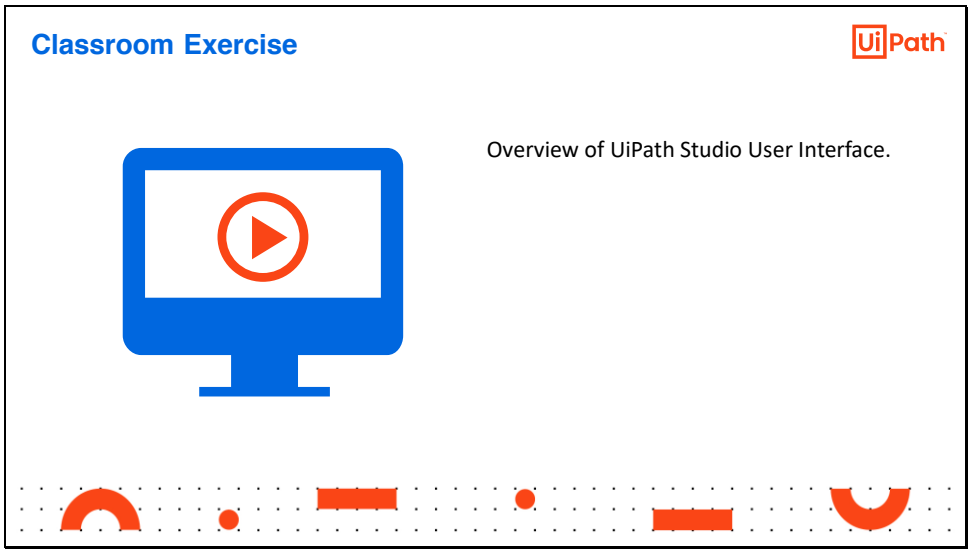
The Imports Panel displays all the namespaces that were imported for the project. Namespaces are containers created to hold types of operations and variables.



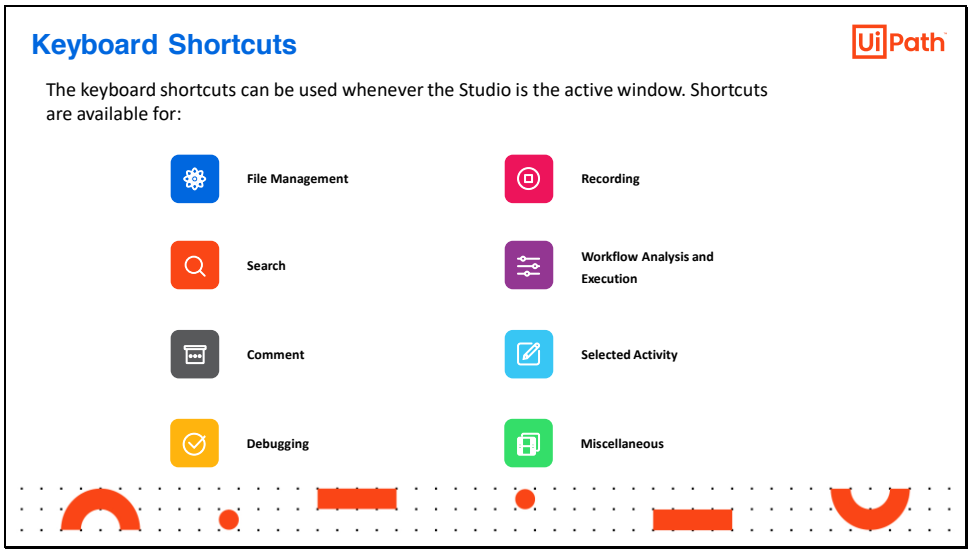
The Main View of UiPath Studio offers two helpful tools to find elements and make changes:

- Search Bar

The Search Bar is positioned in the upper right corner of the Main View. It can successfully search for activities, snippets, files, variables, and arguments inside the workflow.



Give an overview of UiPath Studio User Interface.

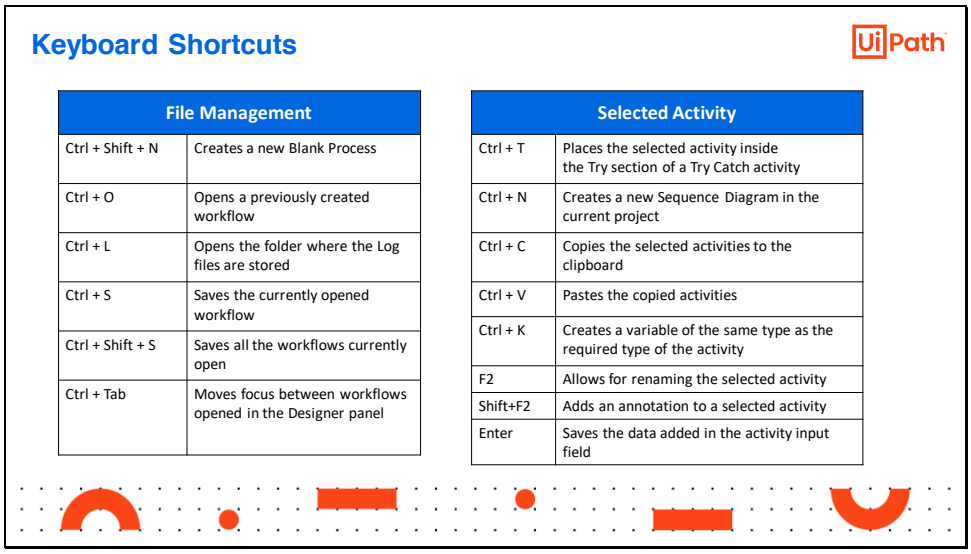


The keyboard shortcuts can be used whenever the Studio is the active window.

Shortcuts are available for:

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

For more details, refer: https://docs.uipath.com/studio/docs/keyboard-shortcuts



File Management	
Ctrl + Shift + N	Creates a new Blank Process
Ctrl + O	Opens a previously created workflow
Ctrl + L	Opens the folder where the Log files are stored
Ctrl + S	Saves the currently opened workflow
Ctrl + Shift + S	Saves all the workflows currently open
Ctrl + Tab	Moves focus between workflows opened in the Designer panel

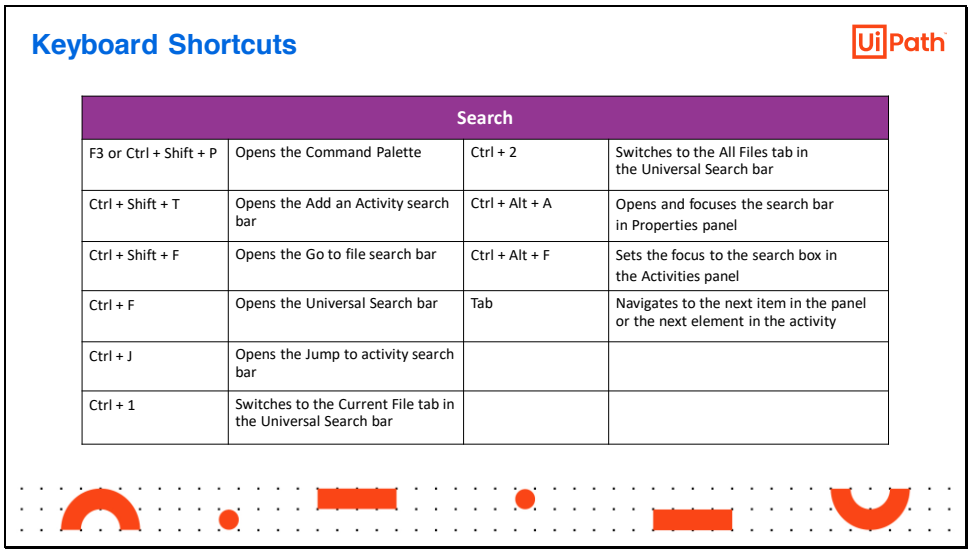
Selected Activity	
Ctrl + T	Places the selected activity inside the Try section of a Try Catch activity
Ctrl + N	Creates a new Sequence Diagram in the current project
Ctrl + C	Copies the selected activities to the clipboard
Ctrl + V	Pastes the copied activities
Ctrl + K	Creates a variable of the same type as the required type of the activity
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:

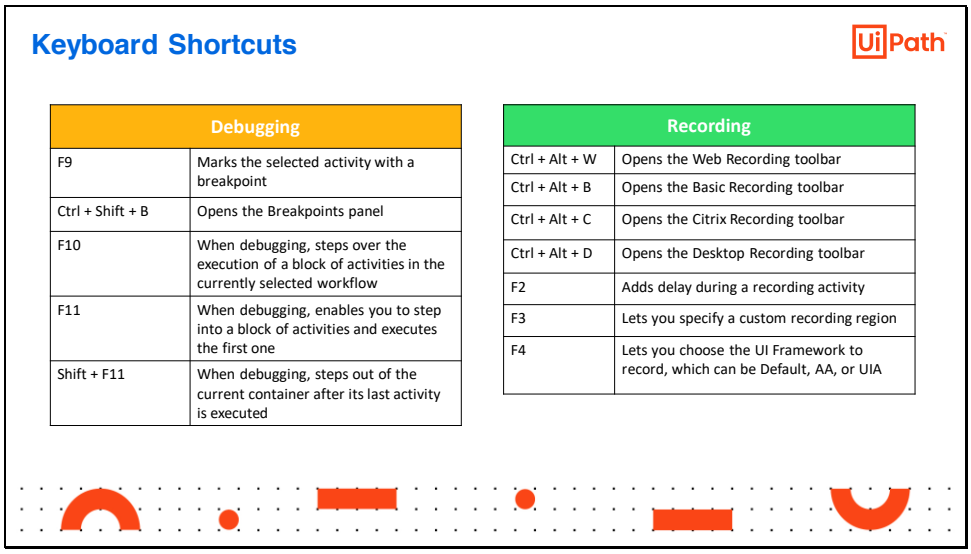
- Ctrl + T - Place the activity inside the Try section of a Try Catch activity.
- Ctrl + N - Create a new Sequence Diagram in the current project.
- Ctrl + C - Copy the selected activity or activities to the clipboard.
- Ctrl + V - Paste the copied activity or activities inside the selected item.
- Ctrl + K - Create a variable of the same type as the required type of the activity.
- Ctrl + 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.
- 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.



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 + P - Opens and focuses the search bar in the Project panel.
- Ctrl + Alt + S - Opens and focuses the search bar in Snippets panel.
- Tab - Navigates to the next item in the panel or the next element in the activity.



Keyboard Shortcuts

UiPath

Debugging	
F9	Marks the selected activity with a breakpoint
Ctrl + Shift + B	Opens the Breakpoints panel
F10	When debugging, steps over the execution of a block of activities in the currently selected workflow
F11	When debugging, enables you to 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

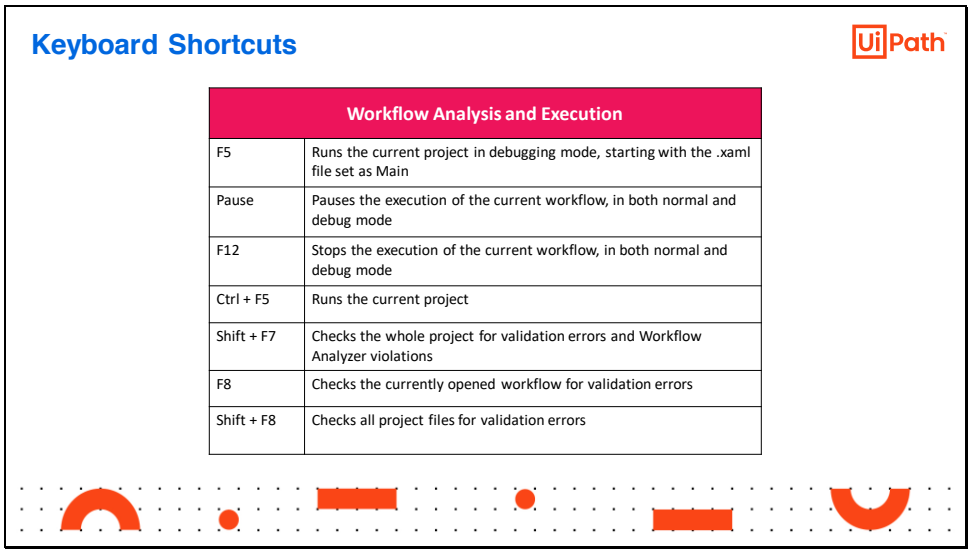
Recording	
Ctrl + Alt + W	Opens the Web Recording toolbar
Ctrl + Alt + B	Opens the Basic Recording toolbar
Ctrl + Alt + C	Opens the Citrix Recording toolbar
Ctrl + Alt + D	Opens the Desktop Recording toolbar
F2	Adds delay during a recording activity
F3	Lets you specify a custom recording region
F4	Lets 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.
- 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:

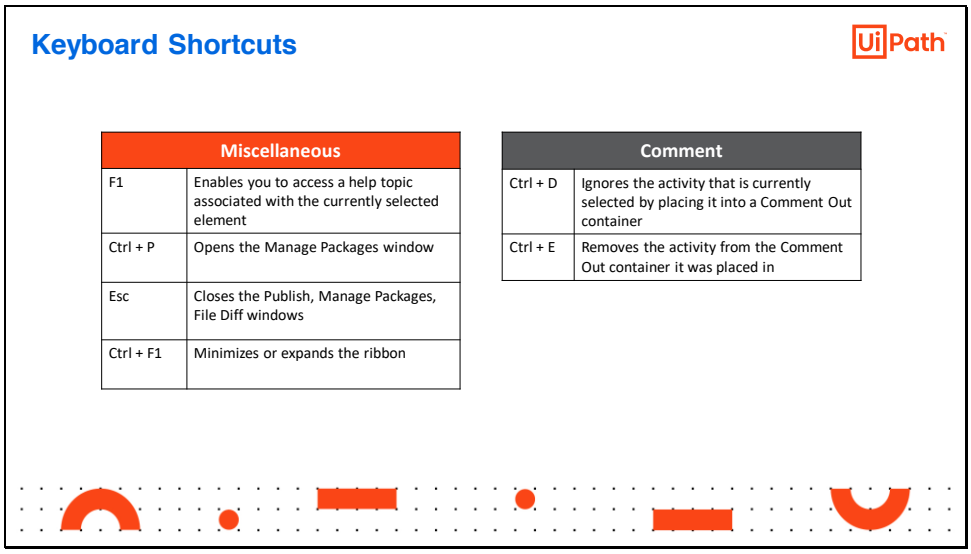
- Ctrl + Alt + B - Open the Basic Recording toolbar.
- Ctrl + Alt + C - Open the Citrix Recording toolbar.
- Ctrl + Alt + D - Open the Desktop Recording toolbar.
- Ctrl + Alt + W - Open the Web Recording toolbar.
- F2 - Add delay during a recording activity.
- F3 - Specify a custom recording region.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



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.

