Lab 6: Introducing Variables in Automation Anywhere

In this lab, we will cover the following topics:

- Working with different variable types
- Using message boxes and prompts
- Converting data types

Technical requirements

In order to install the Automation Anywhere Bot agent, the following is required:

- Google Chrome
- Completed registration with Automation Anywhere Community Edition
- Successful logon to Automation Anywhere Community Edition
- Successful registration of a local device
- The successful downloading of sample data from GitHub

Working with different variable types

In the following section, we will take a walk-through of each variable type. This walk-through will show how to create, assign, use, and output each variable type. Although the process is similar for all variable types, they all use different Automation Anywhere packages. This will give you a clearer understanding of how to implement different data types using Automation Anywhere. We will be using comments and message boxes throughout the walk-throughs. This will also get you familiar with using comments to map out the process and message boxes to check each stage of the bot.

Using the String variable type

In the walk-through that we will look at next, we will be performing the following tasks:

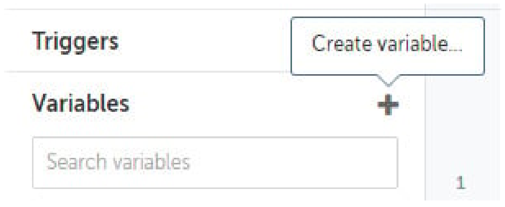
1. Creating three `String` variables -- `strFirstName`, `strSurname`, and `strFullname`
2. Assigning values to `strFirstName` and `strSurname`
3. Merging both variables together and assigning them to `strFullname`
4. Showing the value of `strFullname` in a **Message box**

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

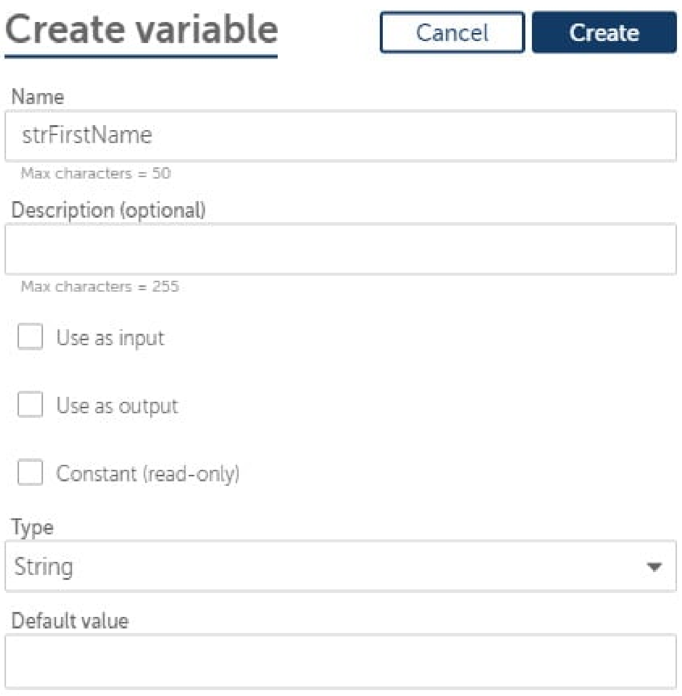
1. Log in to the **Control Room**.

2. Create a new bot and call it `Lab 6 - Variables` in the `\Bot\` folder.

3. Expand the **Variables** pane from the options on the left and select **+** to create a new variable:



4. The **Create variable** dialog will appear. Call this variable `strFirstName` and set it as a `String` type. Once the details are entered, click on **Create**. The dialog should look like this:



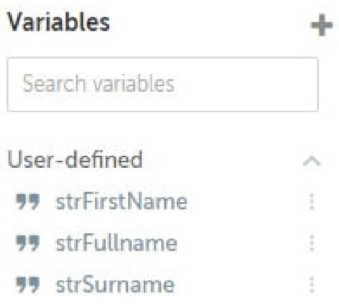
Name
strFirstName
Max characters = 50
Description (optional)
Max characters = 255
Use as input
Use as output
Constant (read-only)
Type
String
Default value

```
You can give a description if you want. This is useful when you have
multiple variables and the variable name does not clearly describe
what it will be used for.

The **Constant (read-only)** checkbox is used to indicate a constant
variable, one that is read only. This is very useful as reference
data.

The **input** and **output** checkboxes relate to passing and
receiving these variables between taskbots. We will cover this in
more detail at a later stage.

You can also give this variable a **Default value**. This assigns it
a value for the first time it is accessed.
```

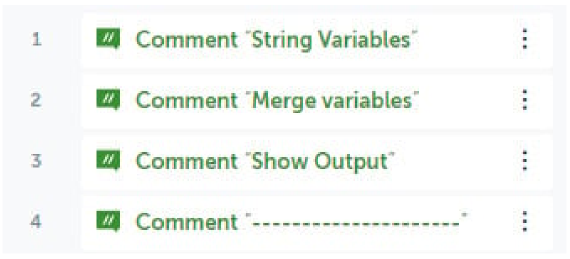
5. Create another new variable named `strSurname` as a `String` type.

6. Create another new variable named `strFullname` as a `String` type.

   Your variable list should appear as follows:



7. Now that we have our variables, let's start by adding some comments to form the template guide for our bot. Expand the **Actions** pane from the options on the left.
8. Add a **Comment** action as line **1**.
9. Set the **Comment** properties text as `"String Variables"` and click on **Save**.
10. Add a new **Comment** action as `"Merge variables"` on line **2** and click on **Save**.
11. Add a new **Comment** action as `"Show Output"` on line **3** and click on **Save**.
12. Add a new **Comment** action as `"---------------------"` on line **4** and click on **Save**. Your bot should now look like this:



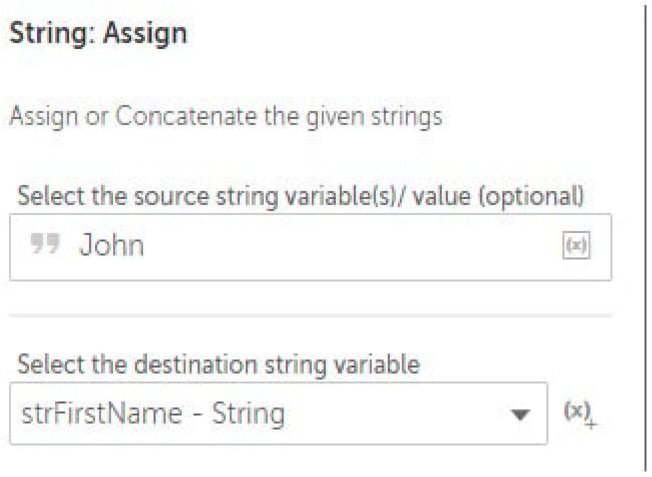
1 Comment "String Variables"
2 Comment "Merge variables"
3 Comment "Show Output"
4 Comment "---------------------"

13. From the `String` package, drag the **Assign** action under line **1**.
14. Set the following properties for the **String: Assign** action on line **2**:

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

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

    The action properties dialog should look like this:


String: Assign

Assign or Concatenate the given strings

Select the source string variable(s)/ value (optional)

