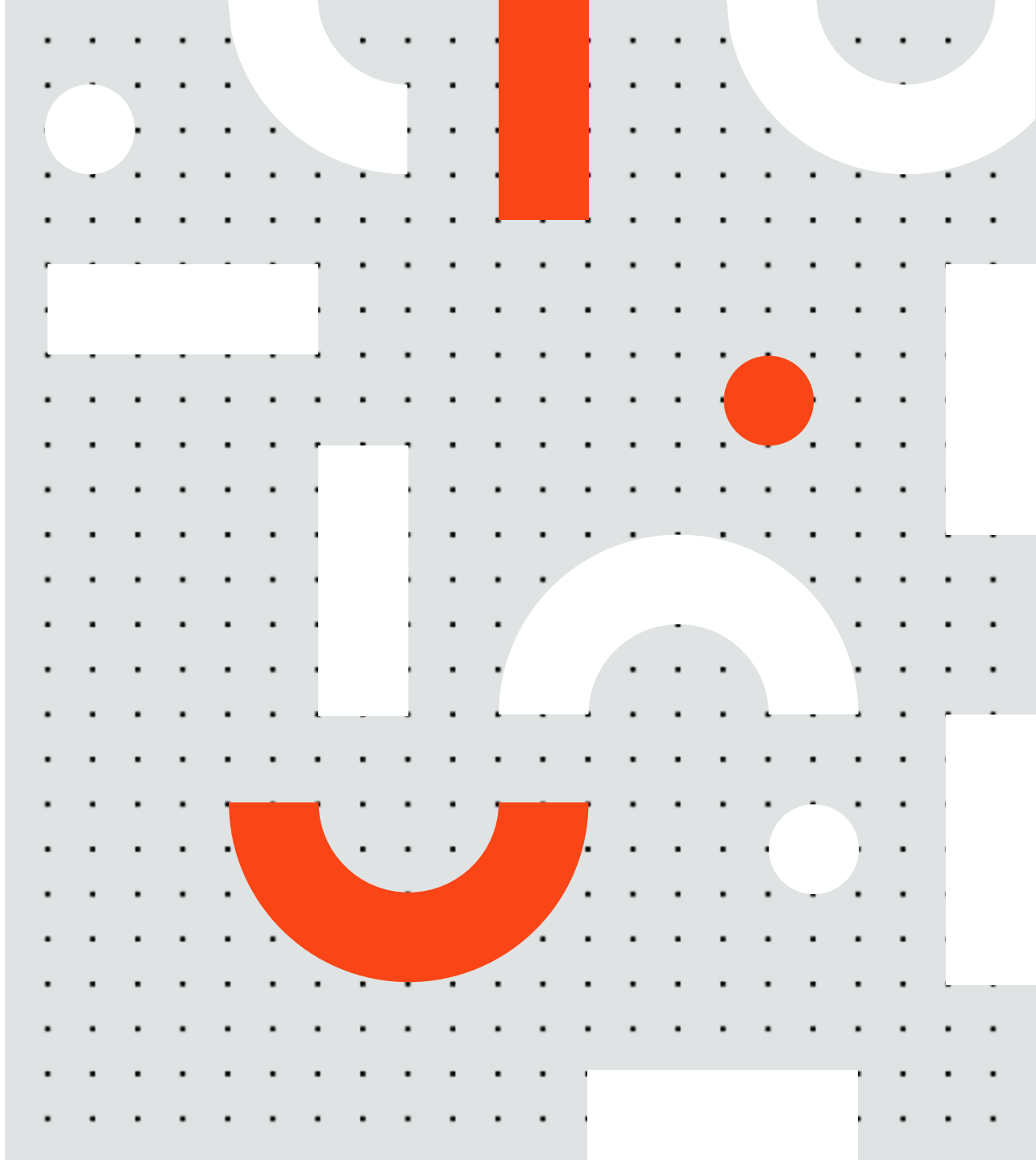
RPA Design & Development v1.1

Lesson 7 Control Flow

UiPath™



Agenda

Control Flow & Universal Statements

- Introduction to control flow
- Generic control statements

Control Flow Statements in UiPath

- The main control flow statements used in RPA/UiPath

Practical Exercise

- Using control flow statements to solve a practical RPA challenge

Learning Objectives

Control Flow & Universal Statements

- Introduction to control flow
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Practical Exercise

- Using control flow statements to solve a practical RPA challenge

Control Flow

The order in which individual statements, instructions or function calls are executed or evaluated in a software project. Control flow statements can be categorized by their effect:

Continuing at a different statement

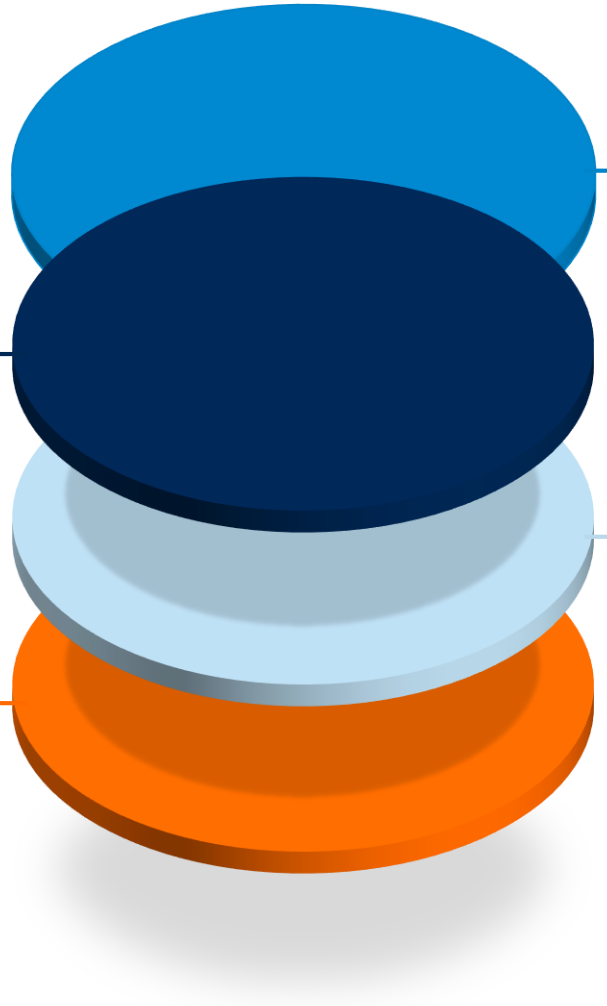
Executing **only if** some condition is met

Executing **until** some condition is met

Executing and **returning**

Preventing any further execution

Basic Control Statements



If

One condition, two outcomes.

Switch

When a single condition generates more than two options, Switch is the most efficient statement

Loop

The repetition of set of instructions based on the condition

Break

Breaks are paired with Loop statements in order to interrupt them; otherwise Loops would continue indefinitely

If

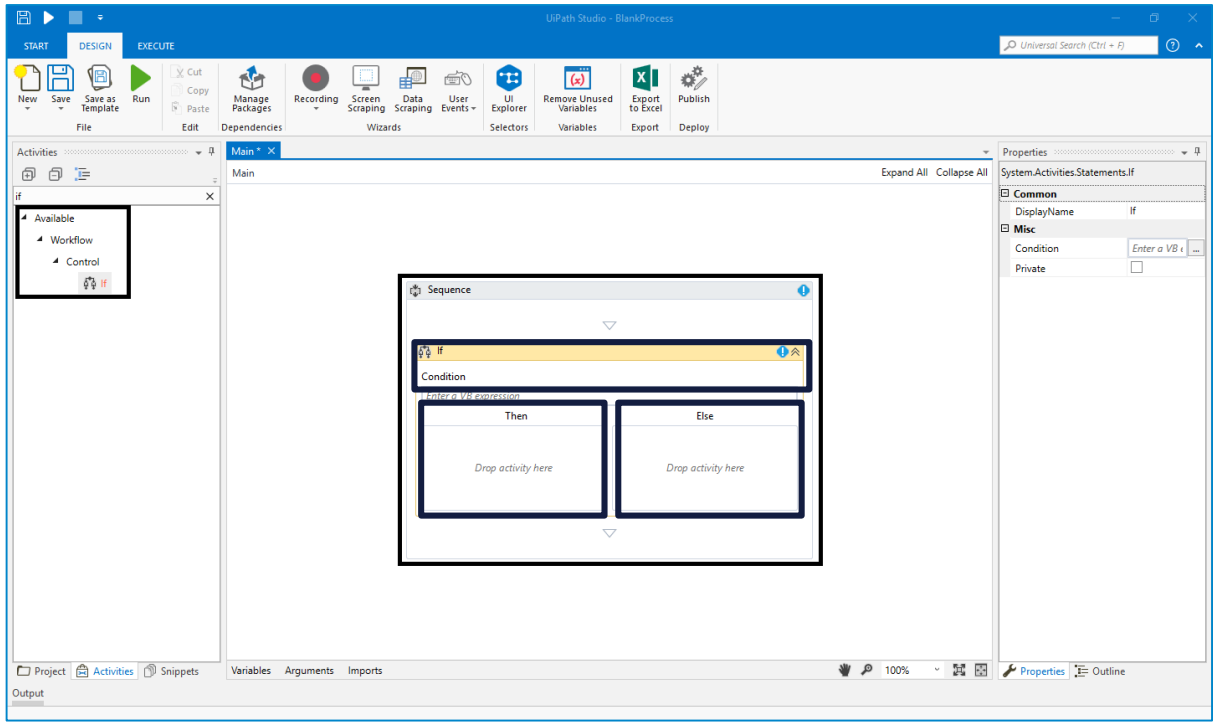
Switch

Loop

Break

The If Statement

The basic concept of If statement is a method of two activity (Then and Else) which contain two condition and one statement.



Practice makes Perfect…

1. How would you explain the If Statement to a 7-year old (using the Marshmallow Experiment)?

2. Consider this statement:

   if a then if b then s else s2

   s2 is executed when ‘condition a’ is met, or when ‘condition a’ is not met?

