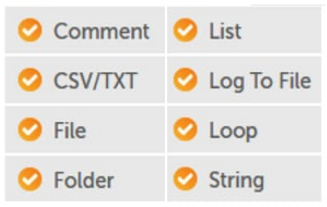
Lab 9: Working with Conditional Logic, Loops, and the Filesystem

In this lab, we will cover the following topics:

- Applying different types of loops
- Applying logical conditions
- Working with the filesystem

Like the previous lab, this lab will also take the form a building a bot, but in this case, you will be building two bots. Both will be by taking you through a walk-through. This will be a bit intensive, but you will gain some valuable experience in terms of how to implement a number of useful actions. This method also puts these actions into context as they are all working toward a complete task. We will use the following packages:



✓ Comment	✓ List
✓ CSV/TXT	✓ Log To File
✓ File	✓ Loop
✓ Folder	✓ String

For this lab, the two bots we'll be building will be automating a human process. The first process involves reading each record in a CSV file and then sorting these records into a file management subfolder system. The second bot will collate files from subfolders, and then rename and delete files and folders. Progressing through the walk-throughs will enable you to build your confidence and understanding of loops, condition statements, and working with the filesystem. By the end of this lab, you will be able to add rule-based decisions for your bot, manage files and folders, and build repeating processes by using loops.

Technical requirements

You will need the following in order to install Automation Anywhere Bot agent:

- Google Chrome
- Completed registration with Automation Anywhere Community Edition
- Logged on successfully to Automation Anywhere Community Edition
- A successfully registered local device
- Successfully downloaded the sample data from GitHub

Applying different types of loops

The majority of business applications work with data in some capacity or another. The obvious ones are applications that have a database in the backend. This could include sales ledgers, customer details, and product data. This data can be large in volume. Developers often design routines to process large datasets. This involves processing each individual record from these datasets. To build this sort of functionality, we use loops.

Being able to build loops is probably a function that's included with all development platforms. Looping is basically having the ability to repeat an action or actions. Loops can be applied in a number of ways; the number of times a process is repeated can be fixed, based on a variable or a number of other conditions. There are many scenarios where loops are deployed, some of which are as follows:

- For every email in a particular folder of a mailbox

- For every row in a table
- For every file in a folder
- For each row in a CSV/TXT file
- For each row in an Excel worksheet
- Condition-based; that is, loop until a file is created/updated

We have already built bots that loop through CSV files and lists. This will be explored further when you are introduced to the `Record` variable type. This is a useful variable type for storing all the fields for a single record. Our walk-through will involve looping through the records of a CSV file and also looping through a list. The bot we'll build will be automating a manual process that involves extracting each record from a daily CSV file and filing it as an alphabetically grouped file.

In the upcoming walk-through, we will be automating the following manual task:

1. The operator receives a daily `.csv` customer file.
2. Each record from the customer file needs to be appended to a corresponding file.
3. The corresponding file is located in an alphabetically grouped naming system.
4. The groups are made up of the following subfolders: `ABCD`, `EFGH`, `IJKL`, `MNOP`, `QRST`, `UVWX`, and `YZ`.
5. Use the surname initial to identify which subfolder relates to the record.
6. Check if the subfolder exists -- create it if it doesn't.
7. Check if a corresponding file exists and if not, create a file with headers.
8. Append the customer details to this file.
9. Move to the next record in the file until all the records have been processed.

We will break this walk-through into six sections to make it easier to follow:

- Section 1 -- Opening the source file
- Section 2 -- Looping through each row
- Section 3 -- Getting the surname initial and identifying the group
- Section 4 -- Checking or creating a subfolder

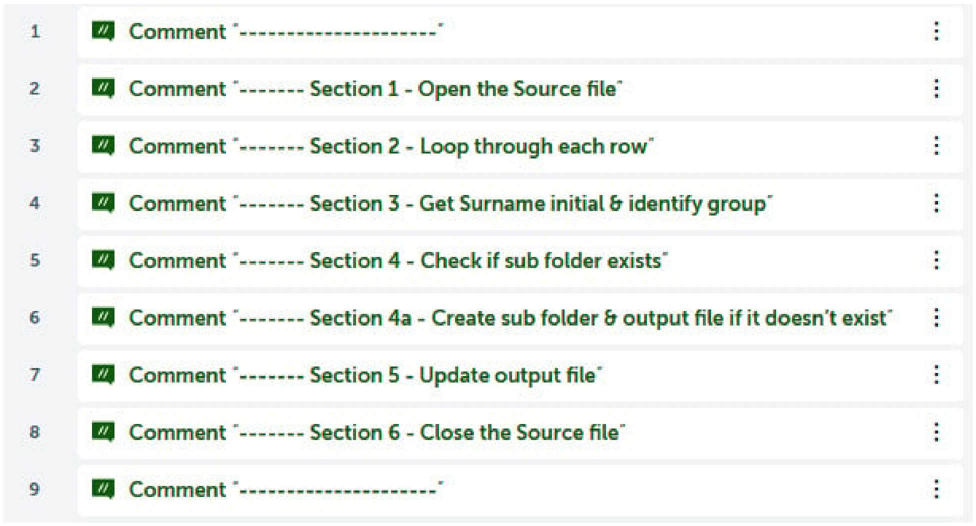
  Section 4a -- Creating a subfolder and output file if it doesn't exist
- Section 5 -- Updating the output file
- Section 6 -- Closing the the source file

As always, we will start by adding some comments to guide us. We will begin with just the basic skeleton and add further levels of detail as we progress.

Let's start this walk-through by executing the following steps:

1. Log into **Control Room**.
2. Create a new bot and call it `Lab 9 - Loops & Conditions`. Place it in the `\Bot\` folder.
3. As always, we'll begin by adding some comments to use as templates for our bot. Add a new **Comment** action called `"---------------------"` on line **1** and click on **Save**.
4. Add a new **Comment** action called `"-------- Section 1 - Open the Source file"` on line **2** and click on **Save**.
5. Add a new **Comment** action called `"------- Section 2 - Loop through each row"` on line `3` and click on `Save`.
6. Add a new **Comment** action called `"------- Section 3 - Get Surname initial & identify group"` on line **4** and click on **Save**.

7. Add a new **Comment** action called `"------- Section 4 - Check if sub folder exists"` on line **5** and click on **Save**.
8. Add a new **Comment** action called `"------- Section 4a - Create sub folder & output file if it doesn't exist"` on line **6** and click on **Save**.
9. Add a new **Comment** action called `"------- Section 5 - Update output file"` on line **7** and click on **Save**.
10. Add a new **Comment** action called `"------- Section 6 - Close the Source file"` on line **8** and click on **Save**.
11. Add a new **Comment** action called `"----------------------"` on line **9** and click on **Save**. Our initial development interface should look like this:



1 Comment "--------------------"
2 Comment "------- Section 1 - Open the Source file"
3 Comment "------- Section 2 - Loop through each row"
4 Comment "------- Section 3 - Get Surname initial & identify group"
5 Comment "------- Section 4 - Check if sub folder exists"
6 Comment "------- Section 4a - Create sub folder & output file if it doesn't exist"
7 Comment "------- Section 5 - Update output file"
8 Comment "------- Section 6 - Close the Source file"
9 Comment "--------------------"

We are now ready to start on our six sections. We will start with *Section 1 -- Opening the source file*. This file is available in this course's GitHub repository.