John

Select the destination string variable

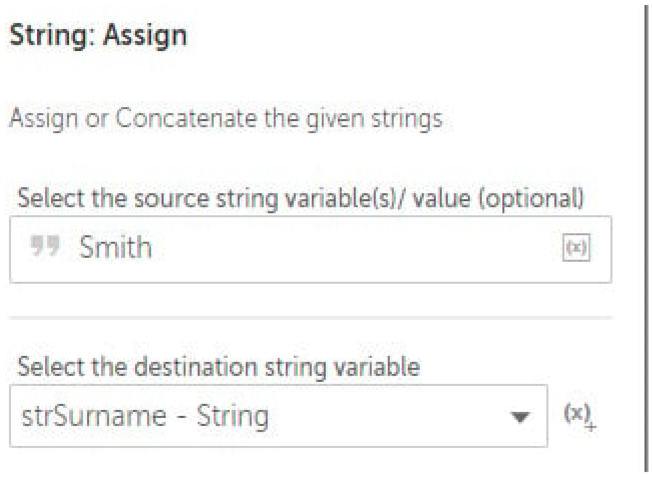
strFirstName - String

15. Click on **Save**.
16. Drag the **String: Assign** action just below line number **2**.
17. Set the following properties for the **String: Assign** action on line **3**:

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

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

    The action properties dialog should look like this:


String: Assign

Assign or Concatenate the given strings

Select the source string variable(s)/ value (optional)

Smith

Select the destination string variable

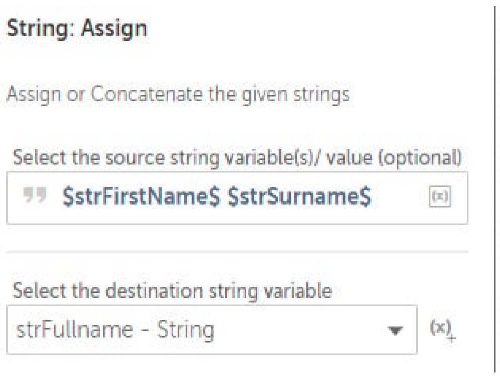
strSurname - String

18. Click on **Save**.
19. Now we will merge the values of the `strFirstName` and `strSurname` variables and assign the results to the `strFullname` variable. Drag the **String: Assign** action just below line **4**.
20. Set the following properties for the **String: Assign** action on line **5**:

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

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

The action properties dialog should look like this:



String: Assign

Assign or Concatenate the given strings

Select the source string variable(s)/ value (optional)

$strFirstName$ $strSurname$

Select the destination string variable

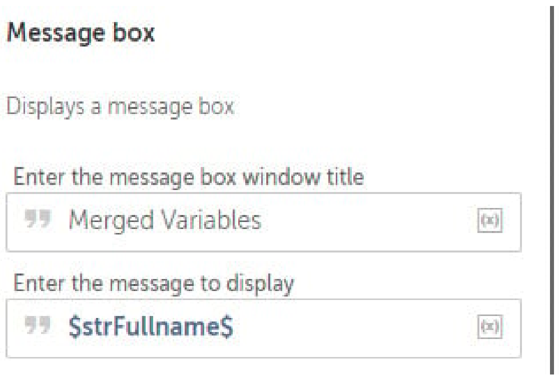
strFullname - String

21. Click on **Save**.
22. To view the **strFullname** variable, add the **Message box** action just below line **6**.
23. Set the following properties for the **Message box** action on line **7**:

    Enter the message box window title: `Merged variables`

    Enter the message to display: `$strFullname$`

    The action properties dialog should look like this:



Message box

Displays a message box

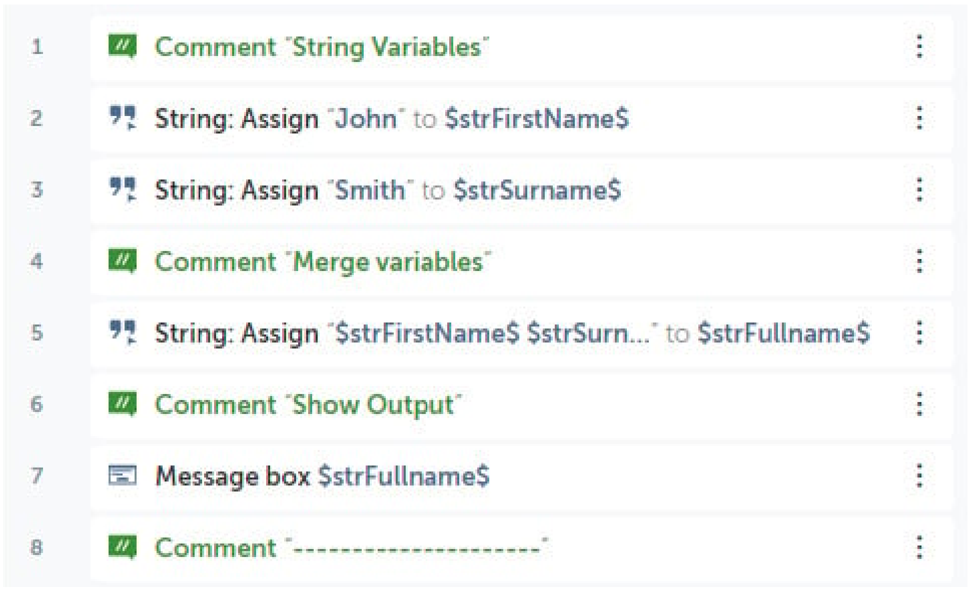
Enter the message box window title

Merged Variables

Enter the message to display

$strFullname$

24. Click on **Save**. The development interface should look something like this:



```
Comment "String Variables"
String: Assign "John" to $strFirstName$
String: Assign "Smith" to $strSurname$
Comment "Merge variables"
String: Assign "$strFirstName$ $strSurn..." to $strFullname$
Comment "Show Output"
Message box $strFullname$
Comment "---------------------"
```

In this walk-through, you have learned how to create **String** type variables and assign values to all of them. We also looked at how to merge the values of two variables and assign them to a single variable.

In the next walk-through, we will look at different data type variables, starting with the `Datetime` data type.

Using the Datetime variable type

In this walk-through, we will be performing the following tasks:

1. Creating two `Datetime` variables -- `dteChristmas` and `dteChristmasPlus2Weeks`
2. Creating a `String` variable, `strDate` , to store the output for the message box
3. Adding 2 weeks to the `dteChristmas` variable and assigning the result to `dteChristmasPlus2Weeks`
4. Showing the value of `dteChristmasPlus2Weeks` in a **Message box**

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

1. While still working on the same bot as before, expand the **Variables** pane from the options on the left and select **+** to create a new variable.