If

Switch

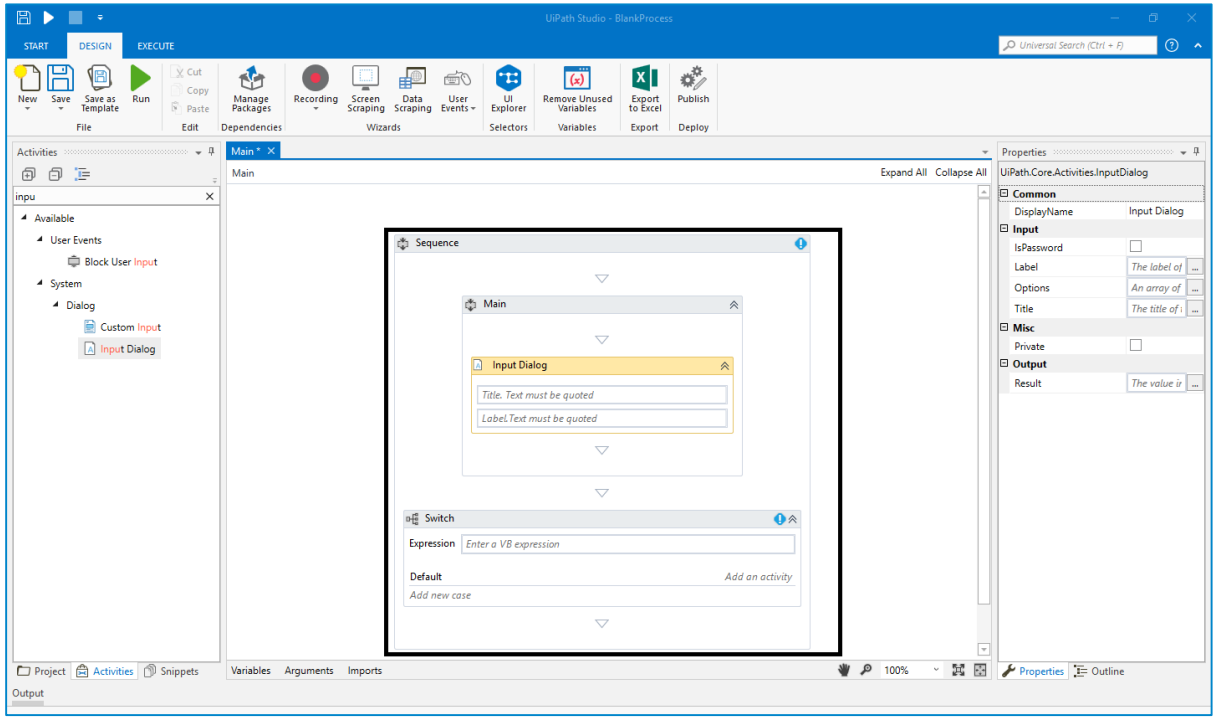
Loop

Break

The Switch Statement

The Switch statement allows one value out of multiple values by specified expression.

- Condition: It processes only integer argument values.
- Use: It is useful in the number of processes.
- Types of Switch statement: Structured and Unstructured



Practice makes Perfect…

An old Mesopotamian saying goes like this…

"Blue eyes are a sign of Bravery, Green eyes are a sign of Generosity, Gray eyes are a sign of Wisdom"

Having a simple user input field ('What is the color of your eyes?'), **how would you use the Switch statement to give the user a unique input?**

How would it look like using only If statements?

Comparison of If and Switch

If

IF V = ‘Blue’ **THEN** print ‘You must be very brave’
ELSE (**IF** V = ‘Green’ **THEN** print ‘You must be very generous’
ELSE (**IF** V= ‘Gray’ **THEN** print ‘You must be very wise’
ELSE print ‘You must be a god, because you don’t have human eyes’))

Switch

SWITCH
Case V = ‘Blue’ print ‘You must be very brave’
Case V = ‘Green’ print ‘You must be very generous’
Case V = ‘Gray’ print ‘You must be very wise’
Default Case print ‘You must be a god, because you don’t have human eyes’

If

Switch

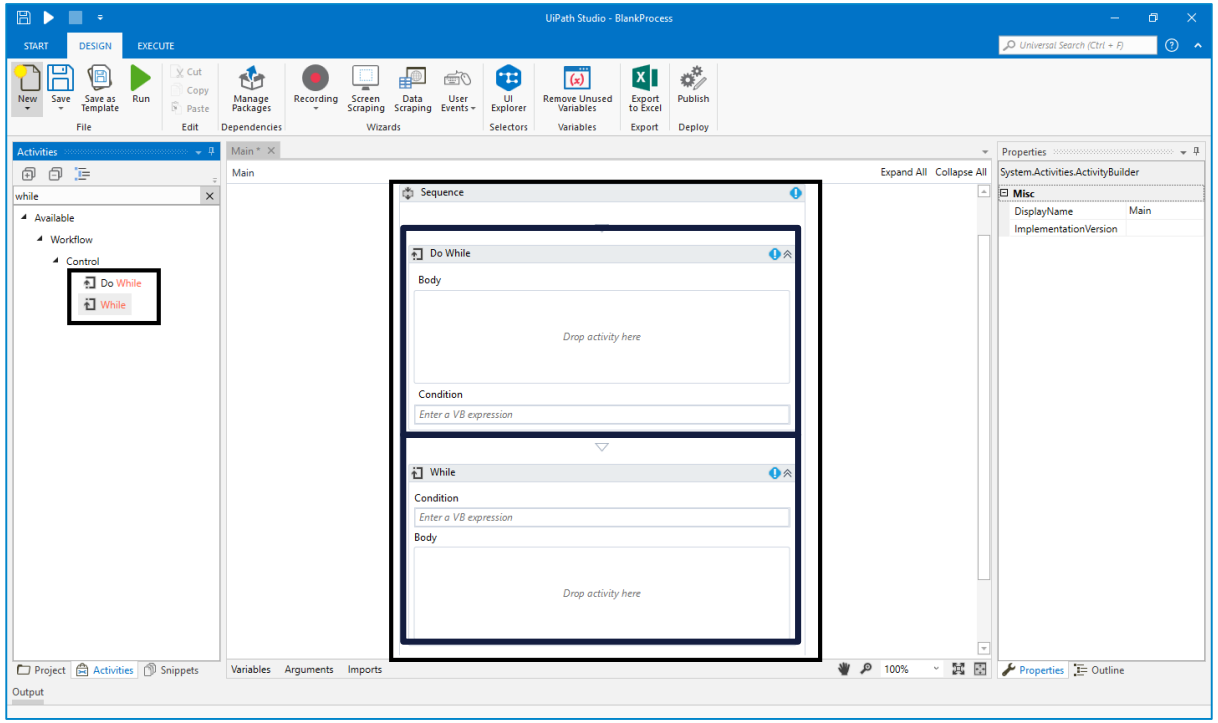
Loop

Break

The Loop Statement

Loop is the structure that executes a repetitive set of operations with these low error activities.

- Condition: It automates repeated tasks in UiPath through two loops statements.
- Do While: If the condition is true, then in the execution process this activity runs first.
- While: If the condition is false, then in the execution process this activity runs first.



If

Switch

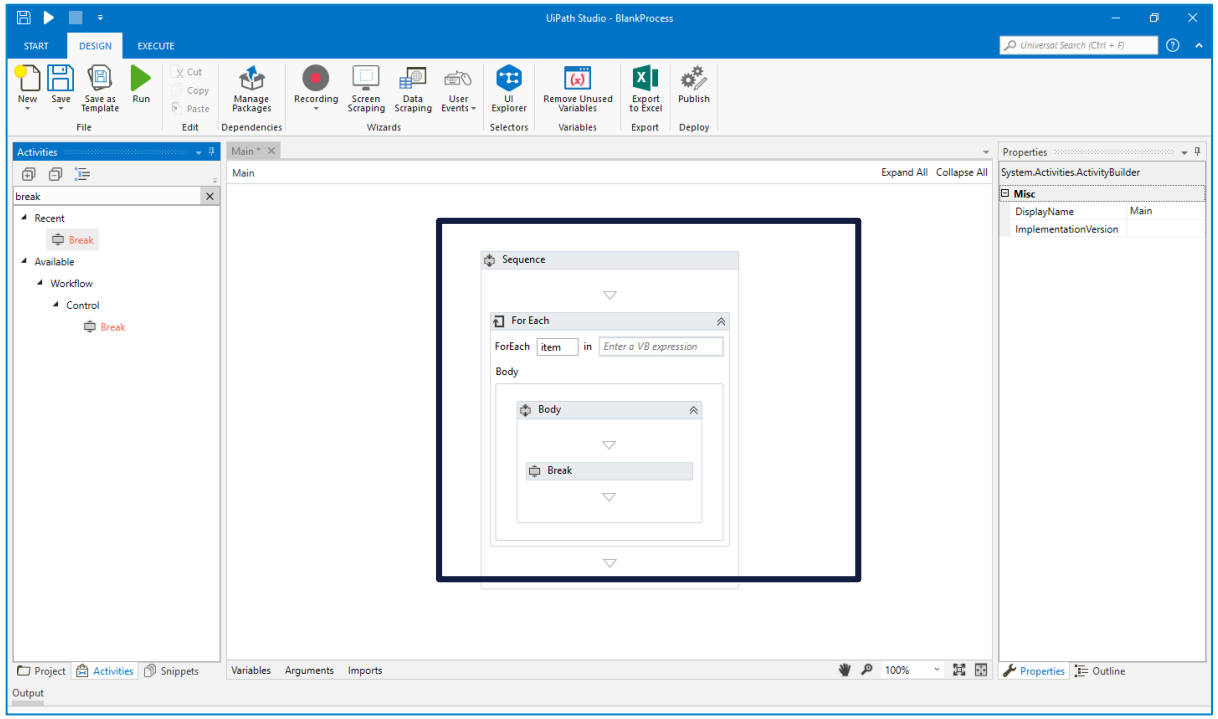
Loop

Break

The Break Statement

It is the process in the UiPath Studio which allows to break an activity on the chosen or starting point.

- Condition: It exits each activity and continues the workflow process activity.
- Switch or Loop statement: Break statement used for loop termination and transfer the statement in the “Switch or Loop statement”.
- Use: It is used in relation with a Loop, to interrupt it and continue the execution outside it.



