Lab Guide

AI with IBM RPA

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Hands-on Lab

Version 1.0 for General Availability

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Table of Contents

1 Introduction

In this lab we will demonstrate how AI solves a wide variety of automation problems and show how easy it is to infuse AI into your bots

1.1 Use Case

Validating customer addresses

1.2 Prerequisites

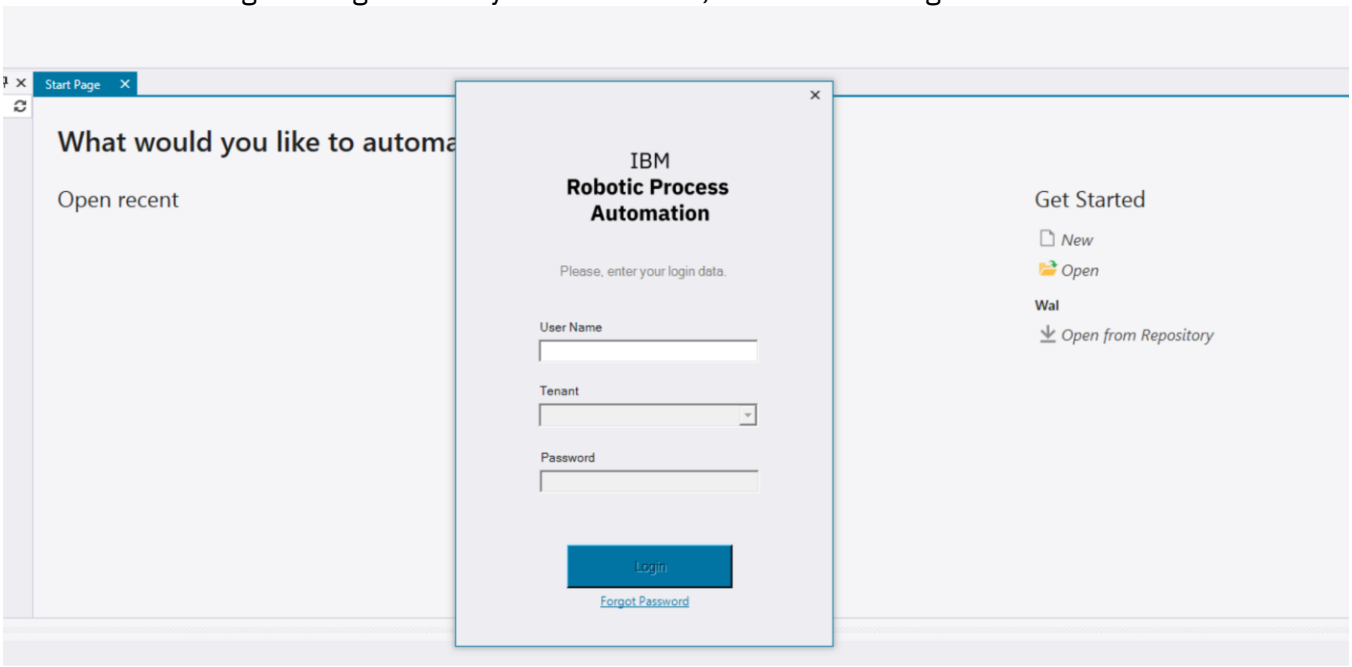
None. You have everything you need in your lab environment. Let’s get started!

2 Getting Started

On your desktop find the IBM RPA Studio icon and launch it.

2.1 Log In

You will see the login dialog. Provide your credentials, then click the login button.



Once the tenant is retrieved, enter your password. Click login again to finish logging into the client.

3 First Scenario – Fuzzy Comparison

Fuzzy comparison uses smart algorithms to determine the similarity between strings. Similarity is graded and the higher the grade the greater the confidence. IBM RPA offers a choice of algorithms to suit different use cases.

3.1 Scenario Description

Focuscorp is a company with a tele-sales team who ask customers for a company address to receive follow-up literature. The problem is that addresses are dictated and are often transcribed incorrectly, causing delivery failures.

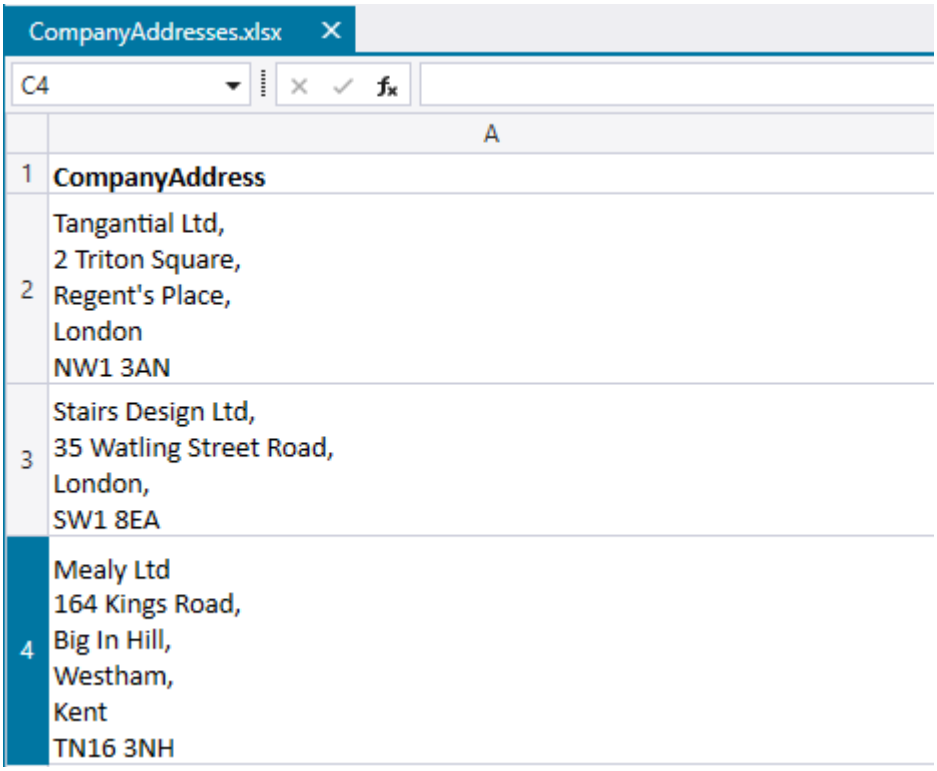
You are an automation developer responsible for building a script that cross checks addresses captured by tele-sales against known addresses. Your script should find the closest match.

3.2 Open a work in progress script

Open the folder ***Lab 1 - AI with RPA\Scenario1***. Open IBM RPA Studio and select *Open* in the top left. Open *Scenario 1 Started.wal* . Your script will open in Studio.

3.3 Company Addresses Spreadsheet

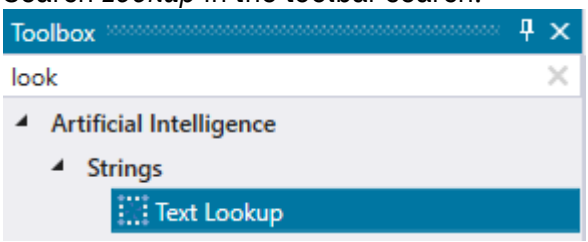
Still in RPA Studio, Open *CompanyAddresses.xls* situated in the same *Scenario1* folder. You should see a list of company addresses:



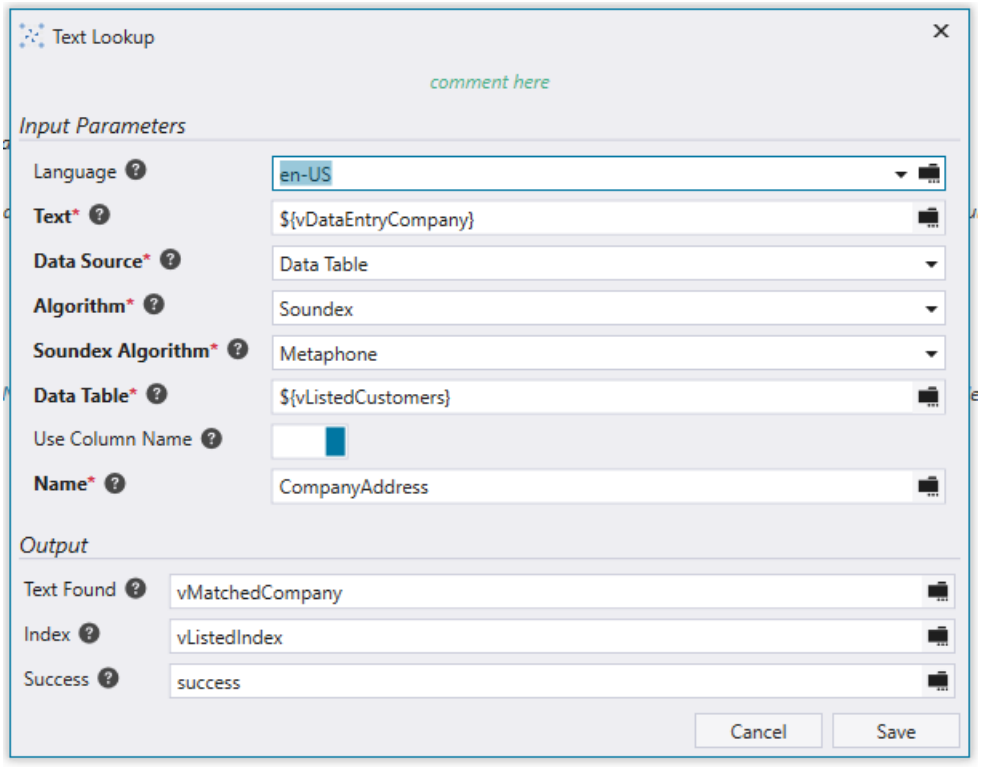
Close the spreadsheet. In RPA Studio, navigate to subroutine *matchInputAddressAgainstCandidates*. On line 20 edit the *ExcelOpen* command and make sure the command opens *CompanyAddress.xlxs* in the above folder.