Section 1 -- Opening the source file

To instruct your bot to open the `Chapter09_InputData.csv` source file, please execute the following steps:

1. Drag the **CSV/TXT: Open** action just below line **2**.

2. Set the following properties for the **CSV/TXT: Open** action on line **3**:

   Session name: `Data`

   File path: **Desktop file** -- `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_InputData.csv`

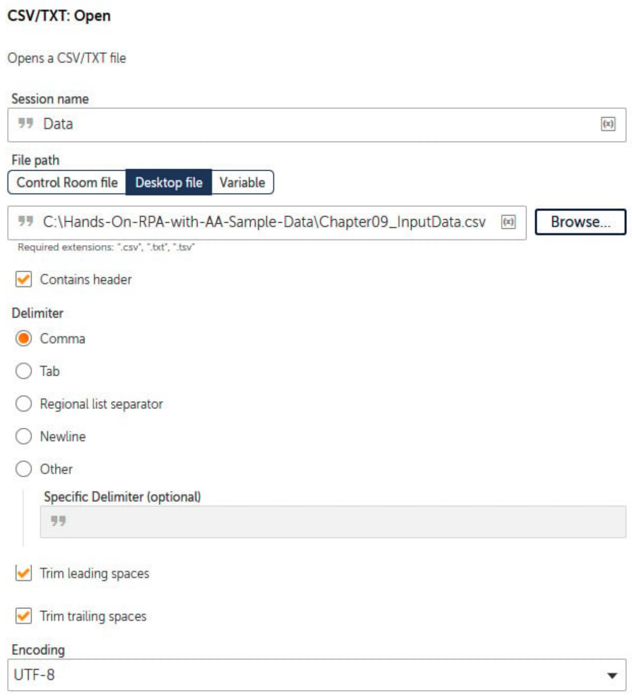
   Contains header: *Checked*

   Delimiter: **Comma**

   Trim leading spaces: *Checked*

   Trim trailing spaces: *Checked*

   The properties window should look like this:


CSV/TXT: Open

Opens a CSV/TXT file

Session name: Data

File path: Control Room file | [✓ Desktop file] | Variable

C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_InputData.csv

Required extensions: ".csv", ".txt", ".tsv"

[✓] Contains header

Delimiter: [✓ Comma] Tab | Regional list separator | Newline | Other

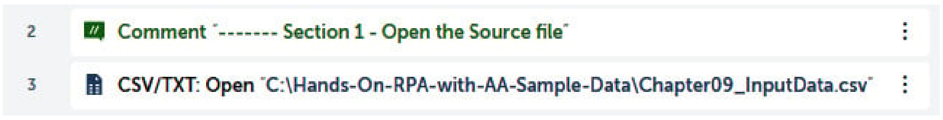
Specific Delimiter (optional):

[✓] Trim leading spaces

[✓] Trim trailing spaces

Encoding: UTF-8

3. Click on **Save**. The development window for this section should look like this:

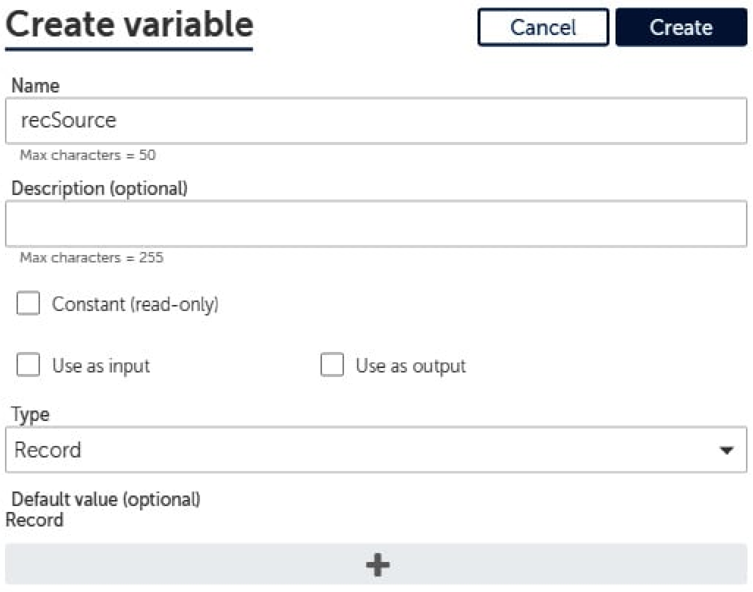

```
2  Comment "------- Section 1 - Open the Source file"
3  CSV/TXT: Open "C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_InputData.csv"
```

With that, we have instructed our bot to open the source file. Next, we will create a **Loop**. This loop will go through the whole file, processing each record. When opening a file, it creates a session, which is like a connection. This is set as `Data`. We need to remember this because when we create the loop, we will need to specify the session. This way, the bot will know what source it needs to iterate from. There may be scenarios where multiple sources are open at the same time; having a unique session name for each individual source stops any sources getting mixed up.

Section 2 -- Looping through each row

As we will be looping through each record, we will use the `Record` variable type to store the working record. Follow these steps to create the variable and the loop:

1. Create a new variable named `recSource` as a `Record` type. The **Create variable** dialog should look like this:


Create variable

Cancel Create

Name: recSource

Max characters = 50

Description (optional):

Max characters = 255

☐ Constant (read-only)

☐ Use as input ☐ Use as output

Type: Record

Default value (optional)
Record

2. Drag the **Loop** action just below line **4**.
3. Set the following properties for the **Loop** action on line **5**:

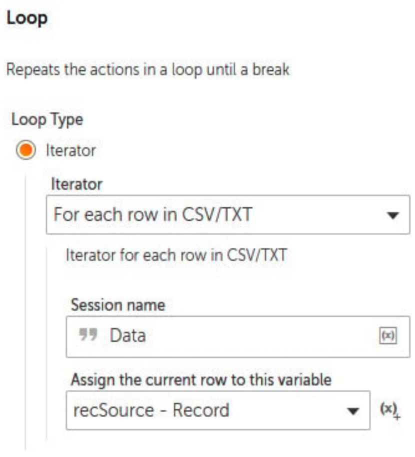
   Loop Type: **Iterator**

   Iterator: **For each row in CSV/TXT**

   Session name: `Data`

   Assign the current row to this variable: **recSource - Record**

   The properties window should look like this:


Loop

Repeats the actions in a loop until a break

Loop Type: ● Iterator

Iterator: For each row in CSV/TXT

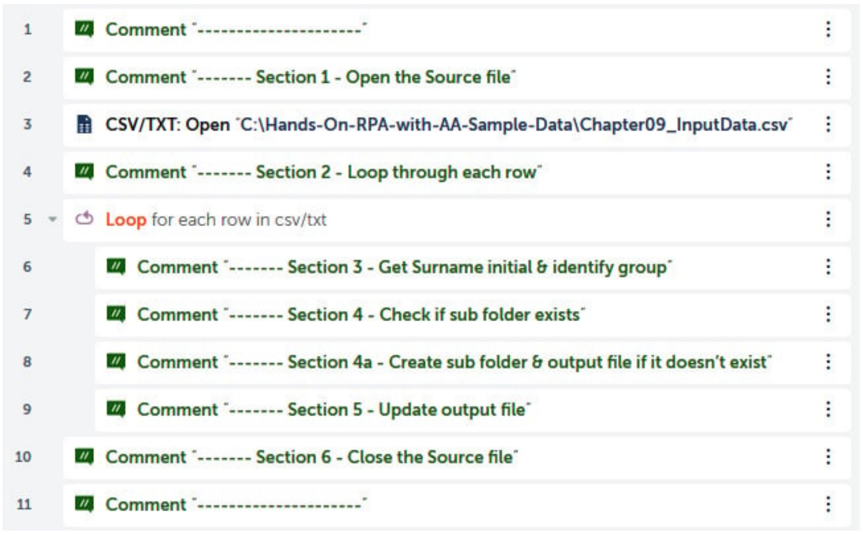
Iterator for each row in CSV/TXT

Session name: Data

Assign the current row to this variable: recSource - Record

4. Click on **Save**.
5. The steps *3* to *5* will be performed with the loop. Move the comments by dragging and dropping lines **6** to **9** so that they are within the **Loop** element on line **5**. We're doing this so the bot knows which actions are to be repeated.

