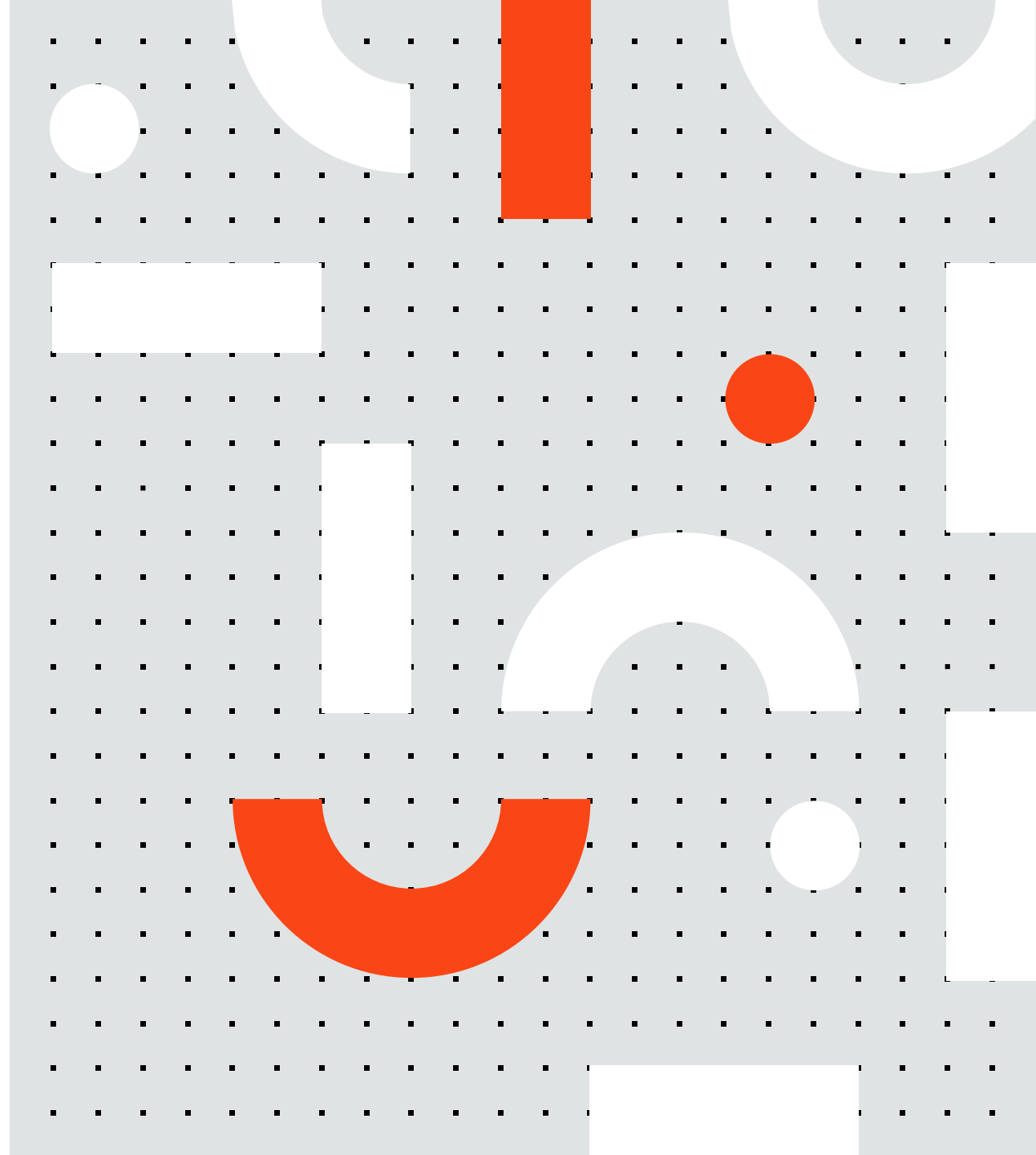# RPA Design & Development

Control Flow

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

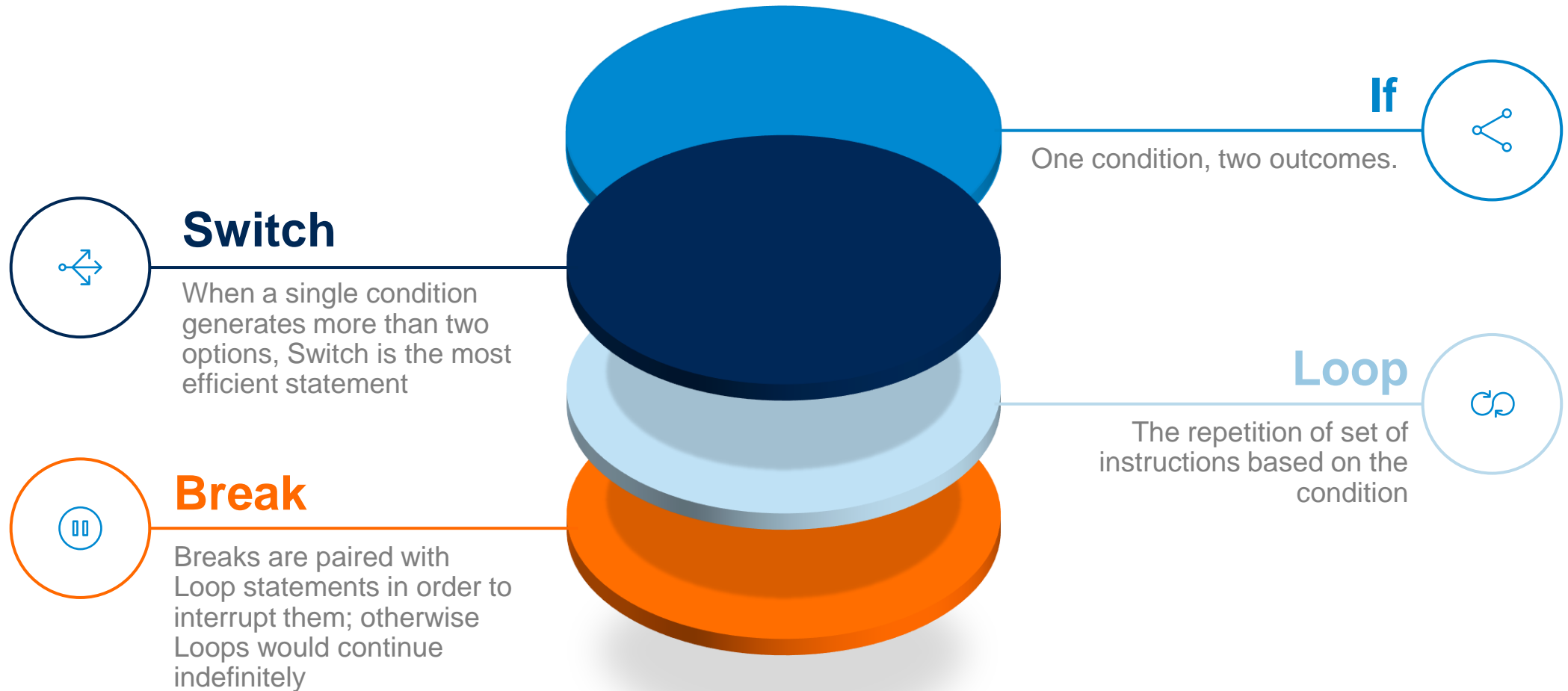Executing **until** some condition is met