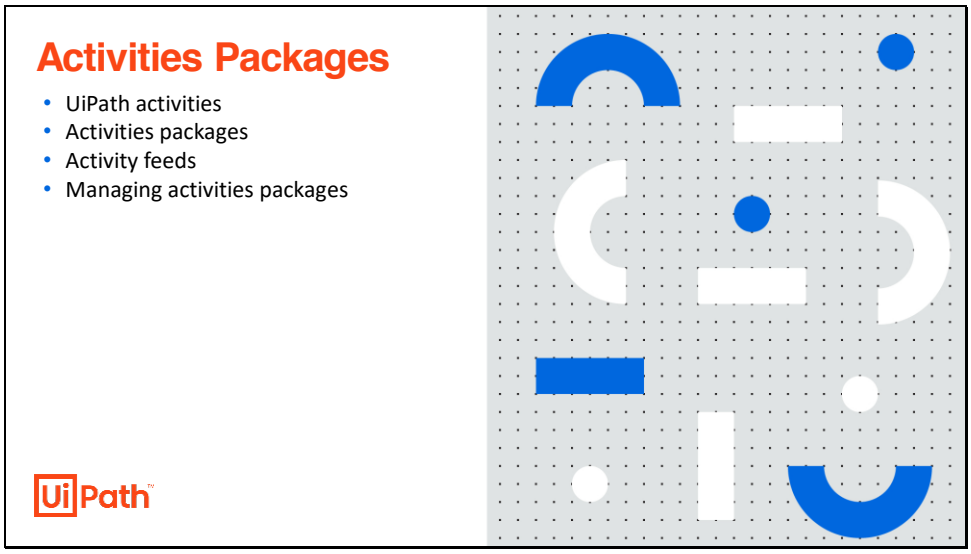


Miscellaneous shortcuts are:

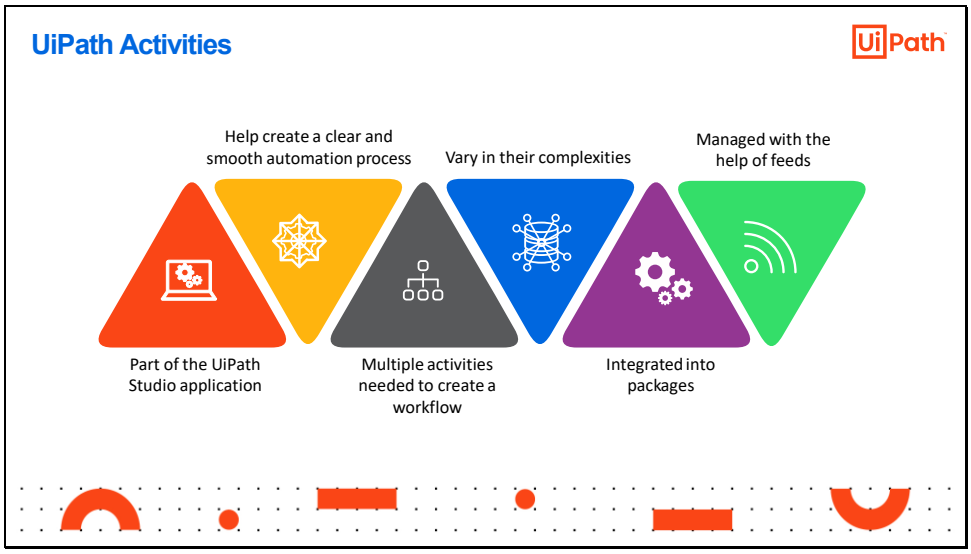
- F1 - Access a help topic associated with the currently selected element.
- Ctrl + P - Open the Manage Packages window.
- Esc - Close the Publish, Manage Packages, File Diff windows.
- Ctrl + F1 - Minimize or expand the ribbon.

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.



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

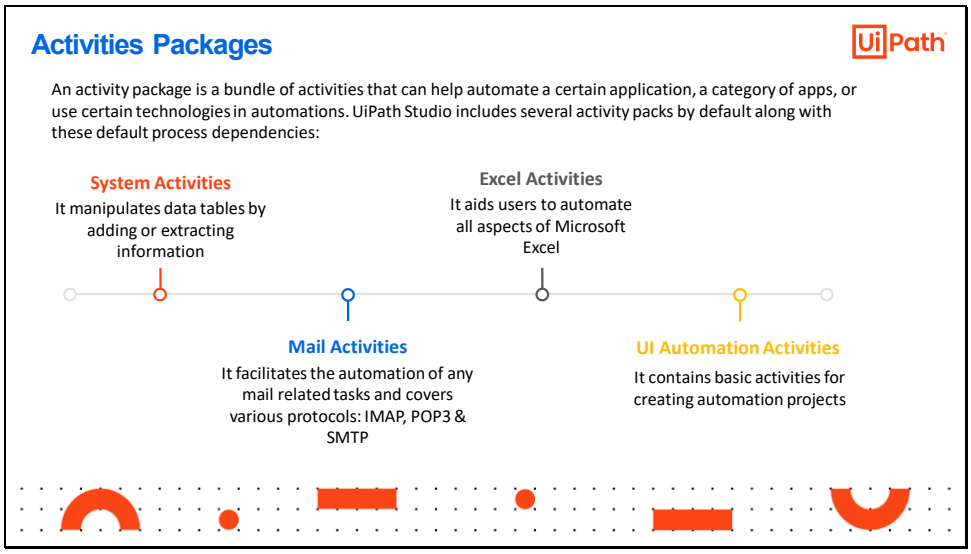


UiPath Activities are part of the **UiPath Studio** application and are designed to help create a clear and smooth automation process. Multiple activities are needed with connections between them to create a workflow.

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.

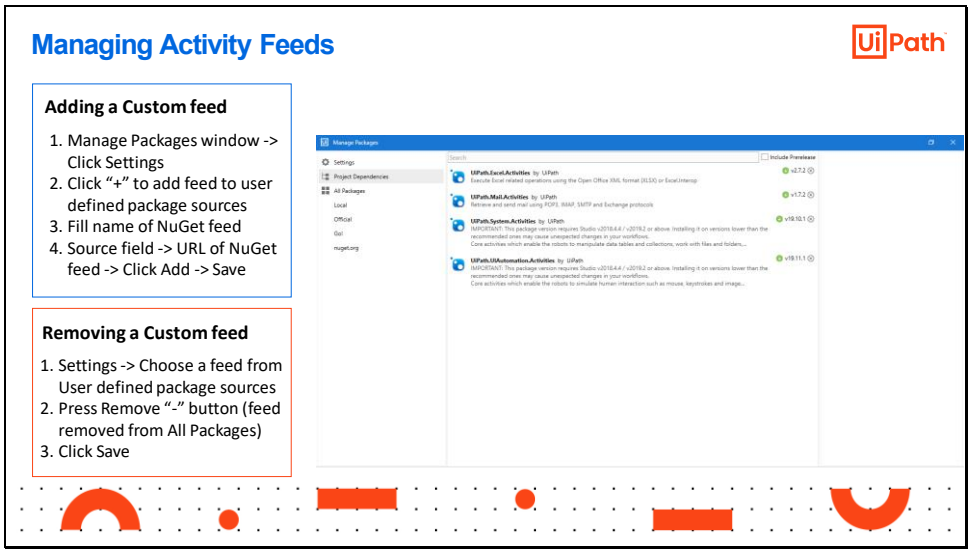


Activities are grouped in packages. An **activity package** is a bundle of activities that can help automate a certain application (Excel Activities, Word Activities), a category of apps (Mail Activities, Terminal Activities), or use certain technologies in automations (OCR Activities, FTP Activities).

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.

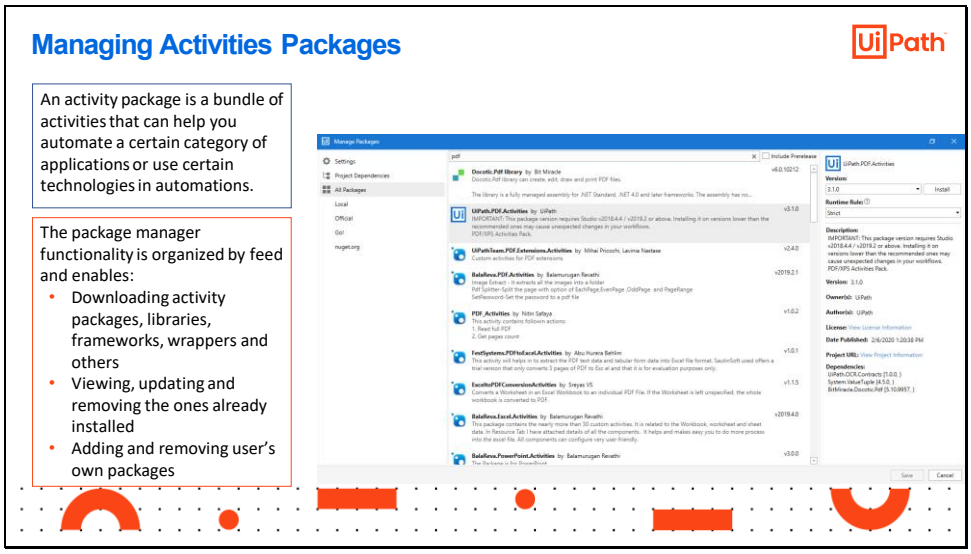


The users can add custom feeds in Studio by following these steps:

- 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.

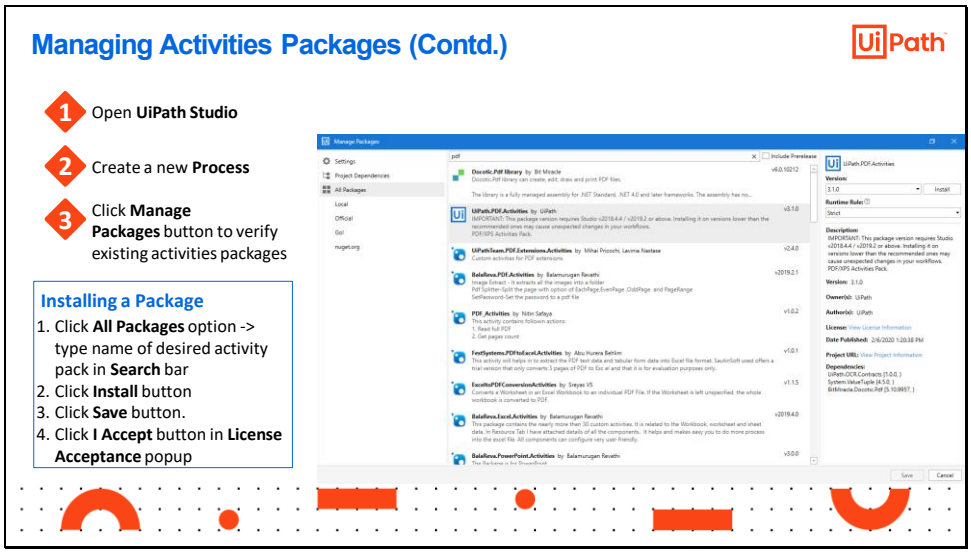


The Package Manager functionality enables us to download activity packages, libraries, frameworks, wrappers and others, view the ones already installed for the project and update them, as well as add and remove your own. It shows the list of available packages per feed and the list of dependencies per 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.

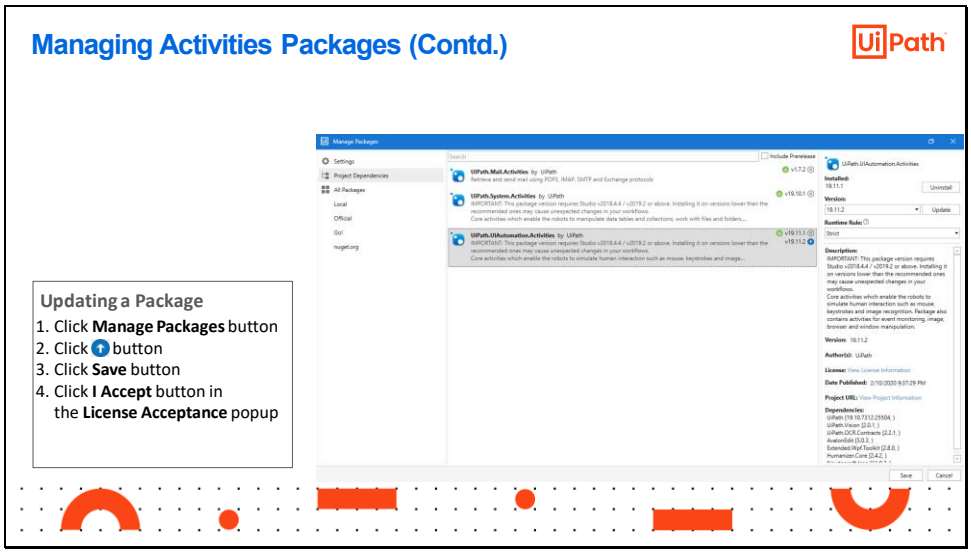


How to add more packages and customize the list of activities:

- 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:

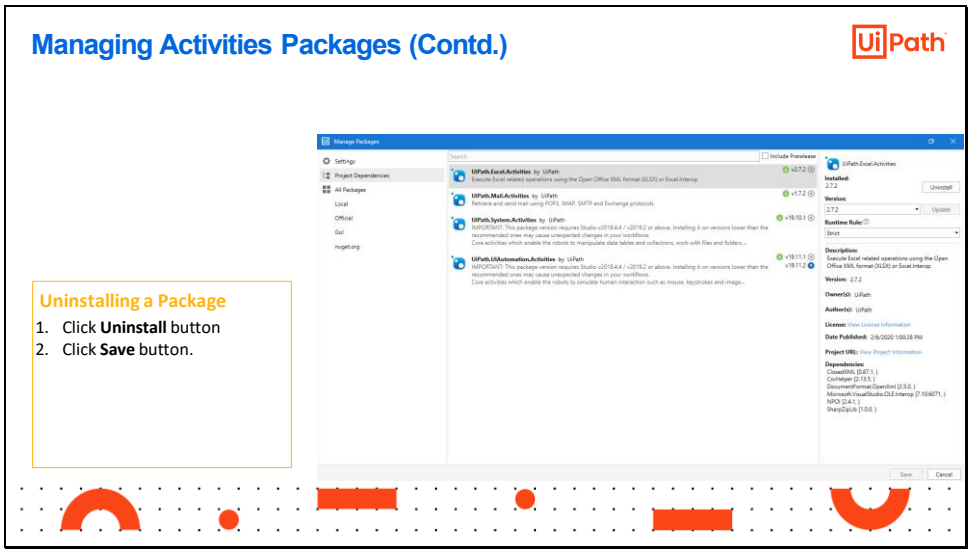
- Click the **All Packages** option and type in the **Search** bar the name of the desired activity pack.
- Click the **Install** button.
- Click the **Save** button.
- Click the **I Accept** button in the **License Acceptance** popup.



Updating a Package:

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

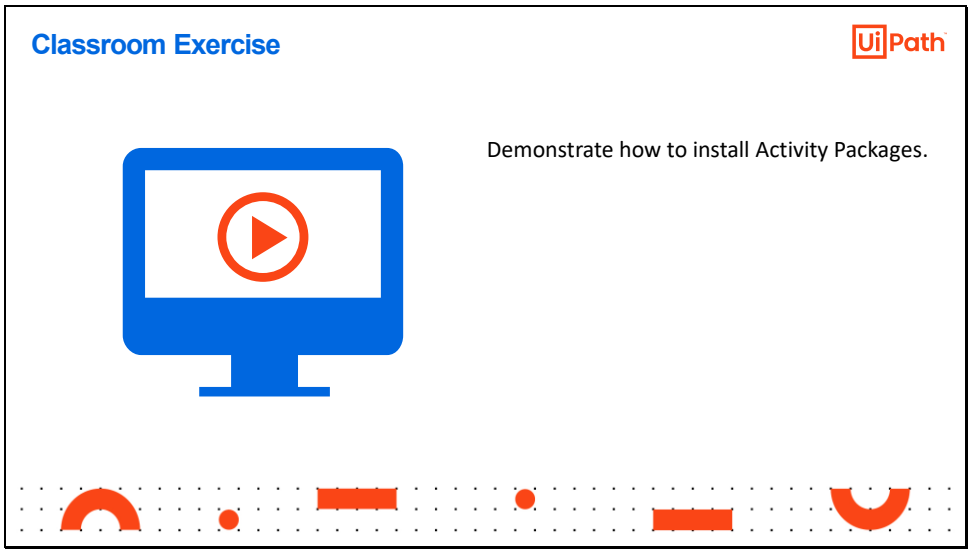
- Click the **Manage Packages** button.
- Click the 'Update this package to the latest version' button.
- Click the **Save** button.
- Click the **I Accept** button in the **License Acceptance** popup.



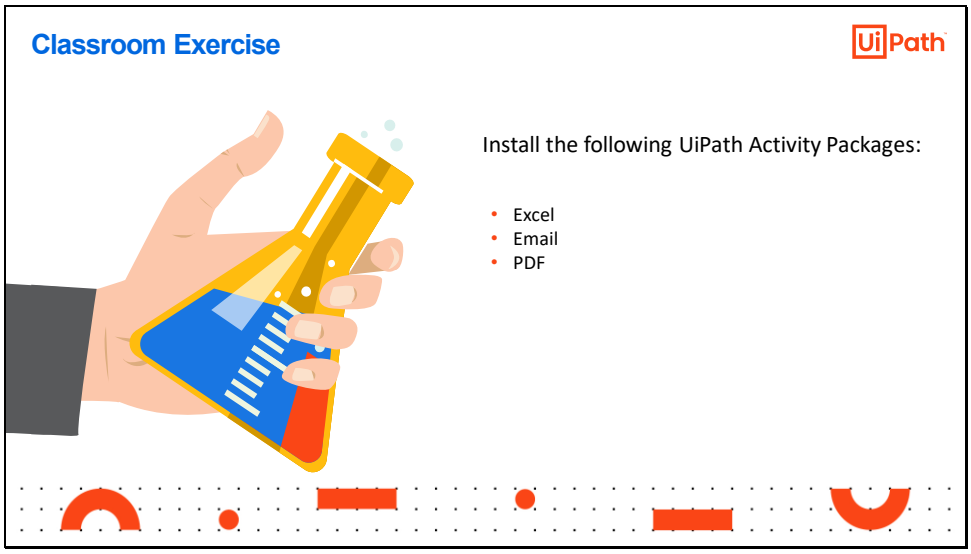
Uninstalling a Package:

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.

