3. Out-of-box Artificial Intelligence

In this lesson

Learn about the artificial intelligence that runs out-of-the-box in IBM watsonx Assistant.

Prerequisites

Complete this section with the assistant you used in the Section 2 **or** your own assistant. If you want to use your own assistant, you must upload the following Action skill which reflects the skill after completing Section 2, but note that this will overwrite your existing actions.

Table of Contents

3. Out-of-box Artificial Intelligence *1*
AI in Action(s) 1
Disambiguation / Ask Clarifying Questions 3
What is disambiguation? 3
See Disambiguation at work 3
Autolearning 5
Digression / Change conversation topic 6
What is a digression? 6
See Digression at work 6
Slot-filling 7
Practice, practice, practice 10
Try it: Build a custom disambiguation and digression 10
Disabling digression and disambiguation 11
The power of out-of-the-box AI 15
Report an issue *15*

AI in Action(s)

Welcome back to the watsonx Assistant hands-on lab! Out of the box, the actions that you built in section *2. Actions* are already equipped with powerful artificial intelligence features from watsonx Assistant. This section of the lab will look at some of these capabilities – let's begin!

Open your assistant on the Lendyr.com website (consult the **Preview your assistant on Lendyr Bank's website** portion of section *2. Actions* if you forget how to do this) or in the Preview page of your assistant, and try out the following conversations:

Say "account opening". What happens? (The goal of this question is for you to think about how to describe this behavior, which is a form of conversational AI, in your own words.)

Say "I want to open a new account". Then, ask "How long does it take to open a new account?" and continue with the action. What did the assistant do when you interrupted its train of thought?

Next, say "open an investment account," followed by "actually make it my checking account". What does the assistant do?

Start a new conversation. This time, say "wowww I'm so frustrated, please let me talk to a real human".

What does the assistant do?

This time, say "I want to open a new investment account". Then respond with anything but a number – like your email address, a word – such as your favorite type of vegetable, and phrase about the weather.

What does the assistant do?

Each of these conversations, and the behavior they prompted from the assistant, reflect a different artificial intelligence feature built into watsonx Assistant!

Disambiguation / Ask Clarifying Questions

What is disambiguation?

Disambiguation is a technical term for asking clarifying questions.

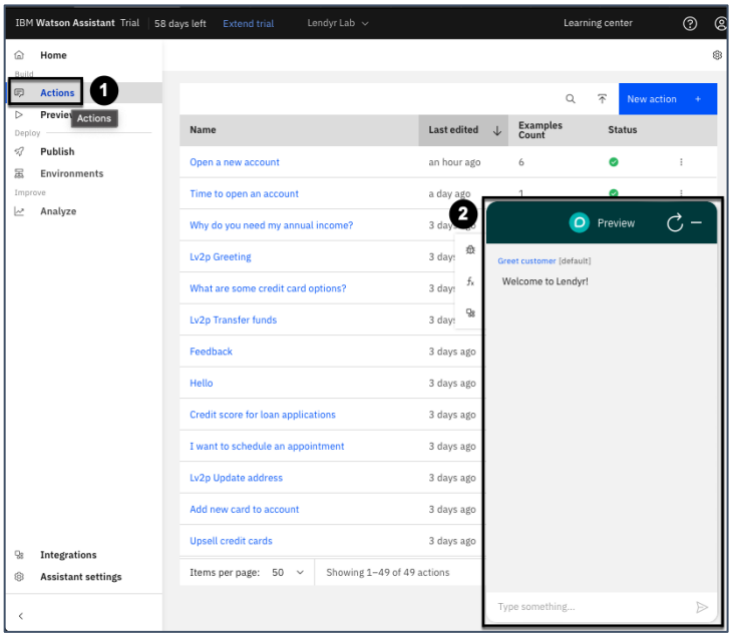
We, as people, often detect and respond to ambiguity. For example, imagine I told you, "I just saw my friend Arvind with binoculars!" Does this mean Arvind was carrying a pair of binoculars? Or does it mean I used a pair of binoculars to see Arvind?

To understand my meaning, you might identify the top two most likely meanings — (1) I used binoculars to see Arvind and (2) Arvind had binoculars when I saw him — and then ask a clarifying question to learn which one I meant.