3.4 Adding Commands

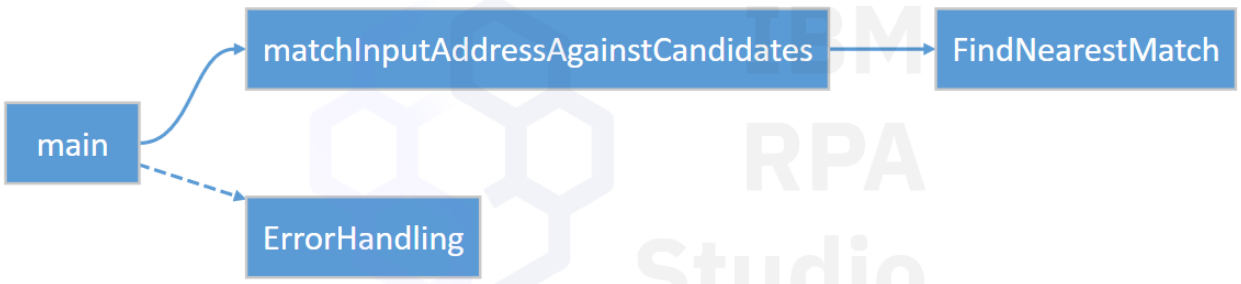
Search *Lookup* in the toolbar search.



Navigate to subroutine *FindNearestMatch*. Drag the *Text Lookup* command to line 39 and fill it out with the information below.

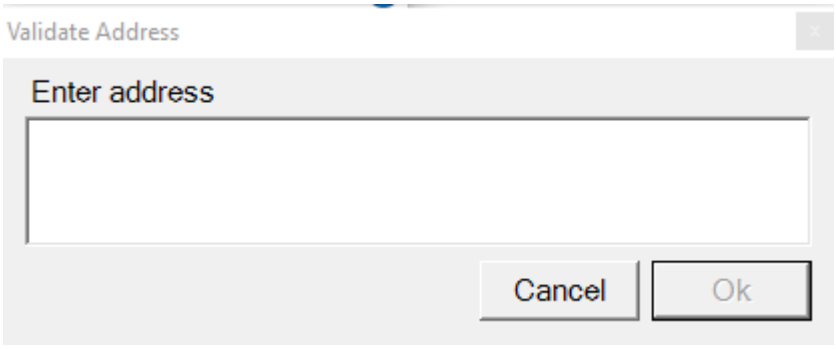


Click on the Call Graph tab. It should look like this



3.5 Run the Script

Run the script by pressing Ctrl+F5 (run without debugging).
You should see a dialog box appear.



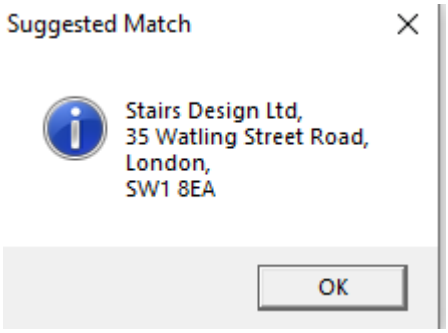
If you get an error its likely you still have the Company Addresses spreadsheet open. Close the spreadsheet and try again

Now enter the following address:

Stairs Design Ltd,
35 ***Waddling*** *Street*
London,
FW1 8EF

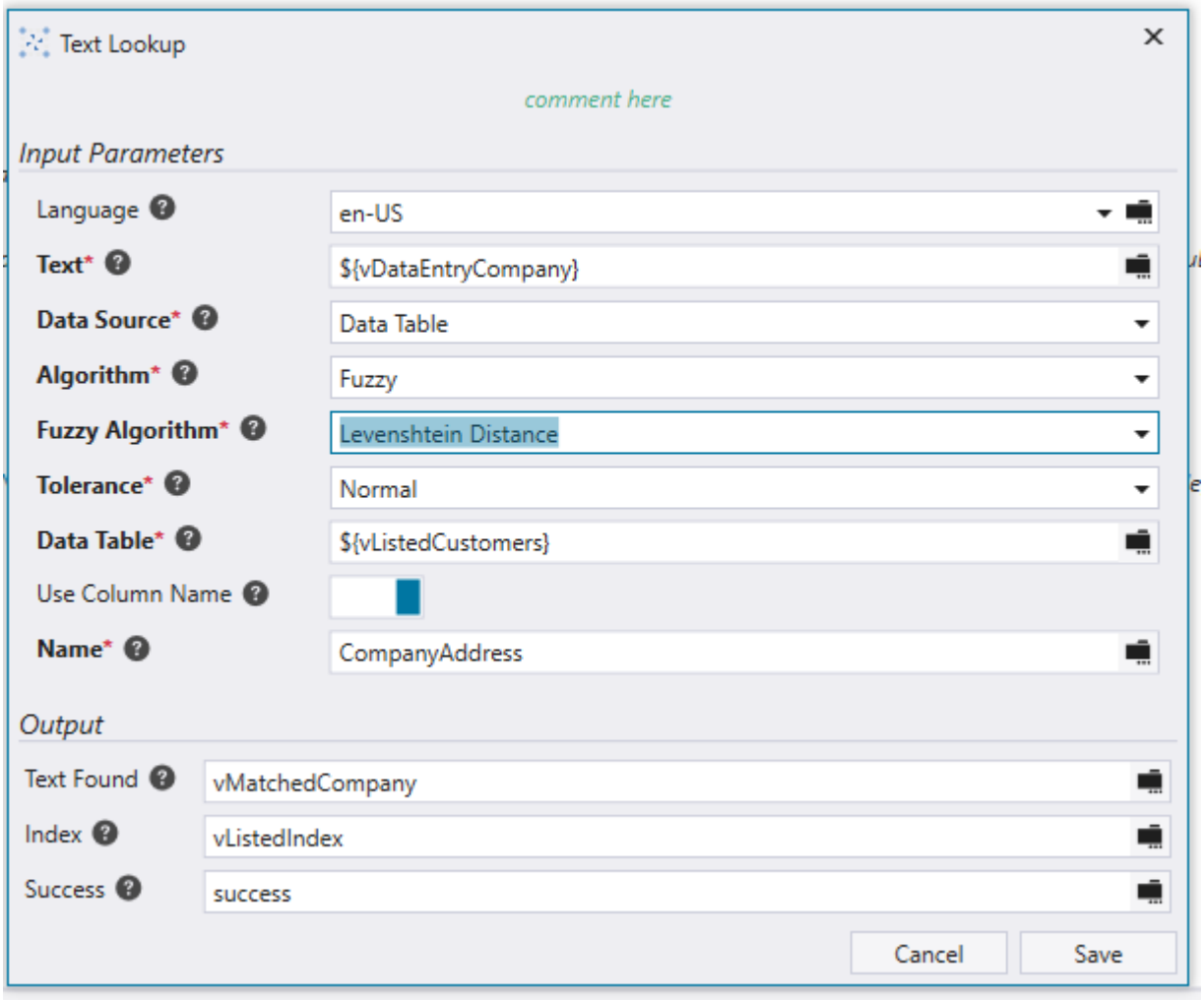
Press OK.

The script performs a fuzzy match between the entered address and the database addresses. It finds a match and displays:



If the fuzzy match falls below the tolerance level it does not display a match.
Try matching more addresses by mistyping the addresses in the *CompanyAddress.xlsx* spreadsheet.