Practice makes Perfect…

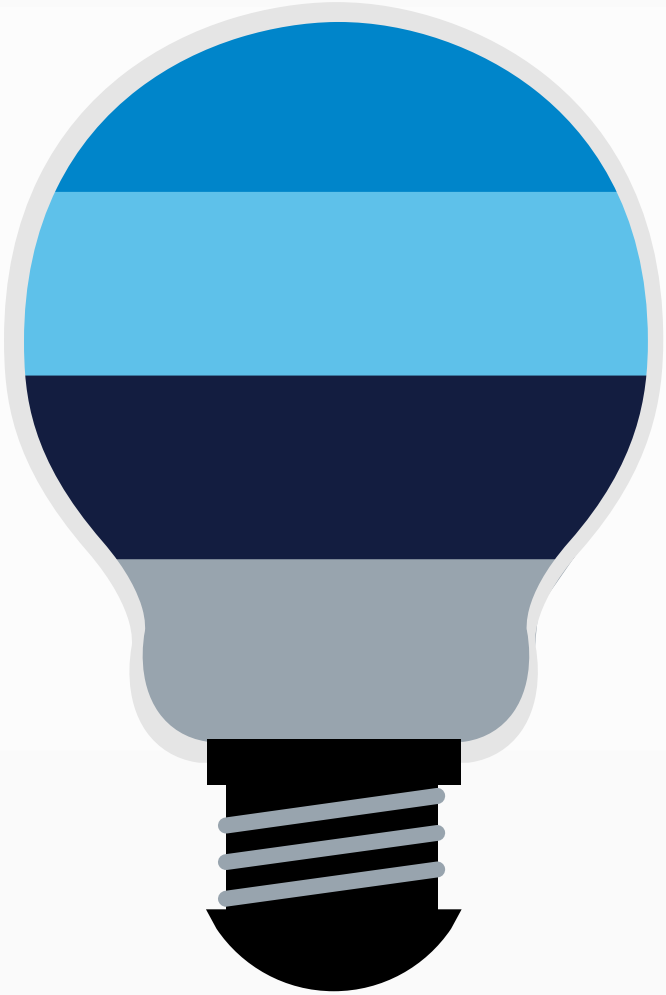
Consider an online game of **‘Guess the price’**:

- A product is being advertised using a video;
- Once the video ends, the bidding starts: each connected user has 60 seconds to introduce the price he thinks the product is worth it (only one amount);
- The winner is the first user that guessed the price.

How would you solve this using a loop?

Exercise

Create a list of songs of an artist from YouTube



To be more specific…

- We want the list with the top songs of a certain artist (in terms of YouTube views)
- Think of the things that may interfere with the desired outcome
- Use the generic statements covered to map the process

Control Flow & Universal Statements

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Control Flow Statements in UiPath

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Control Flow Statements in UiPath

Assign

Delay

Do While

For Each

While

Switch

If

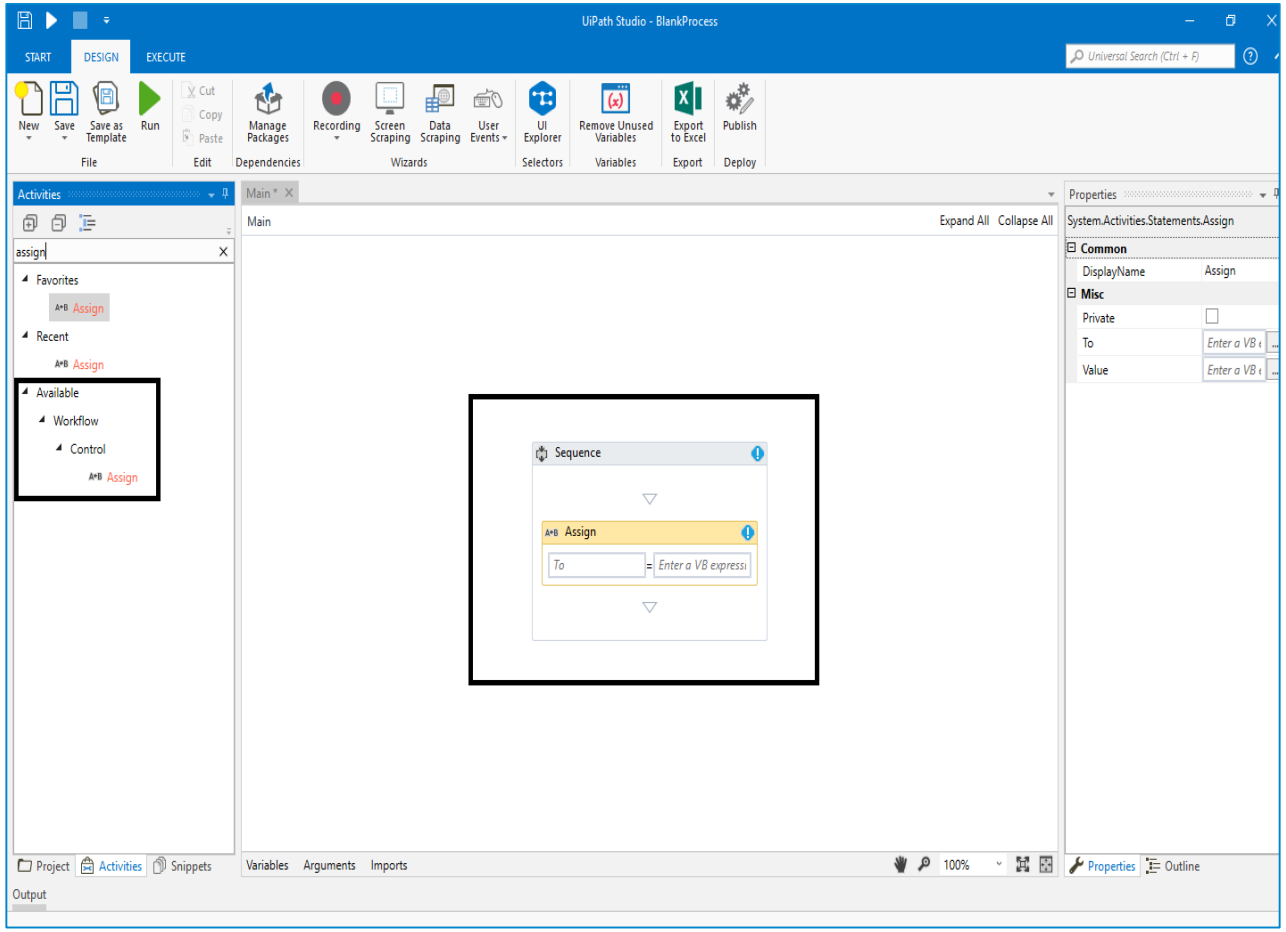
Break

Assign

The Assign statement allocates a value to a variable or argument.

What it can be used for?

- **Increment** the value of a variable in a loop
- **Sum** up two or more variables and assign the result to a different variable
- **Assign** values to an array



Delay

The Delay statement pauses an automation for a period of time.

What it can be used for?

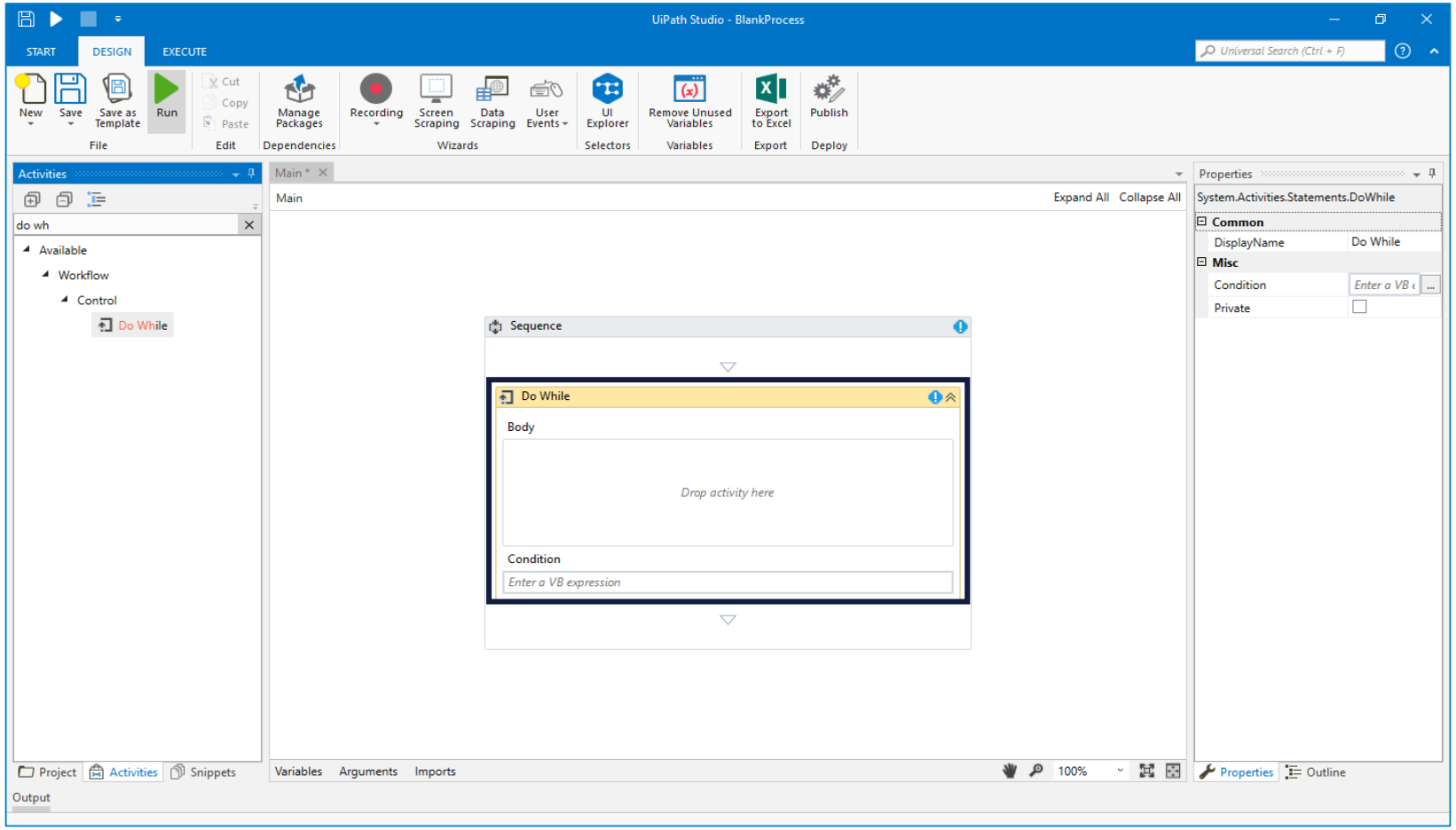
- **Machine Latency:** Delay is used to solve this issue which lead to error.

What are its types?

- **Static Delay**: A pause which is fixed and has a tendency of failure.
- **Dynamic Delay**: Advanced form of static delay in which the conditions regulate the wait or pause time.