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

UiPath™

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.
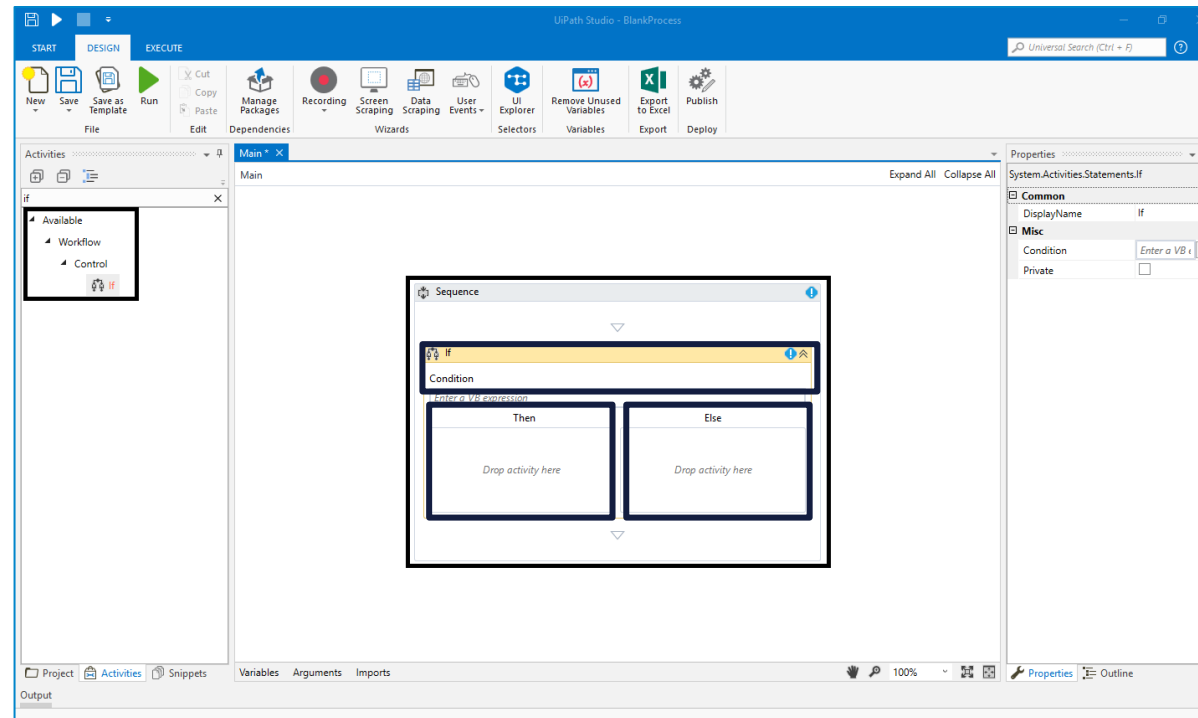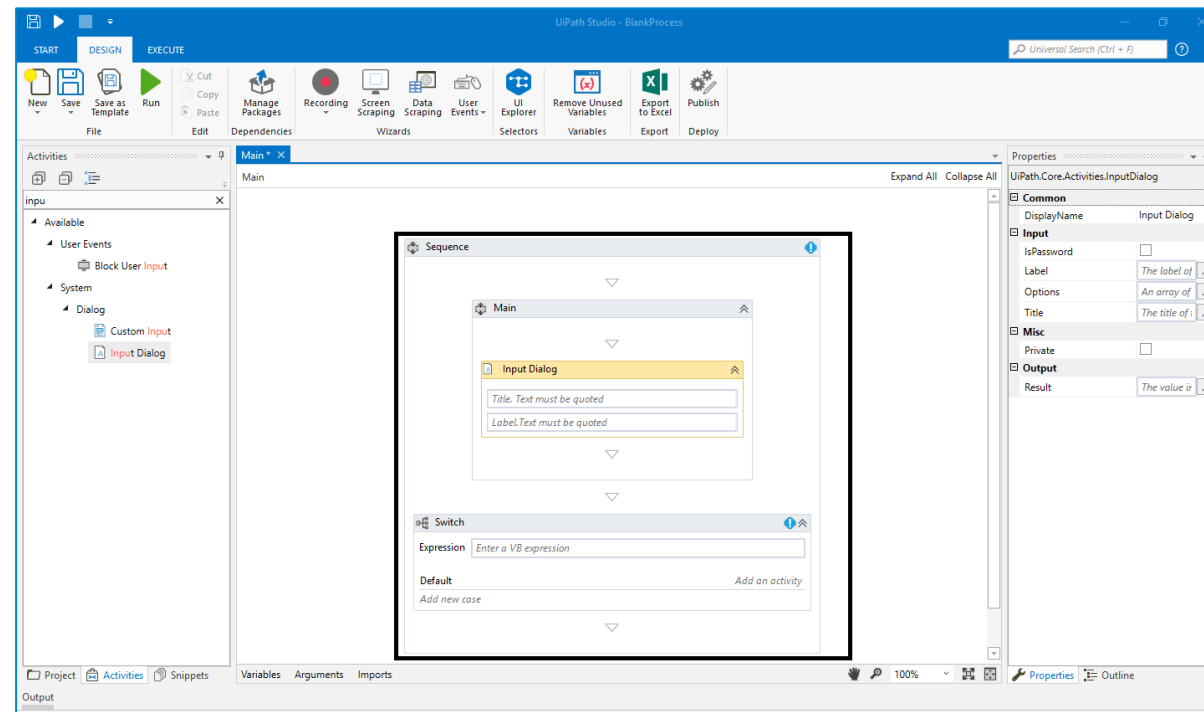
The **Switch** Statement

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.

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?**
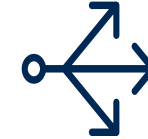
How would it look like using only If statements?

Comparison of **If** and **Switch**
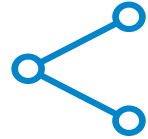
If

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'
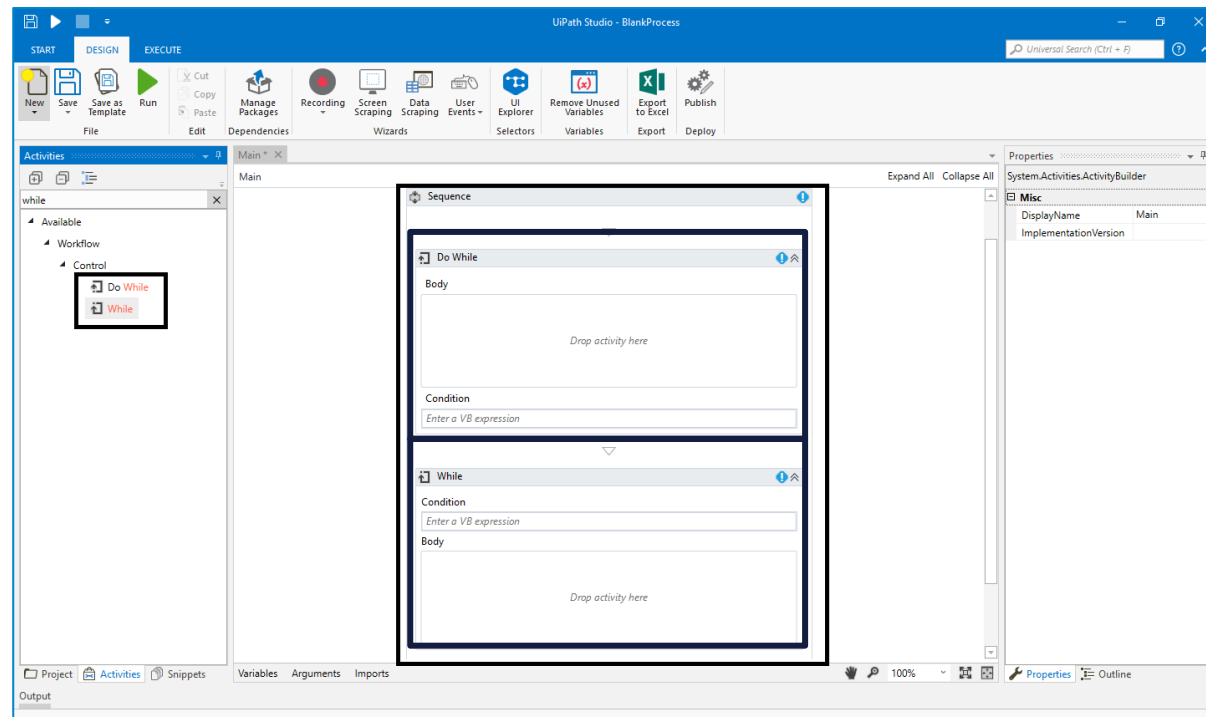
The Loop Statement

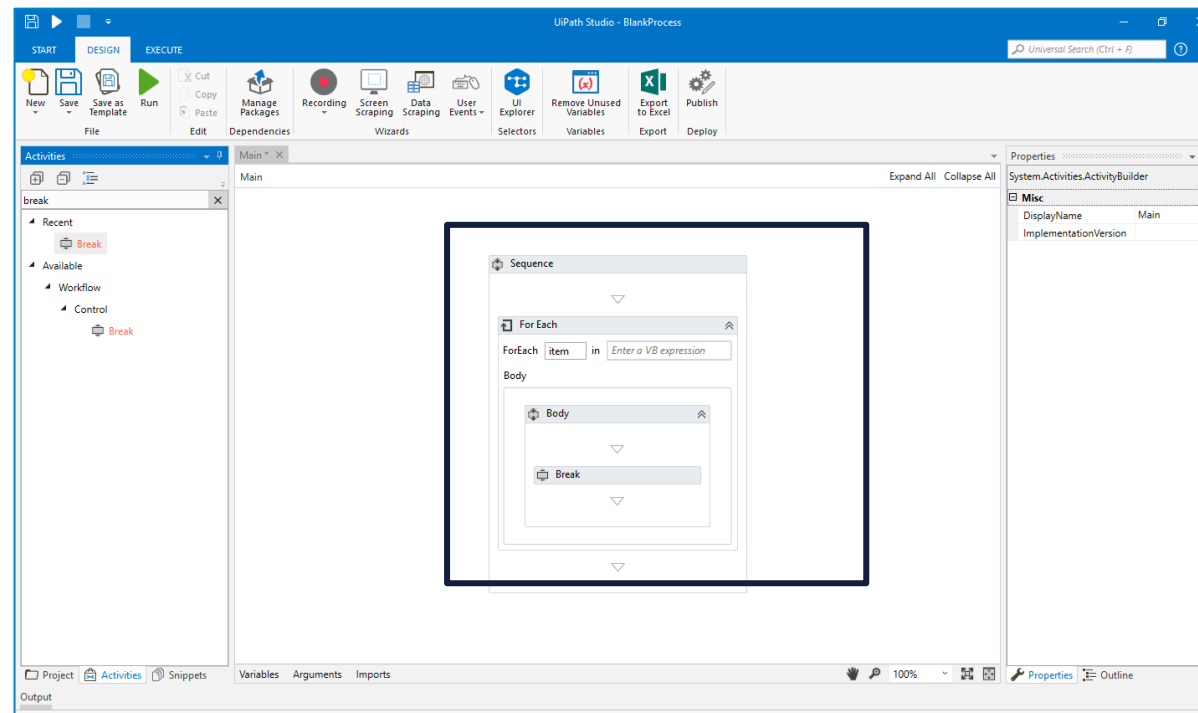Loop is the structure that executes a repetitive set of operations with these low error activities.