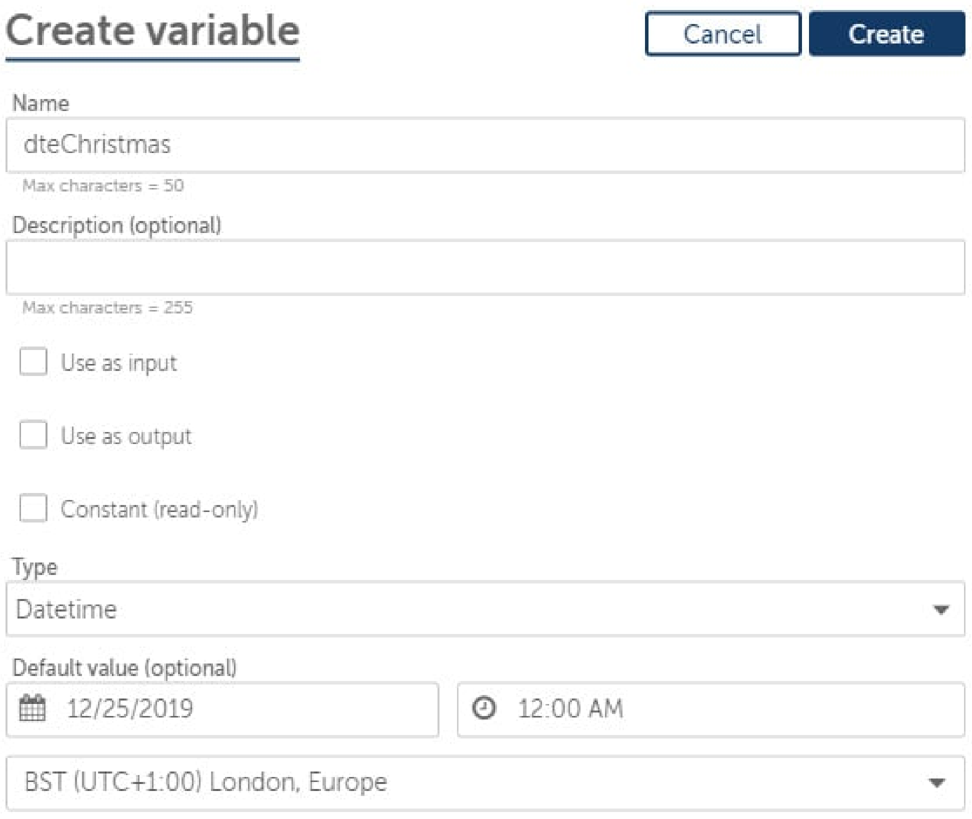
2. The **Create variable** dialog will appear. Set the following values:

   Name: `dteChristmas`

   Type: **Datetime**

   Default value: `12/25/2019 12:00 AM`

   The dialog should look like this:



Name: dteChristmas

Max characters = 50

Description (optional):

Max characters = 255

☐ Use as input

☐ Use as output

☐ Constant (read-only)

Type: Datetime

Default value (optional): 12/25/2019 12:00 AM

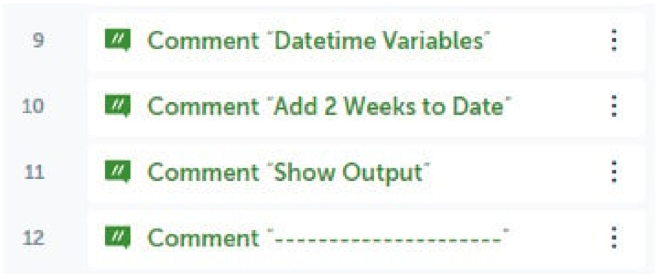
BST (UTC+1:00) London, Europe

3. Click on **Create**.
4. Create another **Datetime** type variable, set the values as follows, and then click on **Create**:

   Name: `dteChristmasPlus2Weeks`

   Type: **Datetime**

   Default value: *(Leave blank)*
5. Create a `String` type variable called `strDate` and then click on **Save**.
6. Now that we have our variables, we start by adding some comments to form the template guide for our bot. Add the **Comment** action as line **9**, set the comment property as `"Datetime Variables"`, and then click on **Save**.
7. Add a new **Comment** action as `"Add 2 Weeks to Date"` on line **10** and click on **Save**.
8. Add a new **Comment** action as `"Show Output"` on line **11** and click on **Save**.
9. Add a new **Comment** action as `"----------------------"` on line **12** and click on **Save**. Your bot should look like this:


9 Comment "Datetime Variables"
10 Comment "Add 2 Weeks to Date"
11 Comment "Show Output"
12 Comment "--------------------"

10. To add 2 weeks to the `dteChristmas` variable, add the **Datetime: Add** action just below line **10**.
11. Set the following properties for the **Datetime: Add** action on line **11**:

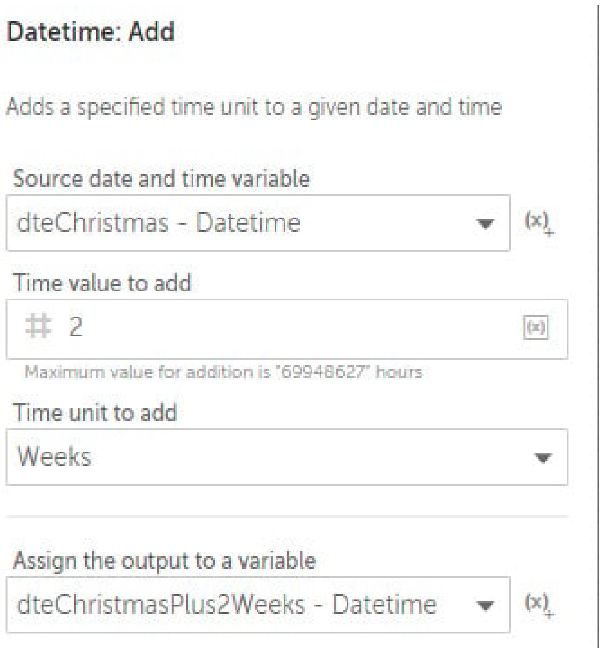
    Source date and time variable: **dteChristmas - Datetime**

    Time value to add: `2`

    Time unit to add: **Weeks**

    Assign the output to a variable: **dteChristmasPlus2Weeks - Datetime**

    The **Datetime: Add** action properties should look like this:


Datetime: Add

Adds a specified time unit to a given date and time

Source date and time variable: dteChristmas - Datetime

Time value to add: 2

Maximum value for addition is "69948627" hours

Time unit to add: Weeks

Assign the output to a variable: dteChristmasPlus2Weeks - Datetime

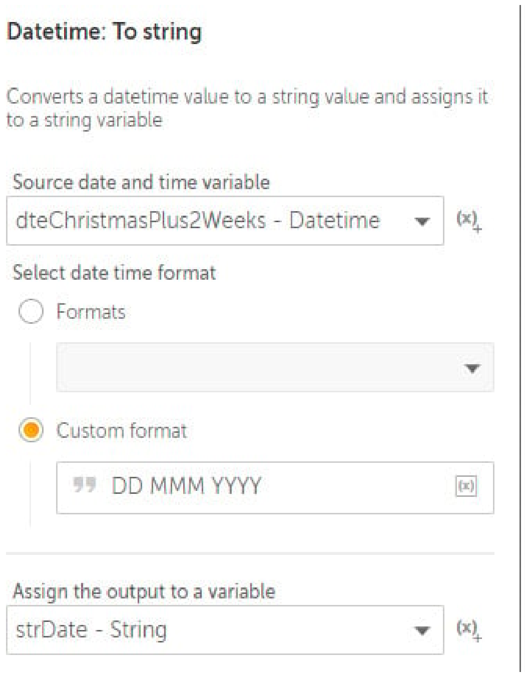
12. Click on **Save**.
13. To view the `dteChristmasPlus2Weeks` variable in a message box, it needs to be converted to a `String` variable. To do this, add the **Datetime: To string** action just below line **12**.
14. Set the following properties for the **Datetime: To string** action on line **13**:

    Source date and time variable: **dteChristmasPlus2Weeks - Datetime**

Select date time format: **Custom format** -- `DD MM YYYY`

Assign the output to a variable: **strDate - String**

The action properties should look like this:



Datetime: To string

Converts a datetime value to a string value and assigns it to a string variable

Source date and time variable: dteChristmasPlus2Weeks - Datetime

Select date time format

( ) Formats

(●) Custom format: DD MMM YYYY

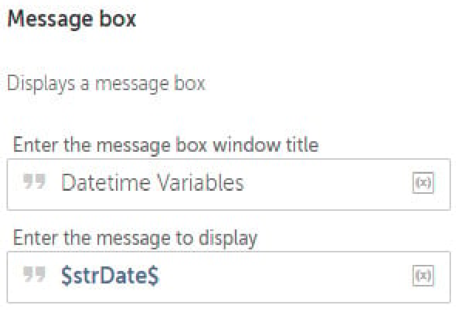
Assign the output to a variable: strDate - String

15. Click on **Save**.
16. To view the results, add the **Message box** action just below line **13**.
17. Set the following properties for the **Message box** action on line **14**:

    Enter the message box window title: **Datetime variables**

    Enter the message to display: `$strDate$`

    The action properties dialog should look like this:



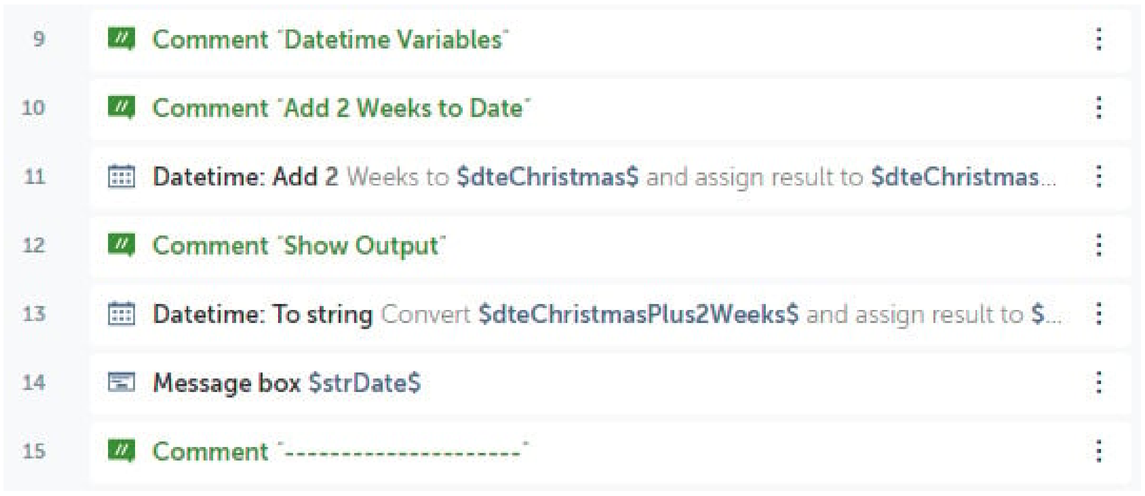
Message box

Displays a message box

Enter the message box window title: Datetime Variables

Enter the message to display: $strDate$

18. Click on **Save**. The development interface should look something like this:


Comment "Datetime Variables"
Comment "Add 2 Weeks to Date"
Datetime: Add 2 Weeks to $dteChristmas$ and assign result to $dteChristmas...
Comment "Show Output"
Datetime: To string Convert $dteChristmasPlus2Weeks$ and assign result to $...
Message box $strDate$
Comment "---------------------"

In this walk-through, you have created two `Datetime` type variables and assigned a value to one of them. The walk-through also demonstrated how to add a time period to a `Datetime` type variable as well as converting it to a `String` variable.

In the next walk-through, we will look at another data type variable, the `Boolean` data type.

Using the Boolean variable type

In the next walk-through, we will be performing the following tasks:

1. Creating a `Boolean` variable -- `blnLeapYear`
2. Creating a `String` variable, `strLeapYear`, to store the output for the message box
3. Setting the `blnLeapYear` variable to `True`
4. Inverting the value of the `blnLeapYear` variable
5. Converting the value of `blnLeapYear` to a `String` variable and assigning it to `strLeapYear`
6. Showing the value of `strLeapYear` in a **Message box**

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

1. While continuing to work on the same bot as previously, expand the **Variables** pane from the options on the left and select **+** to create a new variable.

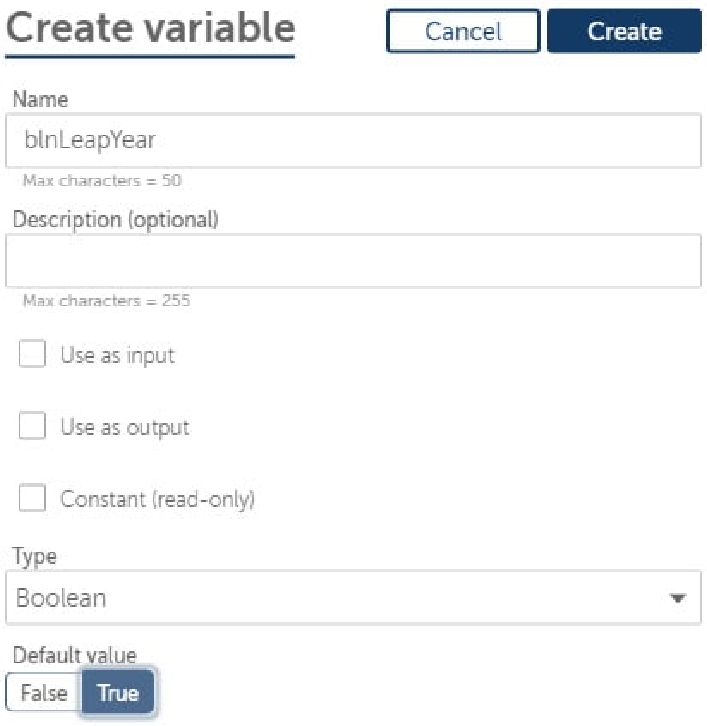
2. The **Create variable** dialog will appear. Set the following values:

   Name: `blnLeapYear`

   Type: **Boolean**

   Default value: **True**

   The dialog should look like this:


Create variable

Cancel | Create

Name: blnLeapYear

Max characters = 50

Description (optional):

Max characters = 255

☐ Use as input

☐ Use as output

☐ Constant (read-only)

Type: Boolean

Default value: False [✓ True]

3. Click on **Create**.

4. Create a **String** type variable called `strLeapYear` and click on **Save**.

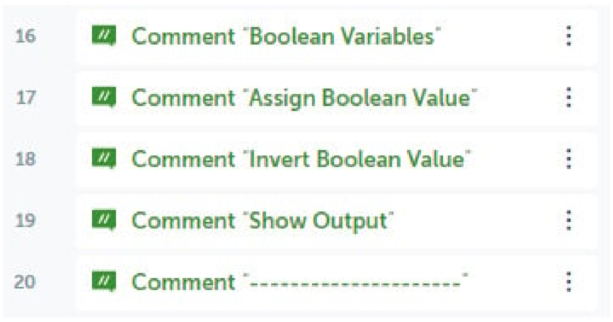
5. Now that we have our variables, we start by adding some comments to form the template guide for our bot. Add the **Comment** action as line **16**, set the comment property as `"Boolean Variables"`, and click on **Save**.