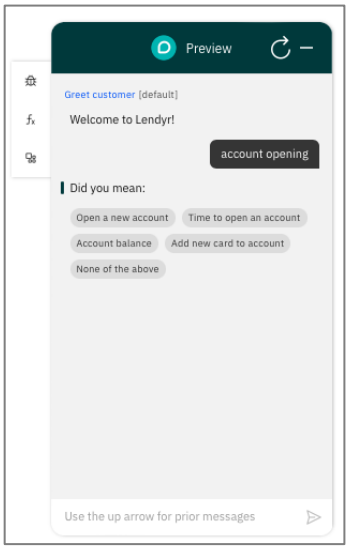
IBM watsonx Assistant does the same thing! Assistant asks clarifying questions when it identifies several plausible actions that the end user might be interested in performing. IBM watsonx Assistant ranks these plausible actions by assigning them a confidence score. The more confident watsonx Assistant is in having correctly identified the end user's intent, the higher the confidence score, and the higher that action is ranked in the suggested actions.

See Disambiguation at work

To see the confidence scores, you must be in the Preview window within the Actions page. Go back to your assistant's **Actions** (1) page, and open the **Preview (2)** (as shown below):

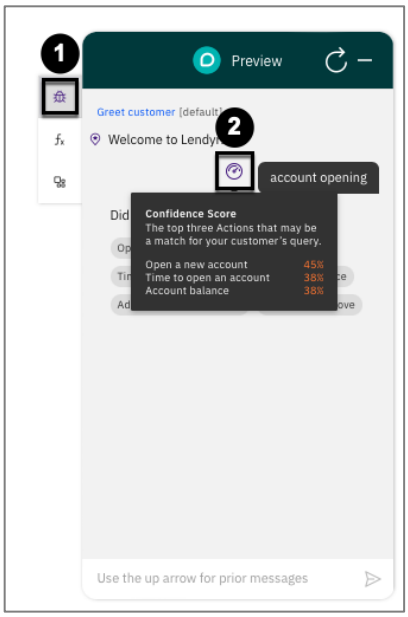


Say “account opening,” and note the clarifying question that your assistant asks in response to the input:



To view the confidence scores in your assistant, as shown below:

1. Click the **Debug mode** icon.
2. Hover your mouse over the **dial icon** next to the “account opening” message.



Industry tip: Developers and technical stakeholders often use the terms **disambiguation** and **ask clarifying questions** interchangeably for this type of functionality.

Additional notes:

- Your confidence scores may differ from those above, as you may have brainstormed and added different customer utterances to this action in section *2: Actions*.
- If you do not see the "Did you mean" message above, you may have added a customer utterance in Section 2 of this lab that helps your assistant understand what you mean without further clarification required. If this is the case, you have trained your assistant so well that it is confident enough not to ask any clarifying questions! You can still click debug to see the confidence scores.

Autolearning

When end users interact with your assistant, they provide the assistant with a lot of data on their behavior. IBM watsonx Assistant pays attention to this, and it learns from such behaviors over time.

Consider disambiguation. When your assistant asks a clarifying question and shows a list of suggested actions, if end users most often click the same one (option #2, for example), then your assistant should (and does!) learn from that experience.

It learns that option #2 is likely to be the best answer to that type of question. Next time, it may list option #2 as the first choice, so end users can get to it more quickly.

And, if the pattern persists over time, your assistant can change its behavior even further. Instead of asking the customer to choose from a list of options, it will choose option #2 as the answer, rather than asking for clarification.

As watsonx Assistant learns, end users get the best answer more often, in fewer clicks, and their experience improves!

Now, imagine that a product manager for a virtual assistant asks you: "I've heard that some AI tools improve themselves automatically. Does watsonx Assistant do this?"

How would you respond? Describe autolearning and its value in your own words.

Write your answer above or, to see others' answers, submit your answer here.

Note: Based upon your conversations with your assistant and the kind of answers you provide it, your assistant may at times act or say things that are different from what is in this guide. This may be because your assistant is autolearning from your interactions.

Digression / Change conversation topic

What is a digression?