6. Click on **Save**. The completed development window should look like this:



```
1   Comment "--------------------"
2   Comment "------- Section 1 - Open the Source file"
3   CSV/TXT: Open "C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_InputData.csv"
4   Comment "------- Section 2 - Loop through each row"
5   Loop for each row in csv/txt
6       Comment "------- Section 3 - Get Surname initial & identify group"
7       Comment "------- Section 4 - Check if sub folder exists"
8       Comment "------- Section 4a - Create sub folder & output file if it doesn't exist"
9       Comment "------- Section 5 - Update output file"
10  Comment "------- Section 6 - Close the Source file"
11  Comment "--------------------"
```

That completes *Section 2 -- Looping through each row*! You seem to be whizzing through this. So far, our bot will connect to the source file and loop through each record, assigning it to our `recSource` variable. Once it has gone through the whole file, it will close it. Next, we have to get the surname initial and identify which group the record belongs to. For example, the surname for the first record is `BOWMAN`. By taking the initial of `B`, we need to identify the subfolder group. The `ABCD` subfolder group contains the initial `B`. This identification process needs to be done for each record.

Section 3 -- Getting the surname initial and identifying the group

To identify the subfolder group, we need the surname initial. When data is assigned to a `Record` type variable, fields can be accessed via the index number. The index is 0-based, so the first field is index `0` and so forth. From looking at the source file at `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_InputData.csv`, we can see that the surname is the second field. This would give it an index of `1`. For this section, we will need a variable to store the surname initial. As it's the reference value that will be used to identify the subfolder group, let's call this `strRefInitial`. Let's get started:

1. Create a `String` type variable named `strRefInitial`.
2. We know the surname is the second field, so it will be indexed at `1`. Drag the **String: Substring** action just below line **6**, ensuring it is within the **Loop** element on line **5**.
3. Set the following properties for the **String: Substring** action on line **7**:

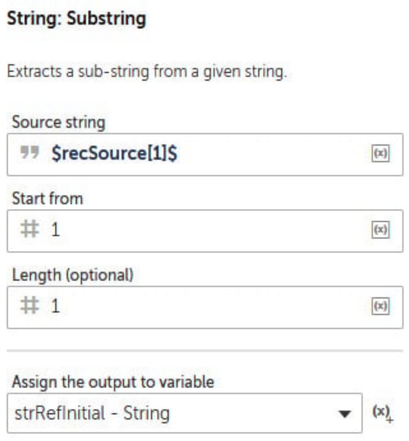
   Source String name: `$recSource[1]$`

   Start from: `1`

   Length: `1`

   Assign the output to variable: **strRefInitial - String**

   The properties window should look like this:


String: Substring

Extracts a sub-string from a given string.

Source string: $recSource[1]$

Start from: 1

Length (optional): 1

Assign the output to variable: strRefInitial - String

4. Click on **Save**.

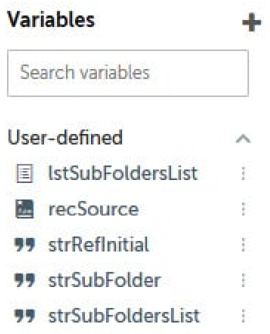
We now have our surname initial. Next, we need to identify which subfolder group this initial belongs to. There are seven sub folders: `ABCD` , `EFGH` , `IJKL` , `MNOP` , `QRST` , `UVWX` , and `YZ` . Our bot needs to make a decision here. Since this is a rule-based decision, it's ideal for RPA. We will now look at how to apply conditions in order to make statements using Automation Anywhere . These conditions will be used to decide which subfolder group the surname initial belongs to.

Applying logical conditions

Let's continue with our walk-through and add our condition:

1. Create a `String` type variable named `strSubFoldersList` for storing our subfolders.
2. Create a `List` type variable, set as a `String` subtype named `lstSubFoldersList` , for looping through our subfolders.
3. Create a `String` type variable named `strSubFolder` for storing the allocated subfolder.

   The variables list should look like this:


Variables

Search variables

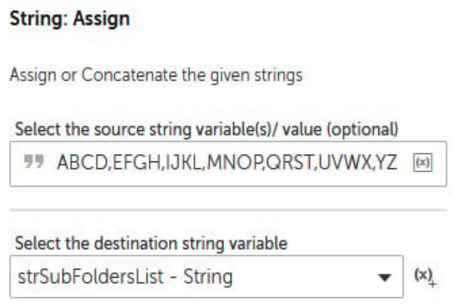
User-defined
- lstSubFoldersList
- recSource
- strRefInitial
- strSubFolder
- strSubFoldersList

4. To assign our subfolder groups to the `strSubFoldersList` variable, drag the **String: Assign** action just below line **7**, ensuring it is within the **Loop** element on line **5**.
5. Set the following properties for the **String: Assign** action on line **8**:

Select the source string variable/value: `ABCD,EFGH,IJKL,MNOP,QRST,UVWX,YZ`

Select the destination string variable: **strSubFoldersList - String**

The properties window should look like this:



String: Assign

Assign or Concatenate the given strings

Select the source string variable(s)/ value (optional): ABCD,EFGH,IJKL,MNOP,QRST,UVWX,YZ

Select the destination string variable: strSubFoldersList - String

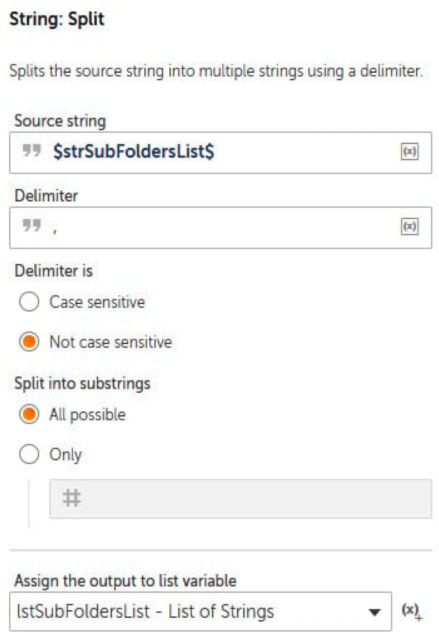
6. Click on **Save**.
7. Next, we need to split this variable into our `List` variable so that we can loop through it. Drag the **String: Split** action just below line **8**, ensuring it is within the **Loop** element on line **5**.
8. Set the following properties for the **String: Assign** action on line **9**:

   Source string: `$strSubFoldersList$`

   Delimiter: `,`

   Assign the output to list variable: **lstSubFoldersList - List of Strings**

   The properties window should look like this:



String: Split

Splits the source string into multiple strings using a delimiter.