6. Add another **Comment** action as `"Assign Boolean Value"` as line **17** and click on **Save**.

7. Add another **Comment** action as `"Invert Boolean Value"` as line **18** and click on **Save**.

8. Add another **Comment** action as `"Show Output"` as line **19** and click on **Save**.

9. Add another **Comment** action as `"--------------------"` as line **20** and click on **Save**. Your bot should look like this:


```
16  Comment "Boolean Variables"
17  Comment "Assign Boolean Value"
18  Comment "Invert Boolean Value"
19  Comment "Show Output"
20  Comment "--------------------"
```

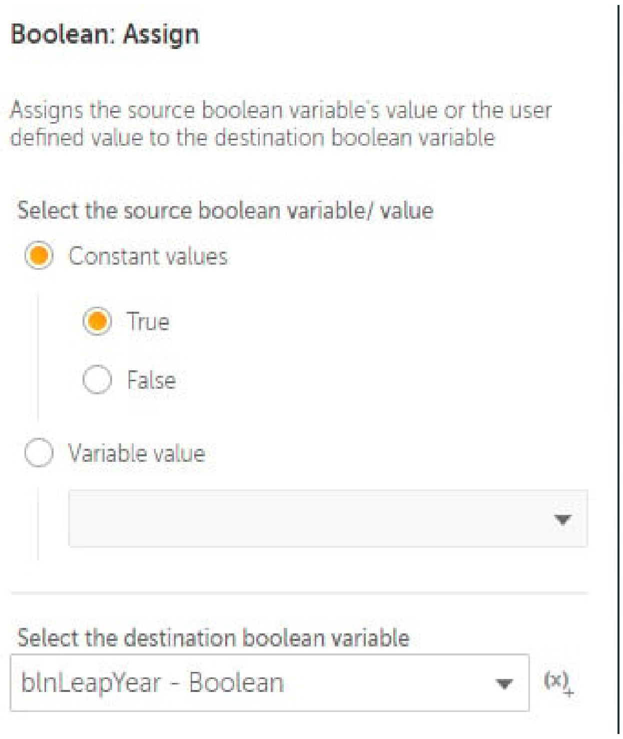
10. To assign a `True` value to the `blnLeapYear` variable, from the **Boolean** package, drag the **Assign** action just below line **17**.
11. Set the following properties for the **Boolean: Assign** action on line **18**:

    Select the source Boolean variable/ value: **Constant values**

    Constant values: **True**

    Select the destination Boolean variable: **blnLeapYear - Boolean**

    The action properties should look like this:



Boolean: Assign

Assigns the source boolean variable's value or the user defined value to the destination boolean variable

Select the source boolean variable/ value

[✓ Constant values]

[✓ True]

False

Variable value

Select the destination boolean variable

blnLeapYear - Boolean

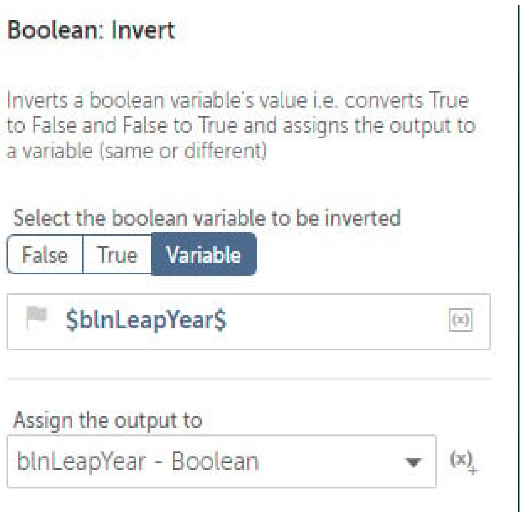
12. Click on **Save**.
13. To invert the value of the `blnLeapYear` variable, from the **Boolean** package, drag the **Invert** action just below line **19**.
14. Set the following properties for the **Boolean: Invert** action on line **20**:

    Select the Boolean variable to be inverted: **Variable**

    Value: `$blnLeapYear$`

    Assign the output: **blnLeapYear - Boolean**

    The Boolean: Invert action properties should look like this:


Boolean: Invert

Inverts a boolean variable's value i.e. converts True to False and False to True and assigns the output to a variable (same or different)

Select the boolean variable to be inverted
False | True | [✓ Variable]

$blnLeapYear$

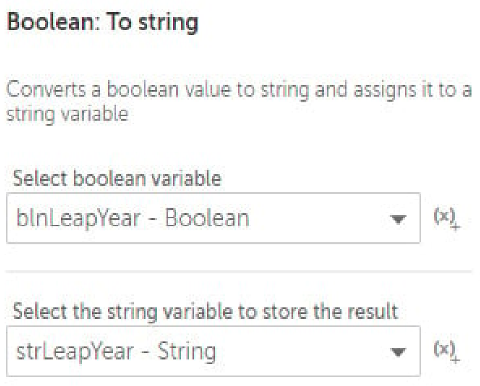
Assign the output to
blnLeapYear - Boolean

15. Click on **Save**.
16. To convert `blnLeapYear` to a `String` variable, add the **Boolean: To string** action just below line **21**.
17. Set the following properties for the **Boolean: To string** action on line **22**:

    Select Boolean variable: **blnLeapYear - Boolean**

    Select the string variable to store the result: **strLeapYear - String**

    The action properties should look like this:


Boolean: To string

Converts a boolean value to string and assigns it to a string variable

Select boolean variable
blnLeapYear - Boolean

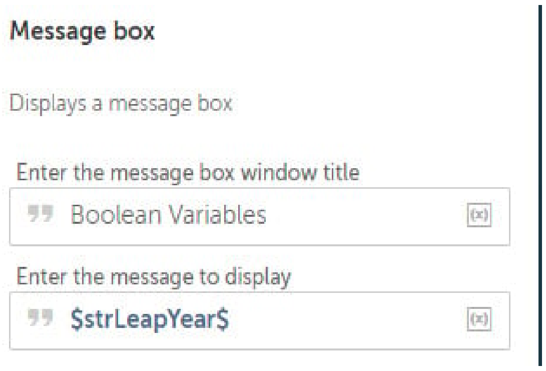
Select the string variable to store the result
strLeapYear - String

18. Click on **Save**.
19. To view the results, add the **Message box** action just below line **22**.
20. Set the following properties for the **Message box** action on line **23**:

    Enter the message box window title: `Boolean variables`

    Enter the message to display: `$strLeapYear$`

    The action properties dialog should look like this:



Message box

Displays a message box

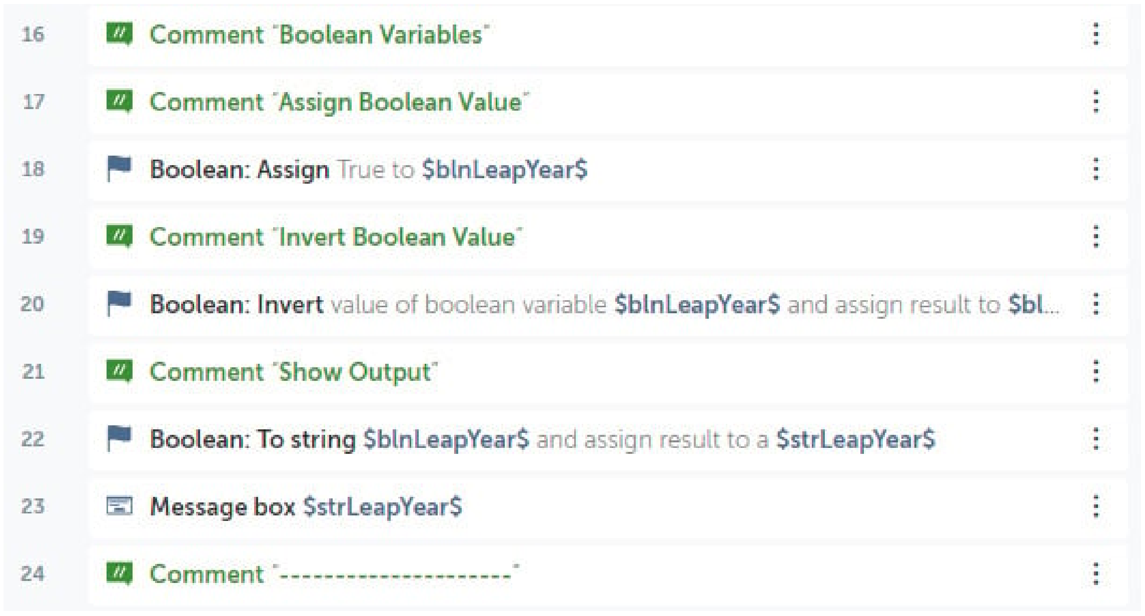
Enter the message box window title

Boolean Variables

Enter the message to display

$strLeapYear$

21. Click on **Save**. The development interface should look something like this:



```
16  Comment "Boolean Variables"
17  Comment "Assign Boolean Value"
18  Boolean: Assign True to $blnLeapYear$
19  Comment "Invert Boolean Value"
20  Boolean: Invert value of boolean variable $blnLeapYear$ and assign result to $bl...
21  Comment "Show Output"
22  Boolean: To string $blnLeapYear$ and assign result to a $strLeapYear$
23  Message box $strLeapYear$
24  Comment "---------------------"
```

In this walk-through, you have created a `Boolean` variable and assigned a `True` value to it. Then this value was inverted using Automation Anywhere actions and the results shown in a message box.

The next variable type we will explore is the `Number` variable, probably one of the most commonly used data types.

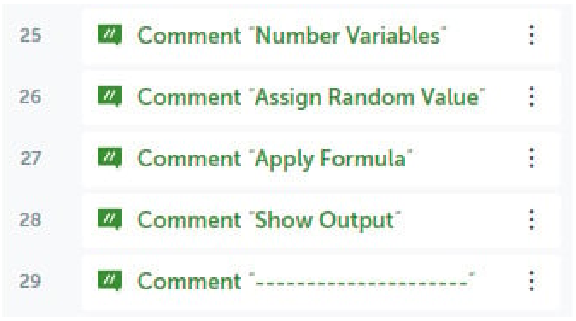
Using the Number variable type

In this walk-through, we will be performing the following tasks:

1. Creating two `Number` variables -- `numRandom` and `numResult`
2. Creating a `String` variable, `strResult`, to store the output for the message box
3. Assigning a random number between `1` and `100` to the `numRandom` variable
4. Applying a formula, *(Random/2) + 25*, and assigning the results to `numResult`
5. Converting the value of `numResult` to a `String` variable and assigning it to `strResult`
6. Showing the value of `strResult` in a **Message box**

Let's start this walk-through by performing the following tasks:

1. While still working on the same bot as before, create a `Number` type variable called `numRandom` and click on **Save**.
2. Create another `Number` type variable called `numResult` and click on **Save**.
3. Create a `String` type variable called `strResult` and click on **Save**.
4. Now that we have our variables, we start by adding some comments to form the template guide for our bot. Add the **Comment** action on line **25**, set the comment property as `"Number Variables"`, and click on **Save**.
5. Add another **Comment** action as `"Assign Random Value"` as line **26** and click on **Save**.
6. Add another **Comment** action as `"Apply Formula"` as line **27** and click on **Save**.
7. Add another **Comment** action as `"Show Output"` as line **28** and click on **Save**.
8. Add another **Comment** action as `"---------------------"` as line **29** and click on **Save**. Your bot should look like this:



25 Comment "Number Variables"
26 Comment "Assign Random Value"
27 Comment "Apply Formula"
28 Comment "Show Output"
29 Comment "---------------------"

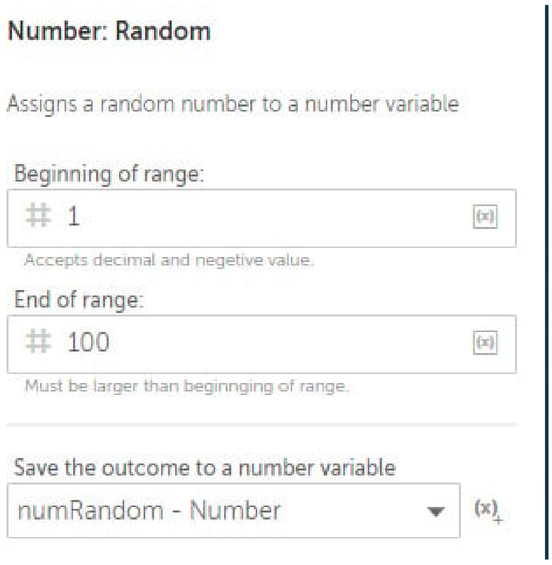
9. To assign a random number to the `numRandom` variable from the **Number** package, drag the **Random** action just below line **26**.
10. Set the following properties for the **Number: Random** action on line **27**:

    Beginning of range: `1`

    End of range: `100`

    Save the outcome to a number variable: **numRandom - Number**

    The action properties should look like this:


Number: Random

Assigns a random number to a number variable

Beginning of range: 1

Accepts decimal and negetive value.

End of range: 100

Must be larger than beginnging of range.

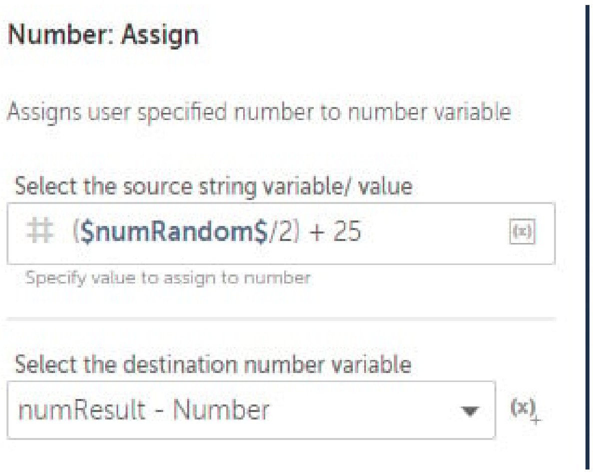
Save the outcome to a number variable: numRandom - Number

11. Click on **Save**.
12. To apply the formula *(Random/2) + 25* and save the outcome to the `numResult` variable, add the **Number: Assign** action just below line **28**.
13. Set the following properties for the **Number: Assign** action on line **29**:

    Select the source string variable: `($numRandom$/2) + 25`

    Select the destination number variable: **numResult - Number**

    The action properties should look like this:


Number: Assign

Assigns user specified number to number variable

Select the source string variable/ value: ($numRandom$/2) + 25

Specify value to assign to number

Select the destination number variable: numResult - Number

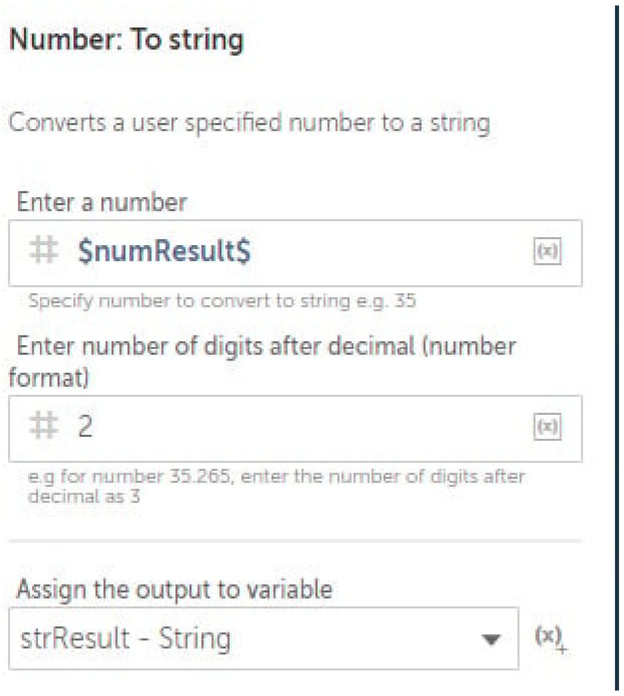
14. Click on **Save**.
15. To convert `numResult` to a `String` variable, add the **Number: To string** action just below line **30**.
16. Set the following properties for the **Number: To string** action on line **31**:

    Enter a number: `$numResult$`

Enter number of digits after decimal: `2`

Assign the output to variable: `strResult - String`

The action properties should look like this:



Number: To string

Converts a user specified number to a string

Enter a number

$numResult$

Specify number to convert to string e.g. 35

Enter number of digits after decimal (number format)

2

e.g for number 35.265, enter the number of digits after decimal as 3

Assign the output to variable

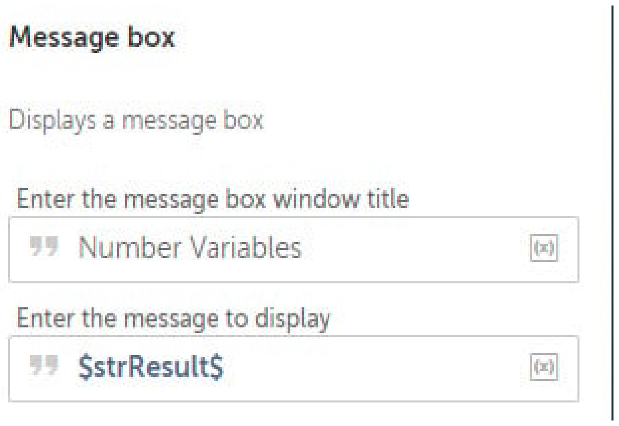
strResult - String

17. Click on **Save**.
18. To view the results, add the **Message box** action just below line **31**.
19. Set the following properties for the **Message box** action on line **32**:

    Enter the message box window title: `Number variables`

    Enter the message to display: `$strResult$`

    The action properties dialog should look like this:



Message box

Displays a message box

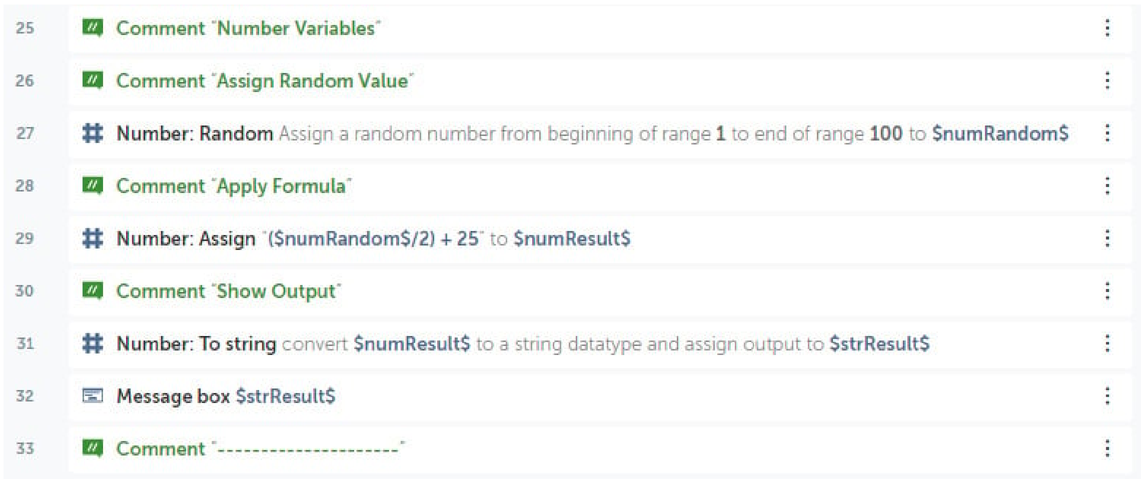
Enter the message box window title

Number Variables

Enter the message to display

$strResult$

20. Click on **Save**, and the development interface should look something like this:



```
Comment "Number Variables"
Comment "Assign Random Value"
Number: Random Assign a random number from beginning of range 1 to end of range 100 to $numRandom$
Comment "Apply Formula"
Number: Assign "($numRandom$/2) + 25" to $numResult$
Comment "Show Output"
Number: To string convert $numResult$ to a string datatype and assign output to $strResult$
Message box $strResult$
Comment "---------------------"
```

You should now have a clear understanding of how to create new variables as well as assign and re-assign values. There are more variable types available, such as `Window`, `File`, and `Record`. Covering the most common variables will give you a good start on your journey to becoming a bot developer. In the walk-throughs so far, you should now be comfortable with using the `String`, `Datetime`, `Boolean`, and `Number` variables. We will cover some of the other variables in the forthcoming chapters.

Using message boxes and prompts

Our bot so far dealt with four types of variables -- `String`, `Datetime`, `Boolean`, and `Number`. They have values assigned to them using the assign action or are set as default values. We will now go through and modify our bot. Instead of assigning values using actions, we will replace this with actions from the **Prompt** package. As well as using the **Prompt** package, you will learn how to disable and enable actions for your bot.

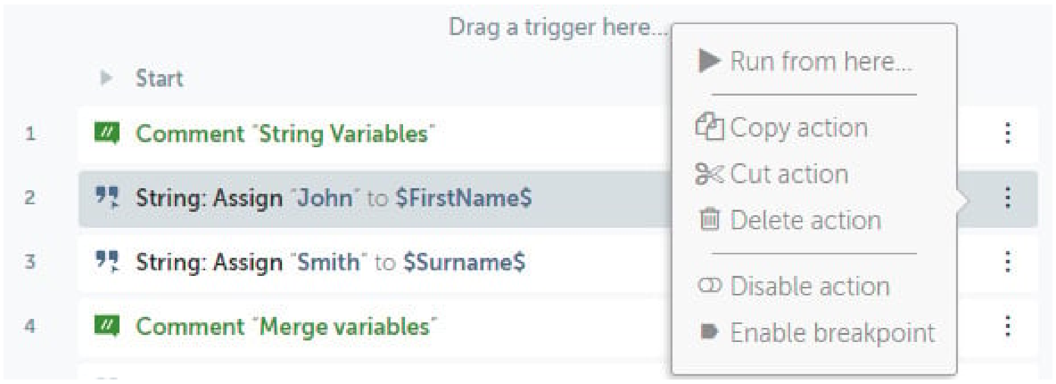
In this walk-through, we will be performing the following tasks:

1. Disabling **Assign** actions from the bot
2. Adding **Prompt** actions for capturing `strFirstName` and `strSurname`
3. Outputting results as **Message box**

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

1. Continuing with the same bot as before, to disable an action, you will notice the three vertical dots at the end of every action line in the development interface. Clicking on this will show the options menus. This gives you a number of editing options for that bot action line.