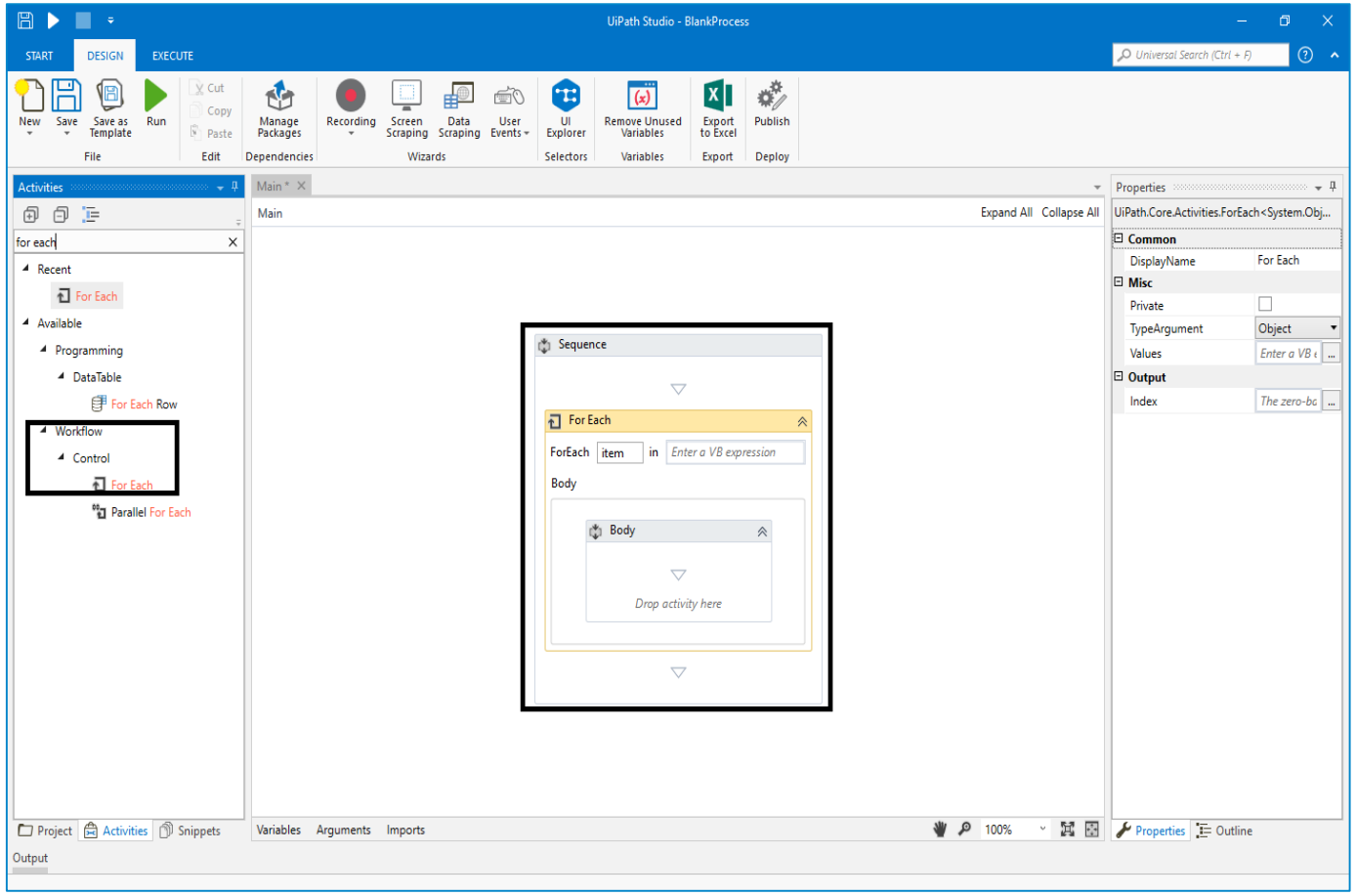
Do While

The Do While statement creates a loop that executes a specific sequence while a condition is met. The condition is evaluated after each execution of the statement



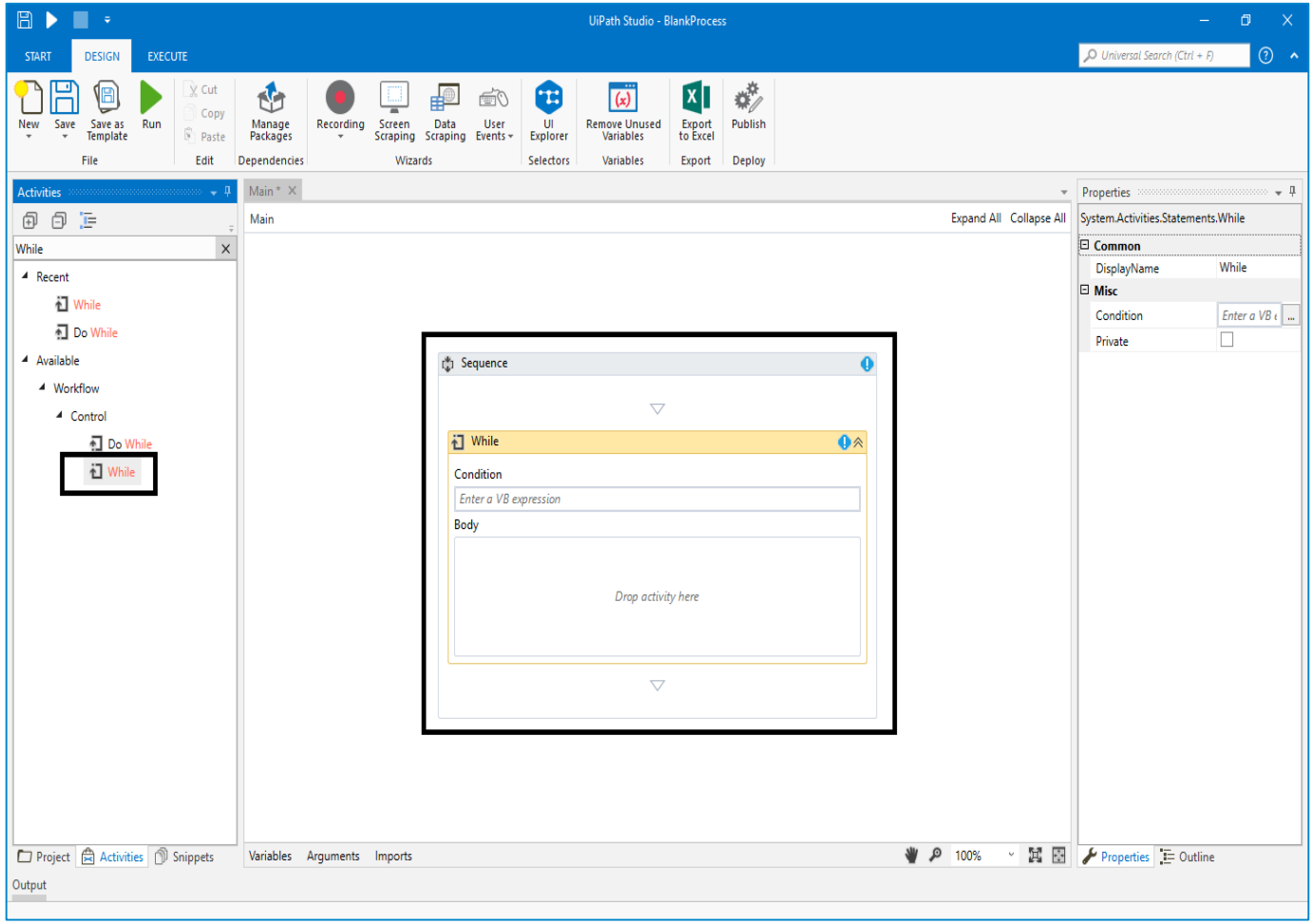
For Each

The For Each statement performs an activity or a series of activities on each element of a collection.



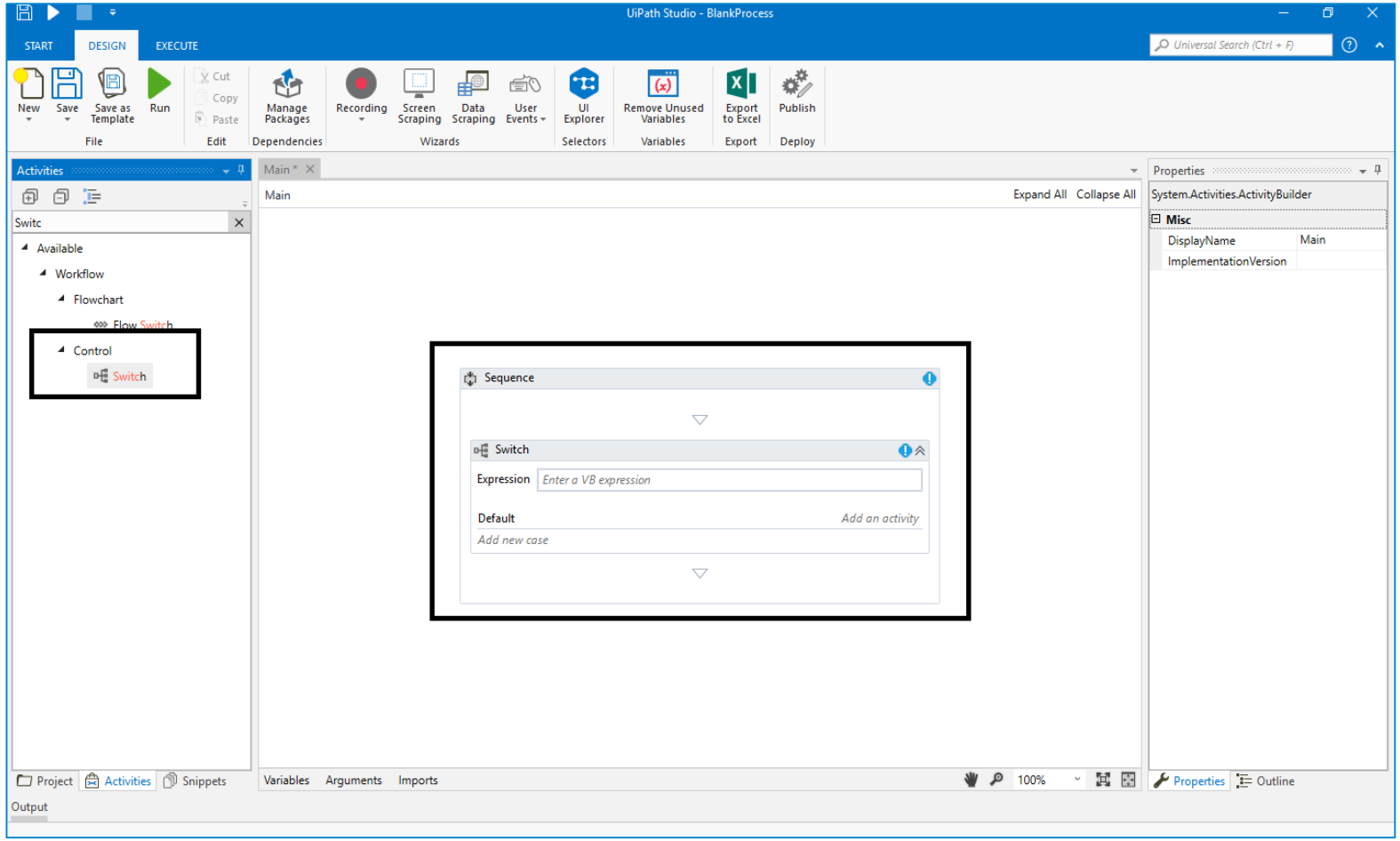
While

The While statement creates a loop that executes a specific sequence and the condition is evaluated before the execution of each statement.