Source string: $strSubFoldersList$

Delimiter: ,

Delimiter is: Case sensitive [✓ Not case sensitive]

Split into substrings: [✓ All possible] Only

Assign the output to list variable: lstSubFoldersList - List of Strings

9. Click on **Save**.

10. We now have a list of our seven subfolder groups and have our surname initial. Next, we will create a loop that will iterate through the list of subfolder groups. Add the **Loop** action just below line **9**, ensuring it is within the **Loop** element on line **5**.

11. Set the following properties for the **Loop** action on line **10**:

    Loop Type: **Iterator**

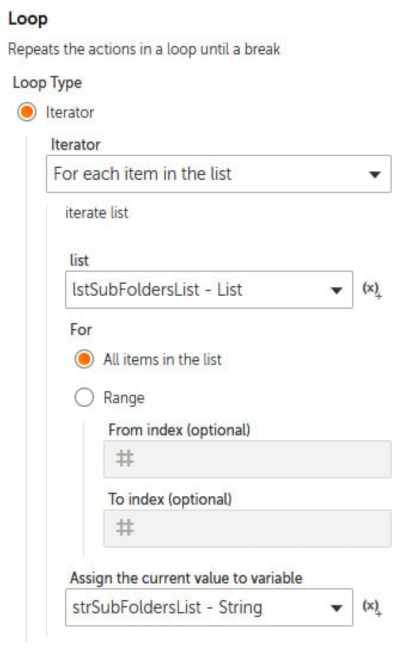
    Iterator: **For each item in the list**

    List: **lstSubFoldersList - List**

    For: **All items in the list**

    Assign the current value to variable: **strSubFoldersList - String**

    The properties window should look like this:



Loop
Repeats the actions in a loop until a break
Loop Type
Iterator [✓]
Iterator
For each item in the list
iterate list
list
lstSubFoldersList - List
For
All items in the list [✓]
Range
From index (optional)
To index (optional)
Assign the current value to variable
strSubFoldersList - String

12. Click on **Save**.

13. Next, we will add a condition statement that checks whether our surname initial is contained in the current subfolder group. Drag the **If** action just below line **10**, ensuring it is within the **Loop** element on line **10**.

14. Set the following properties for the **If** action on line **11**:

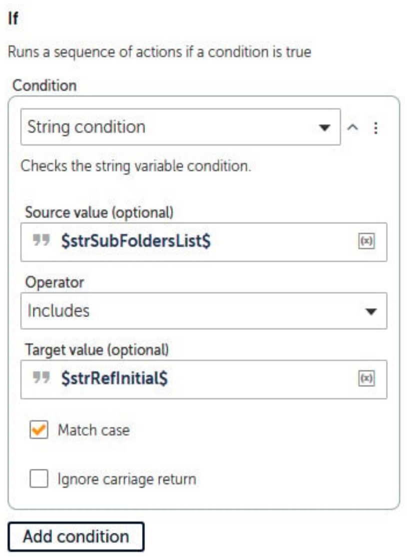
    Condition: **String condition**

    Source value: `strSubFoldersList`

    Operator: **Includes**

    Target value: `$strRefInitial$`

    The properties window should look like this:


If

Runs a sequence of actions if a condition is true

Condition

String condition

Checks the string variable condition.

Source value (optional): $strSubFoldersList$

Operator: Includes

Target value (optional): $strRefInitial$

[✓] Match case

[ ] Ignore carriage return

15. Click on **Save**.

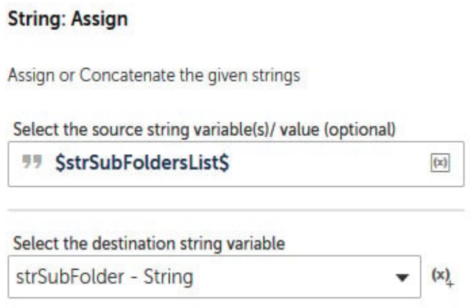
16. We can assign the allocated subfolder group to our variable if this condition is met. Drag the **String: Assign** action just below line **11**, ensuring it is within the **If** statement on line **11**.

17. Set the following properties for the **String: Assign** action on line **12**:

    Select the source string variable(s)/value (optional): `$strSubFoldersList$`

    Select the destination string variable: **strSubFolder - String**

    The properties window should look like this:


String: Assign

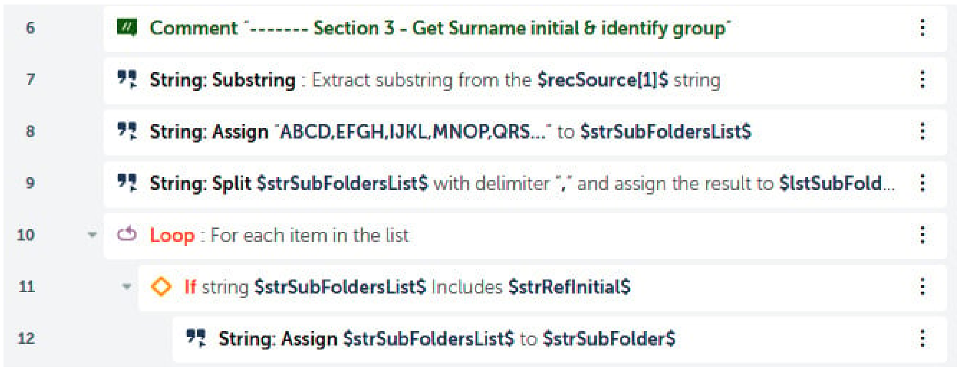
Assign or Concatenate the given strings

Select the source string variable(s)/ value (optional): $strSubFoldersList$

Select the destination string variable: strSubFolder - String

18. Click on **Save**.

The bot is at a stage now where it has identified the subfolder group for the working record using the surname initial. This brings *Section 3 -- Getting the surname initial and identifying the group*, to an end. The development interface for this section should look like this:


6 Comment "------- Section 3 - Get Surname initial & identify group"
7 String: Substring : Extract substring from the $recSource[1]$ string
8 String: Assign "ABCD,EFGH,IJKL,MNOP,QRS..." to $strSubFoldersList$
9 String: Split $strSubFoldersList$ with delimiter "," and assign the result to $lstSubFold...
10 Loop : For each item in the list
11 If string $strSubFoldersList$ Includes $strRefInitial$
12 String: Assign $strSubFoldersList$ to $strSubFolder$

Our next task is to append our working record to an output file. This output file is within the subfolder that has been identified. This output folder and file may not exist, so the bot should create the file/folder in this case. The name of the file should be `Output.csv`.

Section 4 -- Checking or creating a subfolder

The output subfolders should be created in the `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\` folder path if they don't exist. Currently, this folder is empty; a subfolder will need to be created whenever a customer record is added to the subfolder group. Let's get started:

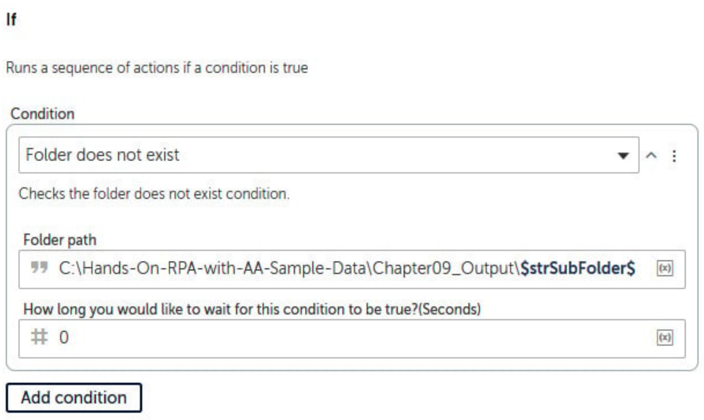
1. We know that the output subfolder has been assigned to the `strSubFolder` variable, so we need to check that it exists. Drag the **If** action just below line **13**, ensuring it is within the **Loop** element on line 5.