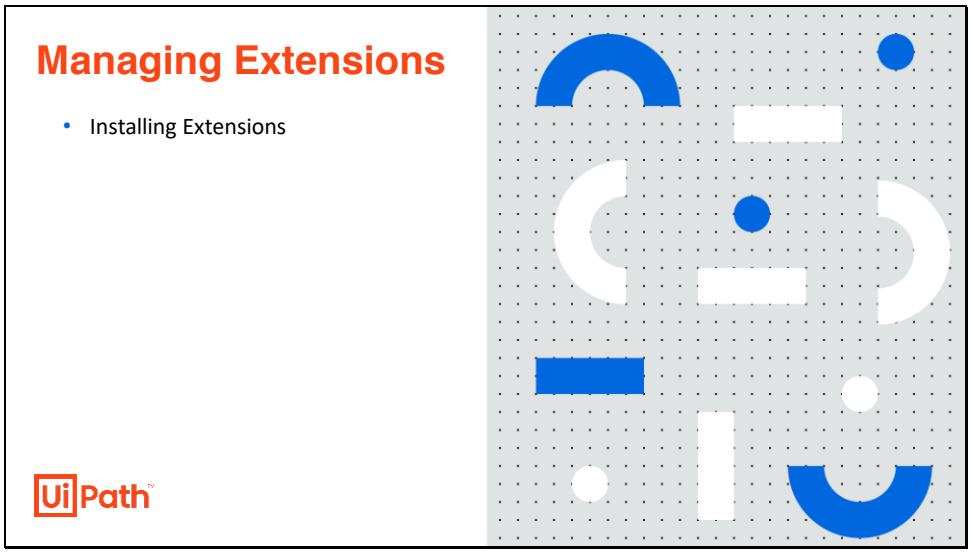


Demonstrate how to install Activity Packages.

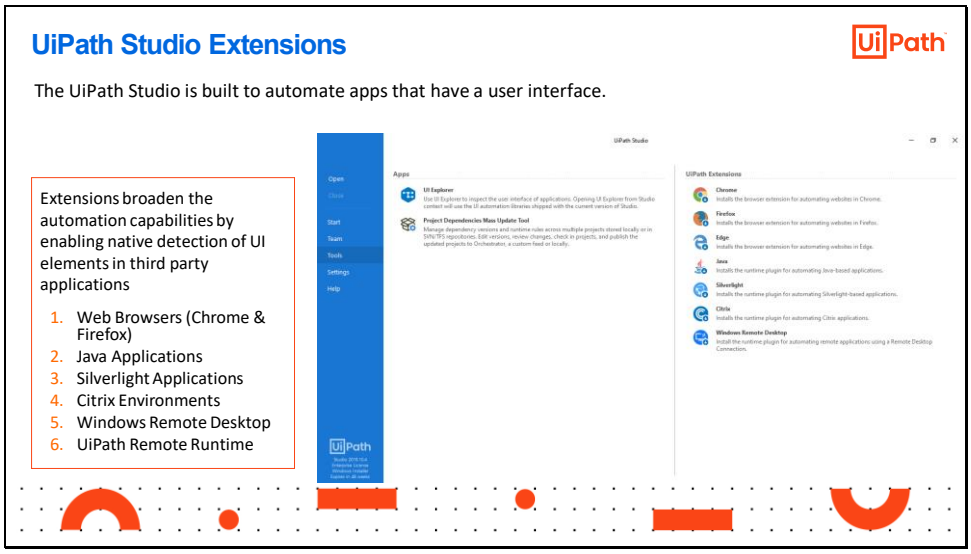


Install the following UiPath Activity Packages:

- Excel
- Email
- PDF



This section explains how to install UiPath Extensions.



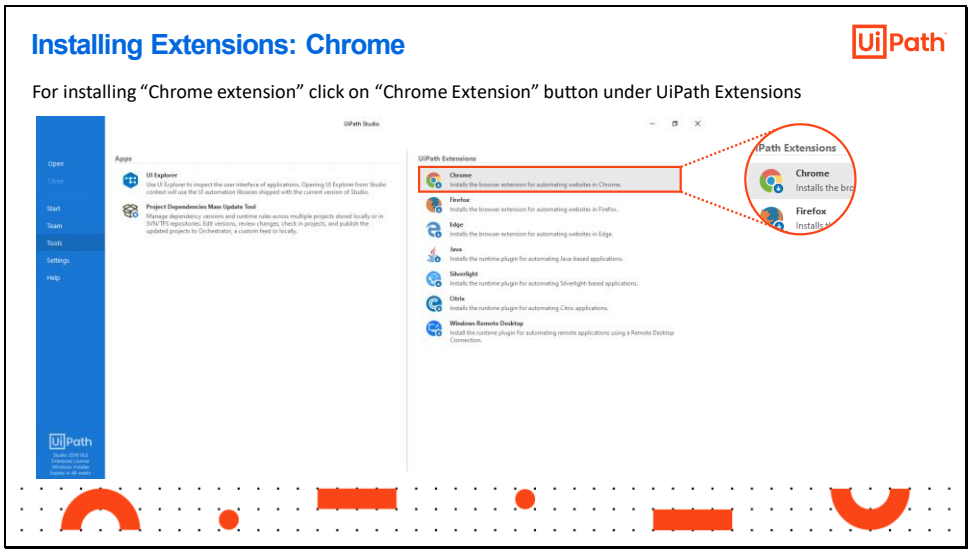
UiPath Extensions:

- 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 building the right selectors. Selectors are essential for building more complex automations. 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
- Java
- Silverlight
- Citrix
- Windows Remote Desktop
- UiPath Remote Runtime

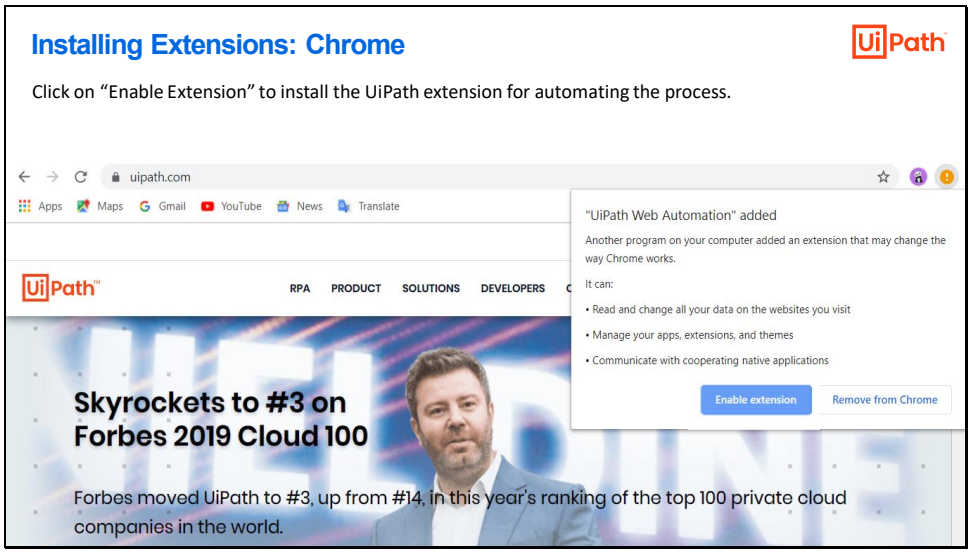
The UiPath extensions can be installed in several ways, including directly from Studio or using the Command Prompt.



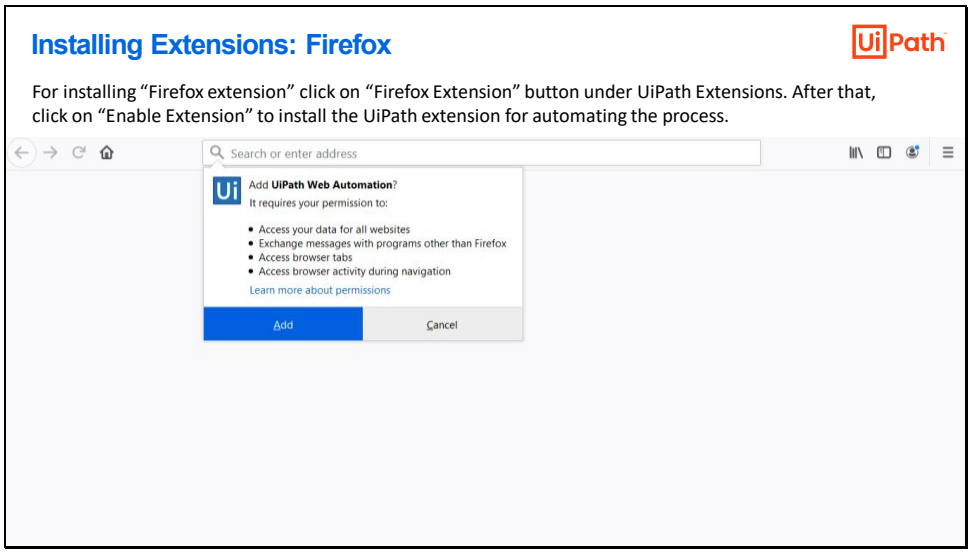
The next step is to install browser extensions. This will enable you to automate web applications. Let us look at demos for installing:

- The Chrome Extension
- The Firefox Extension

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



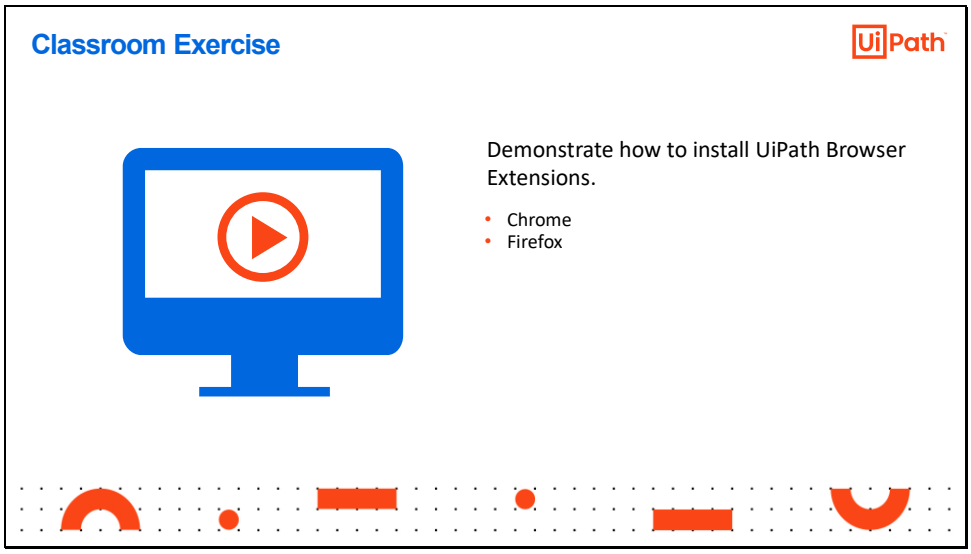
Now open the Chrome browser and click on the notification as shown on the screen. you will get a prompt, click on “Enable extension” button and installation of the Chrome extension is complete.



For installing Firefox extension, Open UiPath Studio, click on "Tools" in the Start toolbar and click on "Firefox Extension" button under 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 UiPath Firefox extension.

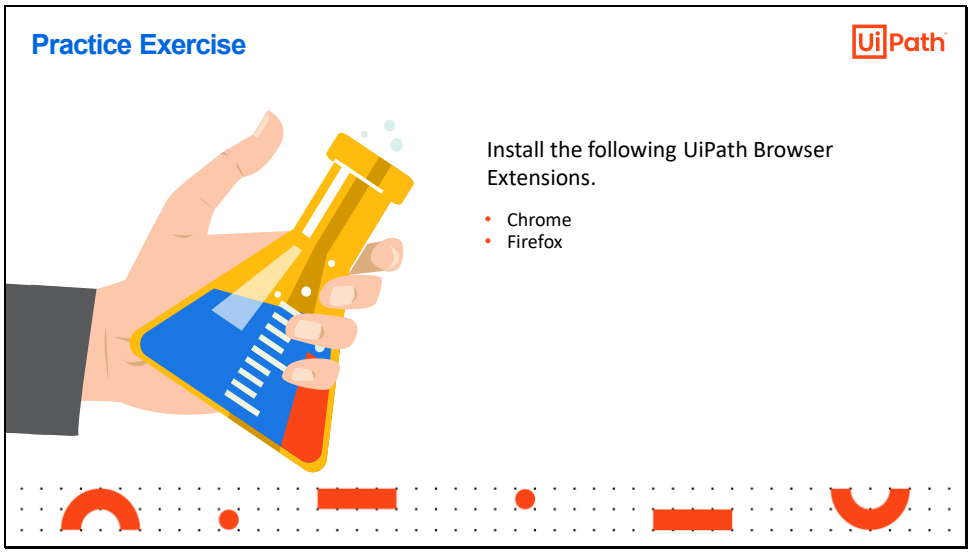
You don't need to install UiPath Internet Explorer extension as UiPath is compatible with Internet Explorer by default .

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



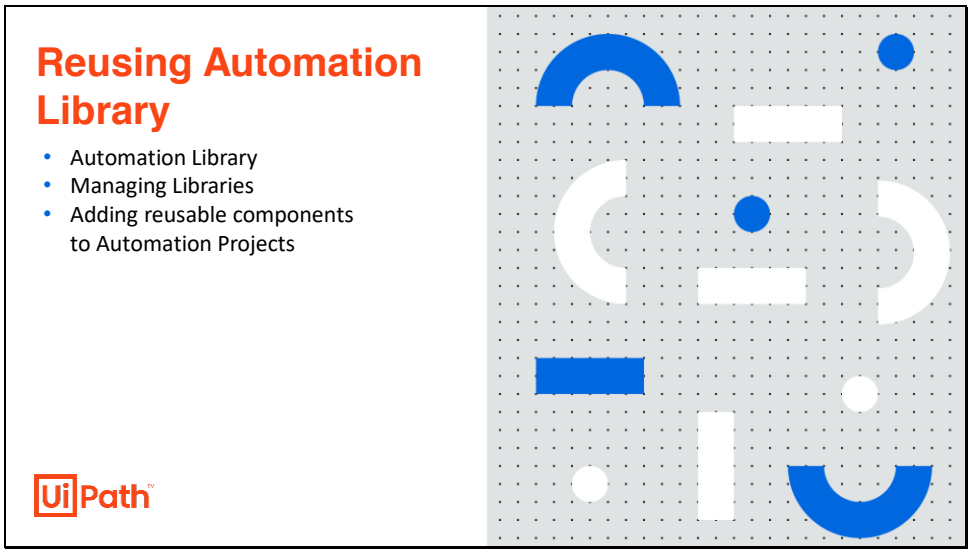
Demonstrate how to install UiPath Browser Extensions.