The **Break** Statement

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

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?
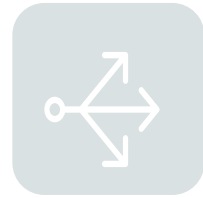
Control Flow Statements in UiPath

Assign

Delay

Do While
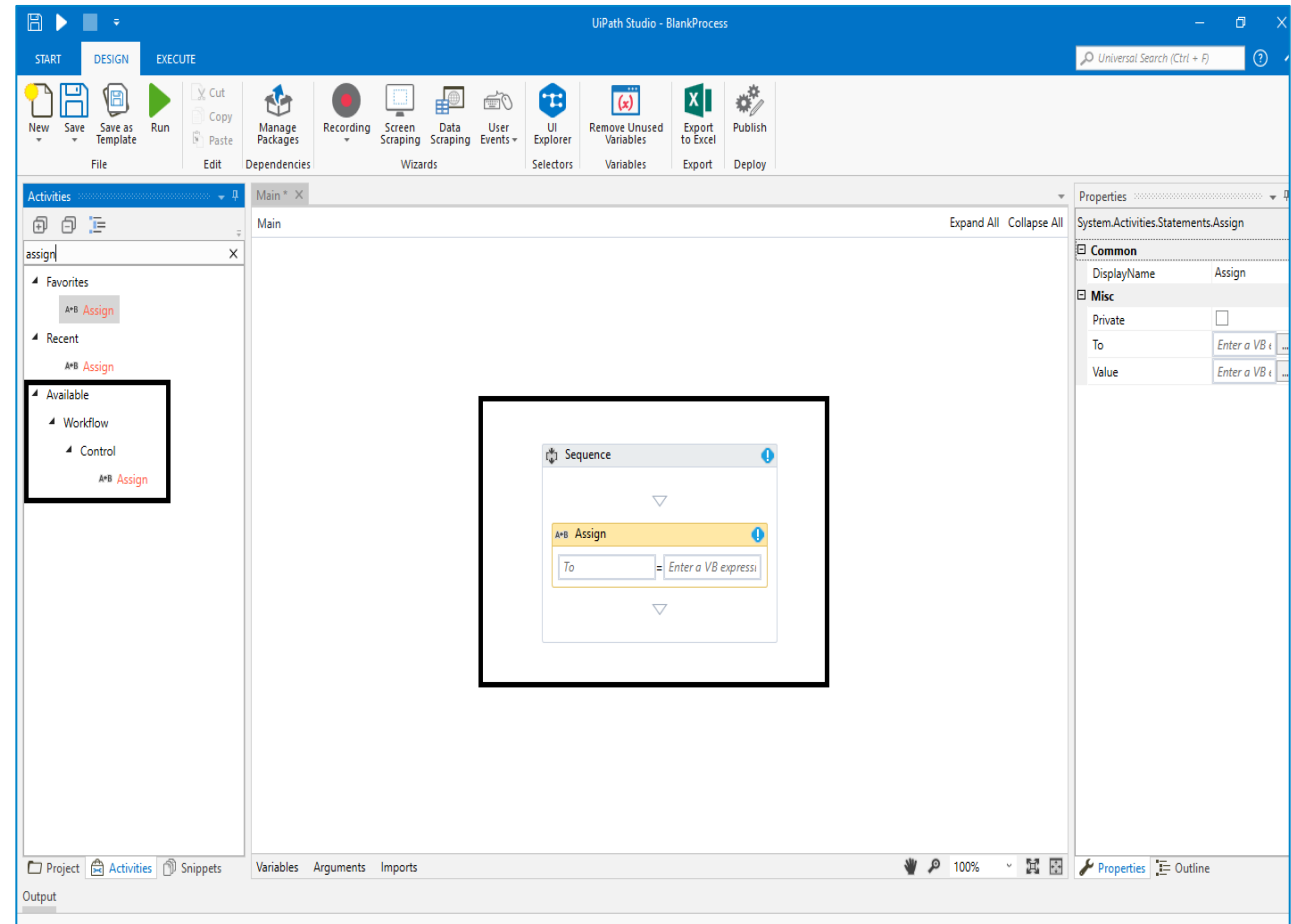
For Each

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
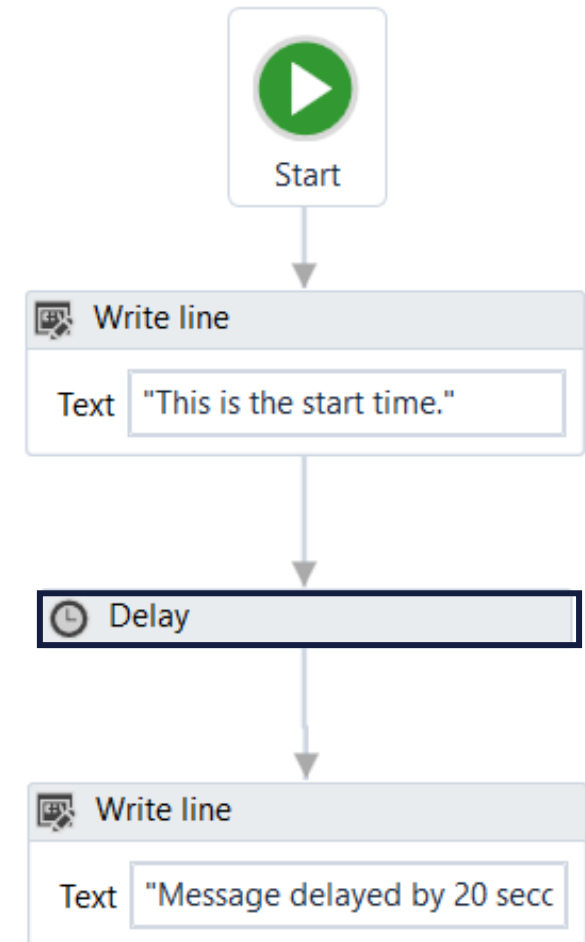- **Assign** values to an array

Delay

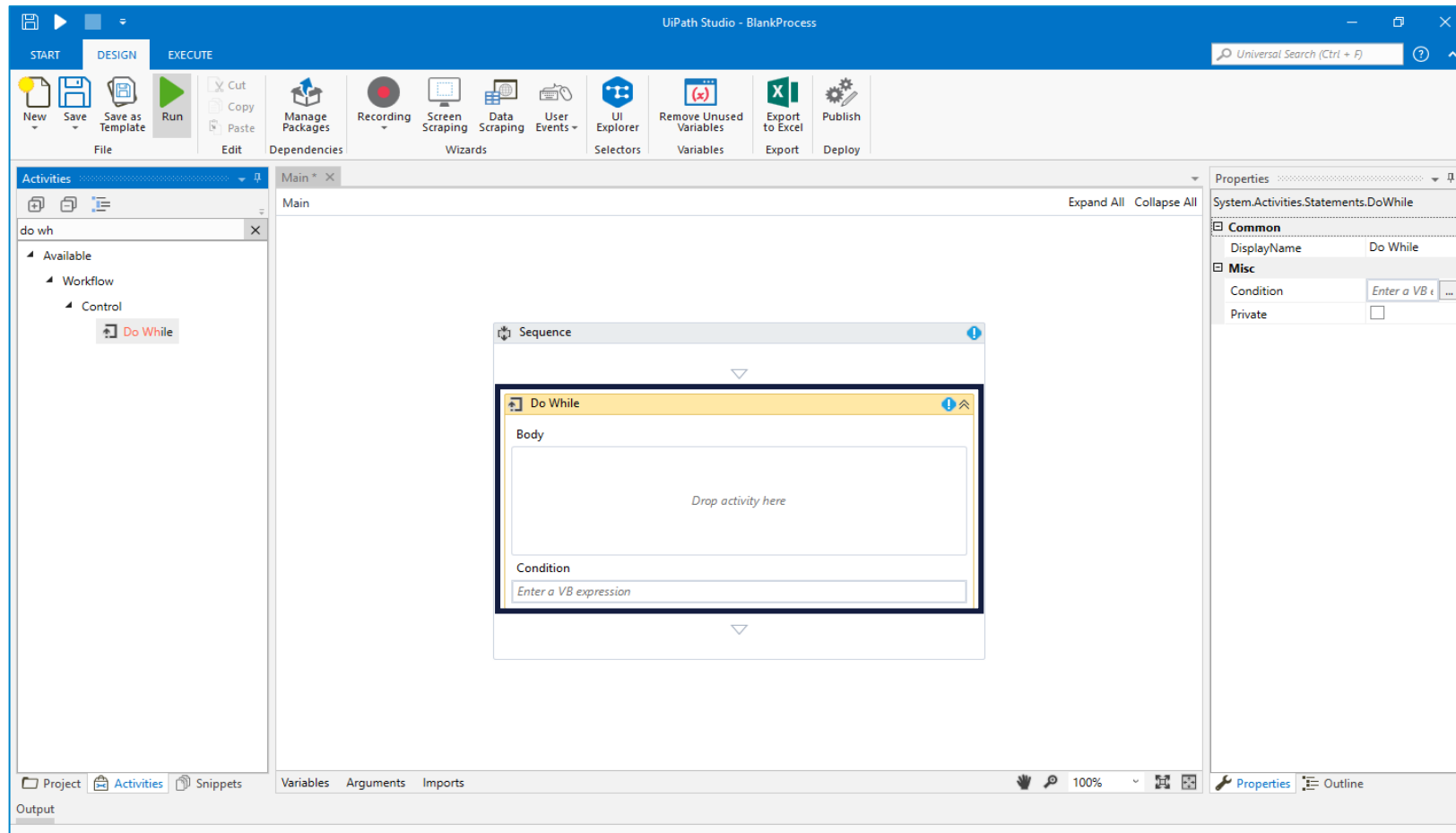The Delay statement pauses an automation for a period of time.

What it can be used for?