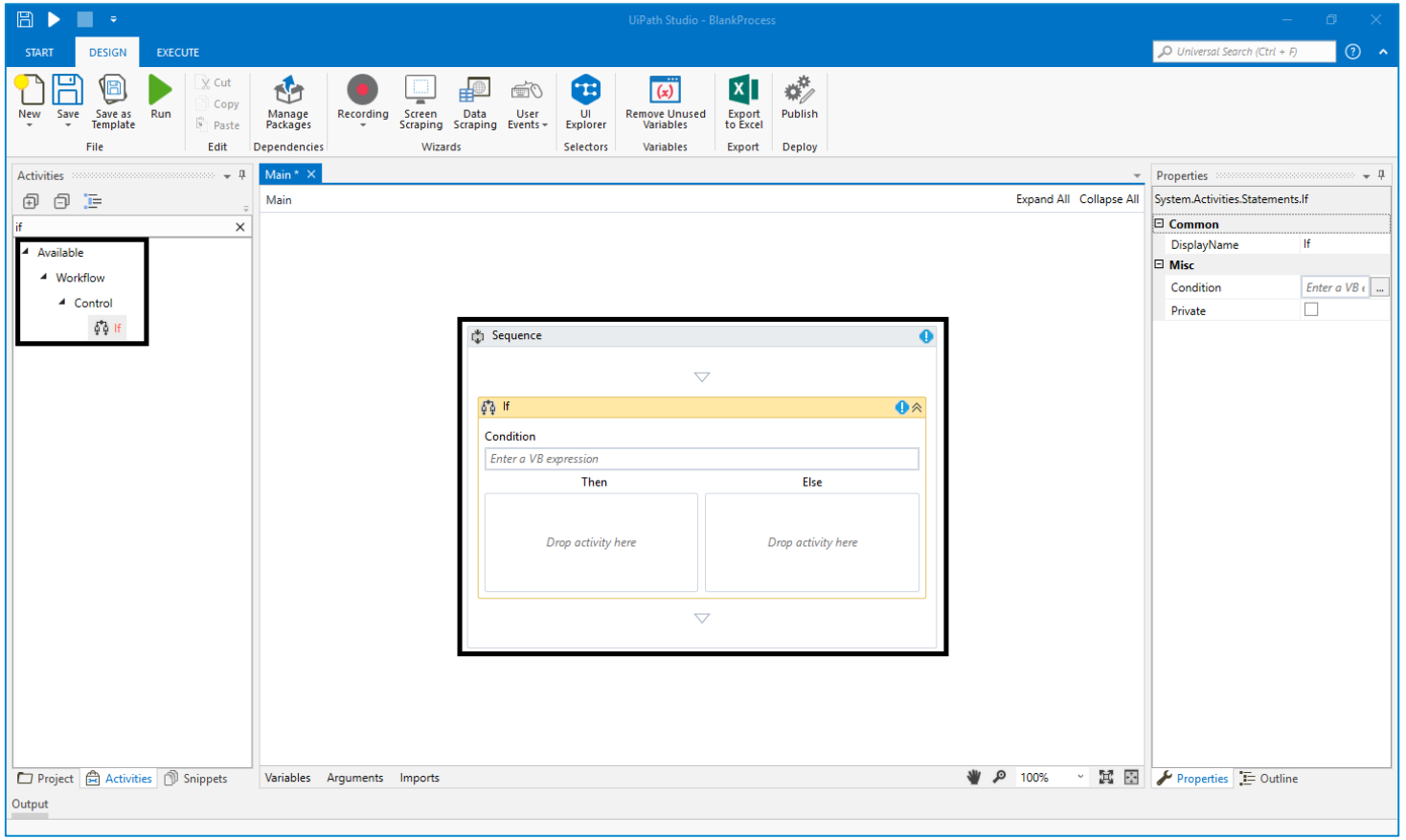
Switch

The Switch statement executes a set of statements out of multiple statements, based on the value of a specific expression.



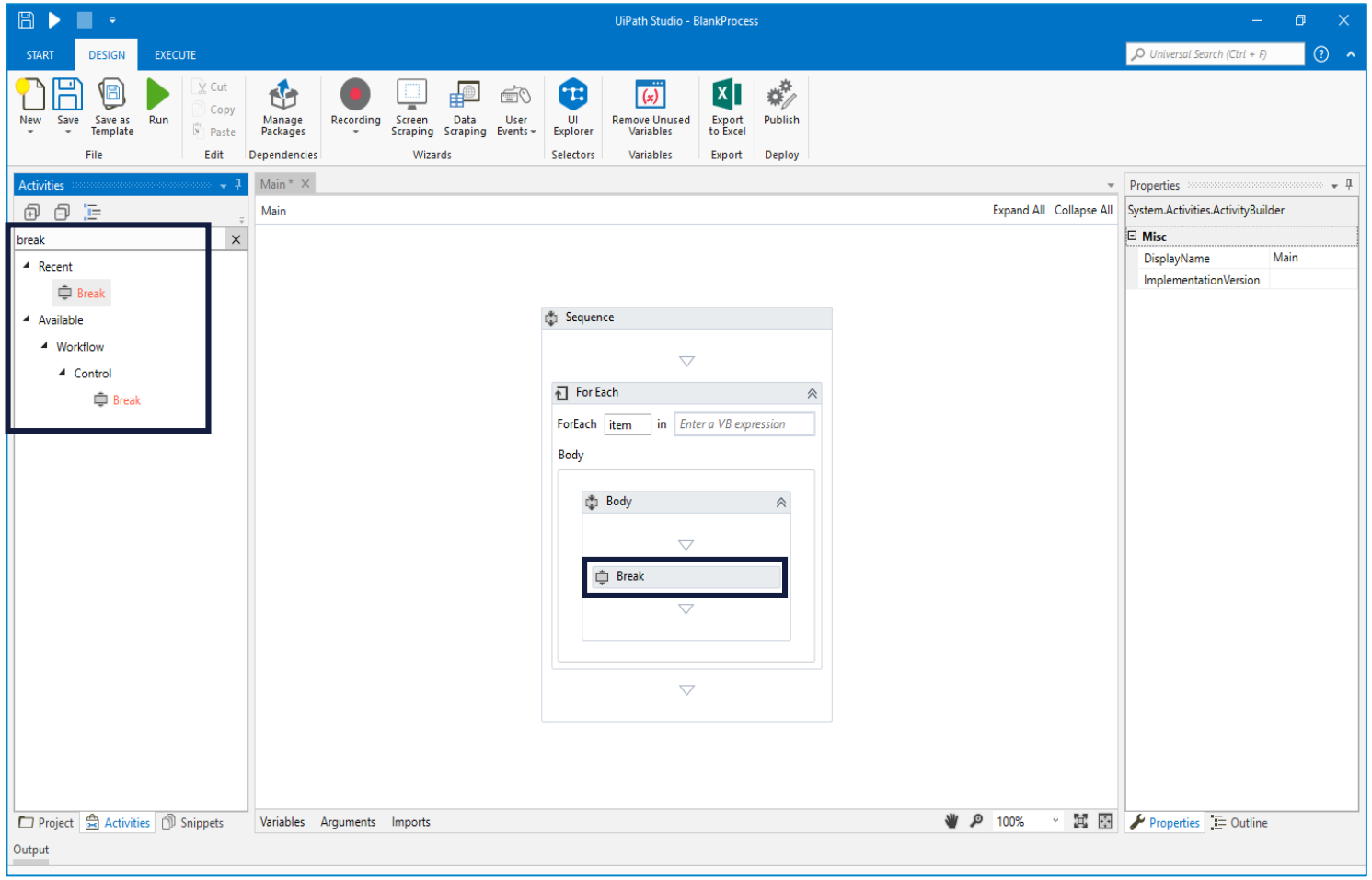
If

The If statement enables a project to take one of two different courses of action, depending on whether a specified condition is met.



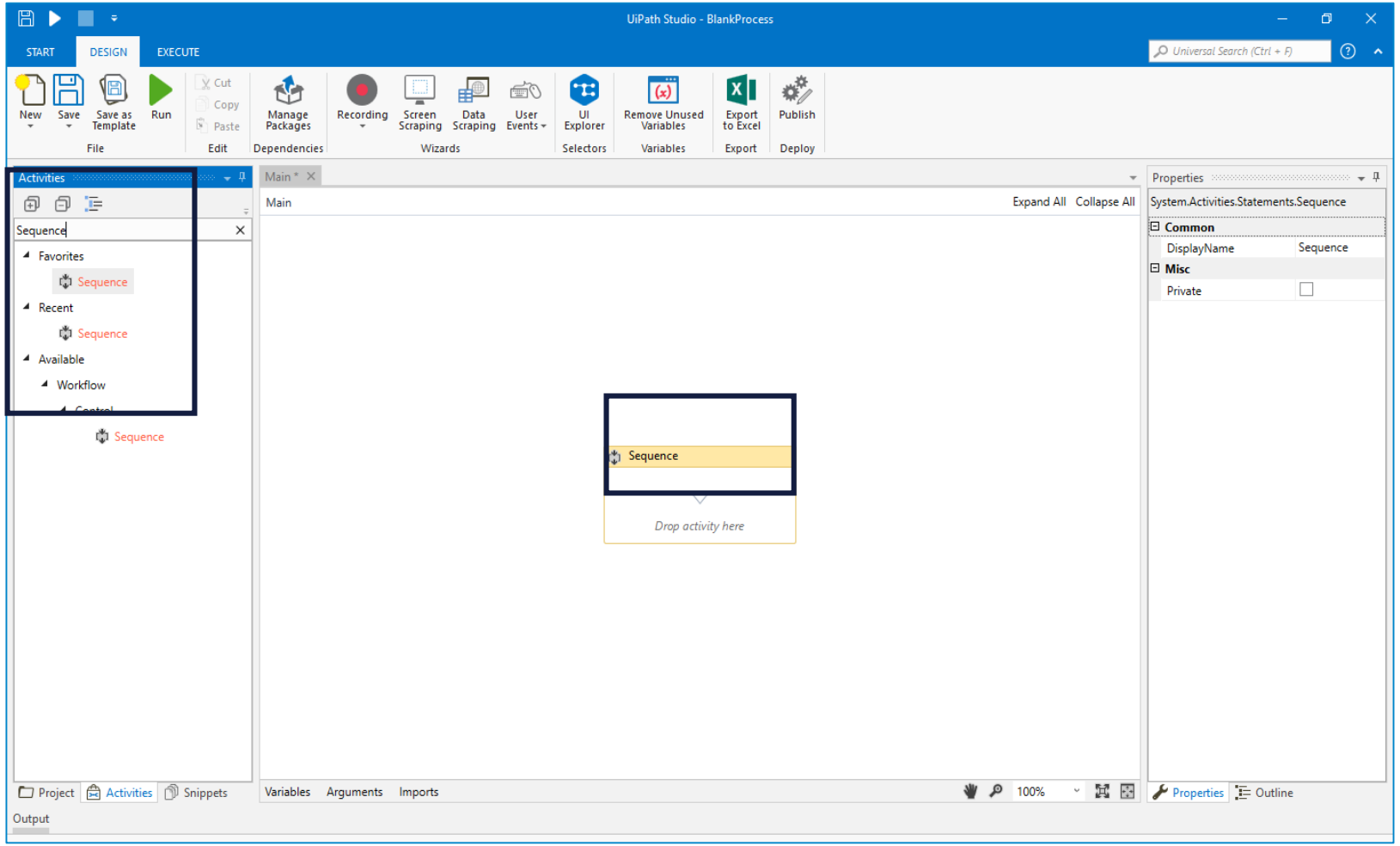
Break

The Break statement stops the loop at a chosen point and continues with the next activity.