- Chrome
- Firefox

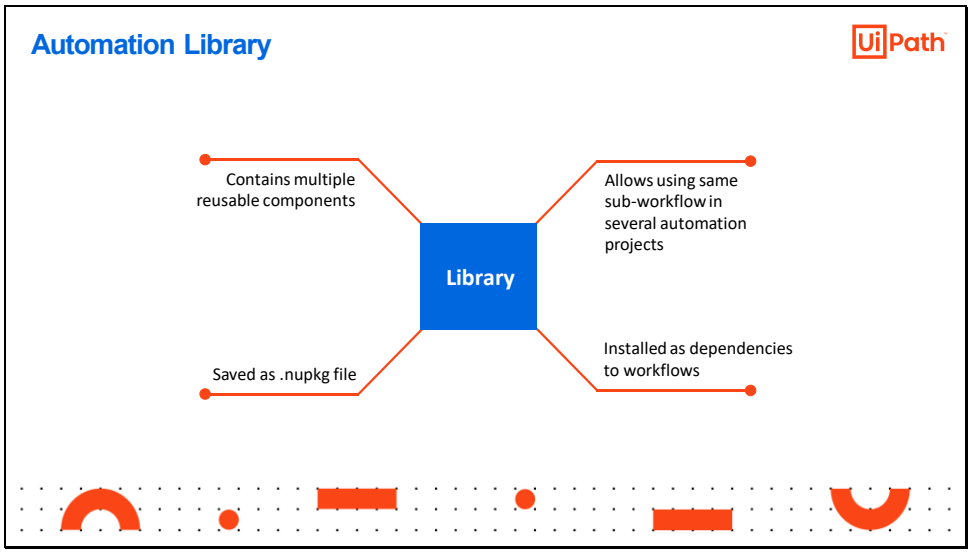


Install the following UiPath Extensions:

- Chrome
- Firefox Extensions



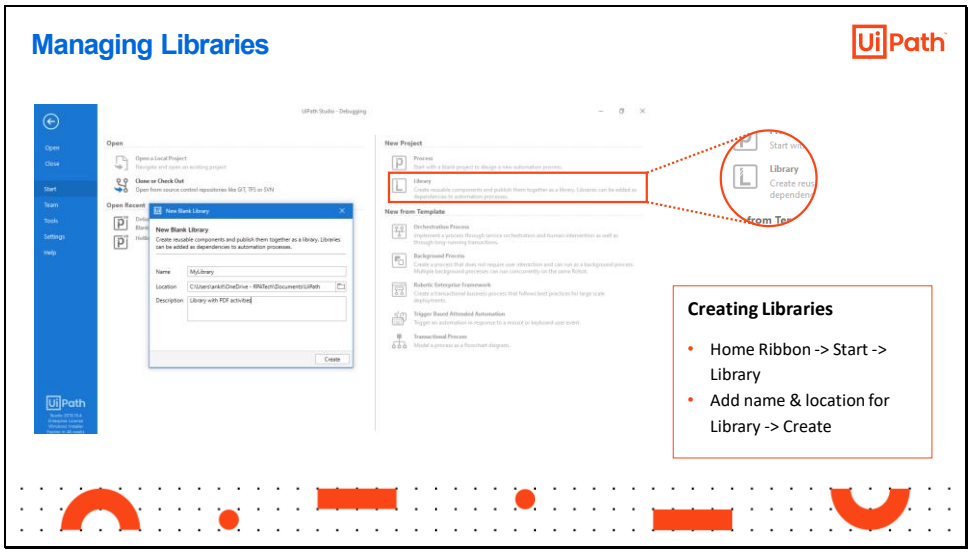
This section introduces the Automation Libraries and explains how to add reusable components to the automation projects.



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 settlement, etc.

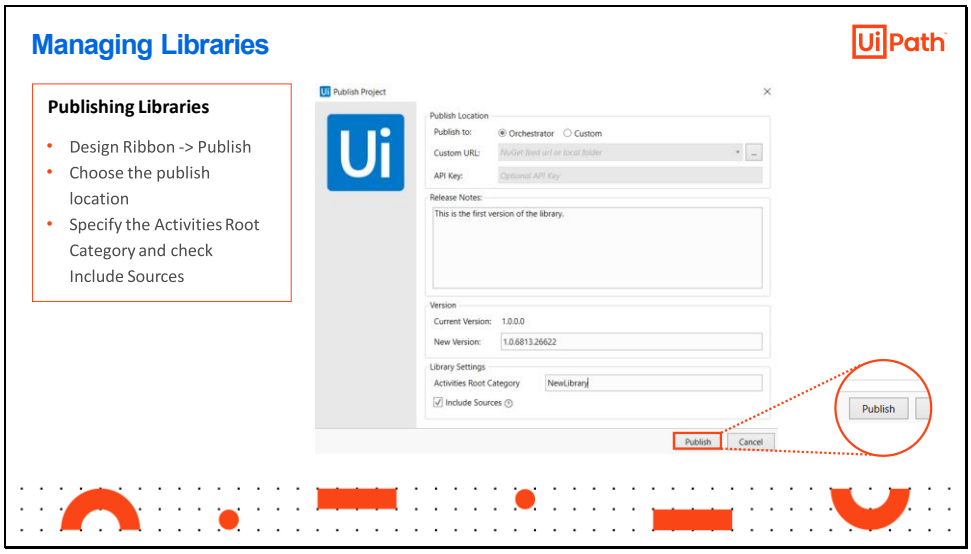
For these scenarios, the developer can create the sub-workflow and save it for use in different and separate projects. These sub-workflows are saved as **Libraries** that are created by developers to reuse the components of one project in other automation.

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.

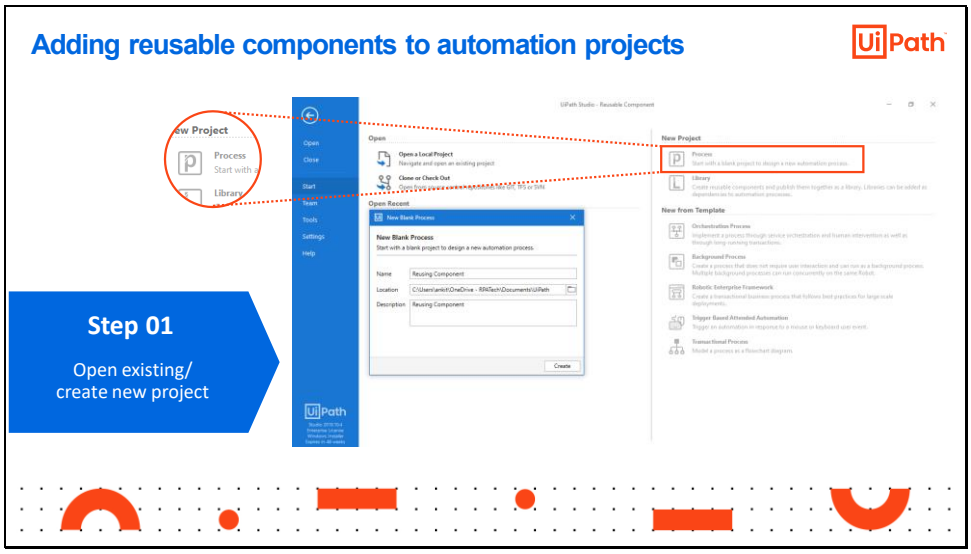


From a functional point of view, Libraries are similar to any other activity package:

• 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.

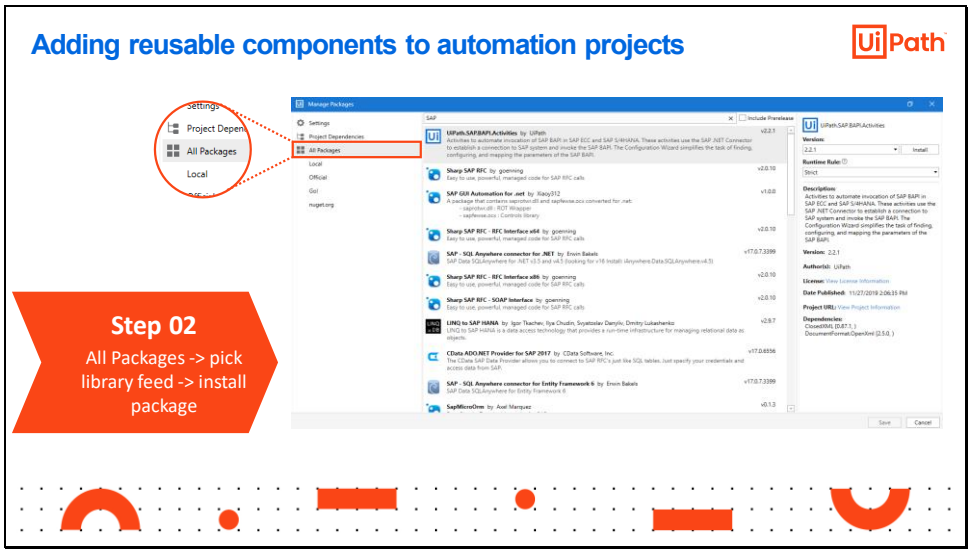


• Publishing Libraries is similar to publishing regular projects – set the feed, input release notes, and set the Activities Root Category and check Include Sources (this is helpful during debugging workflows). The reusable components are available in the Project Panel.

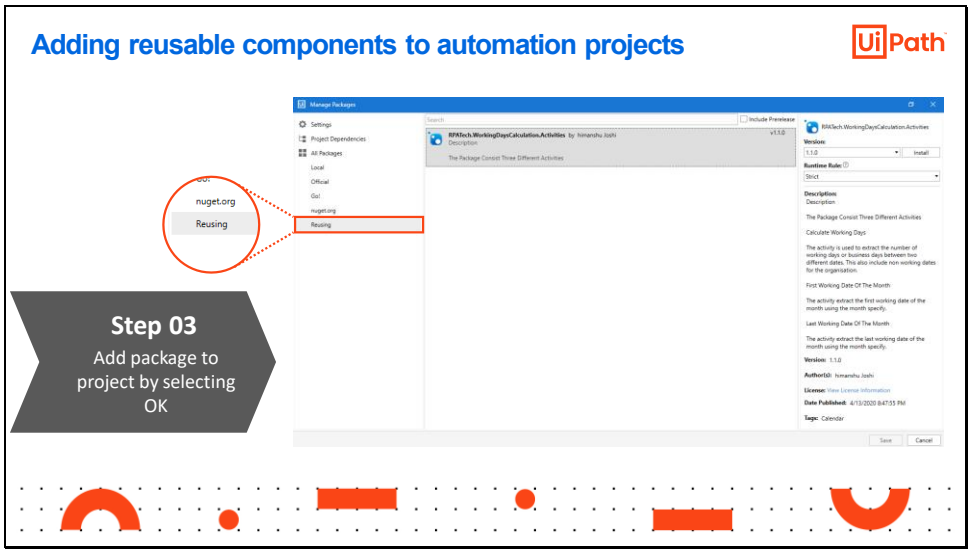


To add the reusable components to new automation projects, follow the following steps:

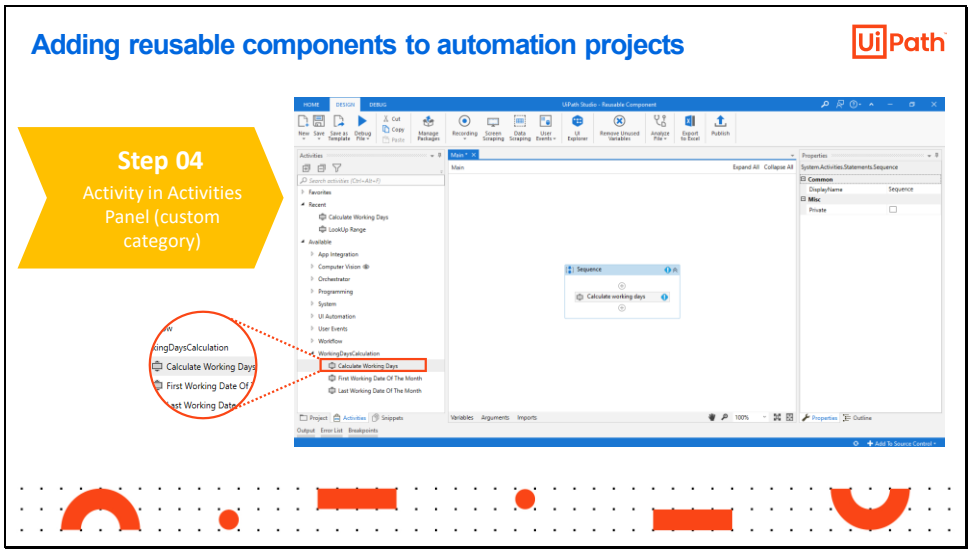
- Open or create a new project.



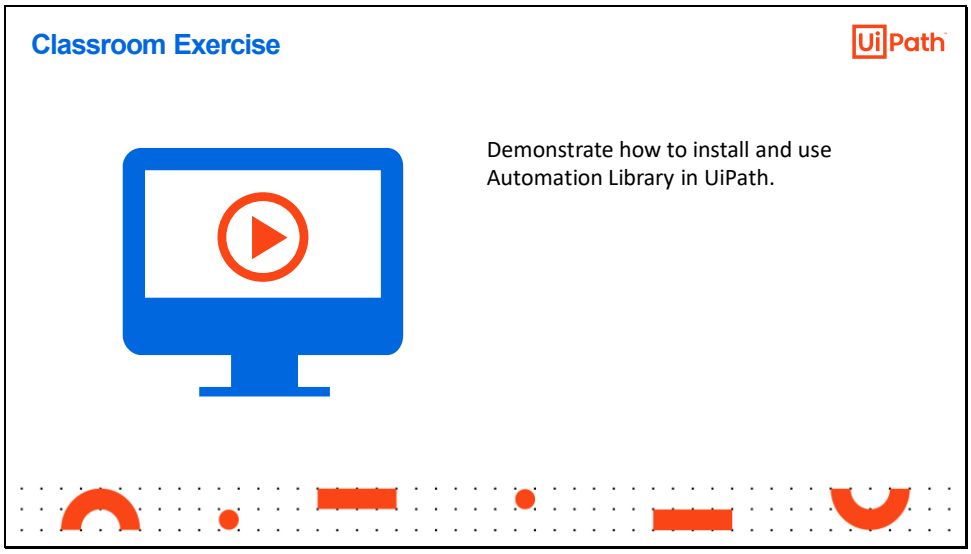
2. Under the **All Packages** category, pick the feed under which the library is saved and install the package.



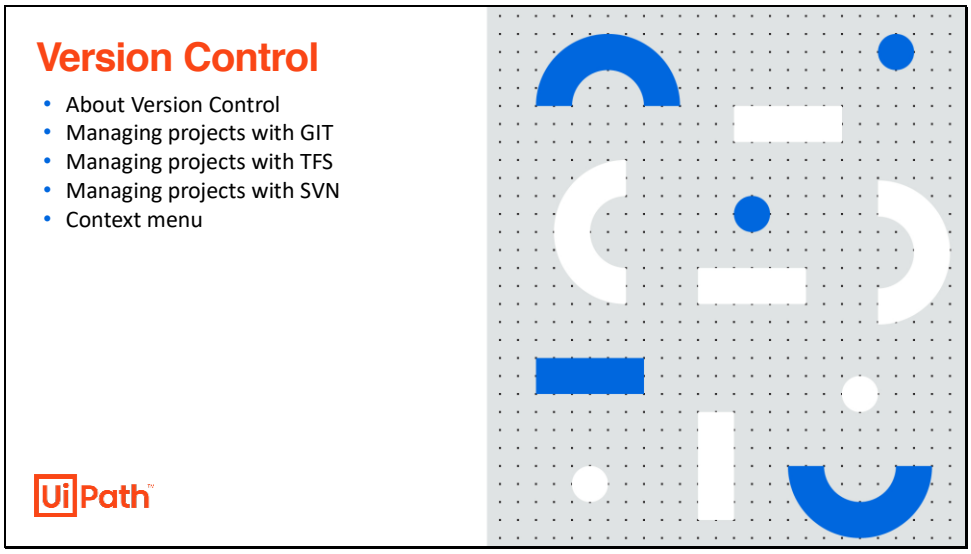
3. Select **OK** to add the package to project definition.



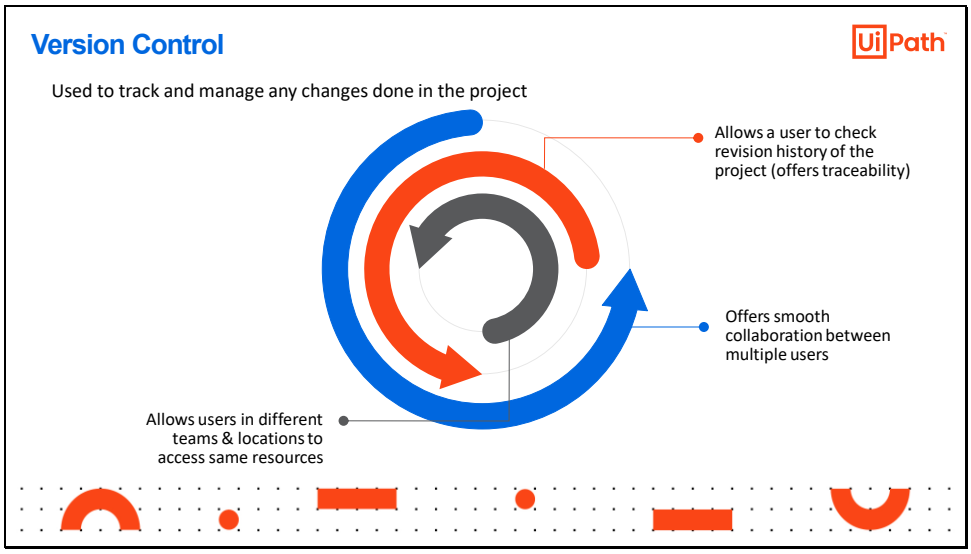
4. The activity is found in the custom category of the **Activities** panel.