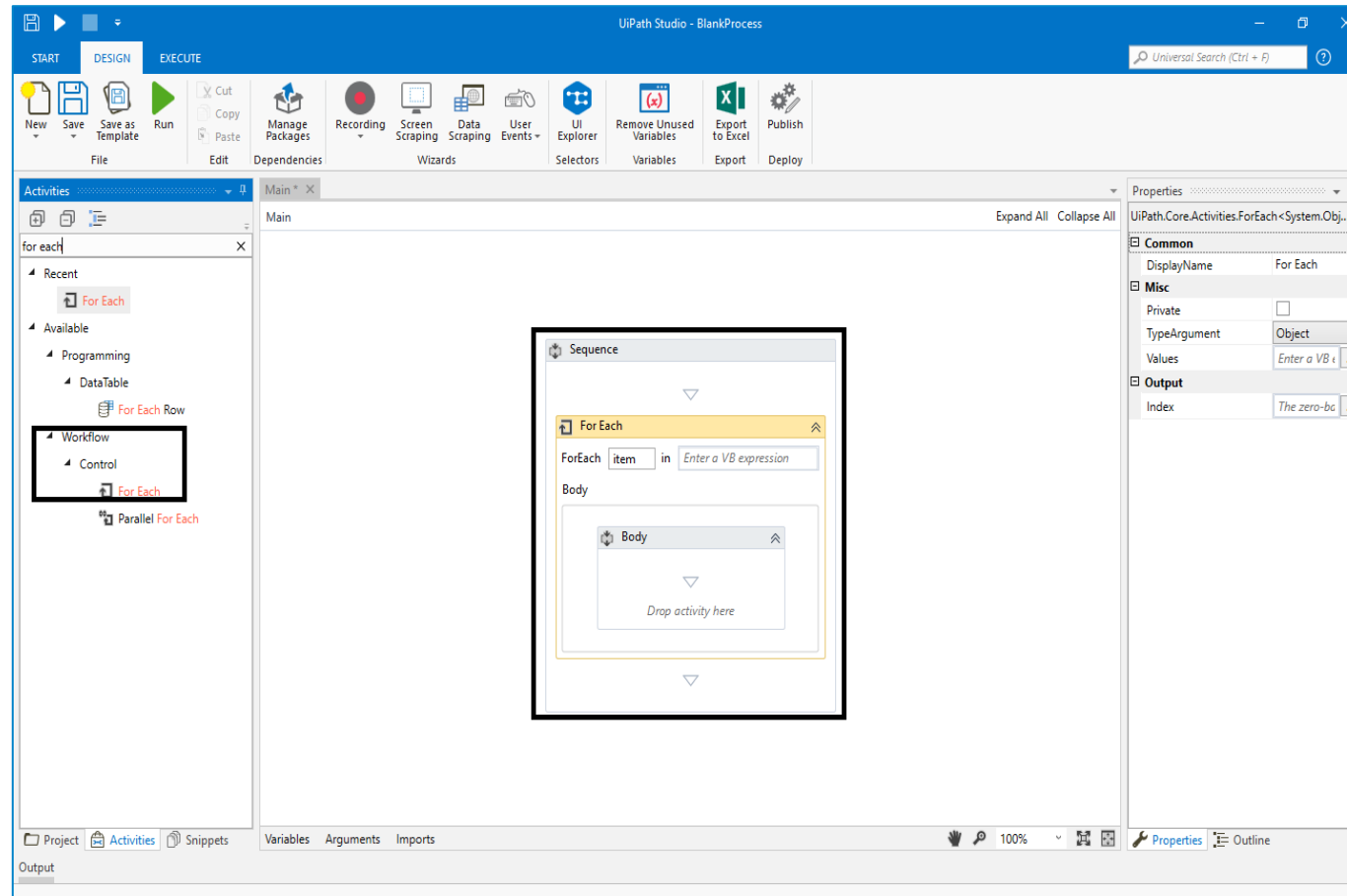- **Machine Latency:** Delay is used to solve this issue which lead to error.

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
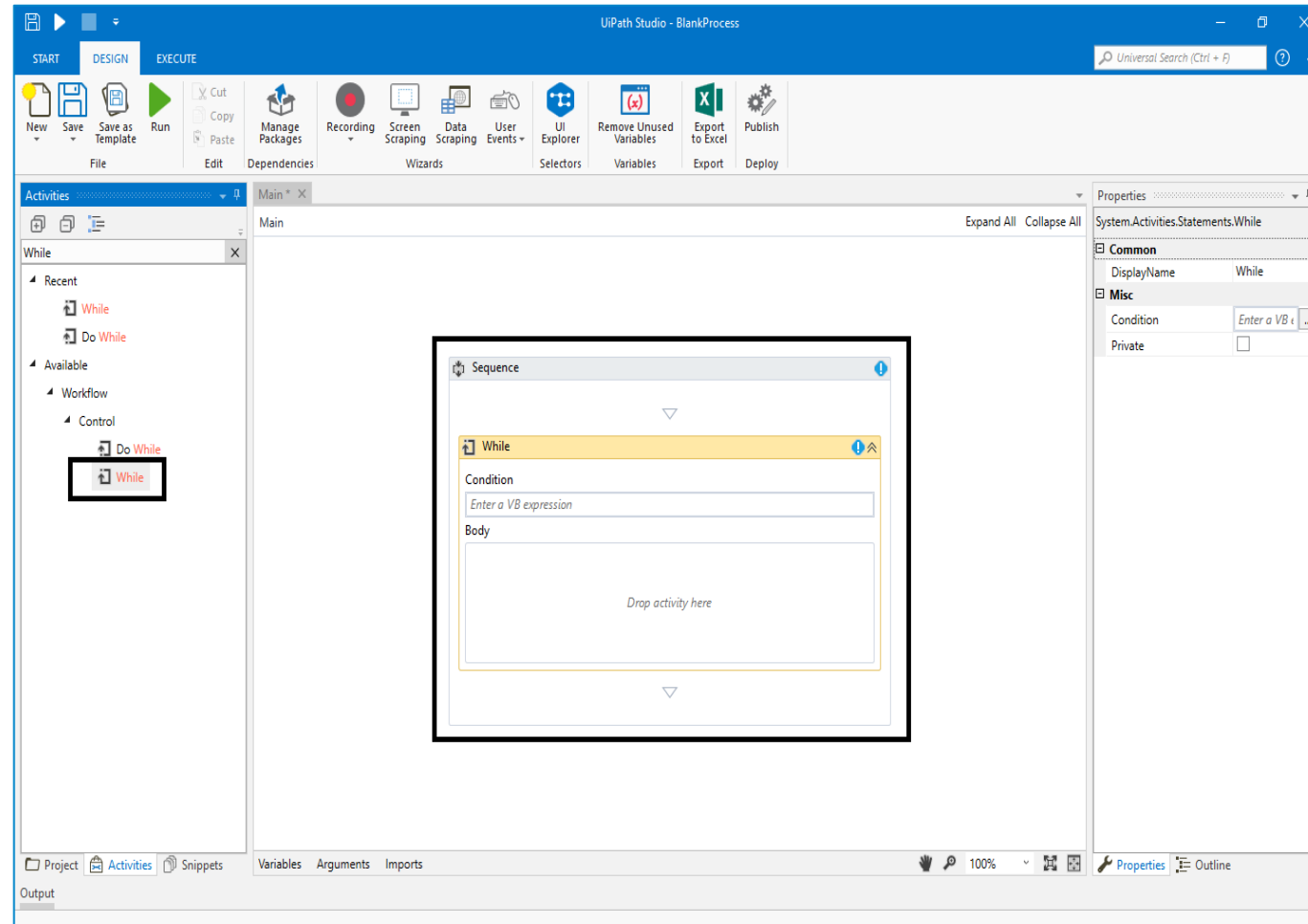
For Each

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.
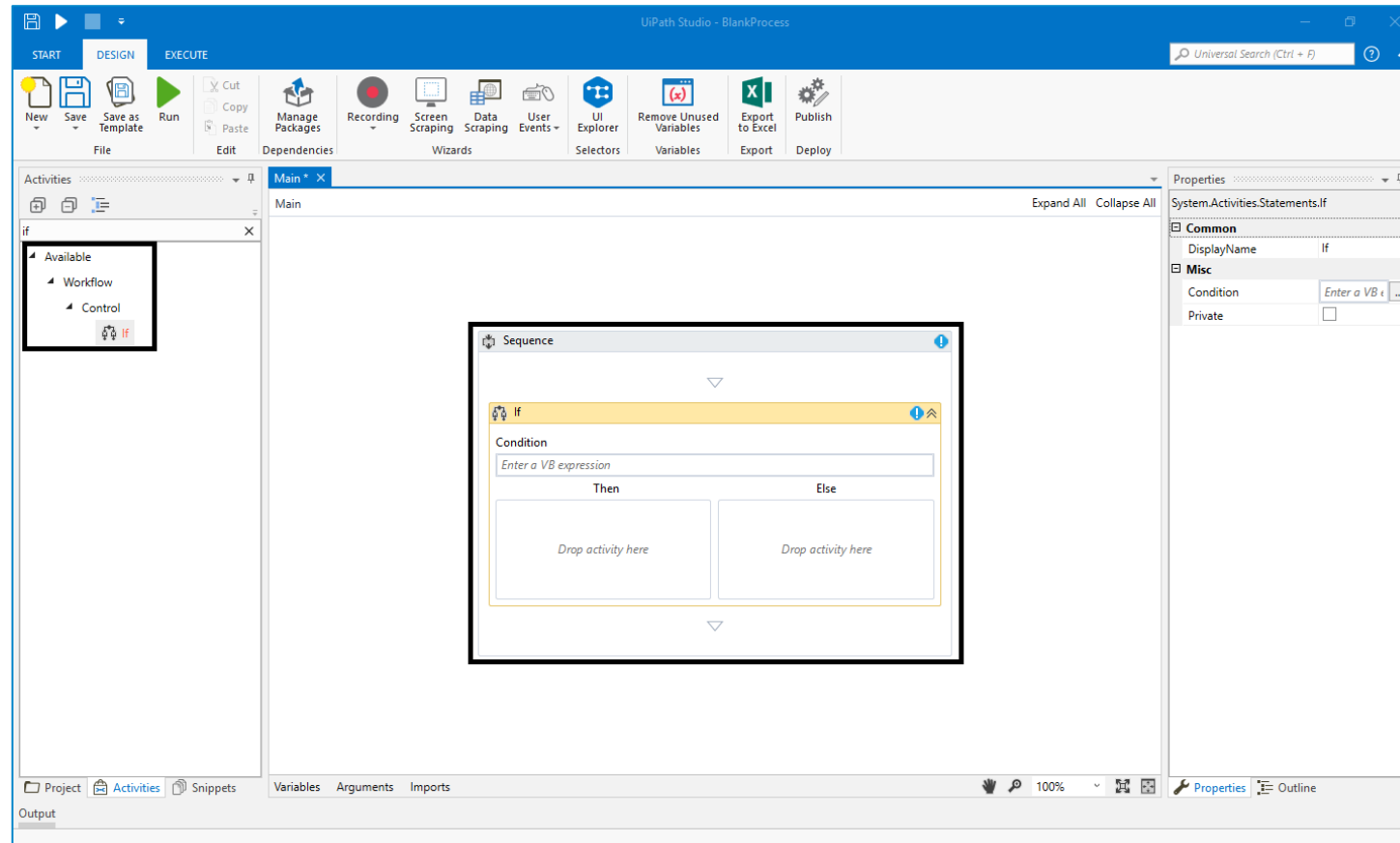
Switch