2. Set the following properties for the **If** action on line **14**:

   Condition: **Folder does not exist**

   Folder path: `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$`

   The properties window should look like this:


If
Runs a sequence of actions if a condition is true
Condition
Folder does not exist
Checks the folder does not exist condition.
Folder path
C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$
How long you would like to wait for this condition to be true?(Seconds)
0

3. Click on **Save**.

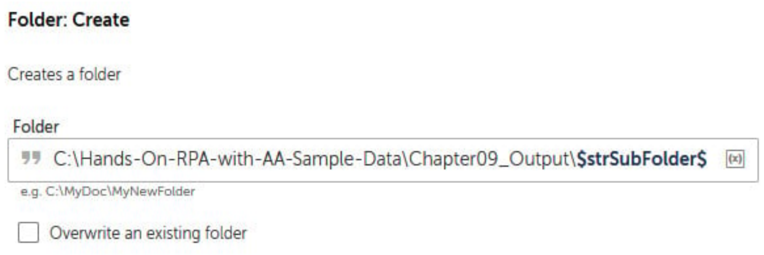
All the actions within the **If** action on line **14** will only be performed if the output folder doesn't exist. The bot will need to create this folder and the output file containing headers only. We'll look at creating this in the next section.

Section 4a -- Creating a subfolder and output file

Before we create the folder and file, it would make sense to move the **Comment** on line **15** so that it's within the **If** action on line **14**. This will make the bot more readable and logically accurate. The output file we're creating should be identical to the source file in terms of structure. This field structure is `Ref,Surname,FirstName,Amount`.

Let's continue with the walk-through and move the **Comment** before creating the output subfolder and file:

1. Drag the **Comment** on line **15** so that it's within the **If** action on line **14**. The **Comment** line should remain as line **15**.
2. To create the subfolder, drag the **Folder: Create** action just below line **15**, ensuring it remains within the **If** action on line 14.
3. Set the **Folder** property for the **Folder: Create** action on line **16** to `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$`.
4. The properties window should look like this:



Folder: Create

Creates a folder

Folder

C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\**$strSubFolder$**

e.g. C:\MyDoc\MyNewFolder

☐ Overwrite an existing folder

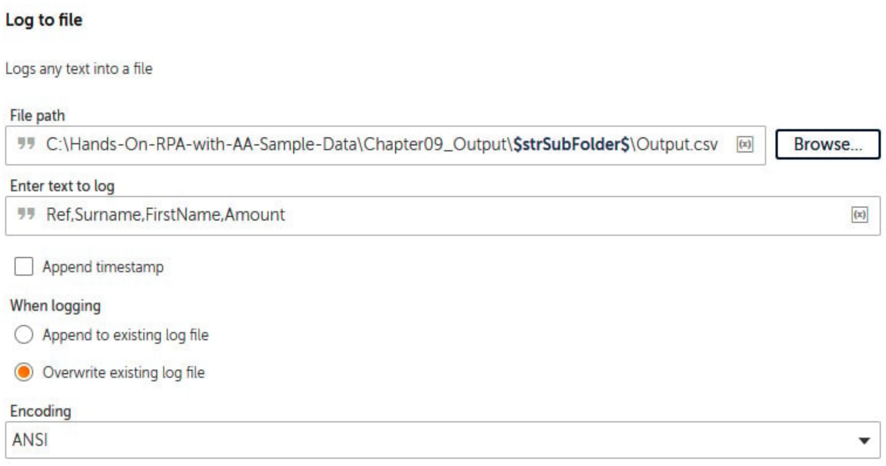
5. Click on **Save**.
6. To create the output file with headers, add the **Log to file** action just below line **16**.
7. Set the following properties for the **Log to file** action on line 17:

   File path: `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$\Output.csv`

   Enter text to log: `Ref,Surname,FirstName,Amount`

   When logging: **Overwrite existing log file**

   The properties window should look like this:


Log to file

Logs any text into a file

File path: C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\**$strSubFolder$**\Output.csv

Enter text to log: Ref,Surname,FirstName,Amount

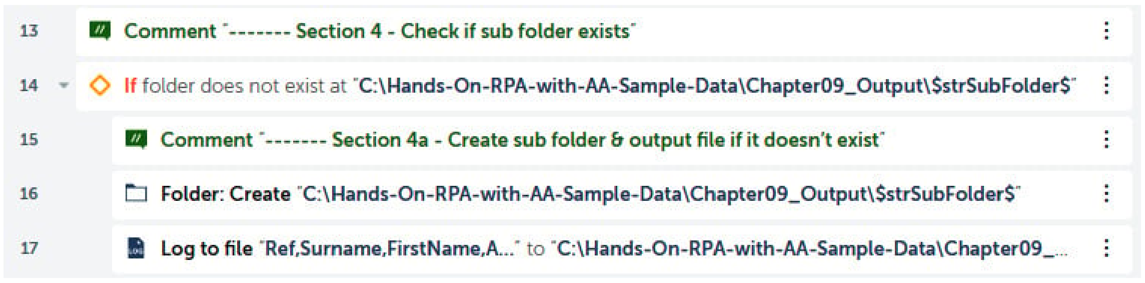
[ ] Append timestamp

When logging
( ) Append to existing log file
(●) Overwrite existing log file

Encoding: ANSI

8. Click on **Save**.

Great work -- that's *Section 4 -- Checking or creating a subfolder*, complete! Our bot will create the necessary subfolder and file if needed. The development window for this section should look like this:


```
13  Comment "------- Section 4 - Check if sub folder exists"
14  If folder does not exist at "C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$"
15      Comment "------- Section 4a - Create sub folder & output file if it doesn't exist"
16      Folder: Create "C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$"
17      Log to file "Ref,Surname,FirstName,A..." to "C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_...
```

In the next section, we will append the working record to our output file. This goes for every record in the source file. At this stage of the process, the output will be present with headers, even if it contains no records.

Section 5 -- Updating the output file

It's time to append our record to the output file. The result will be one file in each subfolder. This file will contain one or more records. Since we have assigned the record to a `Record` type variable, we will use the field index to get the values. We know that there are four fields in each record, so we'll have an index from `0` to `3` (as it's a zero-based index). Let's get started:

1. To append the record to our output file, add the **Log to file** action just below line **18**, ensuring it is within the **Loop** element on line 5.