Demonstrate how to install and use Automation Library in UiPath.

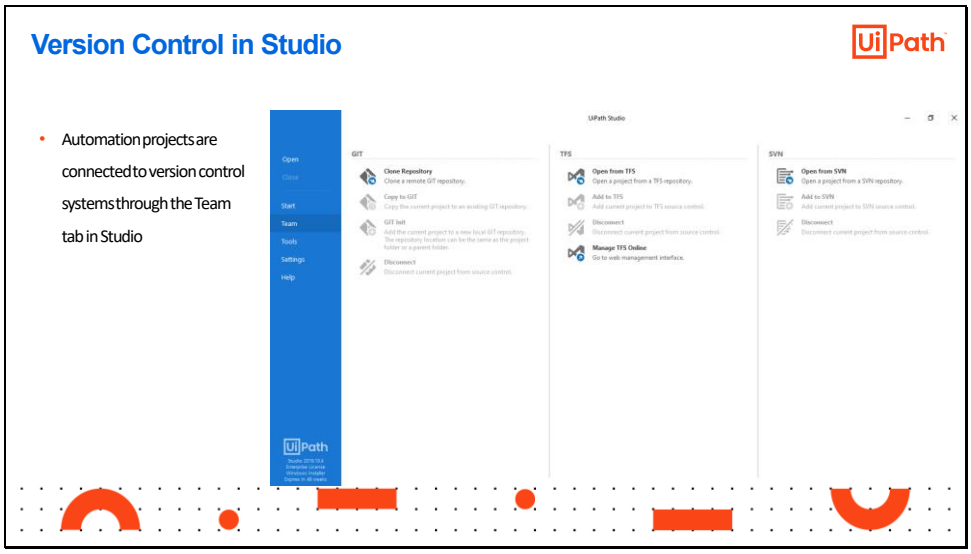


This section gives a brief about Version Control.

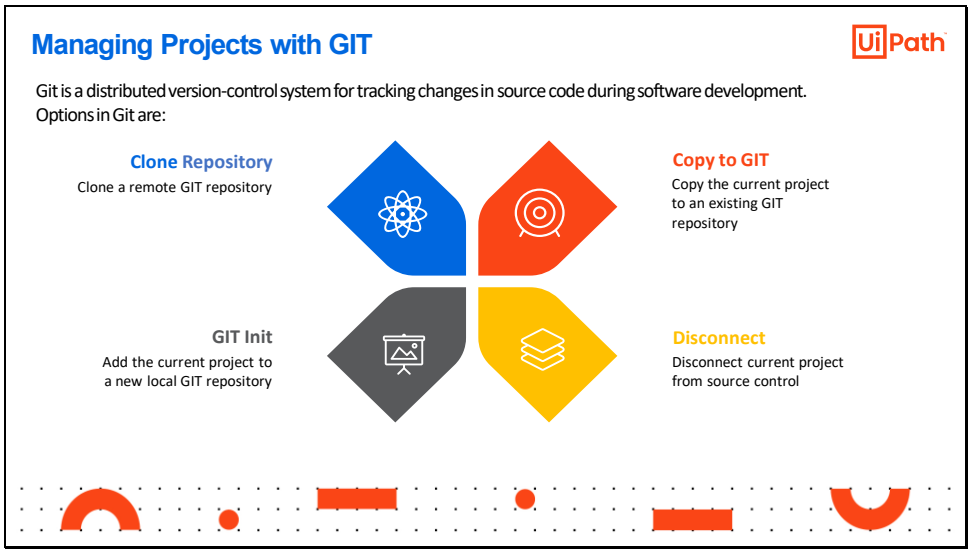


Version control (or source control) is an important aspect in the development phases of a project. It is used to track and manage any changes done in the project code. Through version control systems, the users are able to check the history of all revisions done to the project and act as a center for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

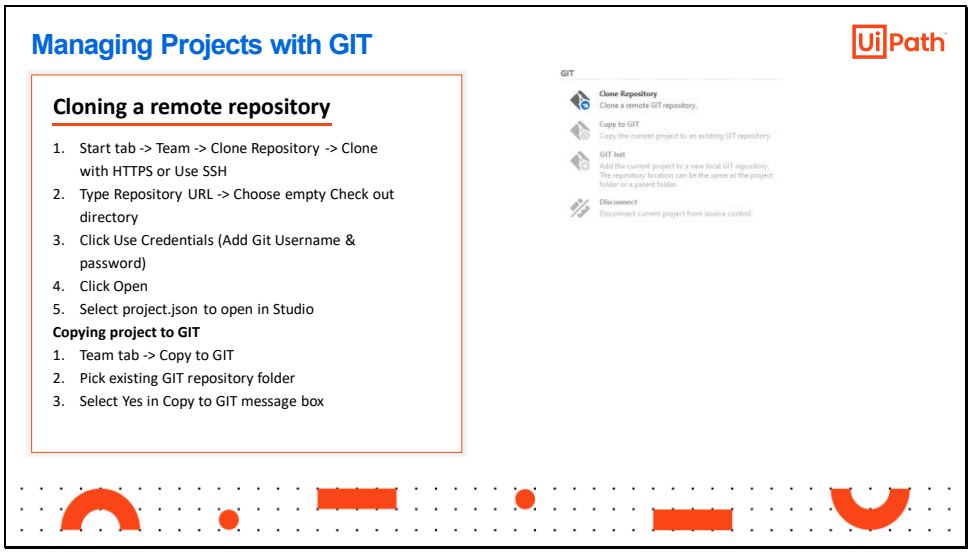
Version control systems are helpful in smooth collaboration between multiple users when developing larger projects. In these projects, it's easy to miss the last version or to go back to a previous version when needed. Source control systems allow users in different teams and locations to access the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



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.



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.

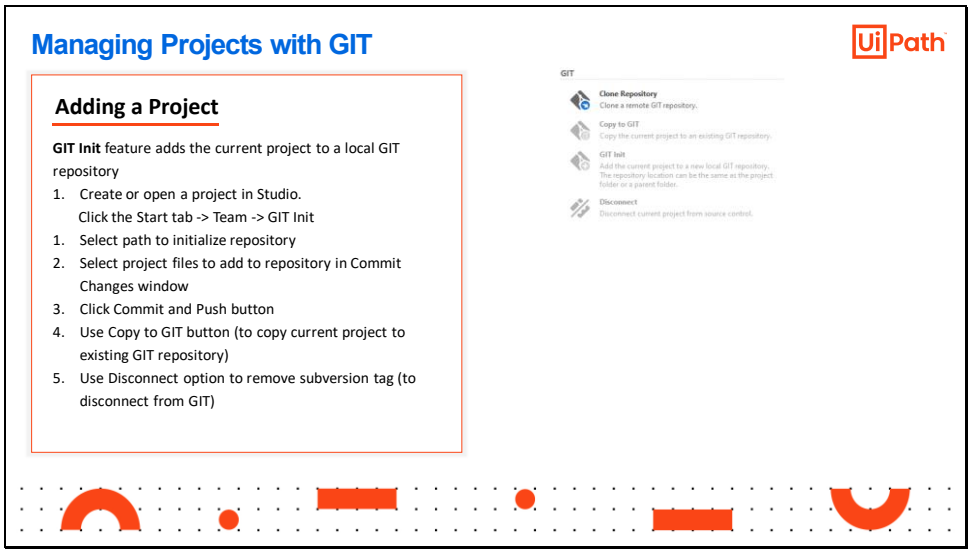


Managing projects with GIT:
Cloning a Remote GIT Repository

- 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

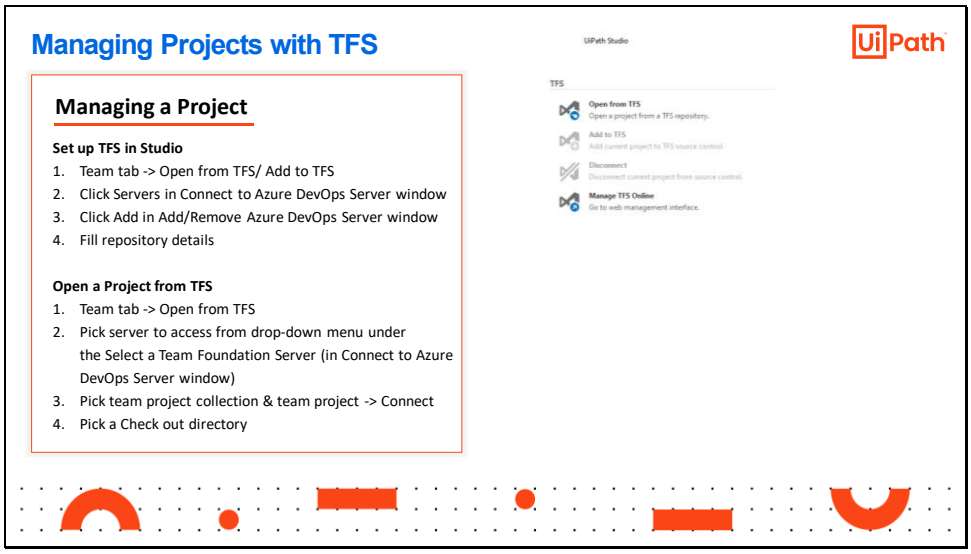
- Team tab -> Copy to GIT
- Pick existing GIT repository folder
- Select Yes in Copy to GIT message box



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 path to initialize repository
- In Commit Changes window, select project files to add to repository
- Click Commit and Push button to commit changes & push to remote repository
- To copy current project to existing GIT repository, use Copy to GIT button
- To disconnect from GIT, use Disconnect option to remove subversion tag

For more details, refer: https://docs.uipath.com/studio/docs/managing-projects-git

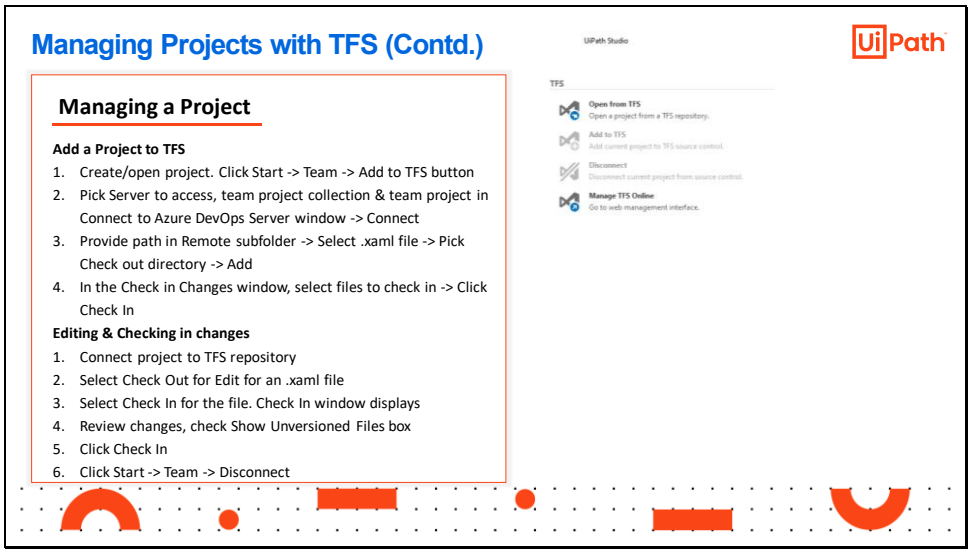


2. Team Foundation Server (TFS) is the source code management established by Microsoft, used for project and release management.
Here, the options are:
• Open from TFS: Open a project from a TFS repository. It contains two blocks: Team Project Collection & Team Project.
• Add to TFS: Add current project to TFS source control.
• Disconnect: Disconnect current project from source control.
• Manage TFS Online: Go to 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 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



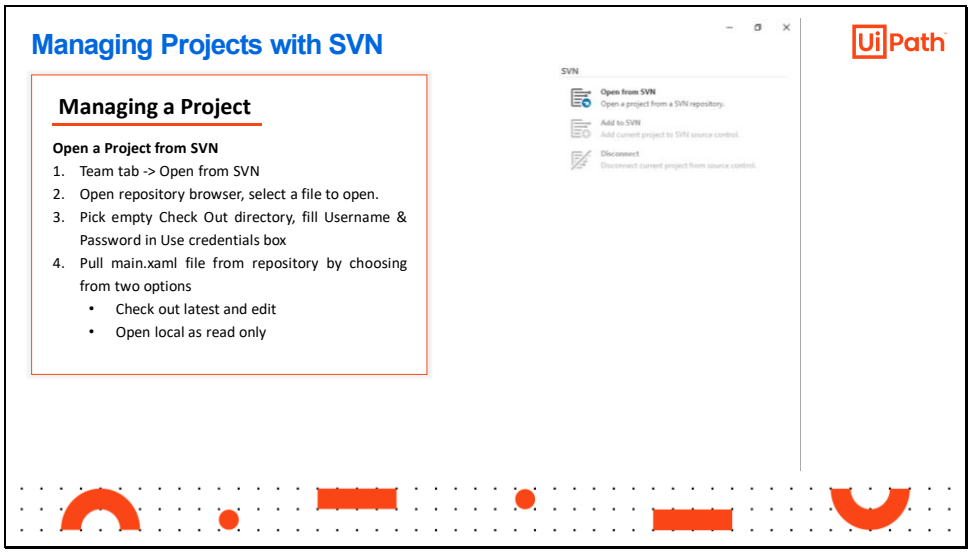
Add a Project to TFS

- 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 an .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/docs/managing-projects-tfs

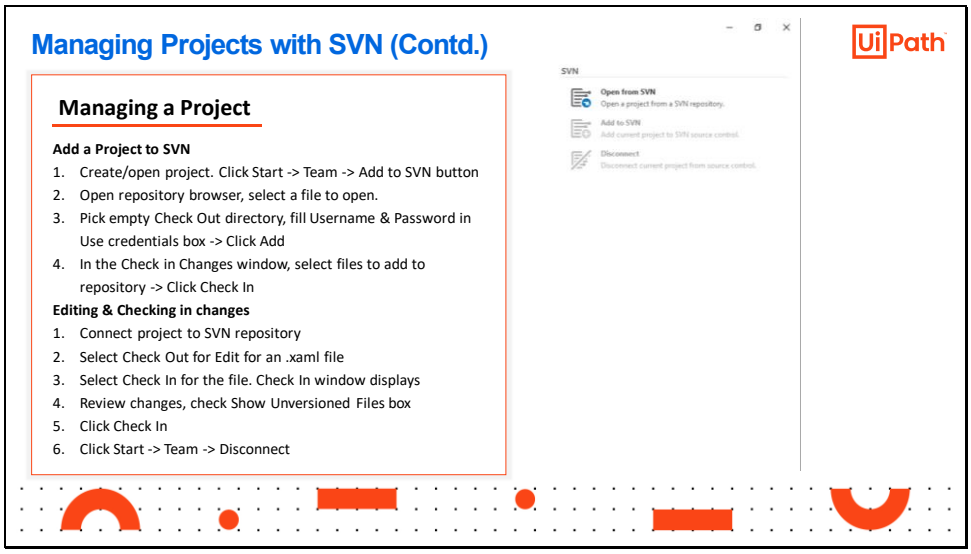


3. Apache Subversion (SVN) is a software versioning and revision control system distributed as open source.

Here, the options are:
- Open from SVN: Open a project from a 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 t**o 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 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:



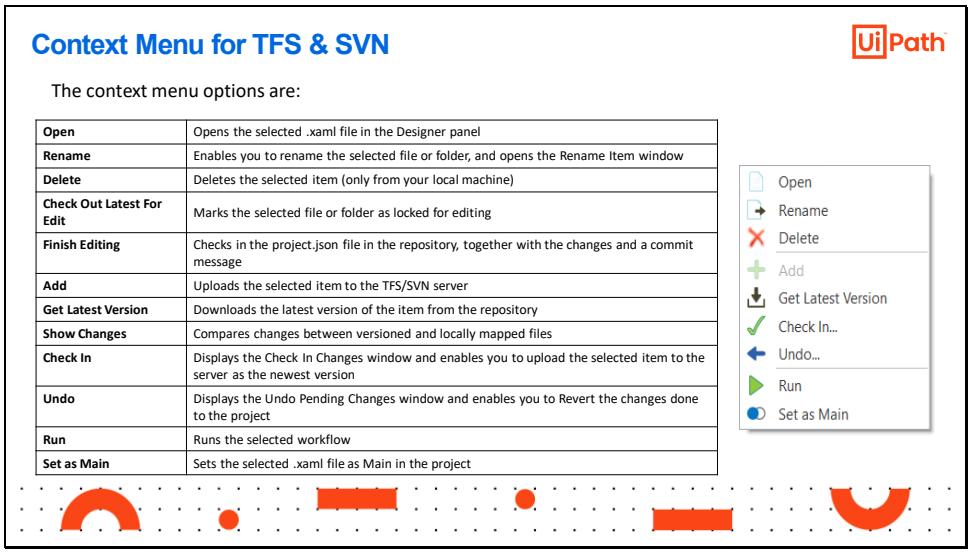
Add a Project to SVN:

- 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/docs/managing-projects-svn

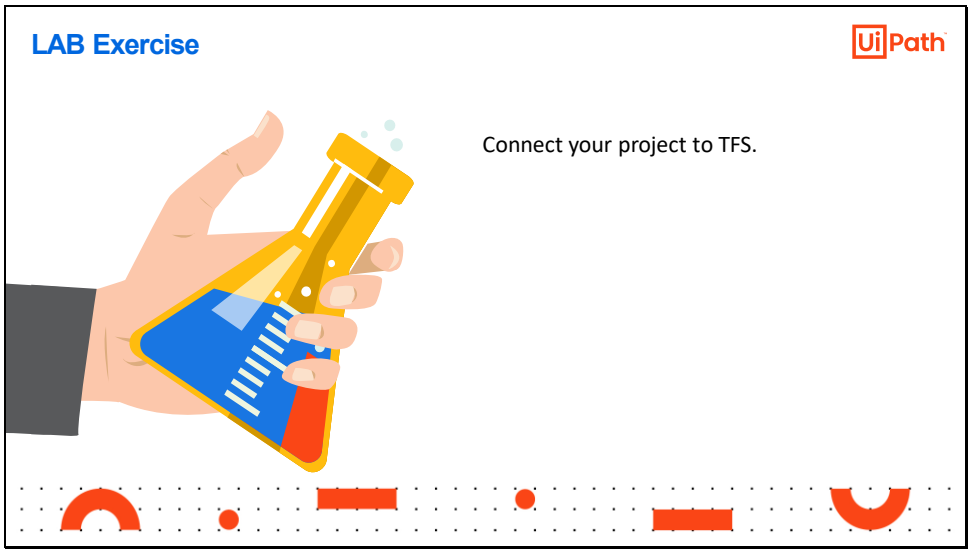


Open	Opens the selected .xaml file in the Designer panel
Rename	Enables you to rename the selected file or folder, and opens the Rename Item window
Delete	Deletes the selected item (only from your local machine)
Check Out Latest For Edit	Marks the selected file or folder as locked for editing
Finish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

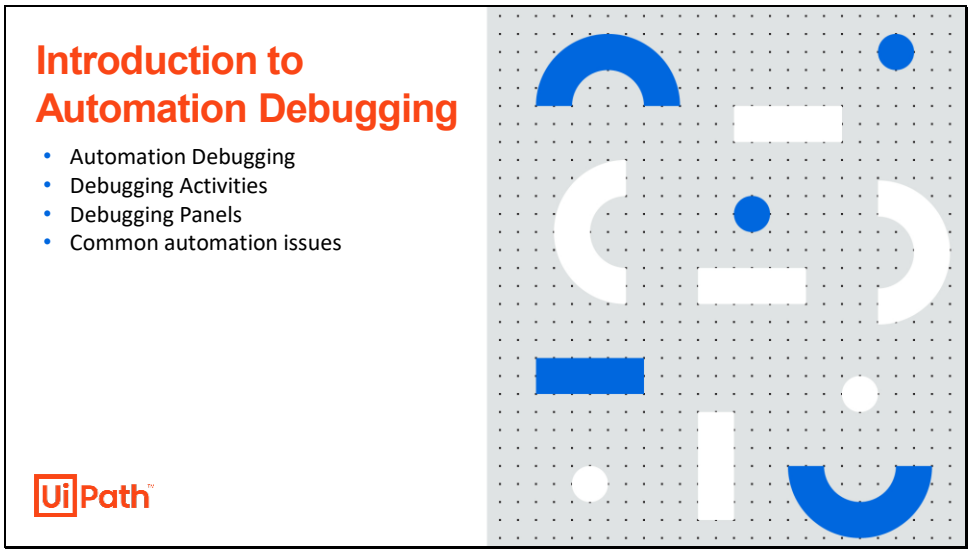
Once a connection with a TFS or SVN repository has been established, you can access the project files via a project panel, that offers the following context menu options:

- **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 respository, 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.

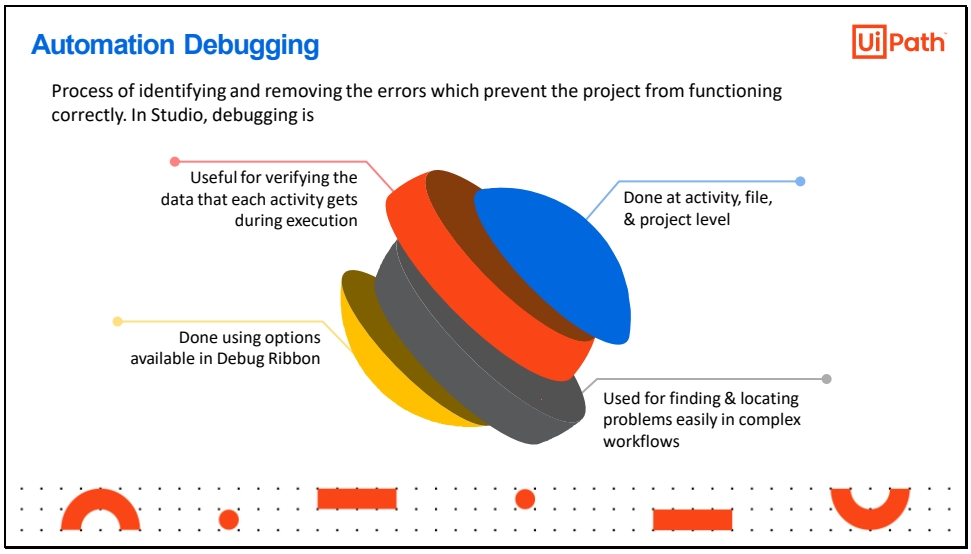
- **Undo**: Displays the Undo Pending Changes window and enables you to Revert the changes done to the project, either revert modified files to previous or unversioned states, or retrieve files which were deleted from the local machine. Changes cannot be reverted after the file was checked in.
- **Run**: 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.



Connect your project to TFS.



This section explains Automation Debugging in detail.



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

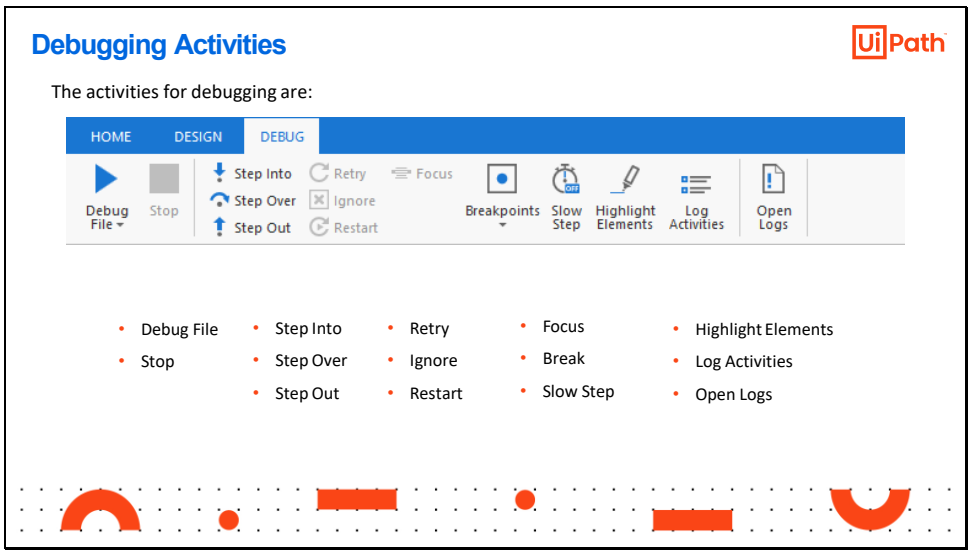
Debugging is done at activity, file, and project level during the design stage of the automation project.

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.

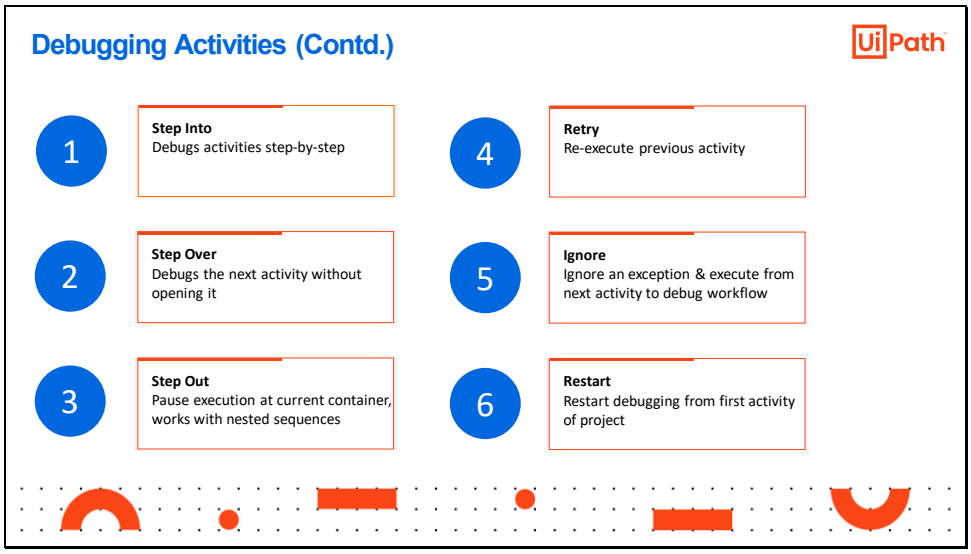
The tool encapsulates whenever an activity has errors, UiPath Studio Process Designer notifies and gives you details about the issues encountered.



The Design and 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
- Break
- Focus
- Slow Step
- Highlight Elements
- Log Activities
- Open Logs

These activities are explained in the subsequent slides.



- 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

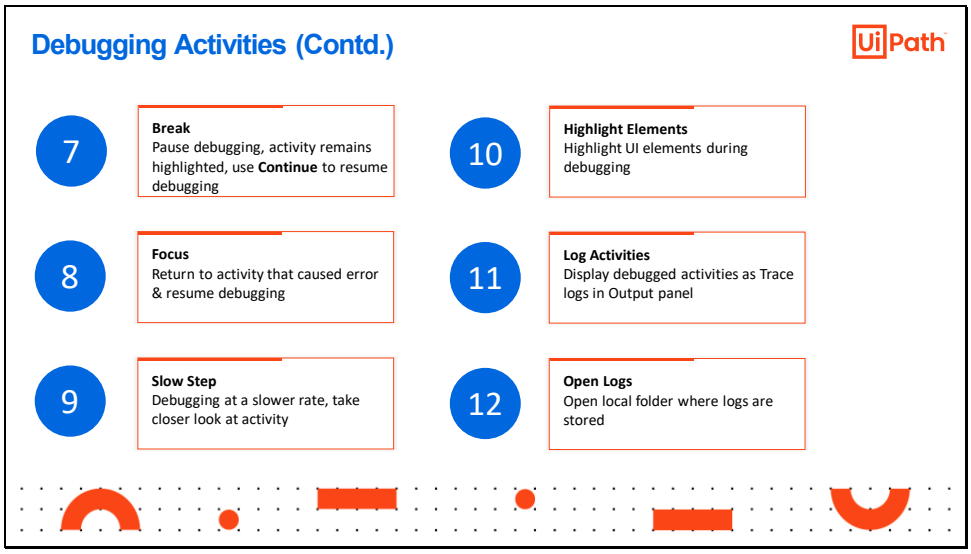
Retry re-executes the previous activity and throws the exception if it's encountered again. The activity which threw the exception is highlighted and details about the error are shown in the Locals and Call Stack panels.

- 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.



- 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.

- 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.

- 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.

- Highlight Elements

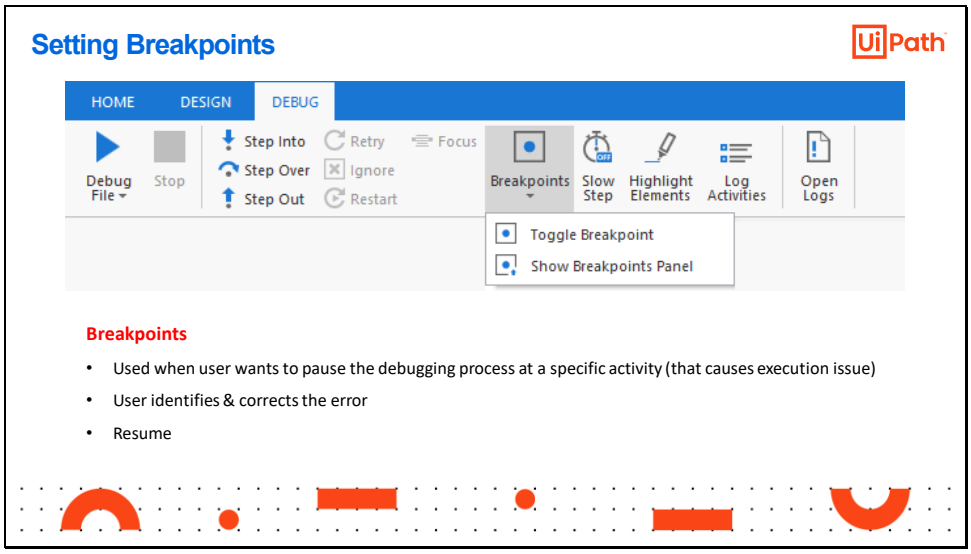
If enabled, UI elements are highlighted during debugging. The option can be used both with regular and step-by-step debugging.

- 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.

- 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).