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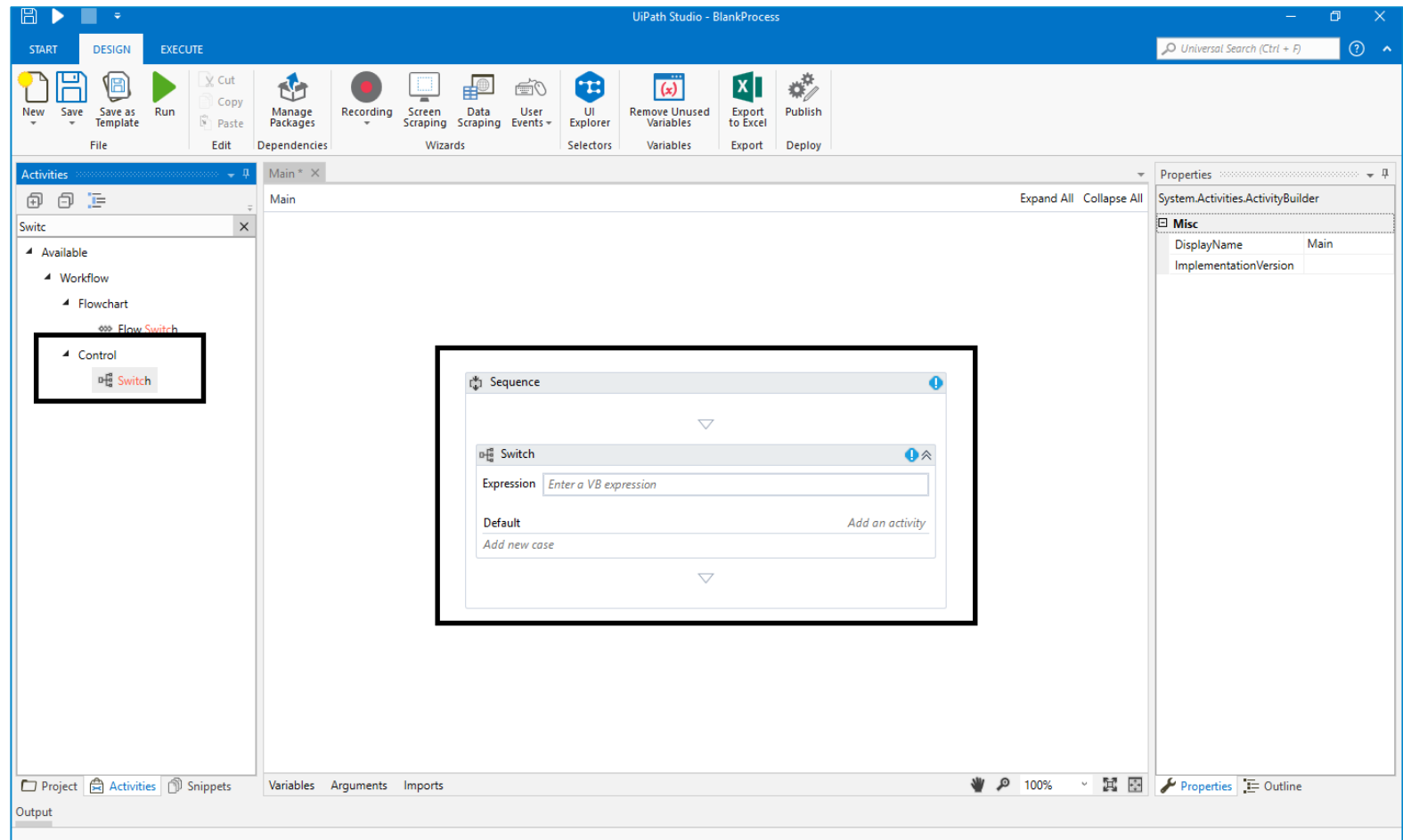
If

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.
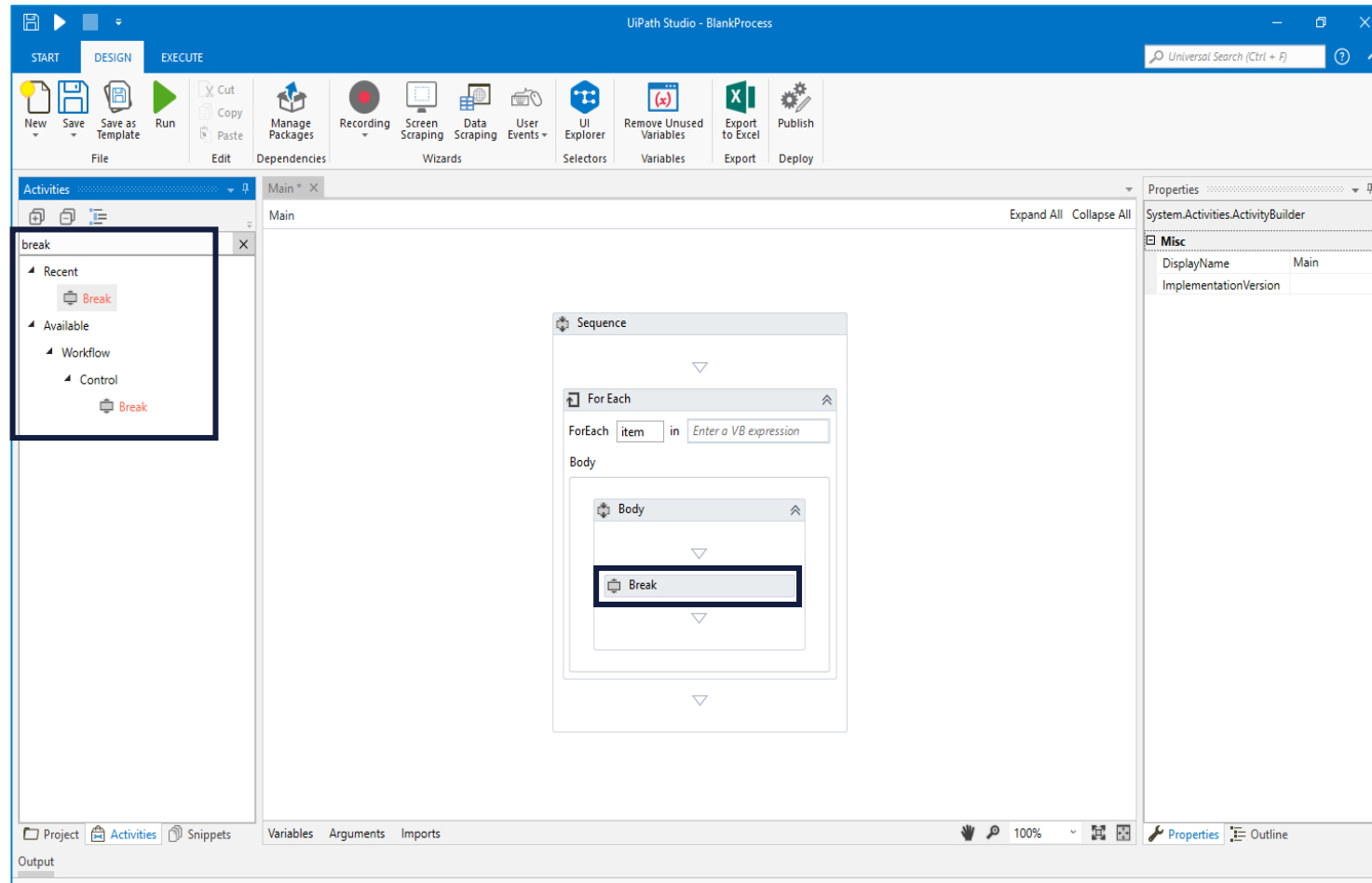
Sequence