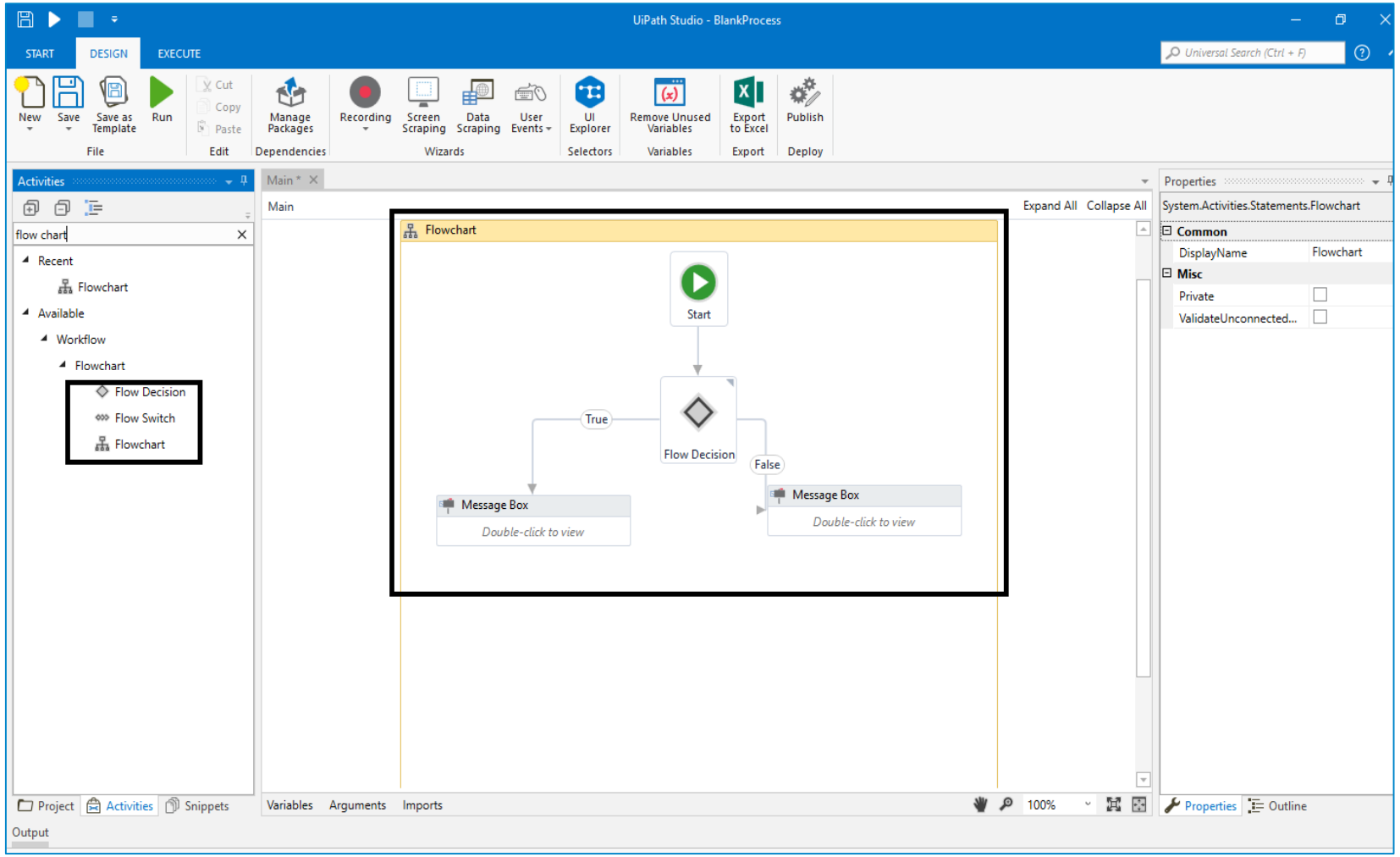
Sequence

Sequence is the smallest project to create a process in UiPath that enables to create a linear process in various activities and execute the sequential order.



Flowchart

The Flowchart represents various steps involved in completing activities, task, and process.



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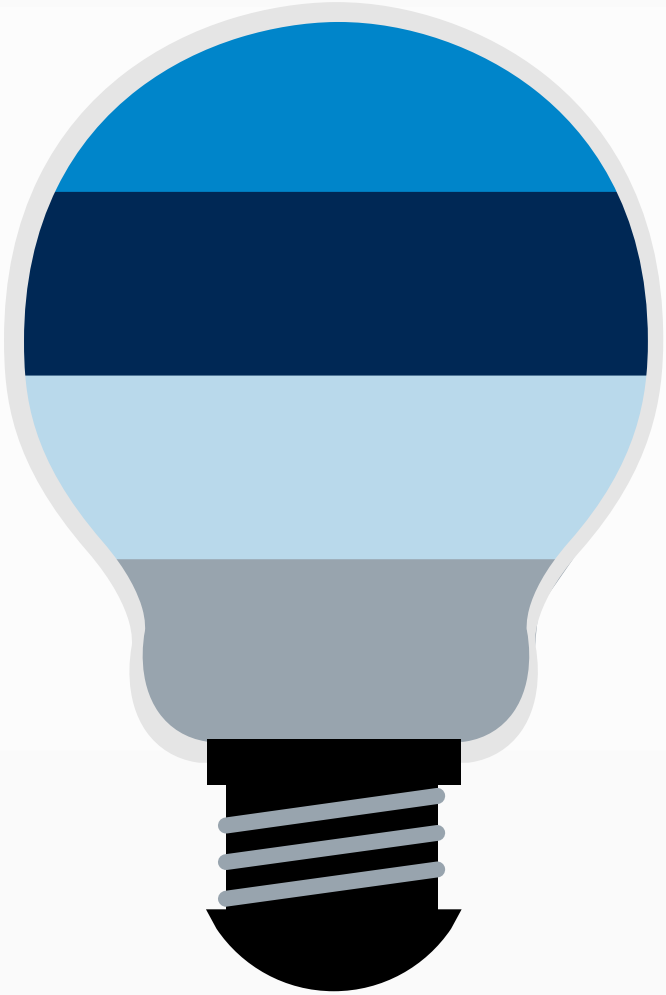
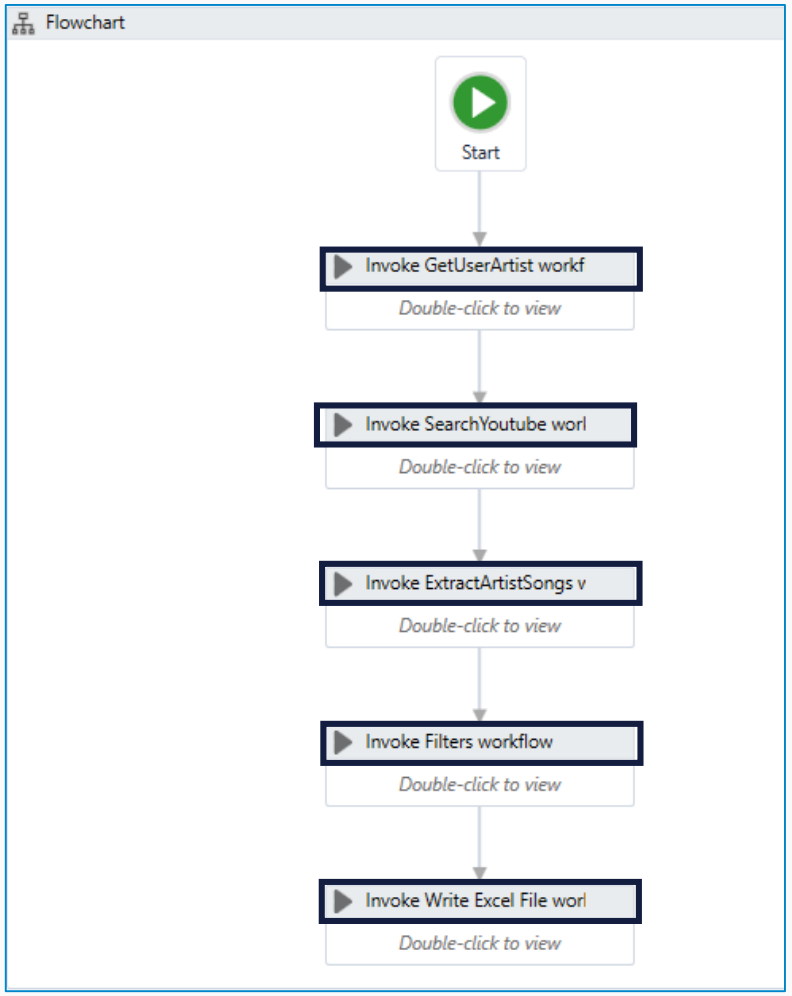
Back to our Exercise… Part II

Create a list of songs of an artist from YouTube



Now that you are familiar with the control flow statements in UiPath, can you translate the solution to our task into UiPath Studio?