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

Setting Breakpoint

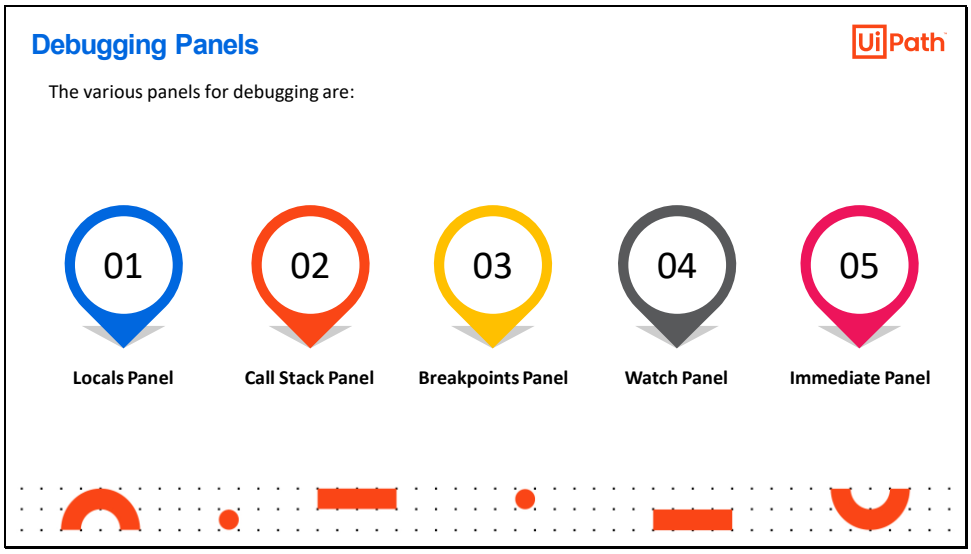
It is used when the user wants to pause the program at a specific location. Once the toggle breakpoint is set to an activity, the program will run till that activity but not execute it. Once the execution is paused, the user can see the current value of the variables, the current state of workflow, identify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

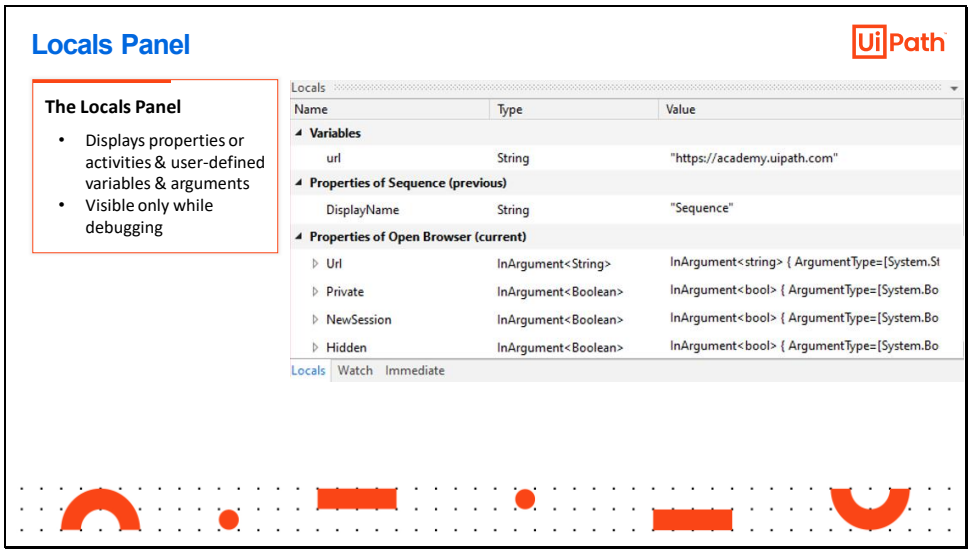


In the Robotic Process Automation, various tools have been provided by UiPath Studio for debugging. These tools are helpful to check the workflow of the programming structure and find the exception. Apart from this, debugging also helps in checking the execution process of each data that is validated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

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

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

These panels are explained in the subsequent slides.

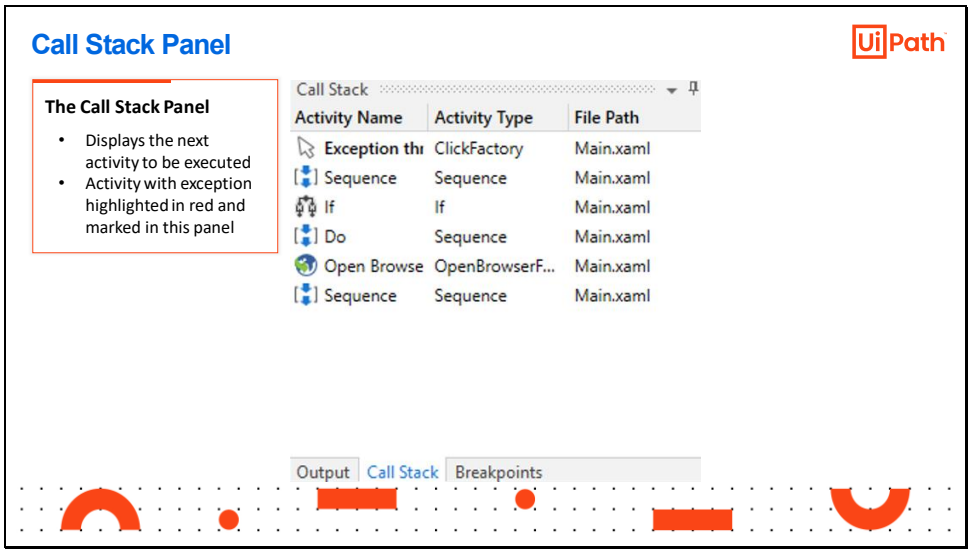


The Locals panel displays properties or activities and user-defined variables and arguments. The panel shows:

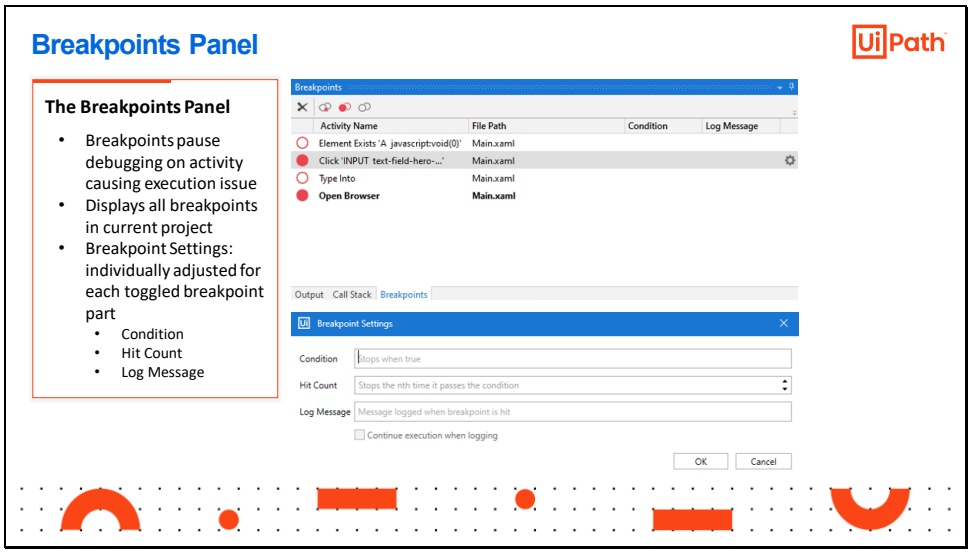
- Exceptions - the description and type of the exception.
- Arguments
- Variables
- Properties of previously executed activity - only input and output properties are displayed.
- Properties of current activity

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 compressed or expanded. The same is available for complex objects, which are displayed in a tabular way.

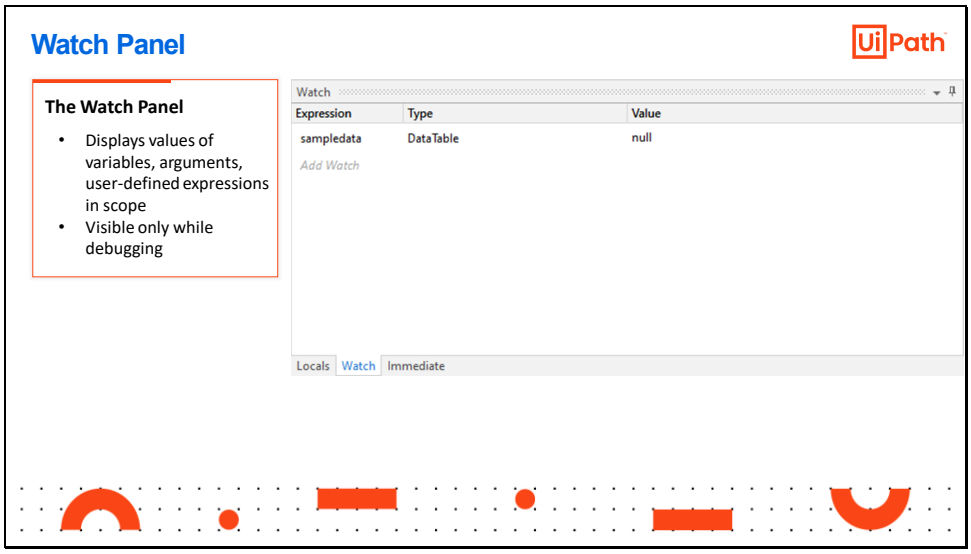


The Call Stack panel displays the next activity to be executed and its parent containers when the project is paused in debugging.
The panel is displayed during execution in debug mode and it gets populated after using Step Into, Break, Slow Step, or after the execution was paused because an error or 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.



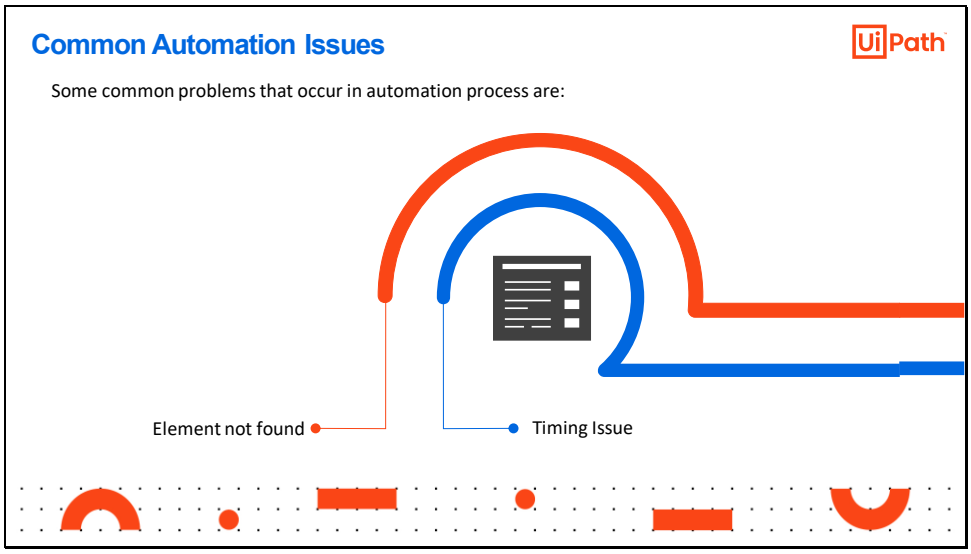
Breakpoints are used to purposely pause the debugging process on an activity which may trigger execution issues. Setting a condition and/or hit count turns the simple breakpoint to a conditional one. Adding logging results turns the conditional breakpoint in a conditional tracepoint. Adding only a logging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



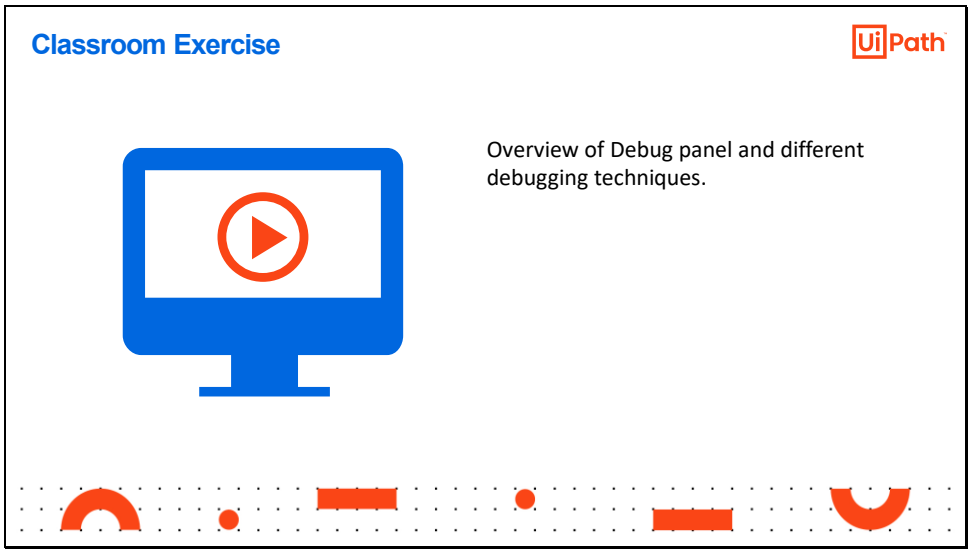
The Watch panel is only visible during debugging. It can be set to display the values of variables or arguments, and values of user-defined expressions that are in scope. It also supports complex object variables like lists of string or dictionary variables. These values are updated after each activity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

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.



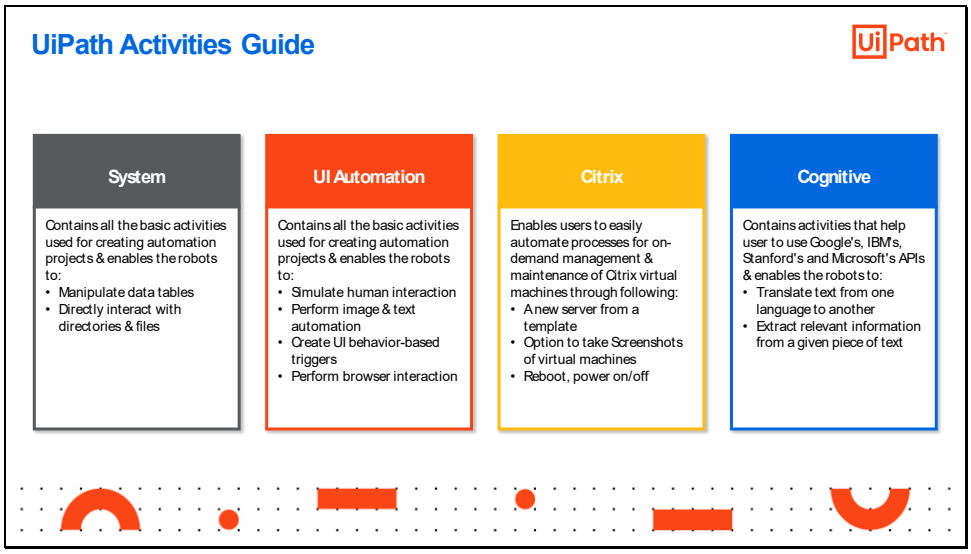
In the automation process, there some common problem that occurs frequently. Some common listed issues are:

- Element not found
- Timing Issue



Overview of Debug panel and different debugging techniques.

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



- **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.

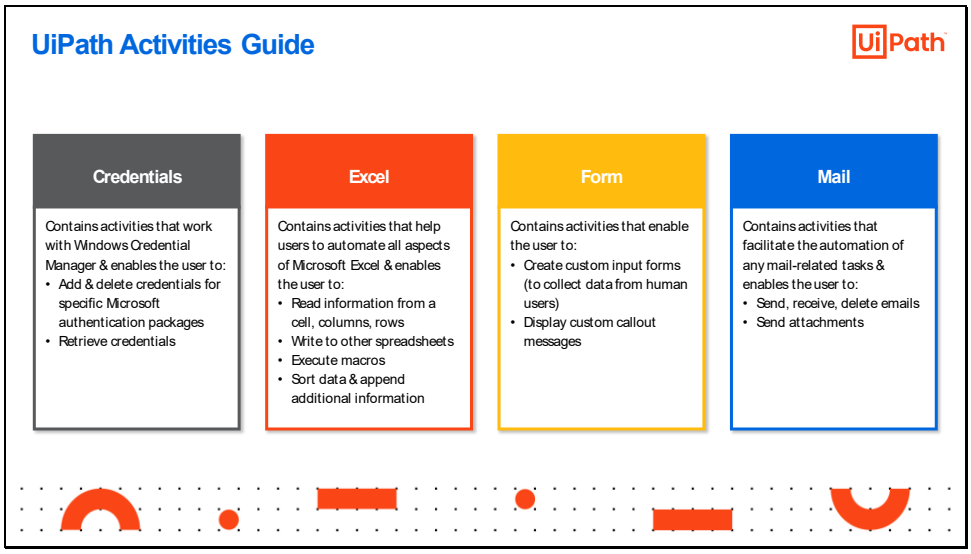
- **Citrix Activities Pack:**

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 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:**

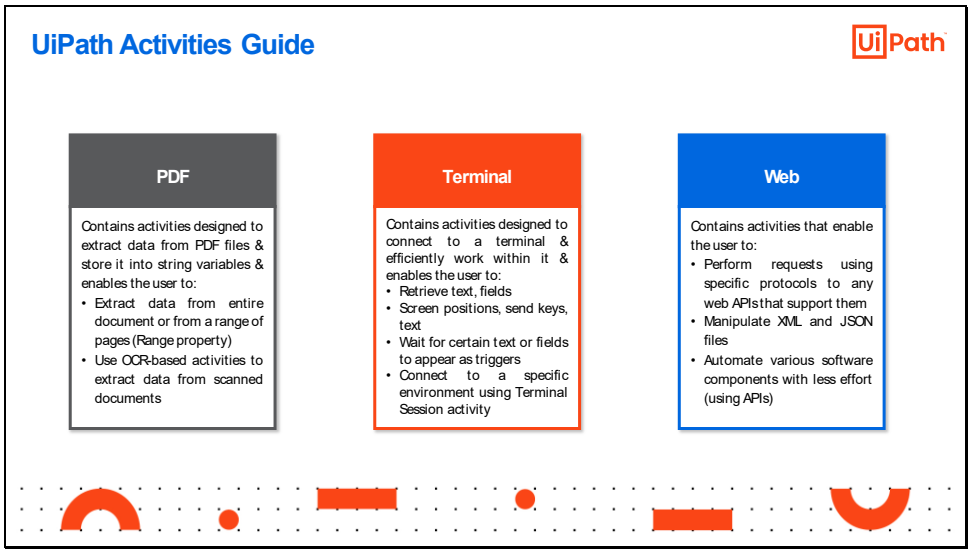
Helps users to automate all aspects of Microsoft Excel, which is an application used by many in all types of businesses. It contains activities that enable the user to read information from a cell, columns, rows or ranges, write to other spreadsheets or workbooks, execute macros, and extract formulas.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

- **Form Activities Pack:**

Enables the user to create custom input forms which 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 mail-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.