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.
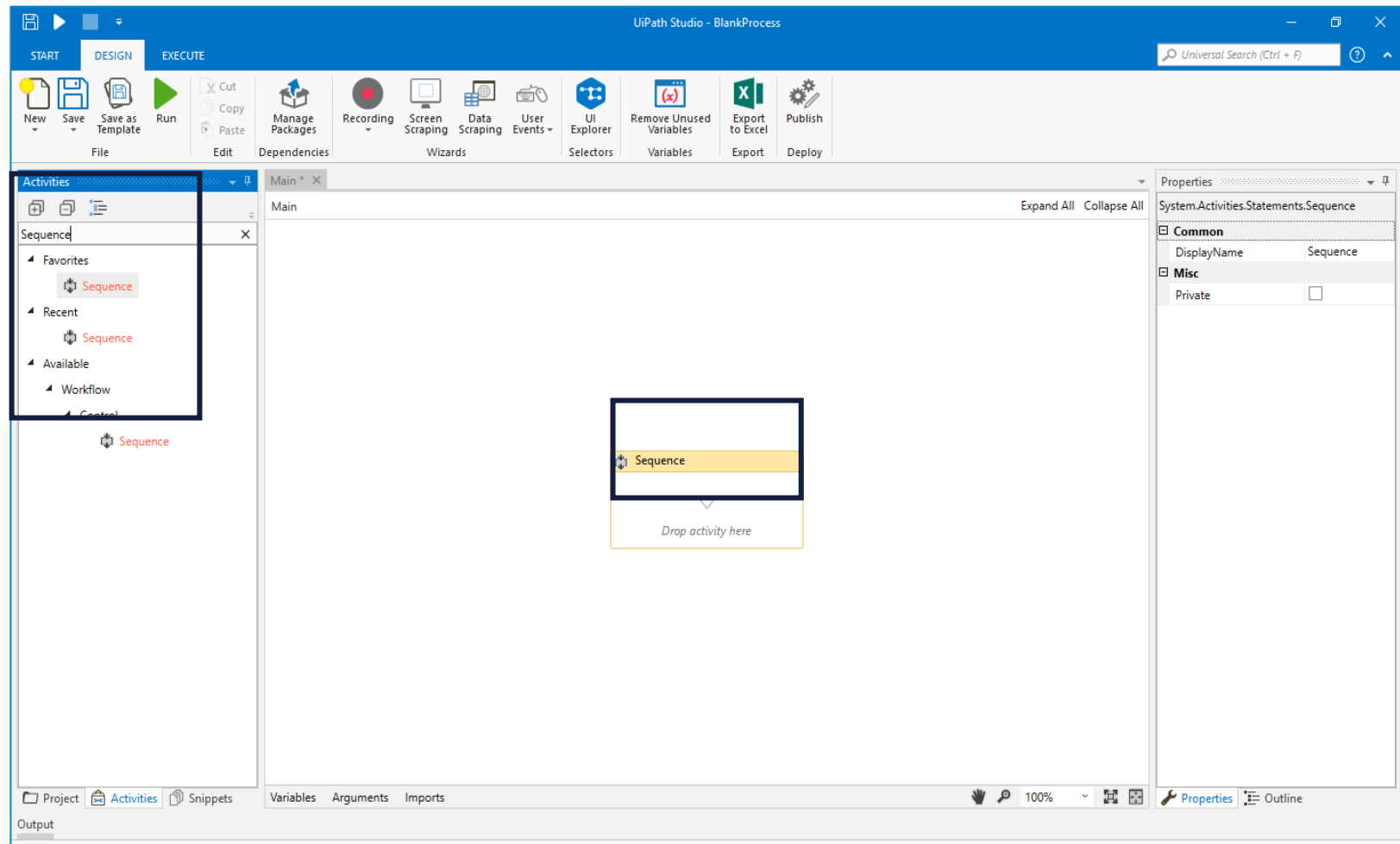
Flowchart

The Flowchart represents various steps involved in completing activities, task, and process.
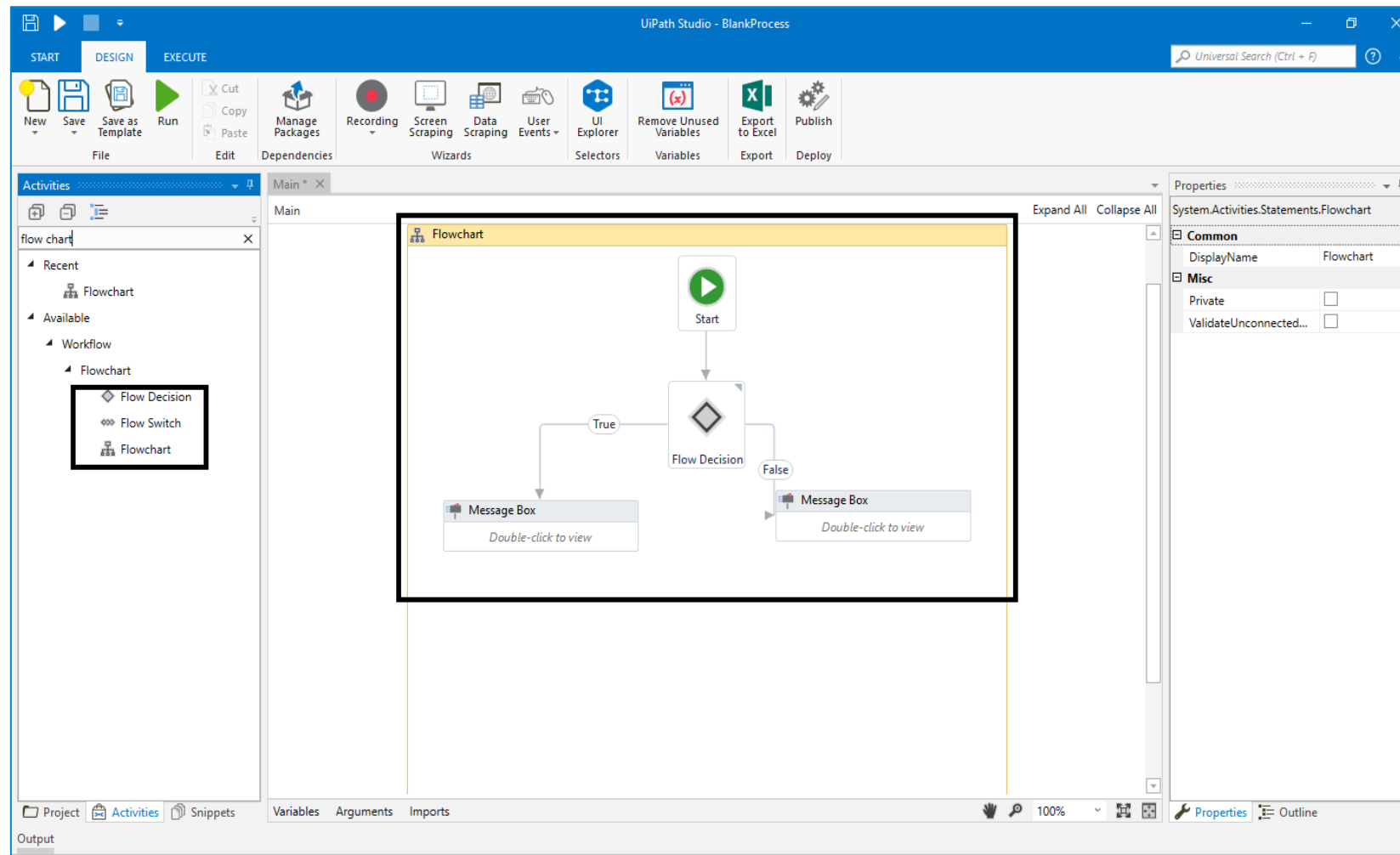
Exercise…
Create a list of songs of an artist from YouTube

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

Flowchart

Start

Invoke GetUserArtist workf
Double-click to view

Invoke SearchYoutube worl
Double-click to view

Invoke ExtractArtistSongs v
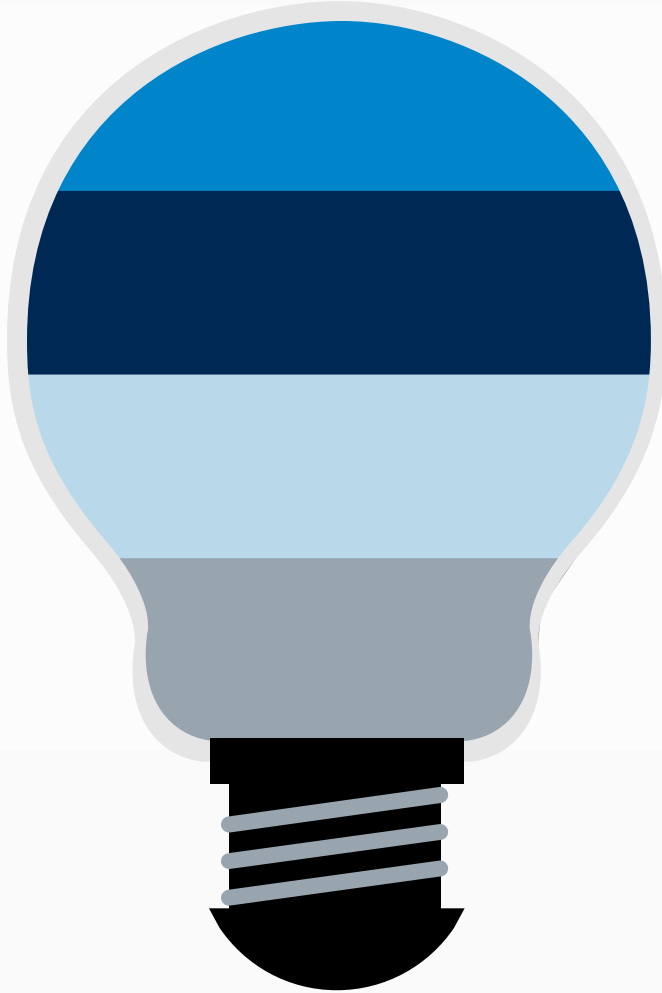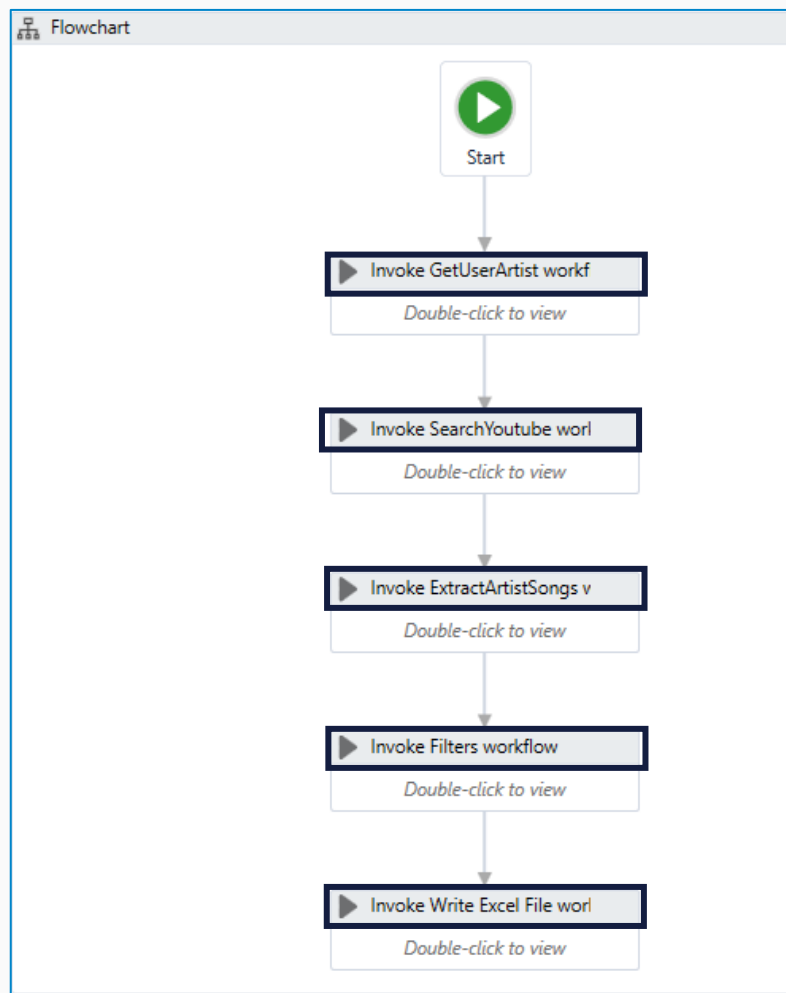*Double-click to view*