Now edit the *ApproxmatelyEqual* command and change the algorithm:



Run the script again. Is the matching better or worse? Which fuzzy matching algorithm do you think is best for this task?[1]

[1] Soundex is better for matching dictated text whereas the Levenshtein algorithm is better for matching typos. This scenario is for matching dictated addresses so the Soundex algorithm would be a better choice. See https://en.wikipedia.org/wiki/Levenshtein_distance

3.6 Advanced Exercise – Using Approximately Equals

If you need to compare individual strings rather than a table of strings, then use the *ApproxmatelyEqual* command. Replace the *lookupCommand* with the WAL code below. This code loops through the table so that you can step though with debug to see the result of each fuzzy comparison.

```
for --variable ${vListedIndex} --from 1 --to ${vListedCustomers.Rows} --step 1
            mapTableRow --dataTable ${vListedCustomers} --row ${vListedIndex} --mappings
"number=1=${vMatchedCompany}"
            approximatelyEquals --culture "en-US" --source "${vDataEntryCompany}" --
target "${vMatchedCompany}" --algorithm "Fuzzy" --fuzzyalgorithm "LevenshteinDistance,
HammingDistance" --tolerance "Normal" vSimilar=value
            if --left "${vSimilar}" --operator "Is_True"
                  logMessage --message "Matching company:  ${vMatchedCompany}" --type
"Info"
                  messageBox --title "Suggested Match" --text "${vMatchedCompany}" --
icon "Information" --buttons "OK" --defaultbutton "FirstButton"
                  break
            endIf
next
```

4 Second Scenario – Knowledge Base Creation

In this scenario we will create a knowledgebase to demonstrate AI within IBM RPA.

4.1 Scenario Description

You will implement a knowledgebase to classify technical support queries.

4.2 AI - Real World Decisions

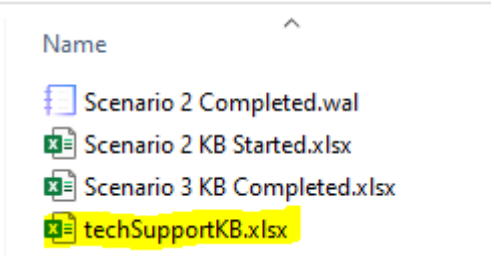
RPA bots are great at making Boolean (true/false) decisions. If a value is true bot will do X, otherwise Y. However, that scenario doesn't always reflect real life. There are many real-world decisions that are not black and white but shades of grey. A human decides to take an action based on cumulated past knowledge and not on simple true/false logic. Traditionally, 'grey' decisions have required humans. But with IBM RPA's knowledgebase, a bot can classify incoming content and automatically make grey decisions. In other words, bots can be cognitive.

4.3 Inspect File

Open the folder titled *Scenario 2* on your desktop.

4.4 Build Knowledge Base

Open the file *techSupportKB.xlsx*



Within this file there are Question, Answer, Context, and Tags:

Question will be the Ticket Subject Line
Answer will be what we'd like it to take an action
Context is a topic header we'd give the cluster
Tags is just a family tag for us to track. Note the + in front of the entry.

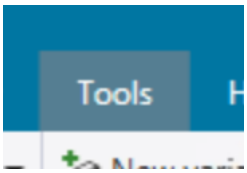
	A	B	C	D
1	**Question**	**Answer**	**Context**	**Tags**
2	I can't login	Reset Password	PasswordReset	+PASSRESET
3	I forgot my password	Reset Password	PasswordReset	+PASSRESET
4	My login is locked	Reset Password	PasswordReset	+PASSRESET
5	I'm locked out	Reset Password	PasswordReset	+PASSRESET
6	My password does not work	Reset Password	PasswordReset	+PASSRESET
7	My PC won't reboot	Reinstall PC	ResinstallPC	+REINSTALLPC
8	My laptop crashed	Reinstall PC	ResinstallPC	+REINSTALLPC
9	Fatal disk error	Reinstall PC	ResinstallPC	+REINSTALLPC
10	Blue screen	Reinstall PC	ResinstallPC	+REINSTALLPC

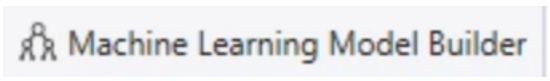
Feel free to add or edit entries, ensuring you keep the same format. When you are done, save the file and close the spreadsheet.

4.5 Upload Knowledge Base

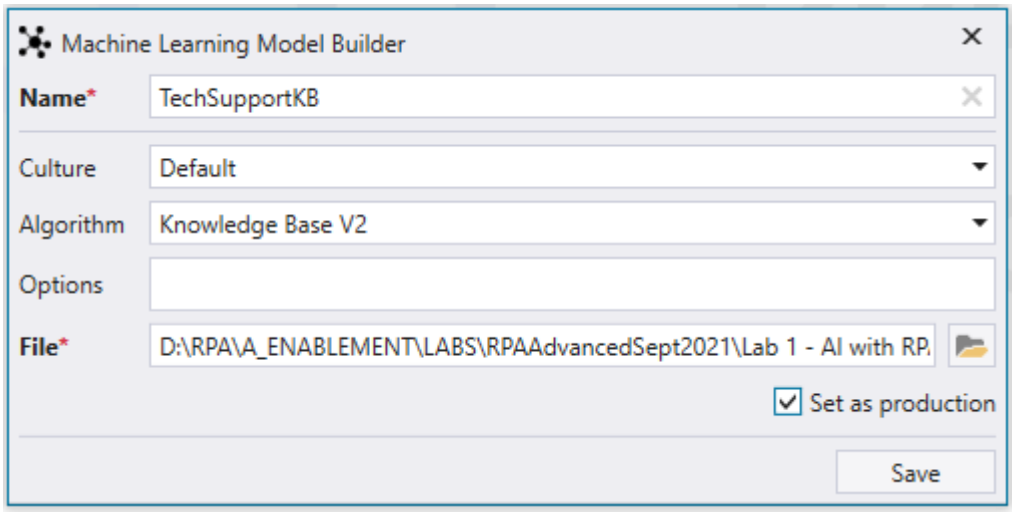
Navigate to IBM RPA Studio

Click Tools at the top of the screen and select the Machine Learning Model Builder option



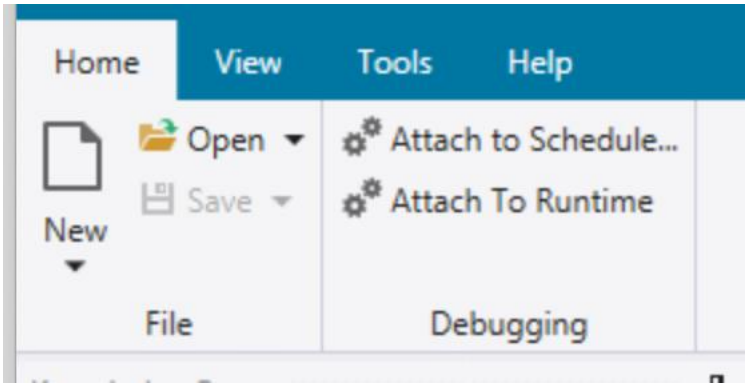


Type *TechSupportKB* as the name for the knowledge base. Leave the culture as *Default*. Select *Knowledge Base V2* as the Algorithm. Using the folder icon select the file *techSupportKB.xlsx*. Click *Set as production* and save. See below.