- **PDF Activities Pack:**

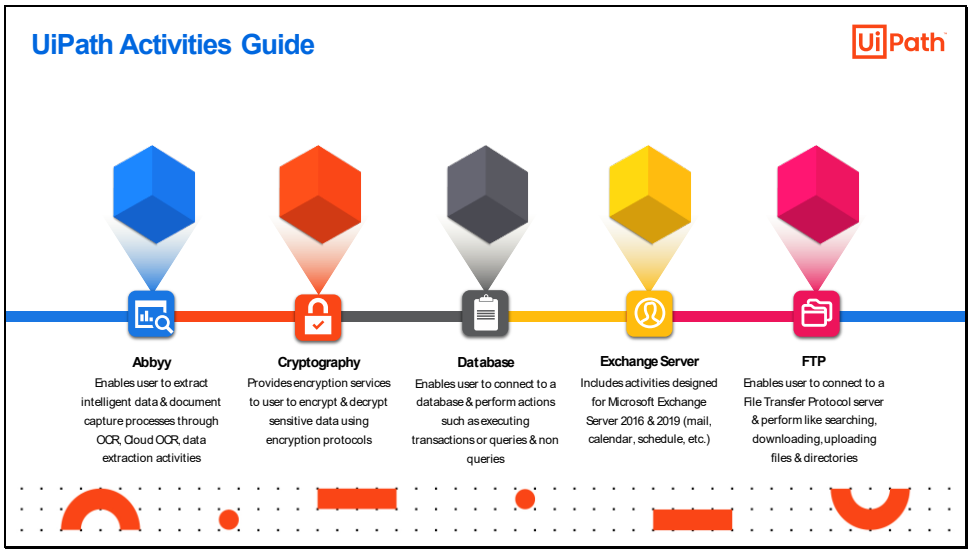
Contains activities designed to extract data from PDF and XPS files and store it into string variables. The data can be extracted from the entire document or from a range of pages specified under the Range property found in each of the activities. In the case of scanned documents, data extraction can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



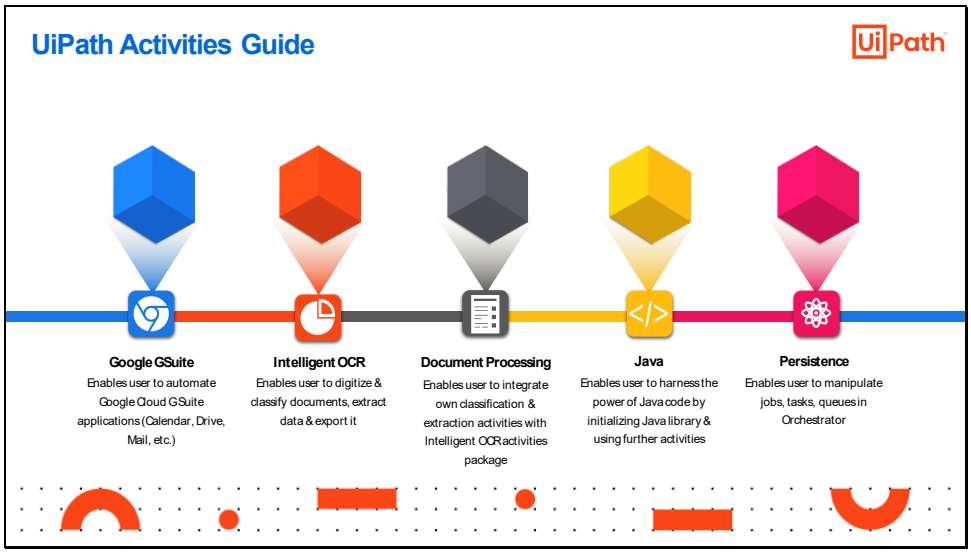
- **Abbyy Activities Pack:** Used for extracting intelligent data and document capture processes from both structured and unstructured documents and it can work with the FineReader and FlexiCapture Abbyy product families. Includes activities for OCR, Cloud OCR, classification, and data extraction.

- **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 criteria) 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.



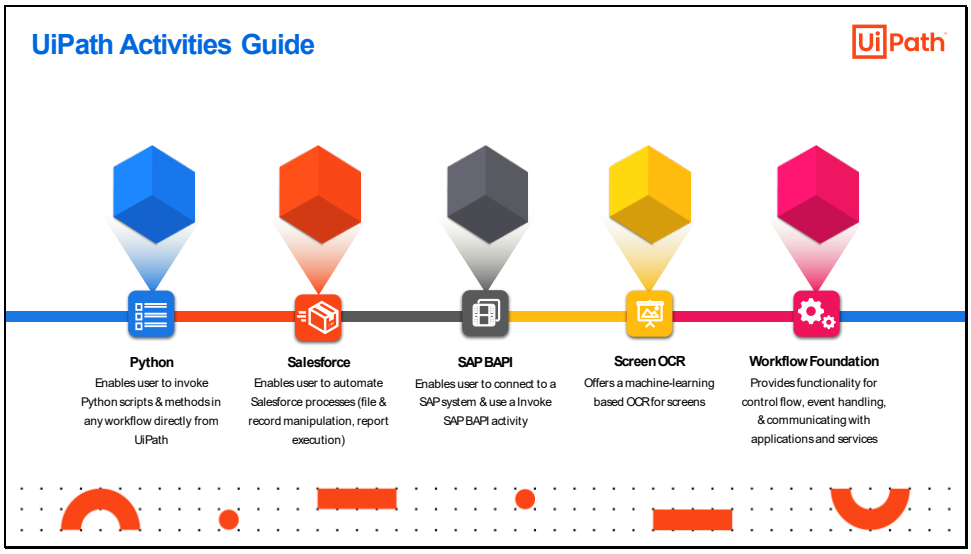
- **Google GSuite Activities Pack:** Helps the user to automate Google Cloud G Suite applications, including Google Calendar, Google Drive, Google Sheets, GMail, and Google Docs. With the Google GSuite Activities Package, the user can create & modify Google Calendar events, manage Google Drive files, 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 a 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.



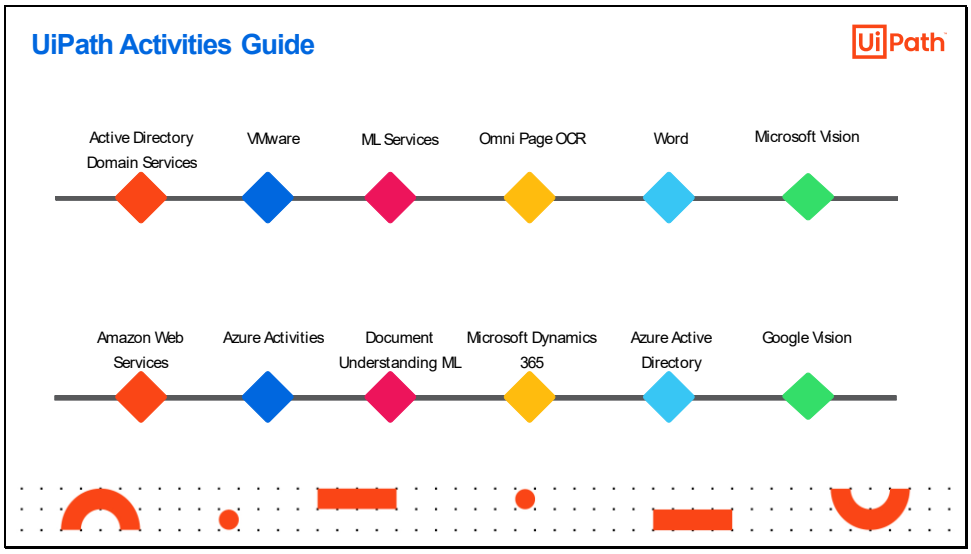
- **Python Activities Pack:** Enables the user to invoke Python scripts and methods in any workflow directly from UiPath by connecting to the Python environment installed on the computer.

- **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 a SAP system and use a 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.

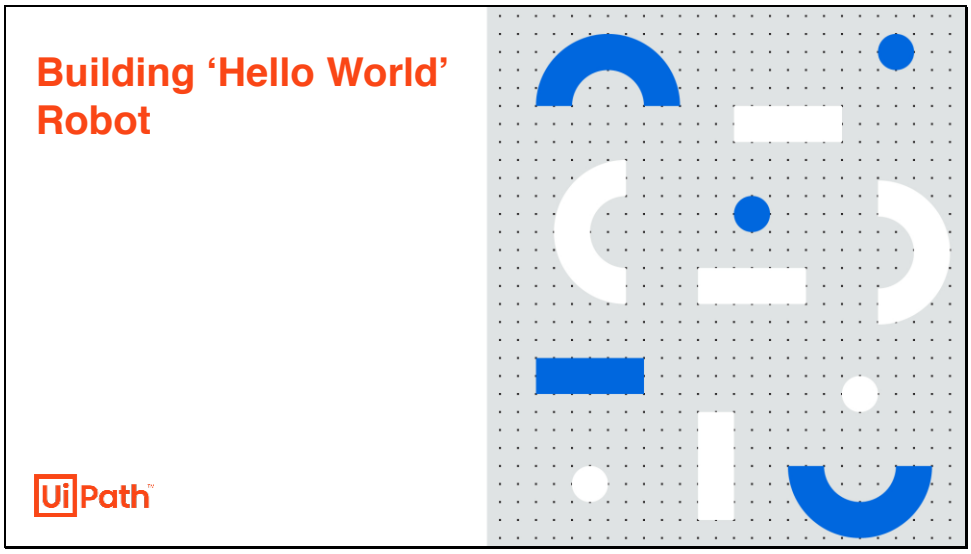
- **Workflow Foundation Activities Pack:** Provides functionality for control flow, conditions, event handling, state management, and communicating with applications and services.



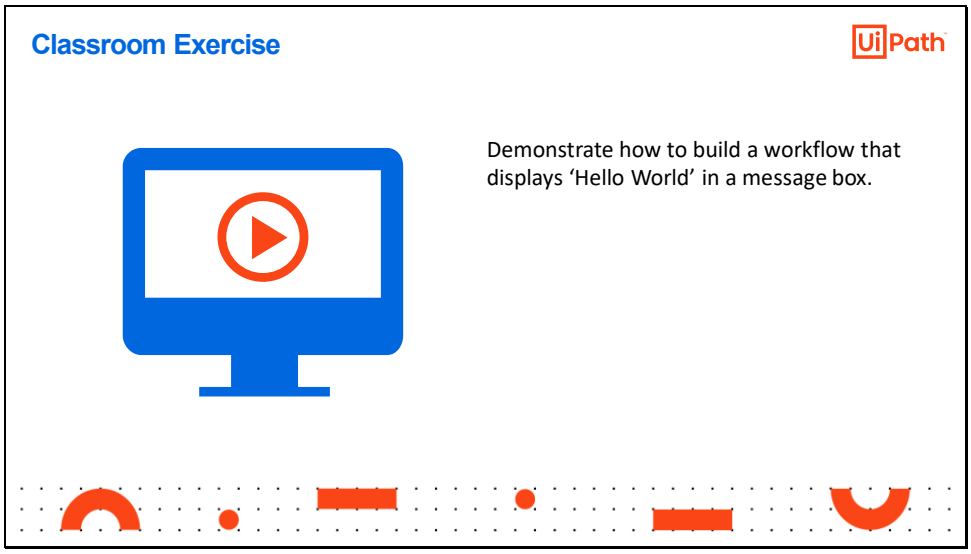
Some other Activity Packs available in UiPath are:

- 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 activities guide, please refer: https://docs.uipath.com/activities



This section explains how to build a workflow in UiPath.

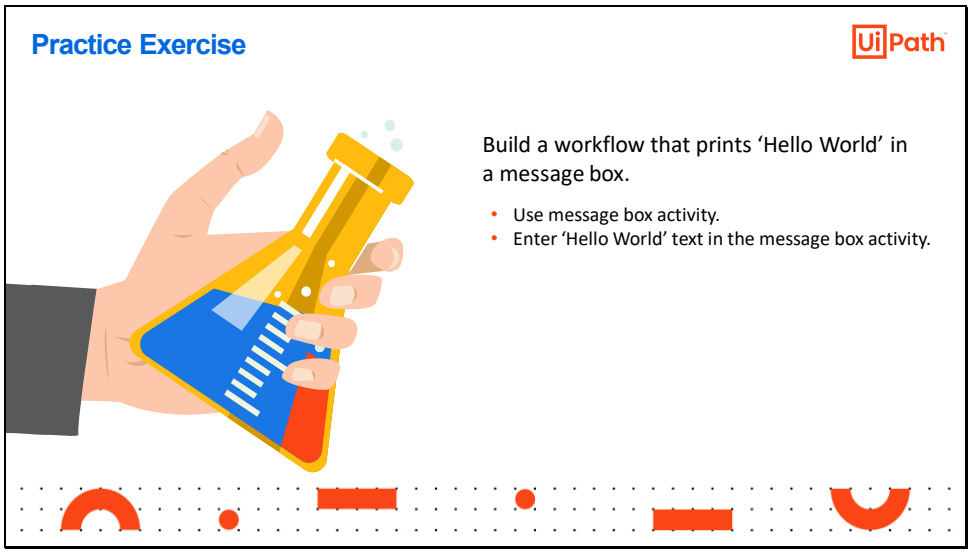


Demonstrate how to build a workflow that displays 'Hello World' in a message box:

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

- Open UiPath Studio, Click on "Start", Click on "Process" and enter the name of the project HelloWorld.
- Click on "Create" to start the project.
- In the Activities panel search for "Message Box" activity.
- Double click on "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 its in double quotes.
- Click on 'Run' and the Robot will display the message "Hello World" on your screen.
- You can click on "Publish" button to publish the Robot. Now open UiPath Robot and you will see your Robot by the name of "HelloWorld". You can execute the robot any time from here.

Congratulations on creating your first Robot!

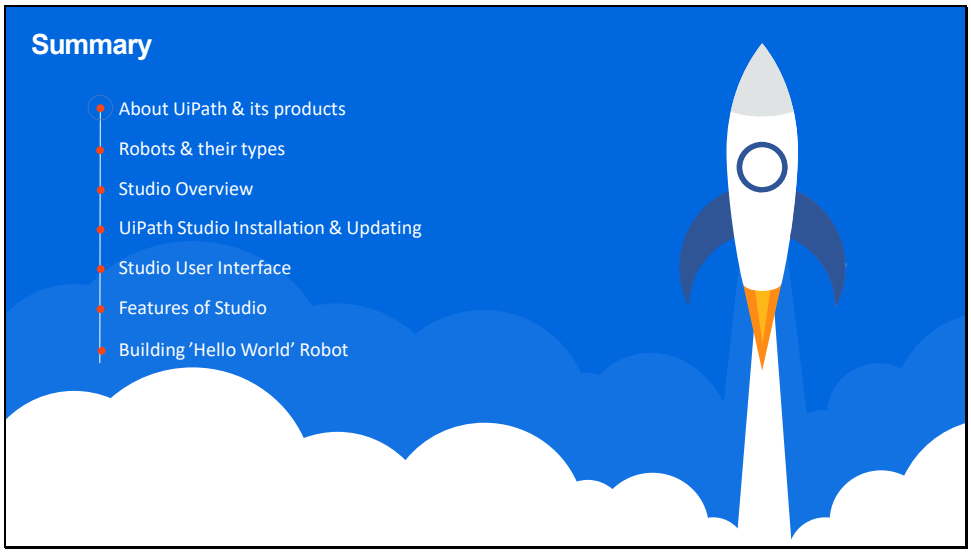


Build a workflow that prints 'Hello World' in a message box.

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

Algorithm

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



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' Robot