Invoke Filters workflow
Double-click to view

Invoke Write Excel File worl
Double-click to view

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

GetUserArtist

Input Dialog ⌃

"Artist Search"

"Please type in your artist:"
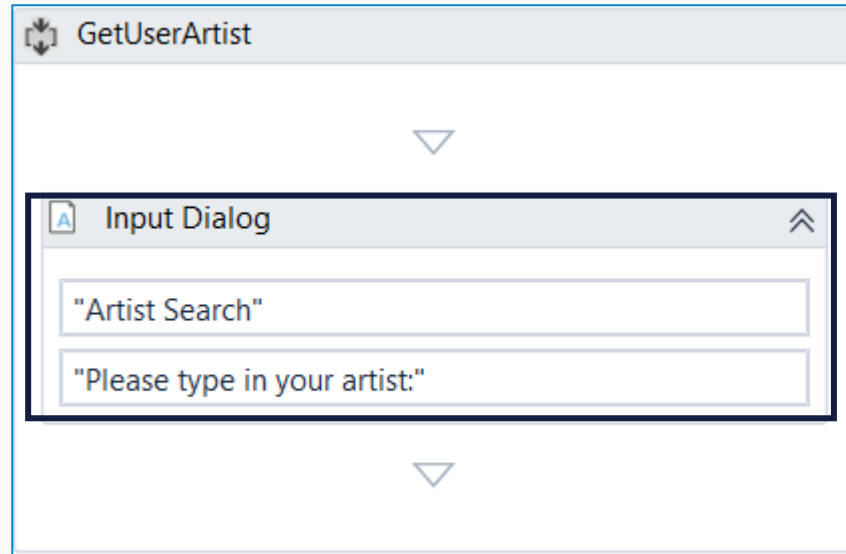
Purpose: Get the artist name and store it as an argument

Activities:

Input Dialog to ask the user for the artist name

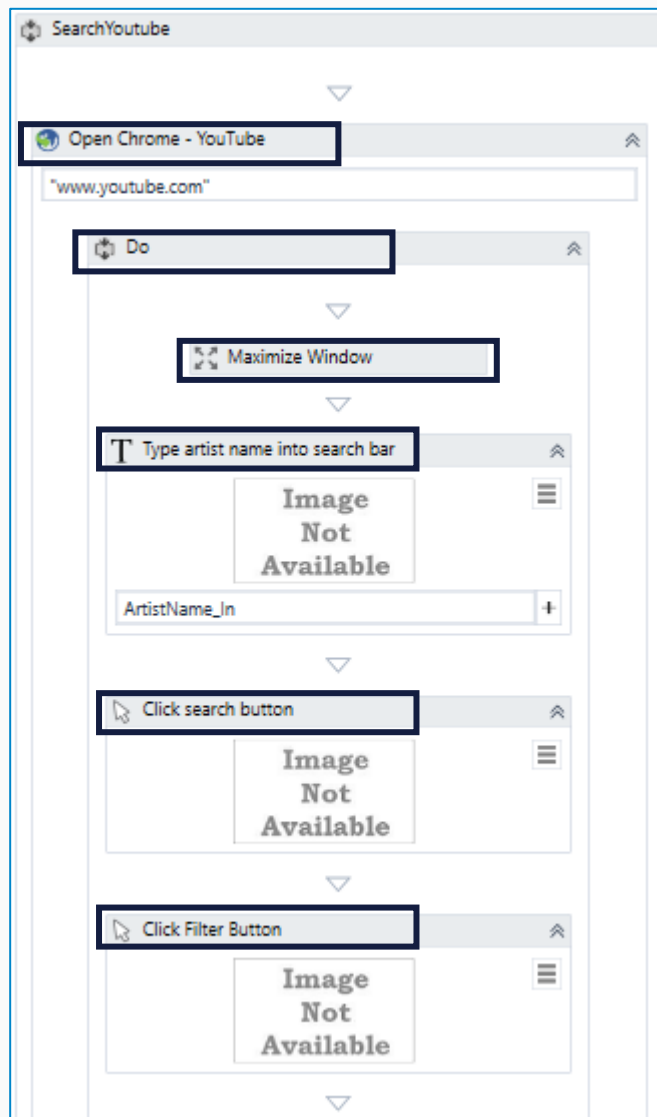**Variables/Arguments:**

Argument: ArtistName (type: string, direction out)

Step 2: SearchYouTube Workflow (part 1)

SearchYoutube

Open Chrome - YouTube

"www.youtube.com"

Do

Maximize Window

Type artist name into search bar

Image Not Available

ArtistName_In

Click search button

Image Not Available

Click Filter Button

Image Not Available

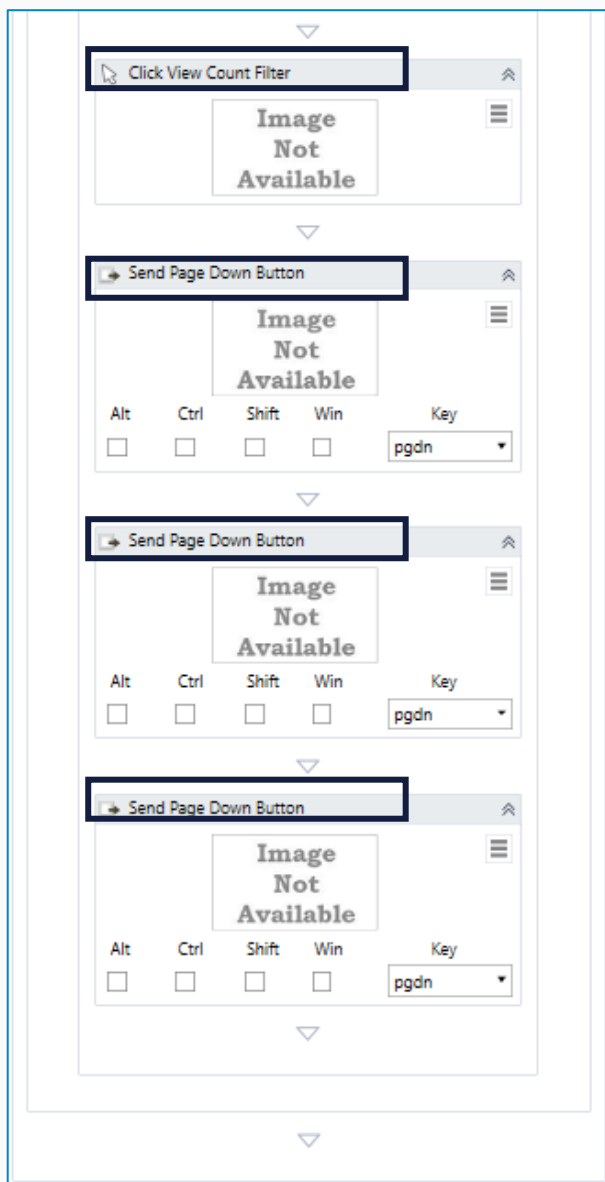**Purpose**: Open YouTube with Chrome browser, search for the artist, sort the results by view count

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)