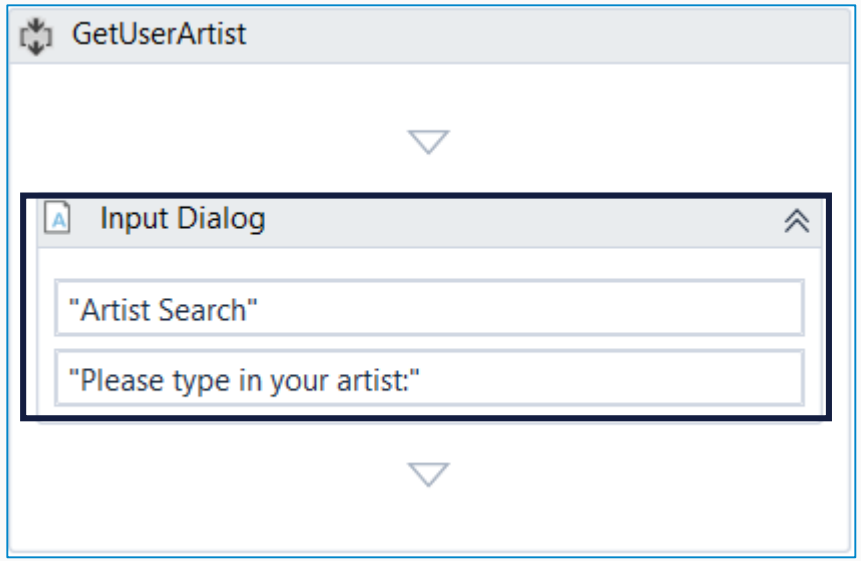
Create a list of songs of an artist from YouTube



Main steps of the solution:

1. Get the artist name and store it as an argument (**GetUserArtist** workflow)
2. Open YouTube with Chrome browser, search for the artist, sort the results by view count (**SearchYouTube** workflow)
3. Scrape the relevant data from the search results and store them inside a DataTable argument (**ExtractArtistSongs** workflow)
4. Filter the results in the DataTable (**Filters** workflow)
5. Write the filtered results in the Excel file (**WriteExcelFile** workflow)

Step 1: GetUserArtist Workflow



Purpose: Get the artist name and store it as an argument

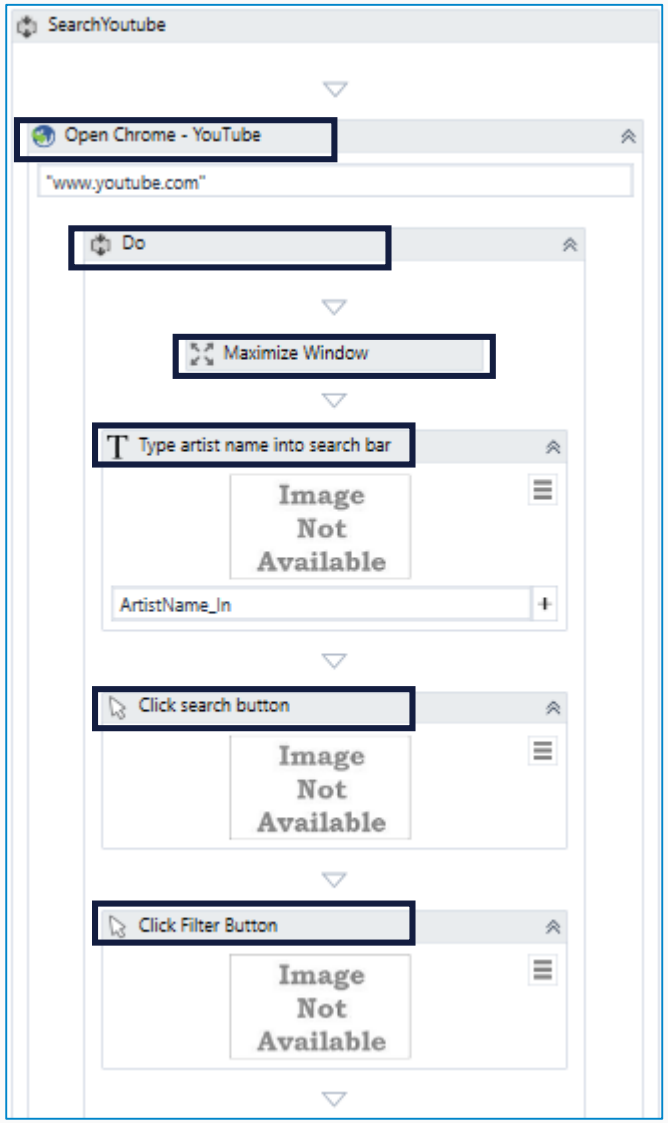
Activities:

Input Dialog to ask the user for the artist name

Variables/Arguments:

Argument: ArtistName (type: string, direction out)

Step 2: SearchYouTube Workflow (part 1)



Purpose: Open YouTube with Chrome browser, search for the artist, sort the results by view count

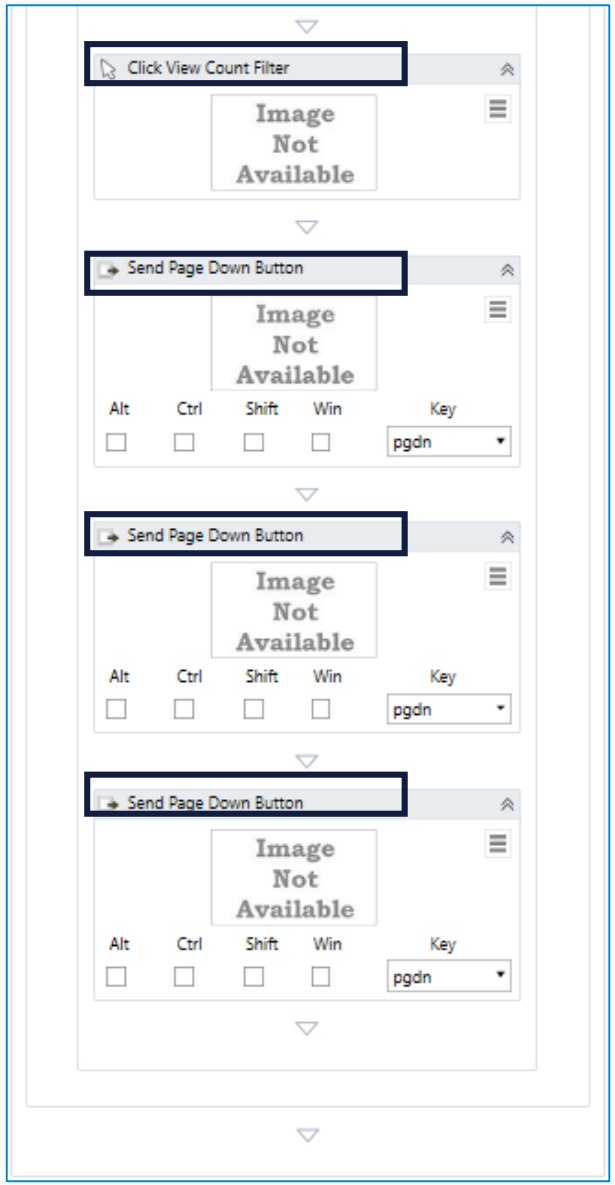
Activities:

1. **OpenBrowser** Chrome – www.youtube.com
2. **Do**
3. **Maximize** the window
4. **TypeInto** for searching the artist name
5. **Click** search button
6. **Click** fiter

Variables/Arguments:

Argument: ArtistName (type: string, direction in)

Step 2: SearchYouTube Workflow (part 2)



Purpose: Open YouTube with Chrome browser, search for the artist, sort the results by view count

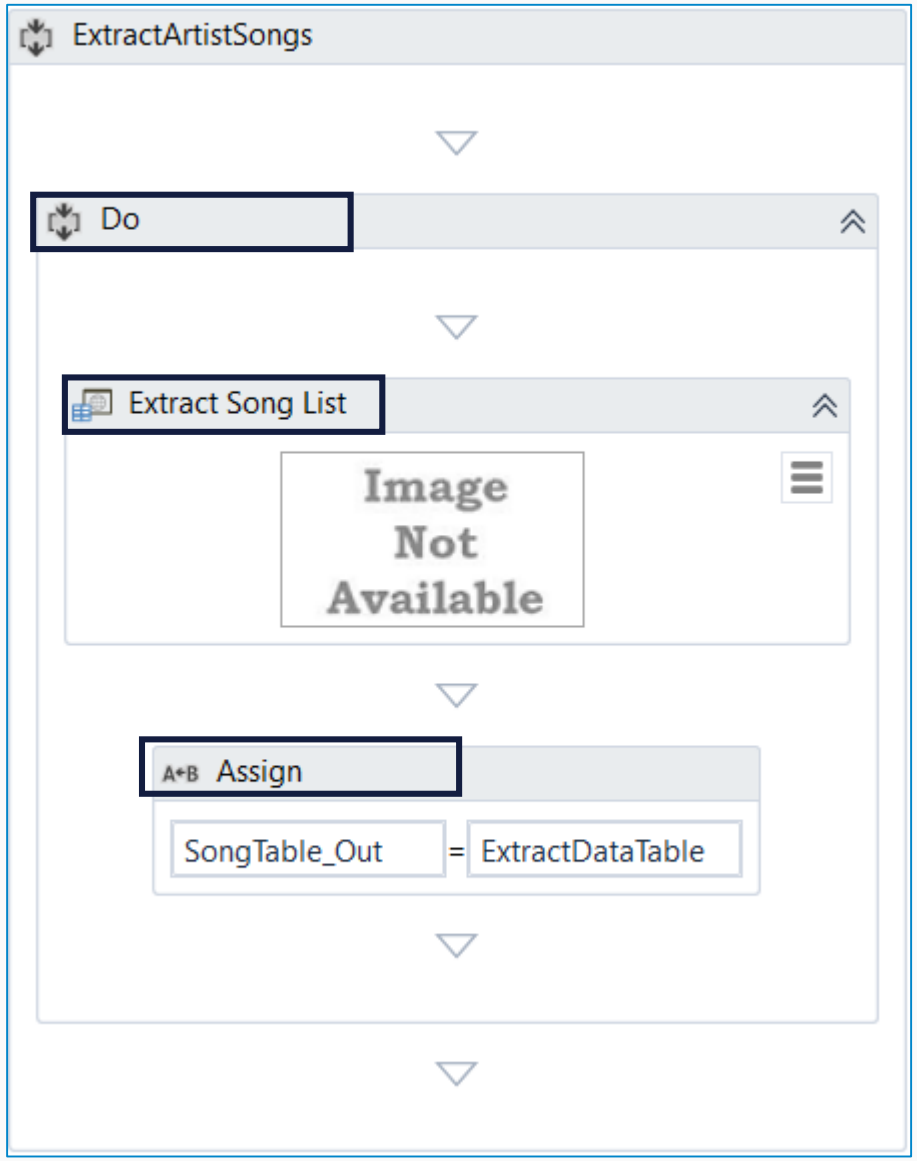
Activities:

1. **Click** View Count
2. **SendHotkey** Page Down **x 3**

Variables/Arguments: -

No variables and arguments are needed.