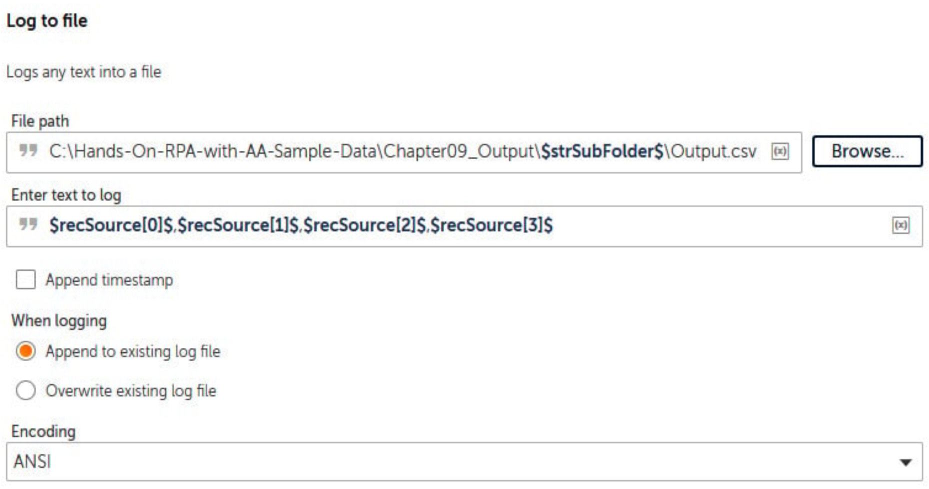
2. Set the following properties for the **Log to file** action on line **19**:

   File path: `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$sSubFolder$\Output.csv`

   Enter text to log: `$recSource[0]$,$recSource[1]$,$recSource[2]$,$recSource[3]$`

   When logging: **Append existing log file**

   The properties window should look like this:



Log to file

Logs any text into a file

File path: C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$\Output.csv

Enter text to log: $recSource[0]$,$recSource[1]$,$recSource[2]$,$recSource[3]$

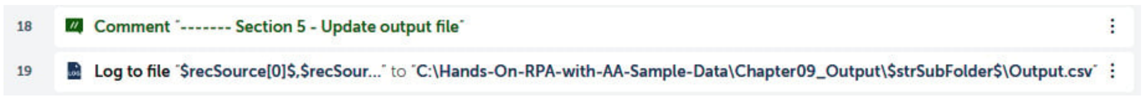
Append timestamp [ ]

When logging: [✓ Append to existing log file] Overwrite existing log file

Encoding: ANSI

3. Click on **Save**.

And that's it -- great work! Our bot is now complete. The development interface for this section should look like this:



```
18  Comment "------- Section 5 - Update output file"
19  Log to file "$recSource[0]$,$recSour..." to "C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$\Output.csv"
```

The bot will now append the customer record to the correct output file in the correct location. In the next section, we will be closing the source file since all the records will have been processed by now.

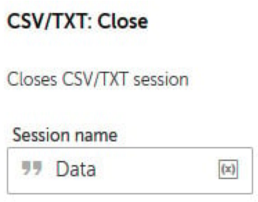
Section 6 -- Closing the source file

Remember when we created the file session in *Section 1 -- Opening the source file*? Well, that session needs to be closed. It is best practice to add the **Close** action at the same time you create a session. Follow these steps to close the session:

1. Add the **CSV/TXT: Close** action just below line **20**.
2. Set the following properties for the **CSV/TXT: Close** action on line **21**:

   Session name: `Data`

   The properties window should look like this:



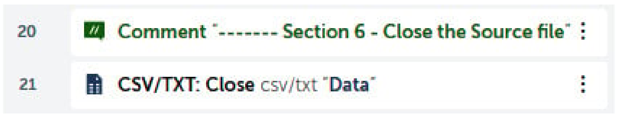
CSV/TXT: Close

Closes CSV/TXT session

Session name: Data

3. Click on **Save**.

And that's it -- great work! Our bot is now complete. The development interface for this section should look like this:



20 Comment "------- Section 6 - Close the Source file"

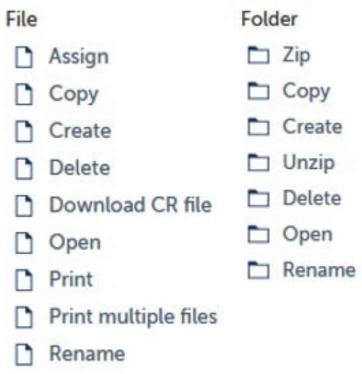
21 CSV/TXT: Close csv/txt "Data"

Go ahead and run the bot to test it. It should create the necessary subfolders. Each subfolder should have an output file. The bot will process each record by appending it to the correct output file.

Here, you have had some good practice creating loops and applying certain condition statements. In the next section, we will explore files and folders further. So far, we have been working on a CSV file at a fixed location. However, there may be cases where you will have to move, rename, copy, and delete files and folders. Due to this, understanding how to work with files and folders is a very useful skill to have.

Working with the filesystem

There may be instances where we must create, delete, move, or rename files and folders. Automation Anywhere has two packages: one for files and one for folders. In the following screenshot, you can see the actions that are available for managing the filesystem in Automation Anywhere:



Our current bot creates seven subfolders, with each folder containing a CSV file called `output.csv`. To get some hands-on experience with files and folders, we are going to automate the following process:

1. Rename every `output.csv` file to its subfolder name.
2. Move the renamed file(s) to `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output`.
3. Delete the empty subfolder(s).

You may have noticed that there isn't a file move action. In order to achieve this, we will perform a copy and delete. We will break this walk-through into five sections to make it easier to follow:

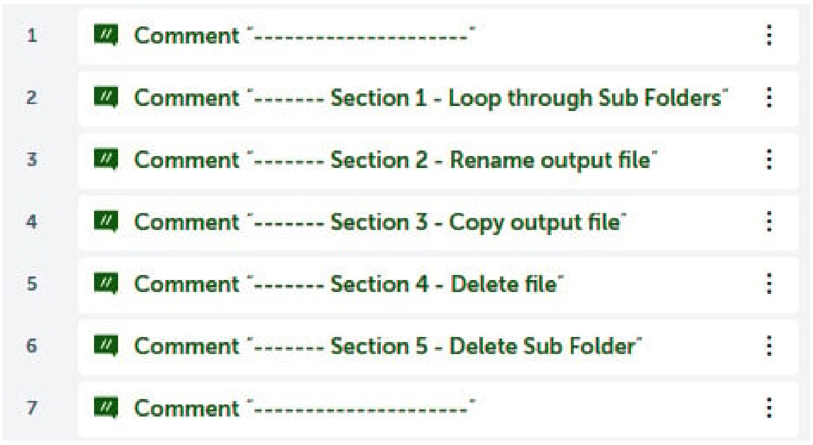
- Section 1 -- Looping through subfolders
- Section 2 -- Renaming the output file
- Section 3 -- Copying the output file
- Section 4 -- Deleting the output file
- Section 5 -- Deleting the subfolder

As always, we will start by adding some comments to guide us. We will begin with just the basic skeleton and add further levels of detail as we progress.

Let's start this walk-through by executing the following steps:

1. Log into the **Control Room** section.

2. Create a new bot and call it `Lab 9 - Files & Folders`. Place it in the `\Bot\` folder.
3. As always, we'll begin by adding some comments that will be used as templates for our bot. Add a new **Comment** action on line **1**, set the value to `"---------------------"`, and click on **Save**.
4. Add a new **Comment** action called `"------- Section 1 - Loop through Sub Folders"` on line **2** and click on **Save**.
5. Add a new **Comment** action called `"------- Section 2 - Rename output file"` on line **3** and click on **Save**.
6. Add a new **Comment** action called `"------ Section 3 - Copy output file"` on line **4** and click on **Save**.
7. Add a new **Comment** action called `"------- Section 4 - Delete file"` on line **5** and click on **Save**.
8. Add a new **Comment** action called `"------- Section 5 - Delete Sub Folder"` on line **6** and click on **Save**.
9. Add a new **Comment** action called `"---------------------"` on line **7** and click on **Save**. Your bot should look like this:



```
Comment "---------------------"
Comment "------- Section 1 - Loop through Sub Folders"
Comment "------- Section 2 - Rename output file"
Comment "------- Section 3 - Copy output file"
Comment "------- Section 4 - Delete file"
Comment "------- Section 5 - Delete Sub Folder"
Comment "---------------------"
```

With that, we can proceed with this walk-through as we know what our bot will be performing. Since this bot works with the files that were generated in the previous walk-through, it is key to build it once the previous bot has been built and tested.