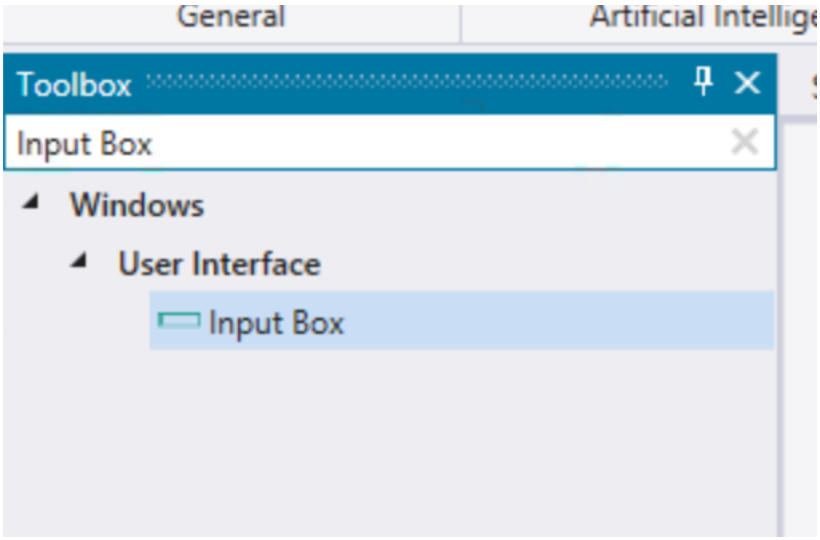
4.6 Build Script

Select *Home*, then *New* in the top left. Select *WAL File*



4.6.1 Input Box Command

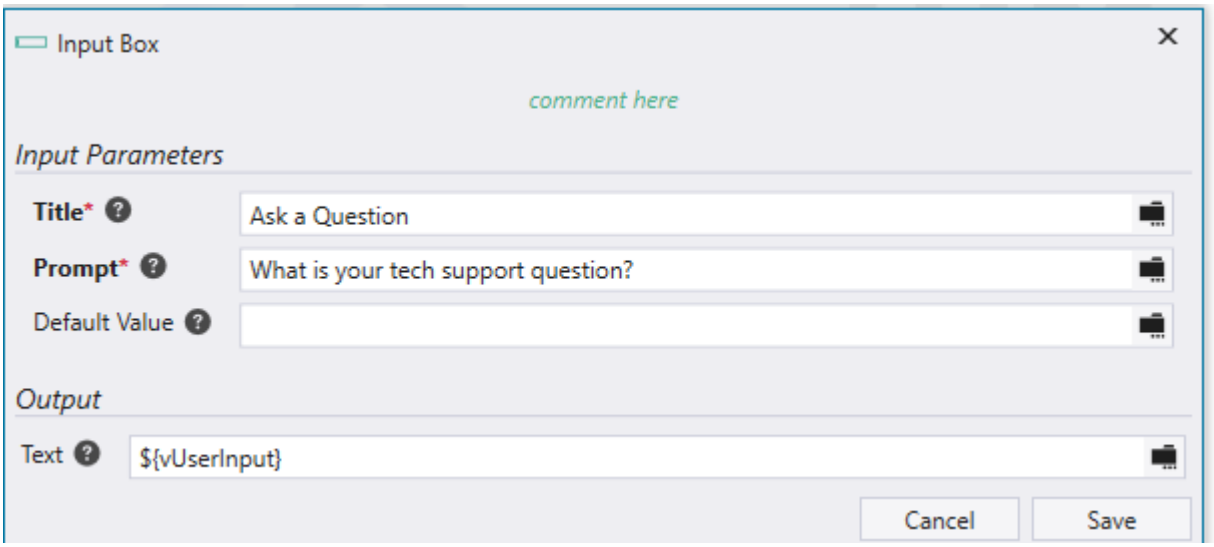
Search the toolbar for an “Input Box” command



Drag the command to your palette

Provide the following fields:

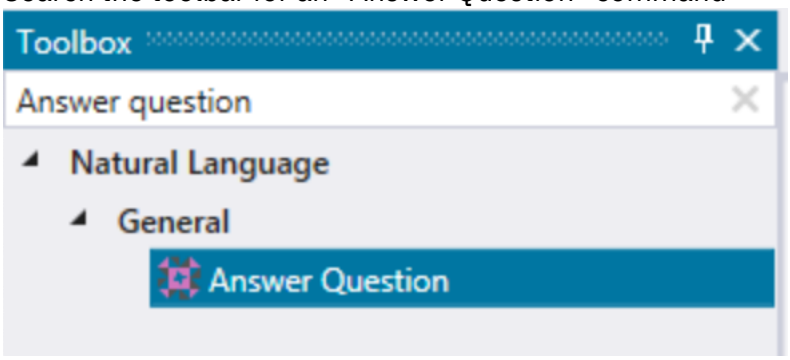
Title: Ask a Question
Prompt: What is your tech support question?
Text: vUserInput



Click Save

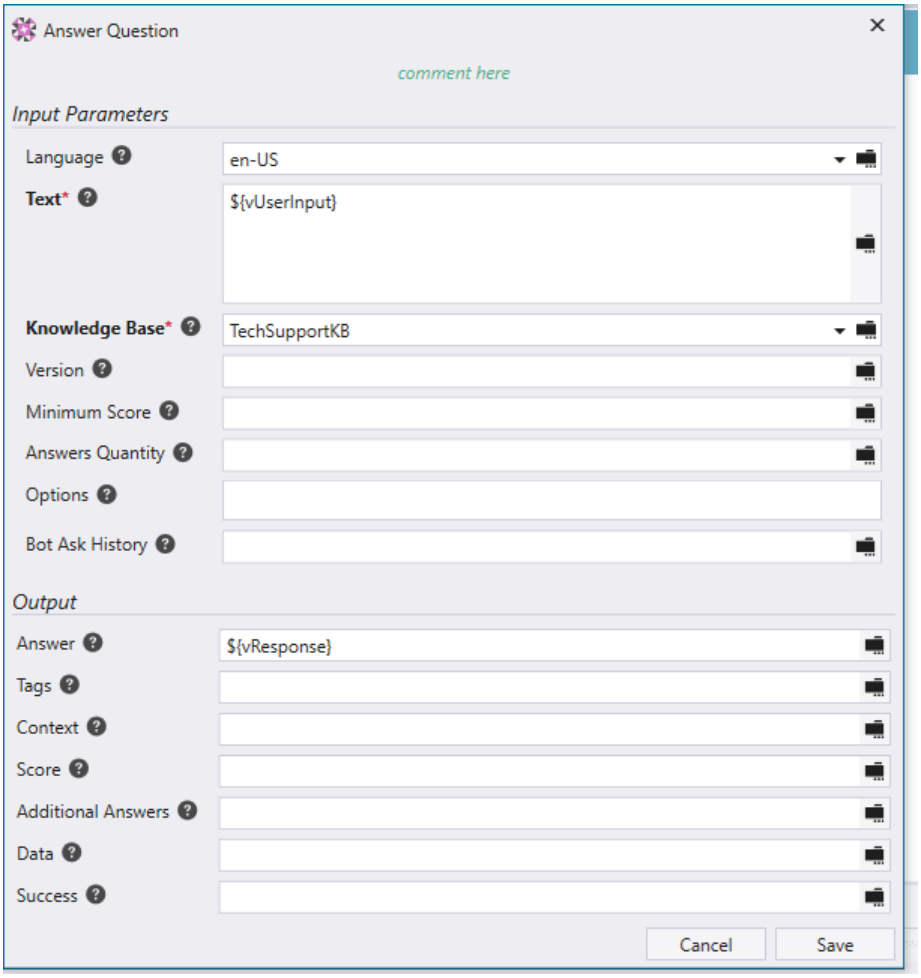
4.6.2 Answer Question Command

Search the toolbar for an “Answer Question” command



Drag the command to your palette under the first command

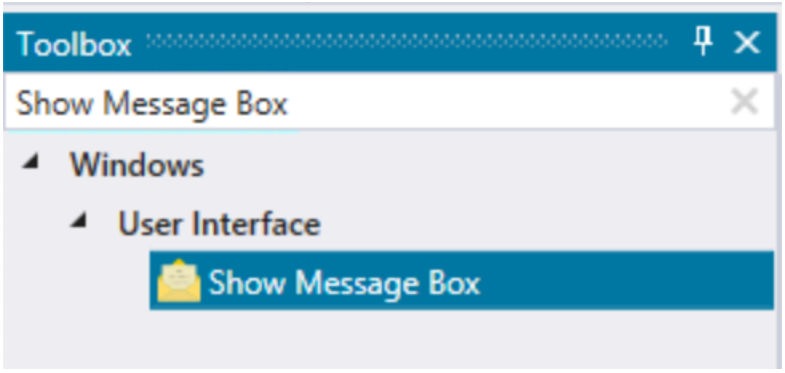
Provide the following parameters to the input fields. Note when entering *Knowledge Base* you should select your uploaded KB from the previous step.



Click Save

4.6.3 Show Message Box Command

Search the toolbar for a “Show Message Box” command

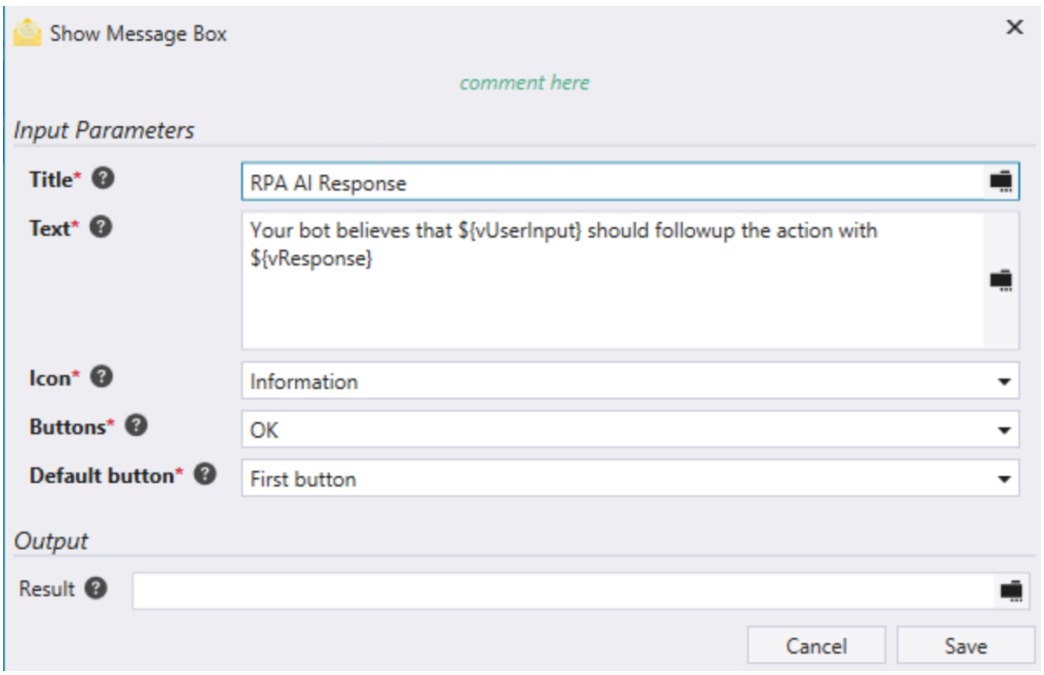


Drag the command to your palette under the second command

Provide the following inputs:

Title: RPA AI Response

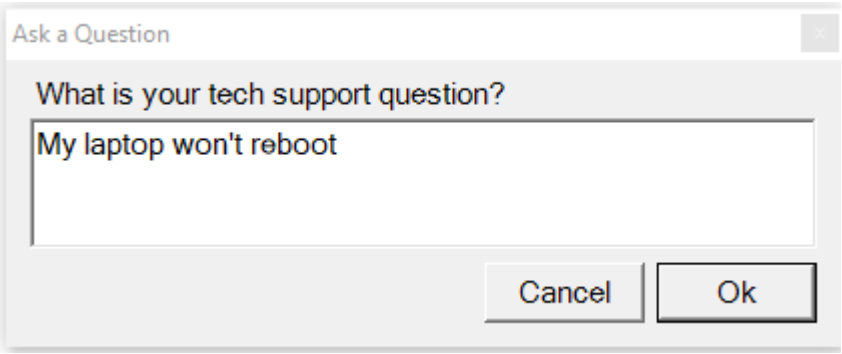
Text: Your bot believes that ${vUserInput} should followup the action with ${vResponse}

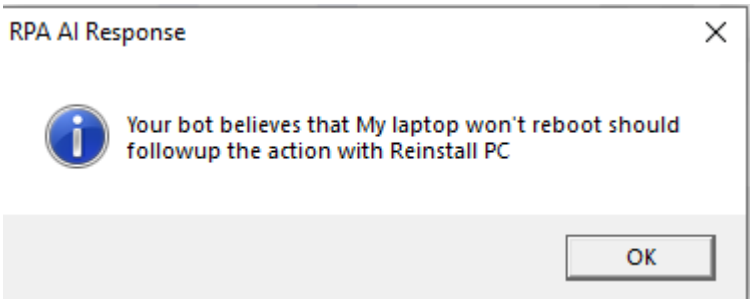


Click Save

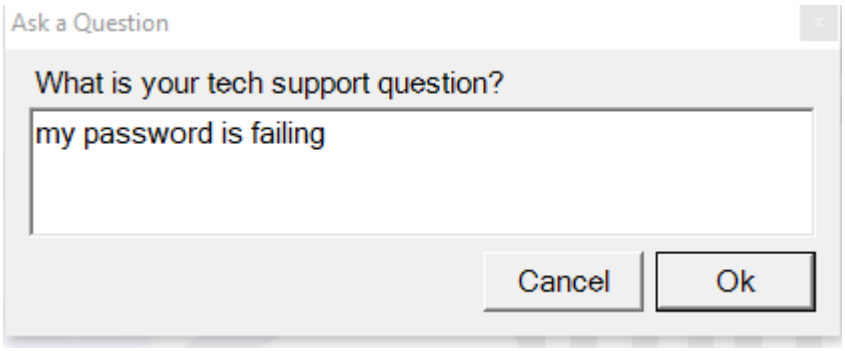
4.7 Run Script

Run the script with Ctl+F5. Enter the following question:





Now run the script again. This time enter the following:



Not that both questions entered were not an exact match of any of the questions entered in the knowledge base. RPA uses machine learning to classify the question to give the most appropriate answer. This is AI in action!

5 Third Scenario – Knowledge Base Training

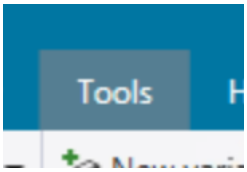
In this scenario, we will train the knowledge base.

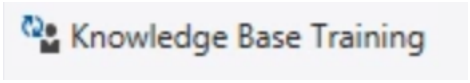
5.1 Real World Alignment

Updating a knowledge base spreadsheet can be time consuming and error prone. To make things easier, you can train the knowledge base within RPA studio.

5.2 Navigate to Knowledge Base Training

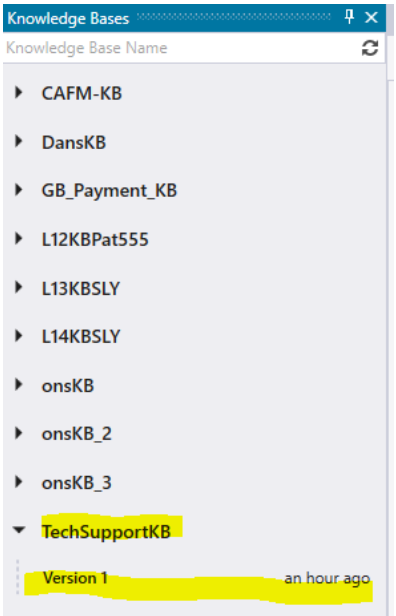
Click Tools at the top of the screen and select the Knowledge Base Training option

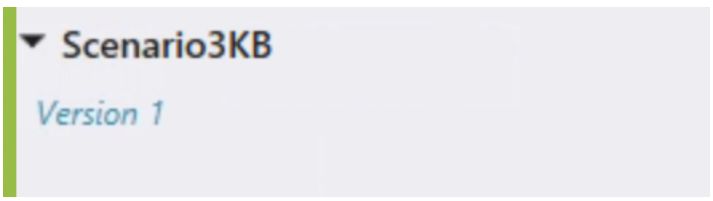




5.3 Open the Knowledge Base

You will see *Knowledge Bases* pop up on the left side. Within this tab, find *TechSupportKB* and select Version 1. See below:

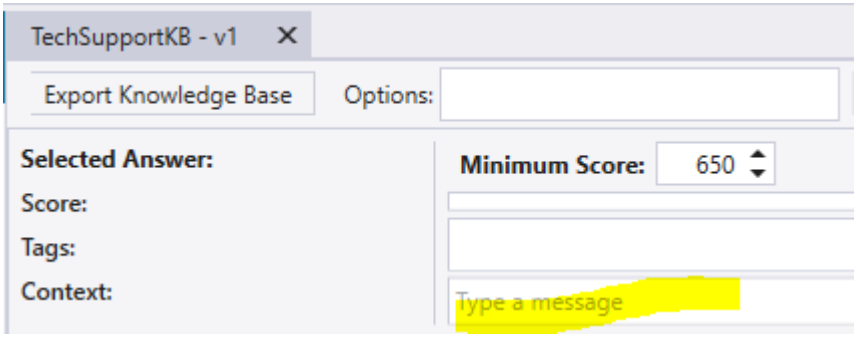




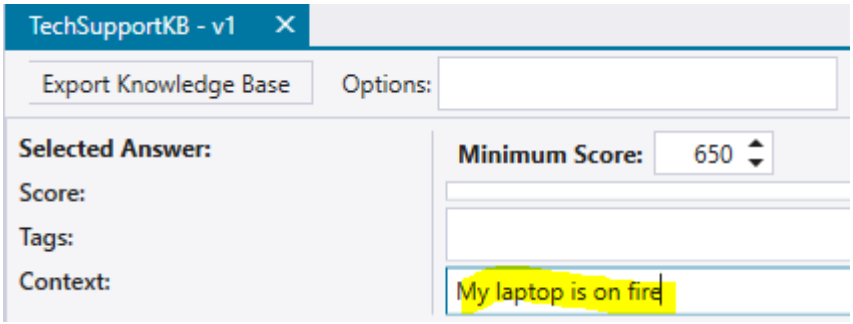
5.4 Training the Knowledge Base

5.4.1 Add new classification

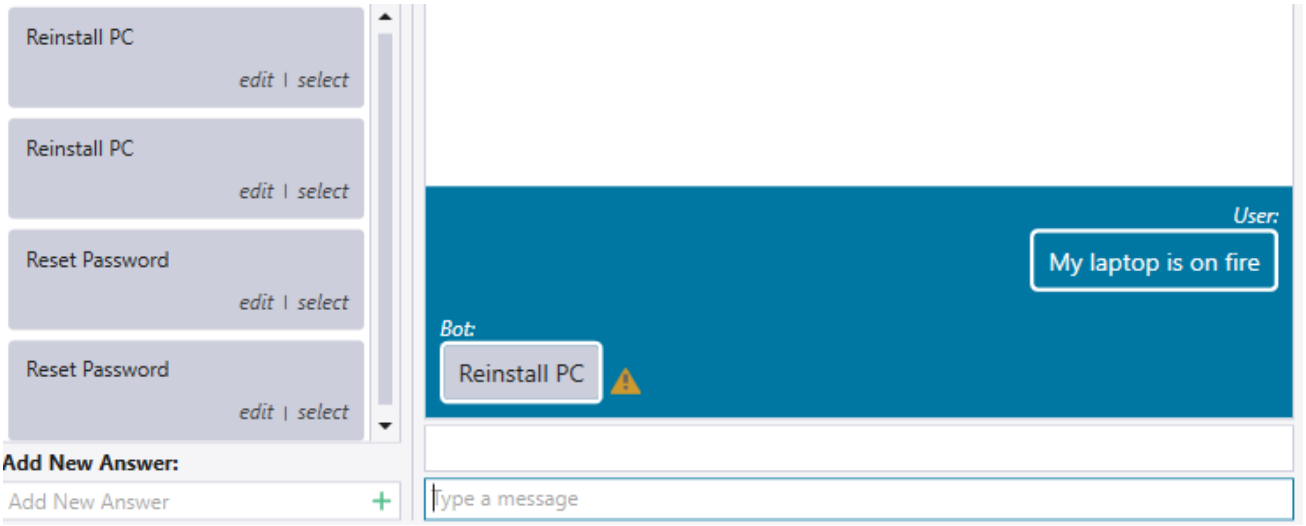
In this exercise you will add a new classification. Find the Context text box:



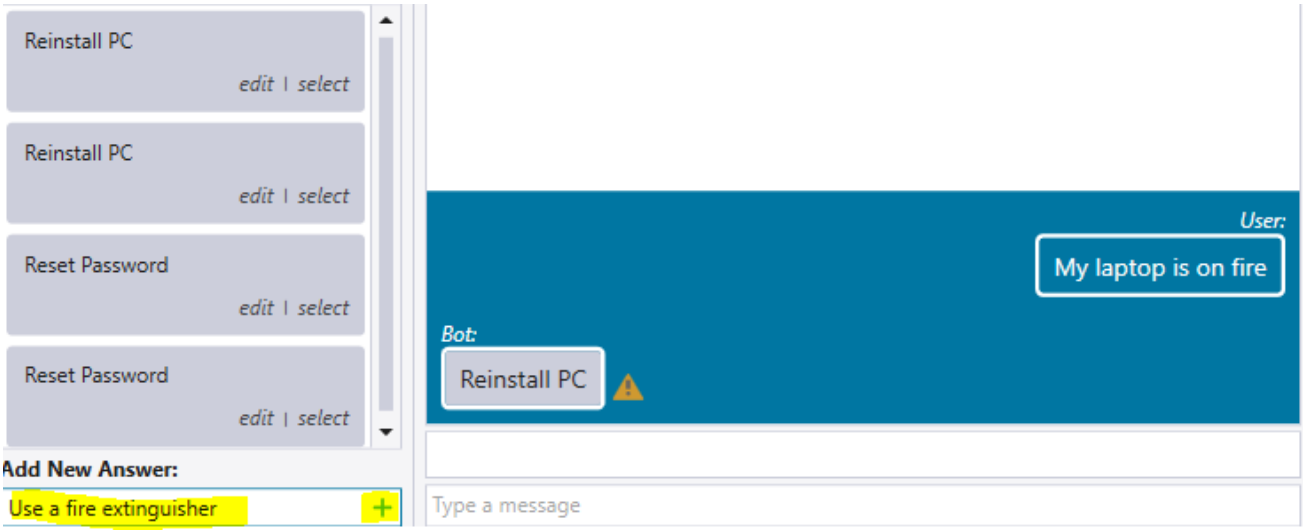
Replace "*Type a message*" with "*My laptop is one fire*" and hit *enter*.:



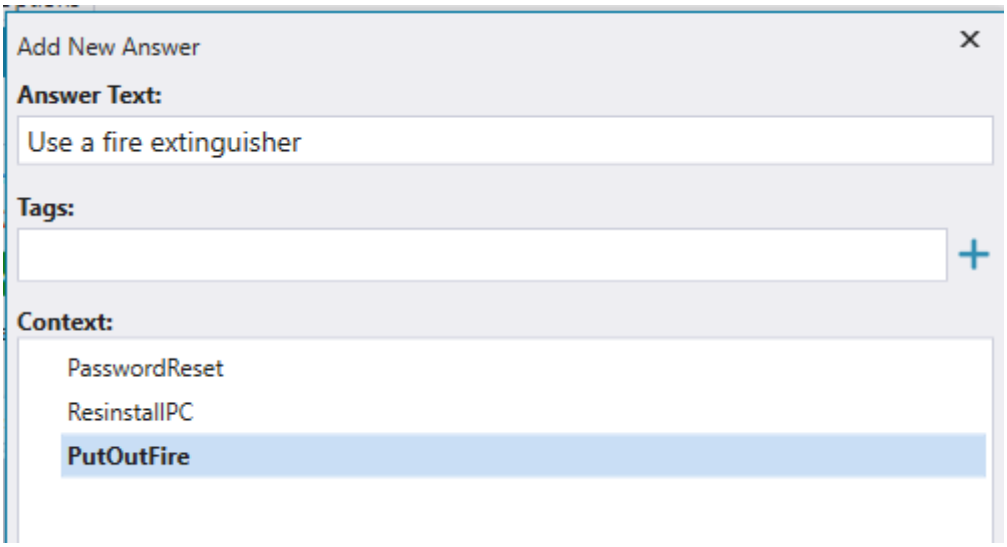
You should see the following:



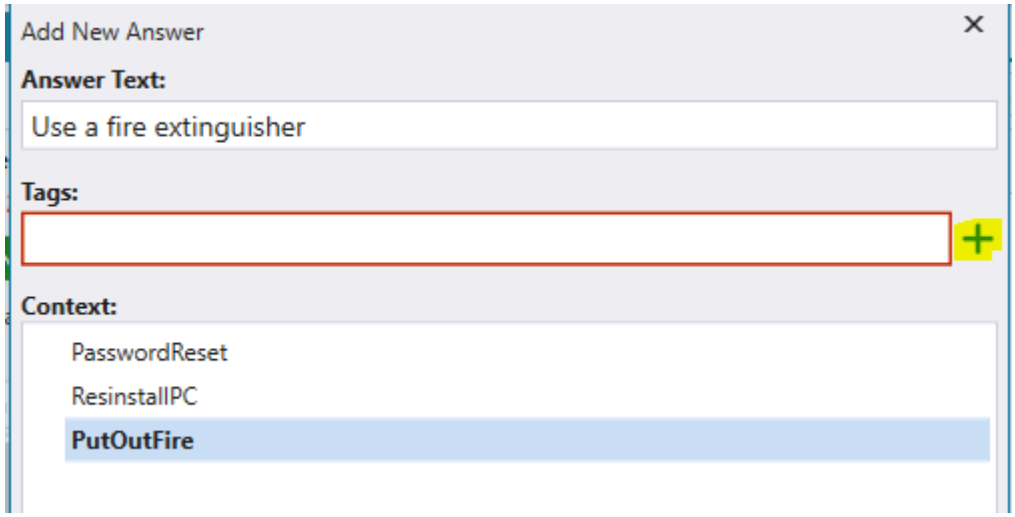
On the left side of the Knowledge Base, add a new answer "*Use a fire extinguisher*":



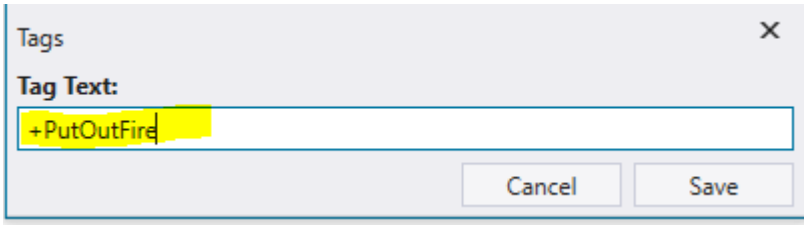
Select the + button to add the answer to the knowledge base. The Add New Answer panel should appear. Select *+ Add new* and enter a new context of *PutOutFire*. You should now see the following:



Now select the + to the right of the Tags Text box:

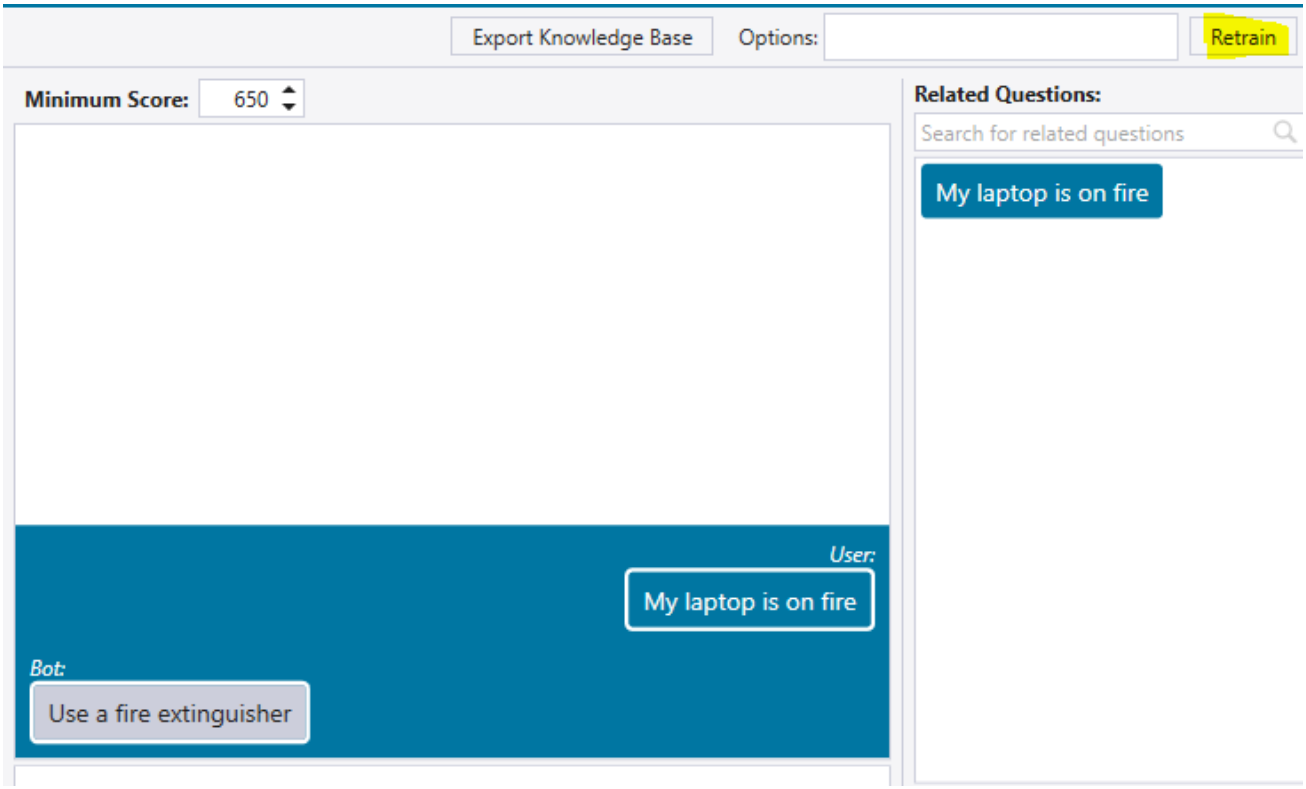


The Add New Answer panel should appear. Enter +PutOutFire. Note the + symbol must be the first character.



Press *Save*. And then *Save* again.

Click "*Retrain*" in the top right corner (see below). This will update the knowledgebase.



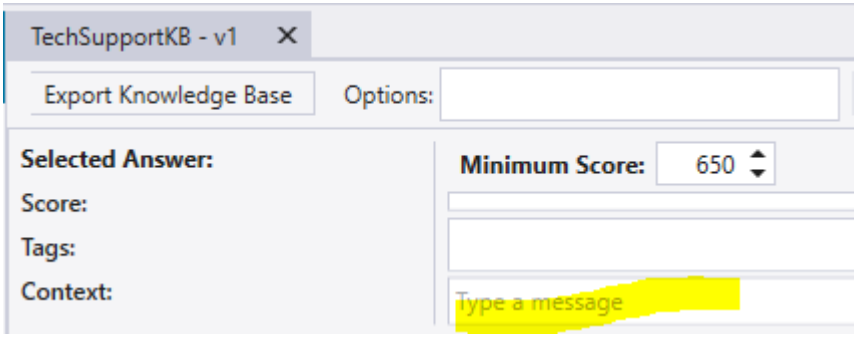
5.4.2 Test new classification

Inside the "Type a message" field, enter "*My laptop is on fire*". This time the answer is successfully classified as "Use a fire extinguisher".

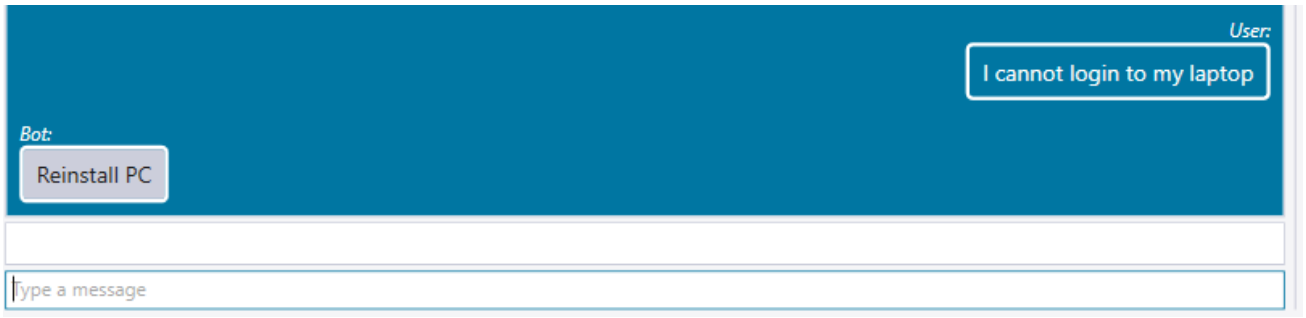
5.4.3 Reclassification

In this exercise you will continue working with the same knowledgebase, but this time reclassify an existing sentence.

Find the Context text box:

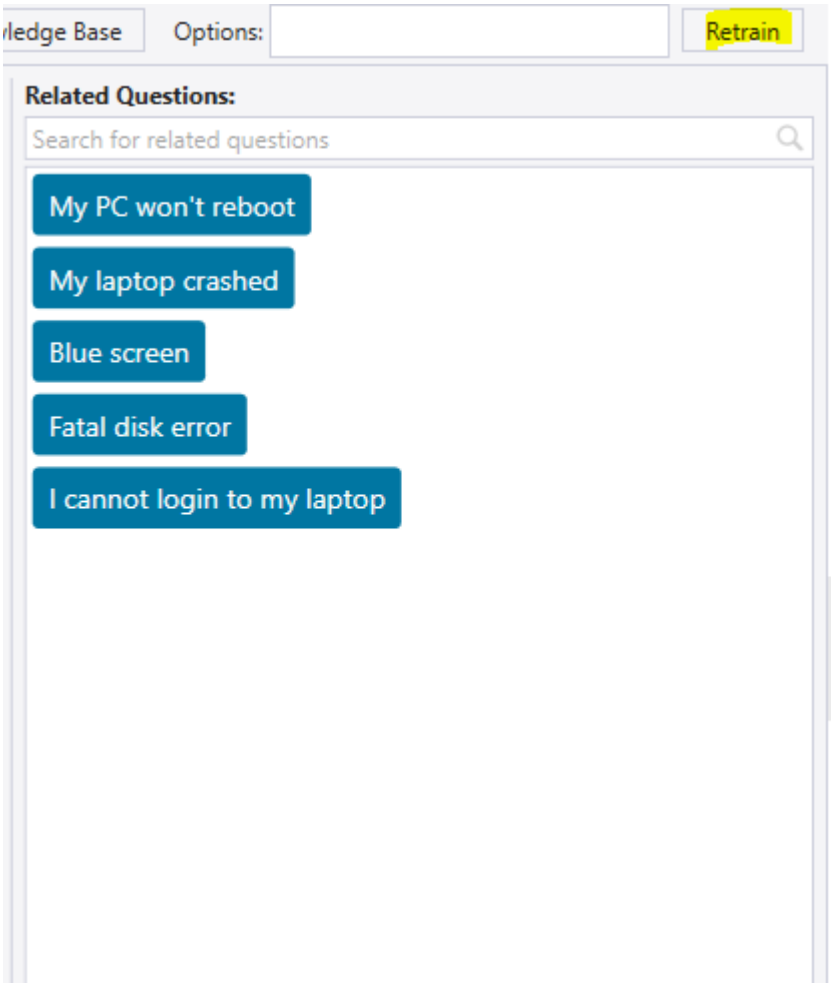


Replace "*Type a message*" with "*I cannot login to my laptop*" and hit *enter*.:



The AI engine thinks the question "*I cannot login to my laptop*" most closely maps to the Answer "*Reinstall PC*". This is the wrong answer - It should be "*Password Reset*". We must retrain it.