Step 3: ExtractArtistSongs Workflow



Purpose: Scrape the relevant data from the search results and store them inside a DataTable argument

Activities:

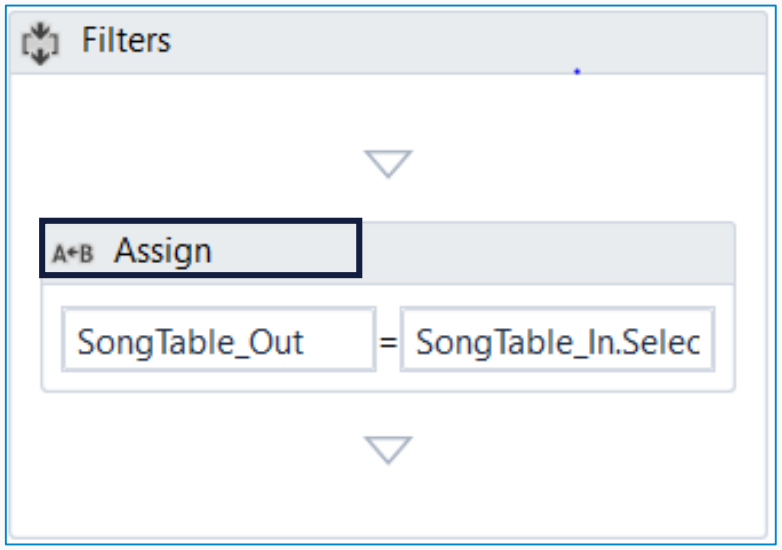
1. **Do**
2. **ExtractData** for extracting the information for each song on the page and store it in a variable
3. **Assign** the info extracted to an argument

Variables/Arguments:

Variable: Song table (type: DataTable)

Argument: Song table (type: DataTable, direction: out)

Step 4: Filters Workflow



Purpose: Filter the results in the DataTable **Activities:**

1. **Assign** to filter out the unwanted results in the DataTable (live songs & songs from other artists)

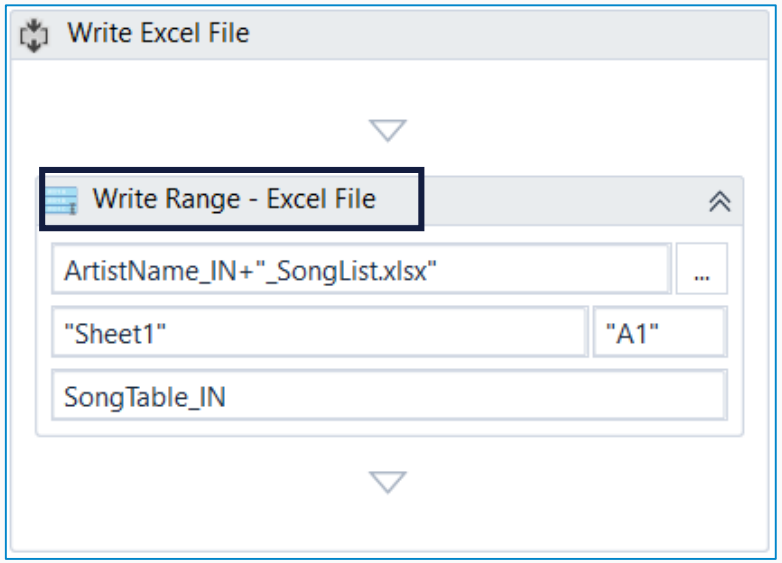
Variables/Arguments:

Argument: SongTable_In (DataTable, direction: in) – extracted data

Argument: Song table (DataTable, direction: out) – filtered data

Argument: ArtistName_IN (String, direction: in) – filter out results

Step 5: WriteExcelFile Workflow



Purpose: Write the filtered results in the Excel file

Activities:

1. **WriteRange** for writing the filtered data in a new Excel file

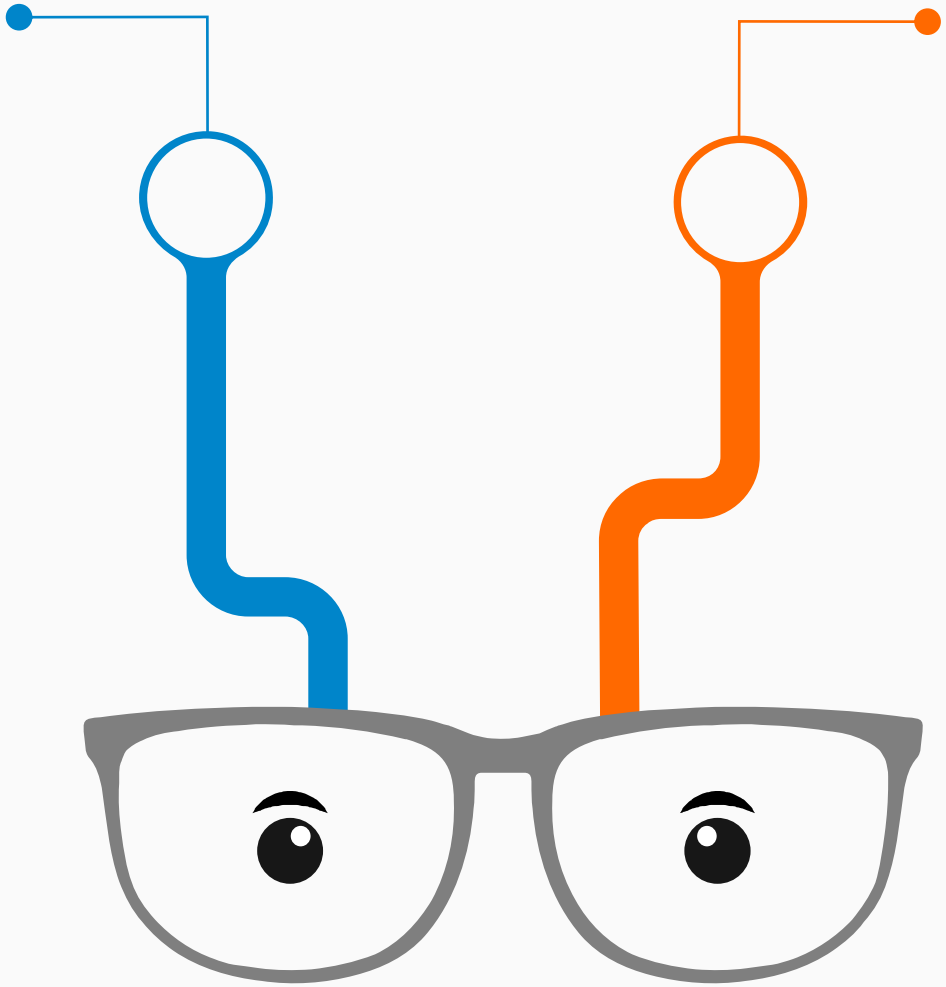
Variables/Arguments:

Argument: SongTable_In (DataTable, direction: in) – filtered data

Argument: ArtistName_IN (String, direction: in) – filter out results

Takeaways
Control Flow & Universal Statements

Control Flow is the order in which individual statements, instructions or function calls are executed or evaluated in a software project.



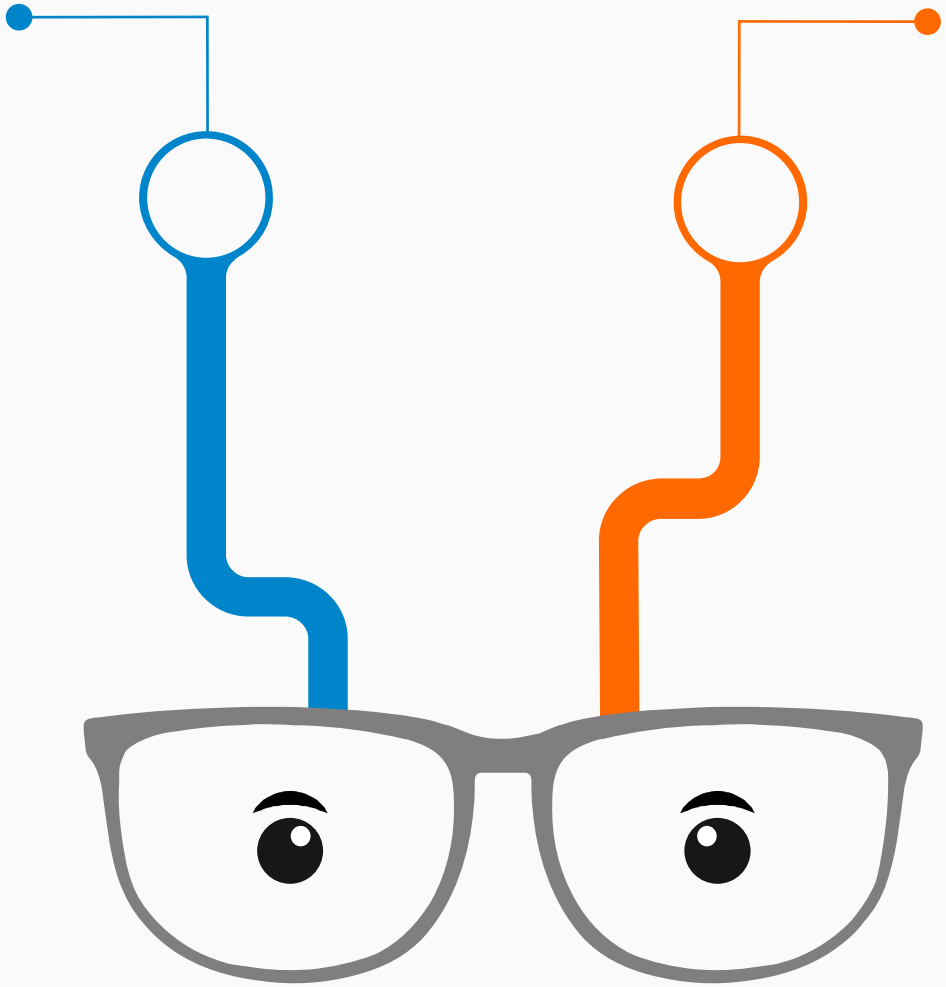
There are four basic control statements:

- If
- Switch
- Loop
- Break

Takeaways

Control Flow Statements in UiPath

There are eight different types of control flow statement that are used in UiPath.



UiPath Control Flow Statements:

- Assign
- Break
- Delay
- Do While
- For Each
- If
- Switch
- While

Questions & Answers

Which of the following statements are interrupted using the Break statements?

a) Do While

b) While

c) For Each

How many nested If statements are needed to replace a Switch statement with 4 cases?

a) 3

b) 4

c) 5

Let's take a variable (V) initially assigned with a value of 10 and decreasing by 1 every time a sequence is executed in a Do While Statement. How many times will the sequence be executed if the expression is V > 0?

a) 11

b) 10

c) 9

Next Steps

Module 3 - Lesson 4: Data Manipulation