Section 1 -- Looping through subfolders

To loop through all the subfolders that were created, follow these steps:

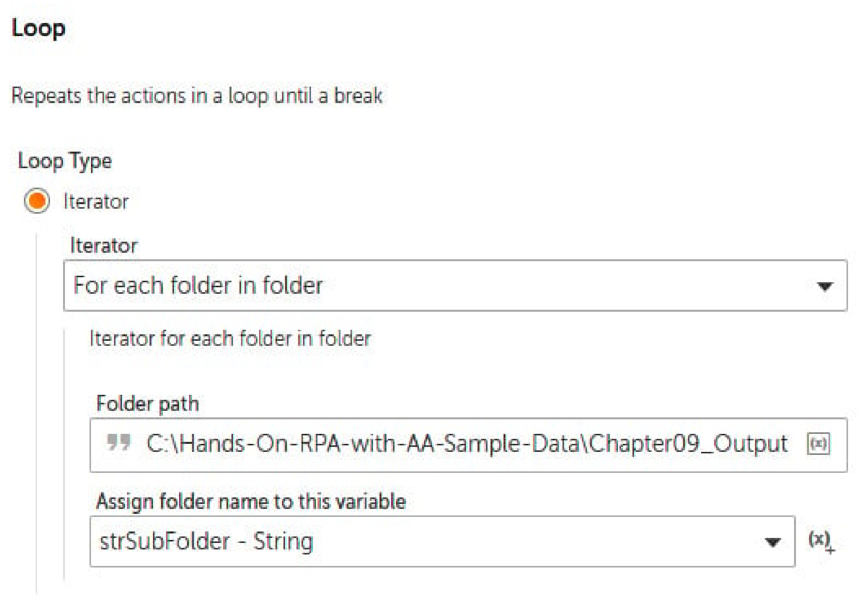
1. We will need a variable to store the subfolder name. For this, create a `String` type variable called `strSubFolder`.
2. To loop through all the subfolders, add the **Loop** action just below line **2**.
3. Set the following properties for the **Loop** action on line **3**:

   Loop Type: **For each folder in folder**

   Folder path: `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output`

   Assign folder name to this variable: **strSubFolder - String**

   The properties window should look like this:


Loop

Repeats the actions in a loop until a break

Loop Type

● Iterator

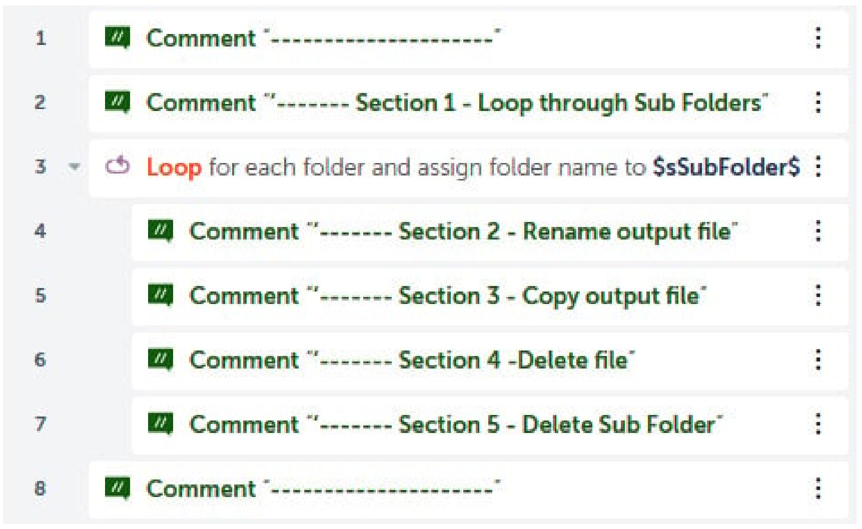
Iterator: For each folder in folder

Iterator for each folder in folder

Folder path: C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output

Assign folder name to this variable: strSubFolder - String

4. Click on **Save**.
5. Since all the other sections will be completed within this **Loop**, drag **Comment** lines **4** to **7** so that they are within the **Loop** element on line **3**. The development interface should look like this:


```
1 Comment "---------------------"
2 Comment "------- Section 1 - Loop through Sub Folders"
3 Loop for each folder and assign folder name to $sSubFolder$
4     Comment "------- Section 2 - Rename output file"
5     Comment "------- Section 3 - Copy output file"
6     Comment "------- Section 4 -Delete file"
7     Comment "------- Section 5 - Delete Sub Folder"
8 Comment "---------------------"
```

The initial loop has now been created. This will instruct the bot to iterate through every subfolder within `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\`. The remaining actions will also be repeated for each subfolder. In the next section, we will rename our `output.csv` file so that its name is the same as the subfolders'.

Section 2 -- Renaming the output file

Here, we will use the variable holding the current subfolder, `strSubFolder`, in order to rename the file. We already know that the original name will be `output.csv`. Let's get started:

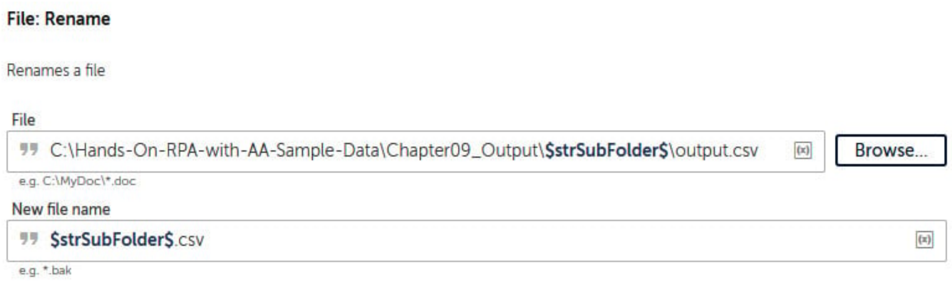
1. To rename a file, drag the **File: Rename** action just below line **4**.

2. Set the following properties for the **File: Rename** action on line **5**:

   File: `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$\output.csv`

   New file name: `$strSubFolder$.csv`

   The properties window should look like this:



File: Rename

Renames a file

File

C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\**$strSubFolder$**\output.csv

New file name

$strSubFolder$.csv

3. Click on **Save**.

That's *Section 2 -- Renaming the output file*, completed. We have not only automated the process of renaming of a file, but have also used variables to identify the file and folder names. Next, we have to move this file, but since a move action isn't available, we will copy and delete instead.