On the left side, click *Select* on one of the "*Reset Password*" entries, then click "*Retrain*" in the top right corner (see below). This will update the knowledgebase.

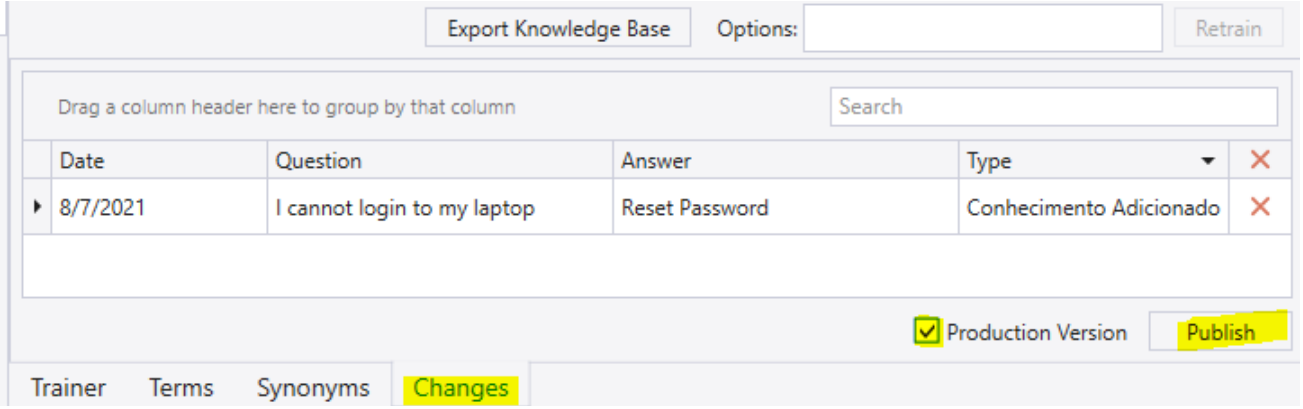


5.4.4 Test reclassification

Inside the "Type a message" field, enter "*I cannot login to my laptop".* This time the answer is successfully classified as "*Reset Password*".

5.4.5 Save changes

To persist your changes, click on the *Changes* tab at the bottom of the knowledge base panel, click *Production Version* check box and press the *Publish*:



The knowledge base is now saved on your tenant where any bot referencing it can use it. To prove this, re-rerun the bot as described in section 4.7 and verify your changes.

6 Fourth Scenario – R Script

R is an open-source language for statistical computing . In this scenario, we will integrate R with WAL script for statistical analysis.

A prerequisite for running R is to install it. The latest compatible version is here:

https://cran.r-project.org/bin/windows/base/old/3.4.4/

Note: newer versions of R are not supported within IBM RPA. Once you have installed R you need to restart RPA Studio for it to pick up the R install location.

6.1 Scenario Description

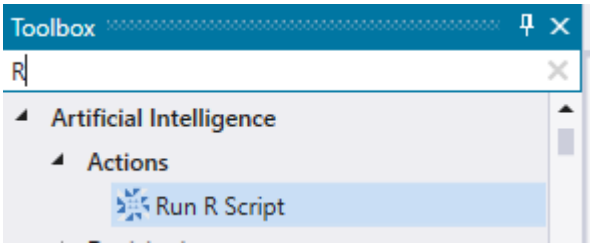
The Focuscorp sales director needs to track the performance of her tele-sales team. She requires a push button on her laptop to chart the top performing sellers. You are an automation developer responsible for implementing this.

6.2 Open a work in progress script

Open the folder entitled *Scenario 4*. Open IBM RPA Studio and select *Open* in the top left. Go into *Scenario 4* folder and open *Scenario 4 Started.wal*. Your script will open in Studio.

6.3 Run the R Script

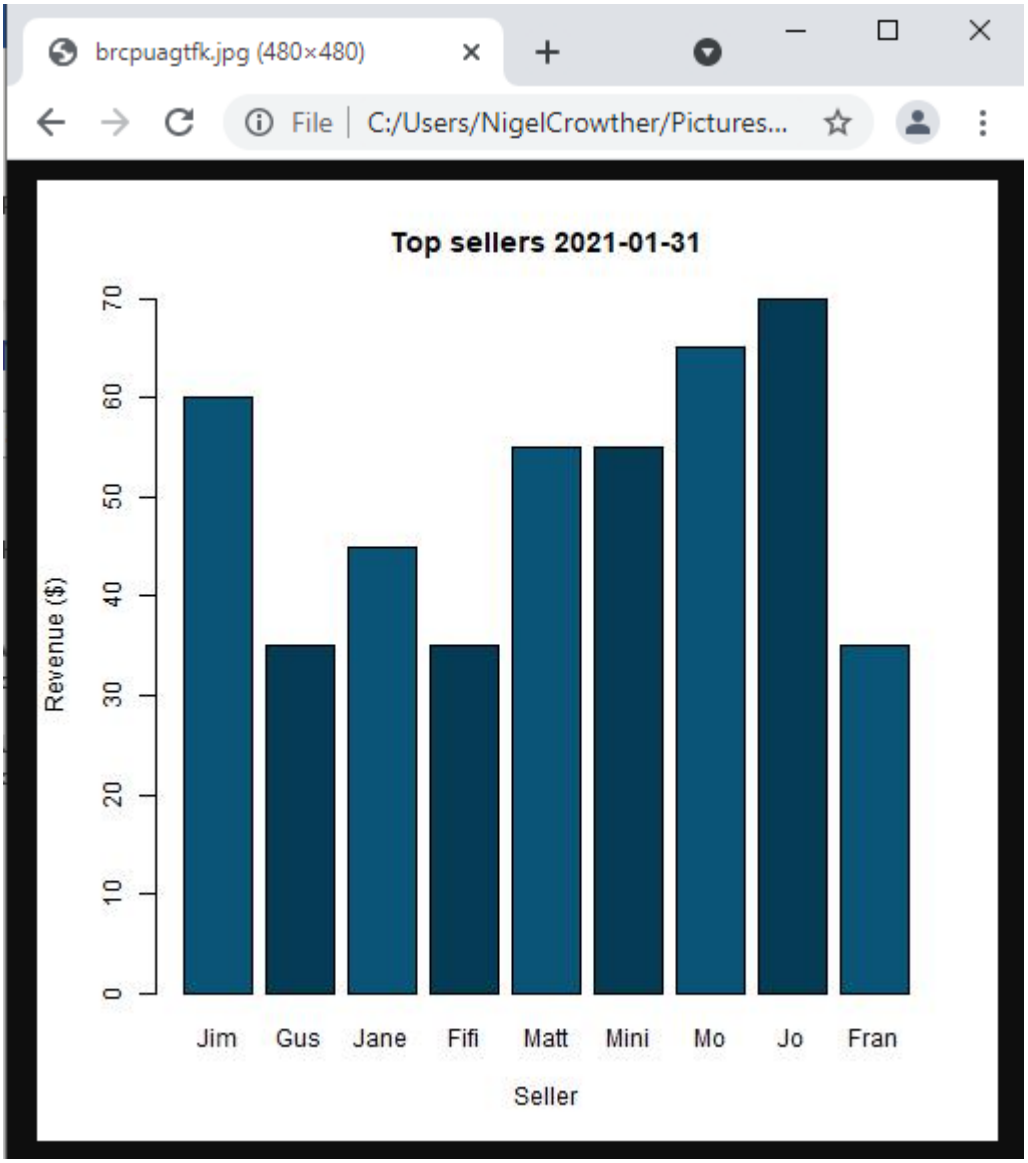
Search *R* in the toolbar search.



Drag the command to line 20 and paste in the following R code:

```
sellers <- c(${sellers})
quantities <- c(${quantities})
myPicturesPathR <- ${myPicturesPathR}
pictureName <- ${pictureName}
barplot(quantities, main=paste("Top sellers ",${currentDate},sep=""), xlab="Seller",
ylab="Revenue ($)", names.arg=sellers, col=c("#0a5477","#053b54"), ylim=c(0,70))
dev.copy(jpeg,filename=paste(myPicturesPathR,"\\",pictureName,".jpg",sep=""))
dev.off()
```

Press Save. Now Run the script. You should see the following graph appear in your browser:



6.4 Advanced - if you have time

Set up the bot so that it can be launched as an attended bot

Congratulations! You have completed the lab.