2. Select the options menu for line **2**:


Drag a trigger here...

Start

1 Comment "String Variables"

2 String: Assign "John" to $FirstName$

3 String: Assign "Smith" to $Surname$

4 Comment "Merge variables"

3. From the options, select **Disable action**.

4. Repeat steps *2* and *3* for line **3**.

5. Values are no longer assigned to the `strFirstName` and `strSurname` variables as these actions have been disabled. To prompt for a value for the `strFirstName` variable, from the **Prompt** package, drag the **For value** action just below line **2**.

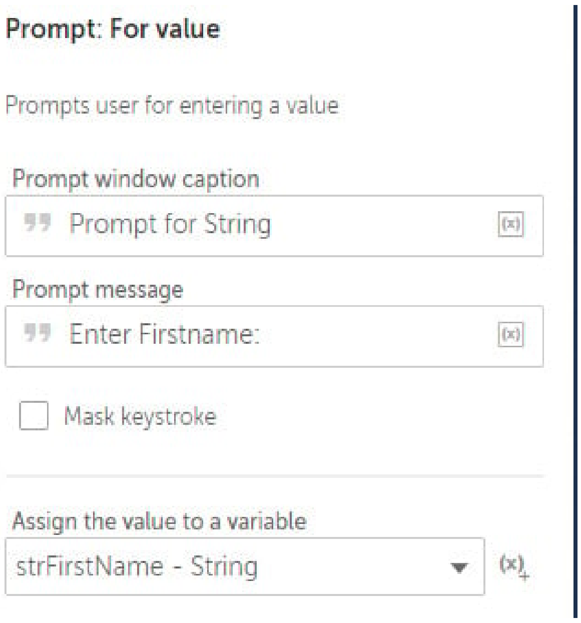
6. Set the following properties for the **Prompt: For value** action on line **3**:

   Prompt window caption: `Prompt for String`

   Prompt message: `Enter Firstname:`

   Assign the value to a variable: **strFirstName - String**

   The action properties should look like this:


Prompt: For value

Prompts user for entering a value

Prompt window caption: Prompt for String

Prompt message: Enter Firstname:

☐ Mask keystroke

Assign the value to a variable: strFirstName - String

7. Click on **Save**.

8. Add another **Prompt: For value** action just below line **4**.

9. Set the following properties for the **String: Assign** action on line **5**:

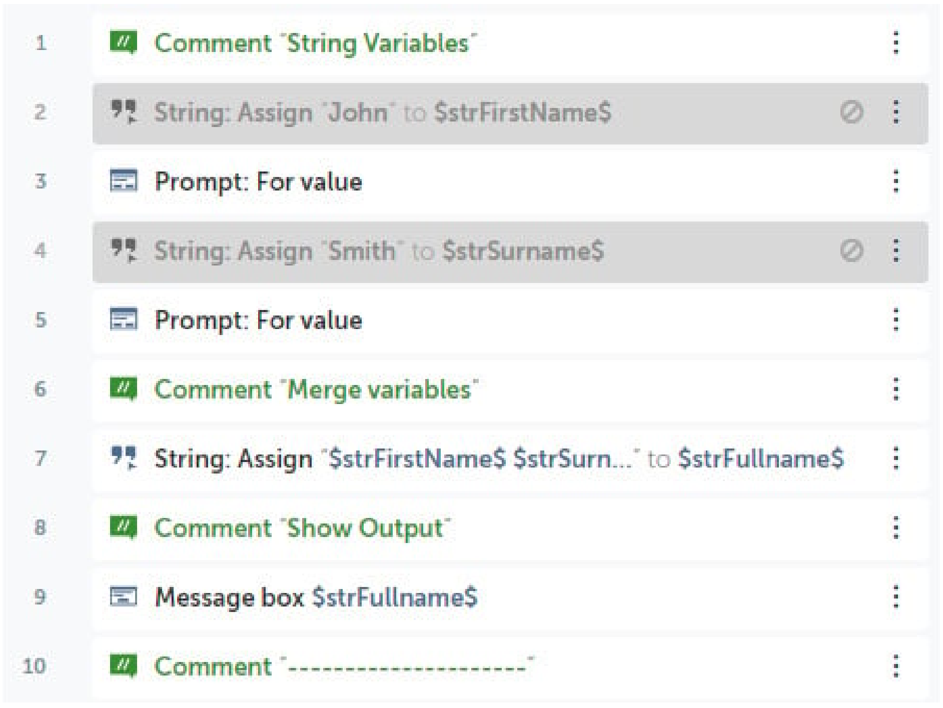
   Prompt window caption: `Prompt for String`

   Prompt message: `Enter Surname:`

   Assign the value to a variable: **strSurname - String**

10. Click on **Save**.

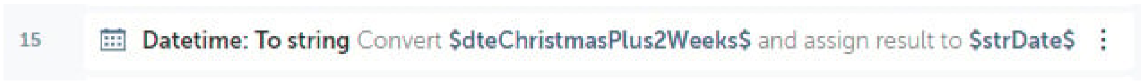
You have disabled actions and created some prompts to get the name values assigned to our variables. The **Message Box** that's already in place on line **9** will output the merged variable values. The development interface should look something like this:



```
1   Comment "String Variables"
2   String: Assign "John" to $strFirstName$
3   Prompt: For value
4   String: Assign "Smith" to $strSurname$
5   Prompt: For value
6   Comment "Merge variables"
7   String: Assign "$strFirstName$ $strSurn..." to $strFullname$
8   Comment "Show Output"
9   Message box $strFullname$
10  Comment "--------------------"
```

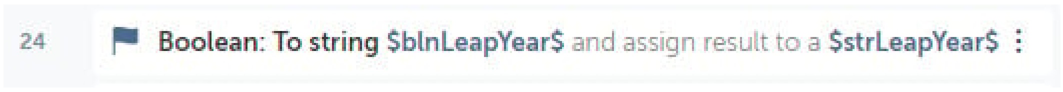
Converting data types

Let's look at the data conversions performed by the current bot. The first data conversion the bot performs is converting a `Datetime` data type to a `String` data type. Take a look at line **15** from the development interface:



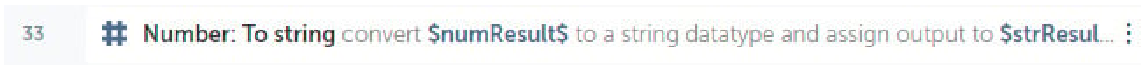
```
15  Datetime: To string Convert $dteChristmasPlus2Weeks$ and assign result to $strDate$
```

The next data conversion performed is from a `Boolean` data type to a `String` data type. This is demonstrated on line **24** of the development interface:



```
24  Boolean: To string $blnLeapYear$ and assign result to a $strLeapYear$
```

Finally, the bot converts a `Number` data type to a `String` data type. This is on line `33` of the development interface:



33 Number: To string convert $numResult$ to a string datatype and assign output to $strResul...

Whenever a data type is converted, two variables are required. The first is the original value that needs to be converted, and the other is the target variable. The target variable should always be the same as target data type.

Go ahead and run your bot. It should have prompts, message boxes, and all the variable conversions and calculations. You have done a great job so far. Being able to create and work with variables of different types is an essential skill for all developers. Your knowledge of not only creating and assigning, but also converting, data types is a great start to building your confidence with Automation Anywhere.

In the next lab, we will expand further on the packages. In particular, you will learn how to launch and navigate around desktop and web applications. We will also explore the use of automation with Excel and email applications.