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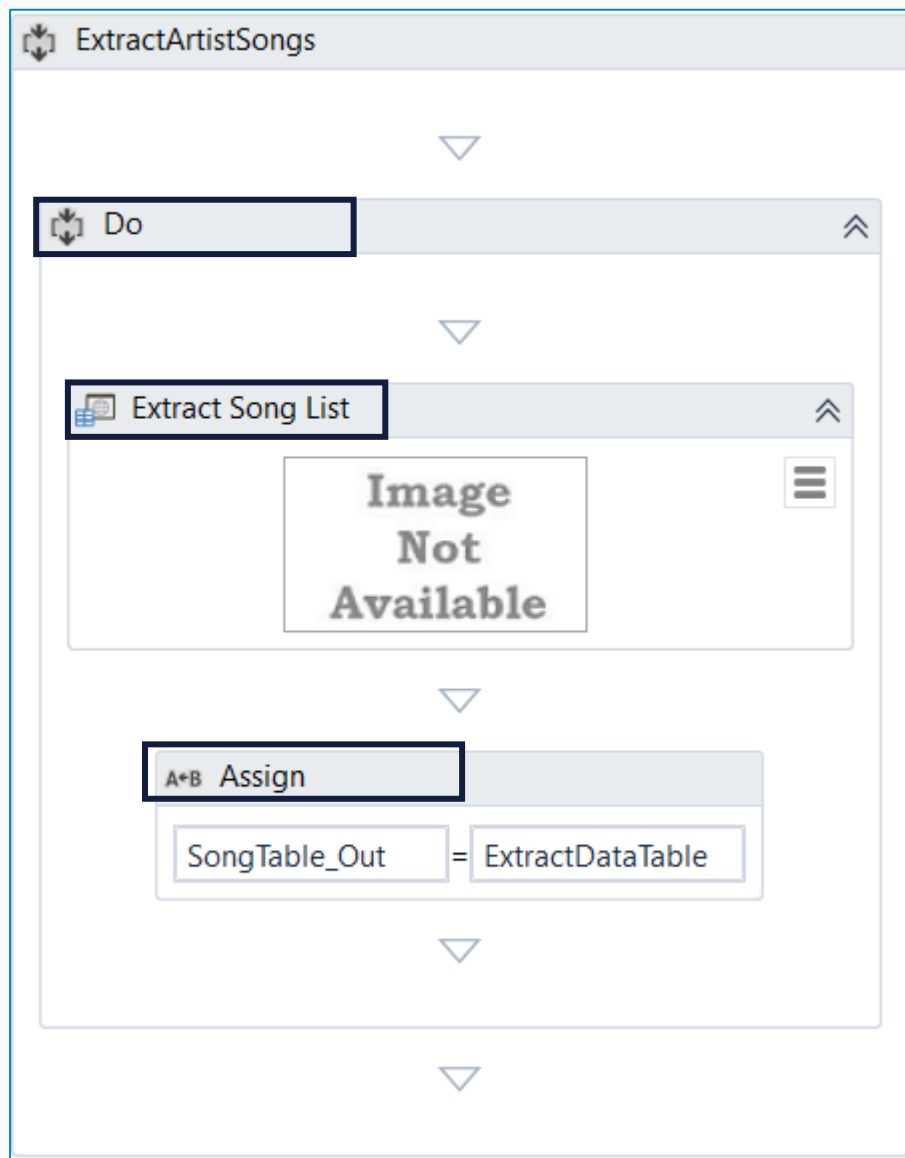
Activities:

1. **Click** View Count

Variables/Arguments: -

No variables and arguments are needed.

Step 3: **ExtractArtistSongs** Workflow

ExtractArtistSongs

Do

Extract Song List

Image Not Available

Assign

SongTable_Out = ExtractDataTable

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

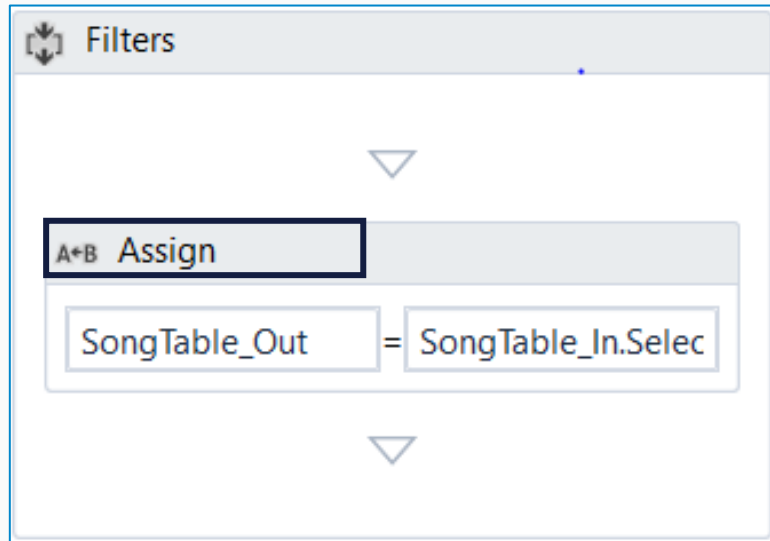3. **Assign** the info extracted to an argument

Variables/Arguments:

Variable: Song table (type: DataTable)

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

Step 4: **Filters** Workflow

Filters

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
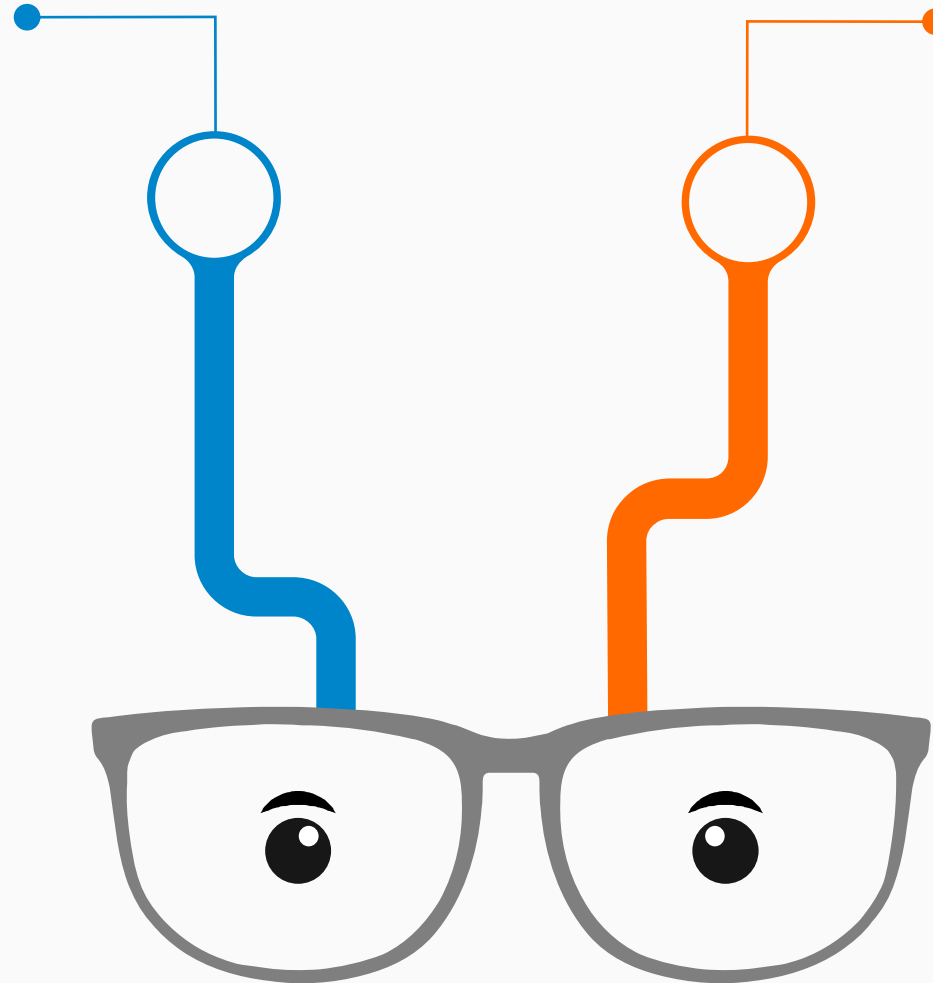
Variables/Arguments:

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

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

Takeaways
Control Flow & Universal Statements

UiPath™

Control Flow is the order in which individual statements, instructions or function calls are executed or evaluated in a software project.
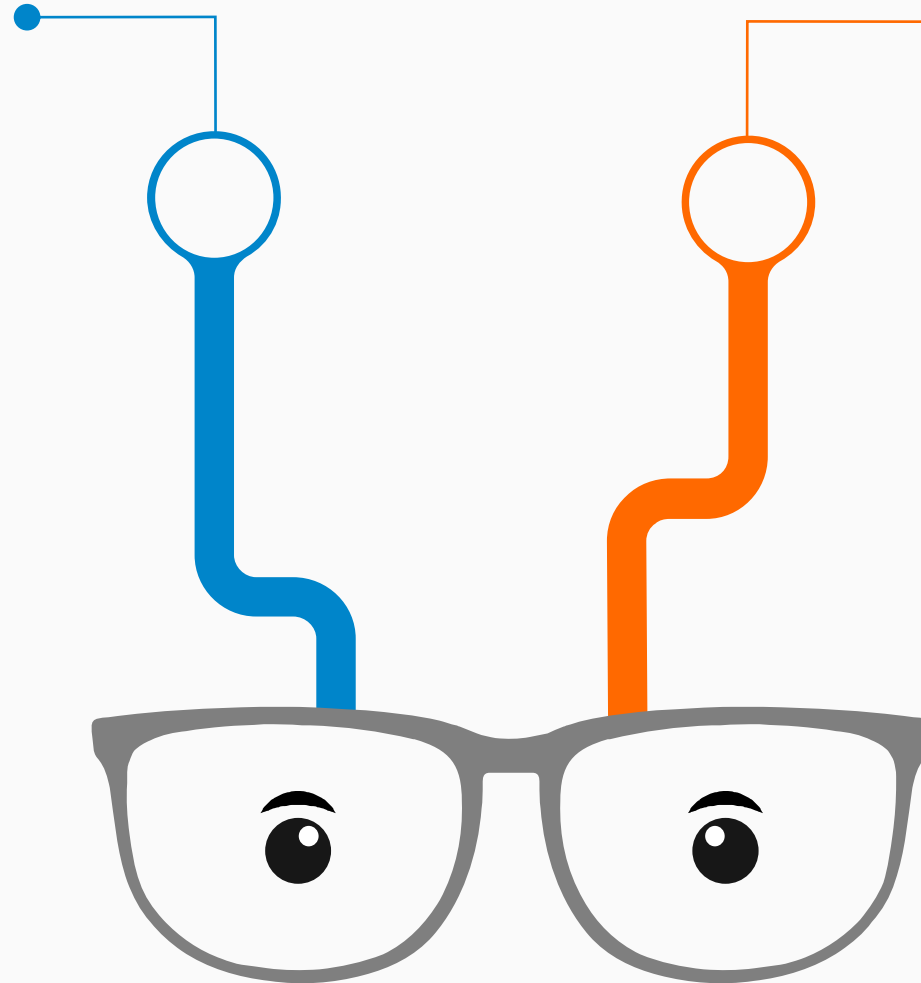
There are four basic control statements:
- If
- Switch
- Loop
- Break

Takeaways
Control Flow Statements in UiPath

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

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

Which activity can be used to process every item in a collection individually?

a) Do while

b) If

c) For each

Next Steps

Data Manipulation