Section 3 -- Copying the output file

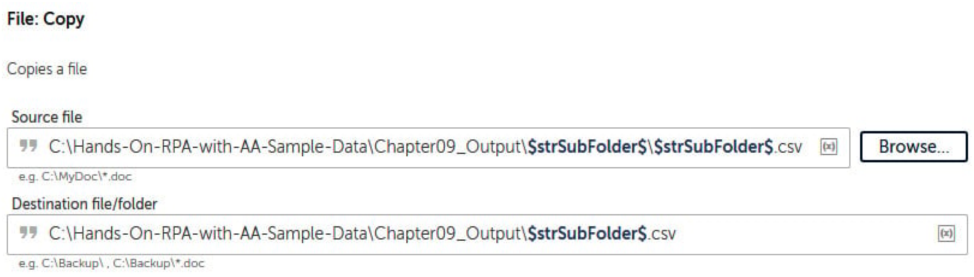
The **Copy** action for files duplicates a file. We could have used this function to perform the rename and move process in one action, but I decided against this as I wanted to demonstrate how to use the rename action. Let's get started:

1. To copy a file, drag the **File: Copy** action just below line **6**.
2. Set the following properties for the **File: Copy** action on line **7**:

   Source file: `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$sSubFolder$\$strSubFolder$.csv`

   Destination file/folder: `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$.csv`

   The properties window should look like this:



File: Copy

Copies a file

Source file

C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\**$strSubFolder$****$strSubFolder$**.csv

Destination file/folder

C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\**$strSubFolder$**.csv

3. Click on **Save**.

With that, *Section 3 -- Copying the output file*, has been completed; the file has been copied to our target destination. Now, we need to delete the original source file.

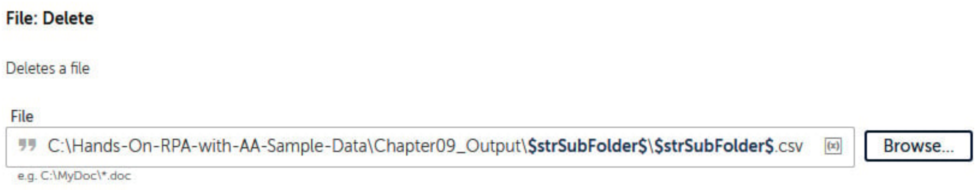
Section 4 -- Deleting the output file

You will have noticed how similar the file and folder actions are. As with the previous file actions, we will now delete the file from our subfolder. Let's get started:

1. To delete the source file, drag the **File: Delete** action just below line **8**.
2. Set the following properties for the **File: Delete** action on line **9**:

   File: `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$\$strSubFolder$.csv`

   The properties window should look like this:



File: Delete

Deletes a file

File

C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$\$strSubFolder$.csv

3. Click on **Save**.

We are fast approaching the end of this process. We have one last action to perform, deleting the subfolder.

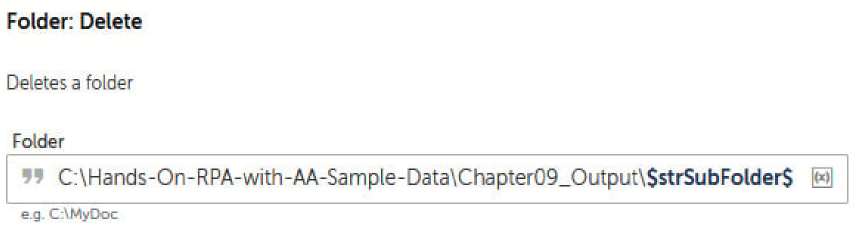
Section 5 -- Deleting the subfolder

Now that we have an empty folder that is obsolete, it needs to be deleted. Deleting a folder is very similar to deleting a file: it can be done with just one parameter. Let's get started:

1. To delete the subfolder, drag the **Folder: Delete** action just below line **10**.
2. Set the following properties for the **Folder: Delete** action on line **11**:

   Folder: `C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$`

   The properties window should look like this:



Folder: Delete

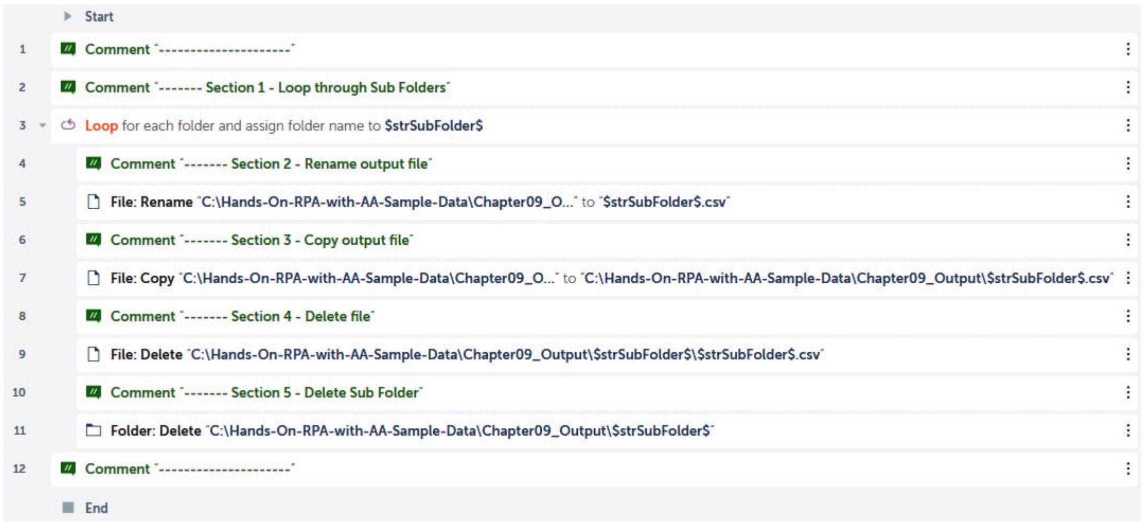
Deletes a folder

Folder

C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$

3. Click on **Save**.

Now that the bot is complete, you can go ahead and run it. The development interface should look like this:



```
Start
Comment "--------------------"
Comment "------- Section 1 - Loop through Sub Folders"
Loop for each folder and assign folder name to $strSubFolder$
    Comment "------- Section 2 - Rename output file"
    File: Rename "C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_O..." to "$strSubFolder$.csv"
    Comment "------- Section 3 - Copy output file"
    File: Copy "C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_O..." to "C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$.csv"
    Comment "------- Section 4 - Delete file"
    File: Delete "C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$\$strSubFolder$.csv"
    Comment "------- Section 5 - Delete Sub Folder"
    Folder: Delete "C:\Hands-On-RPA-with-AA-Sample-Data\Chapter09_Output\$strSubFolder$"
Comment "--------------------"
End
```

This bot should collate and rename all the files that were generated by the first bot in this lab. It will also delete all the subfolders that were created. I've made you work hard in this lab by building two bots. Hopefully, you have had some great insight into the types of tasks that can be automated using RPA.

Summary

I know this has been a pretty full-on lab, but you have persevered through it, so I think a big congratulations is in order. In this lab, we went through two separate walk-throughs and built two separate bots. We have covered a lot of packages. Just to recap once more, first, we built some nested loops that went through lists, records, and folders. We also discovered a new `Record` data type variable. You were then given some exposure to all the other types of looping available, all of which we will cover in later chapters. The walk-throughs also included building some rule-based decisions with conditional statements, using variables, and checking if files exist.

Hopefully, you have had a great confidence boost in your RPA skills, but there is still more to come. In the next lab, we will be delving into how to automate XML files. For this, I have a great walk-through for you. It will involve working with nodes within XML files, which will include updating, creating, and deleting node values, as well as reading multiple nodes.