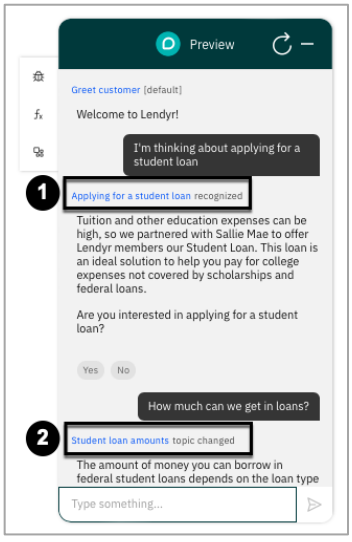
We, as people, often get distracted or change the subject during a conversation. For example, imagine I was telling you an incredibly interesting story about seeing my friend Arvind with binoculars. To you, this might be far from the most interesting story you had ever heard. You might interrupt and say, “Wow! Also, before I forget, I got some cheap tickets to see the Jets next month. Want to come with me?”

End users also want to be able to change the topic when they interact with a virtual assistant. IBM watsonx Assistant is flexible: it can seamlessly switch between actions when the end user wants a change.

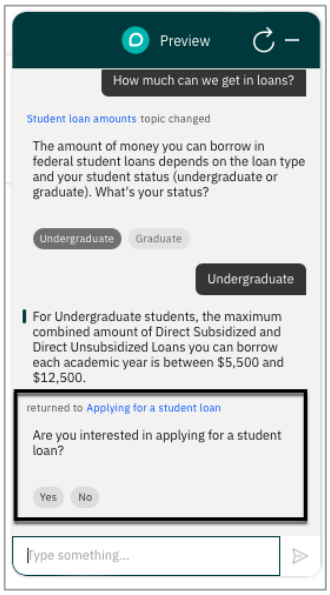
In practice, end users often change the topic as they proceed through an action in order to learn more about the intermediate steps in that action. For example, an end user might ask about the transfer limit as they walk through a transfer funds action. In another example, as can been seen during the Show Feature Tour on Lendyr Bank’s assistant, an end user might ask why a company needs to know their annual income as they walk through a loan application form. To address such topic changes, builders often write several actions that address the same topic. This can add a lot of additional work, but it makes their virtual assistant more robust, equipped to handle a broad range of questions that end users might ask before completing their primary task. With watsonx Assistant’s Digression capability, builders do not need to do this additional work!

See Digression at work

Here is an example of digression where watsonx Assistant moves between different actions. In the Preview, type “I’m thinking about applying for a student loan”. Note that the assistant recognizes the **Applying for a student loan** action **(1)**. Then, type in “How much can we get in loans?”, and note that the assistant digresses to the **Student loan amounts** action **(2)**:



Then, once you complete the new **Student loan amounts** action by selecting "Undergraduate," the assistant returns to the original **Applying for a student loan** action:



Think about your industry and use cases, or an industry and related use cases for one of your clients. Brainstorm an action that end users might want to complete, then write down a few topic changes or quick Q&As they might interrupt the conversation with as they complete the action:

Write your answer above or, to see others' answers, submit your answer here.

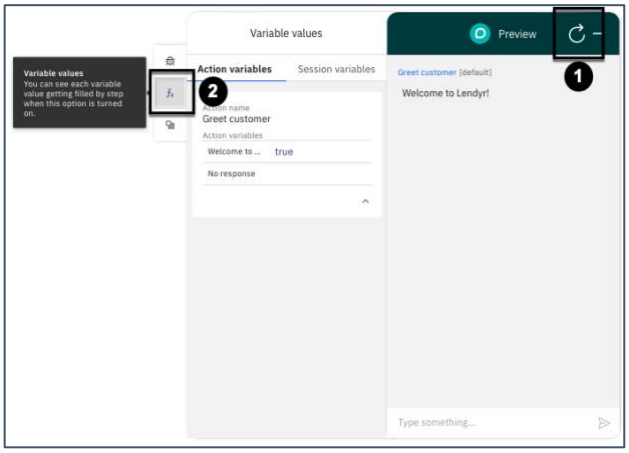
Important note: When you configure your assistant to accept a response from the end user, that response has a defined type. Response types can be free text, currency, or options. (For example, in Section 2 you created a *number* input when asking *What's your investor number?*) IBM watsonx Assistant *does not allow* the end user to change the topic when the response type is free text.

Industry tip: Developers and technical stakeholders often use the term **digression**, **interruption**, or **change conversation topic** for this type of functionality.

Slot-filling

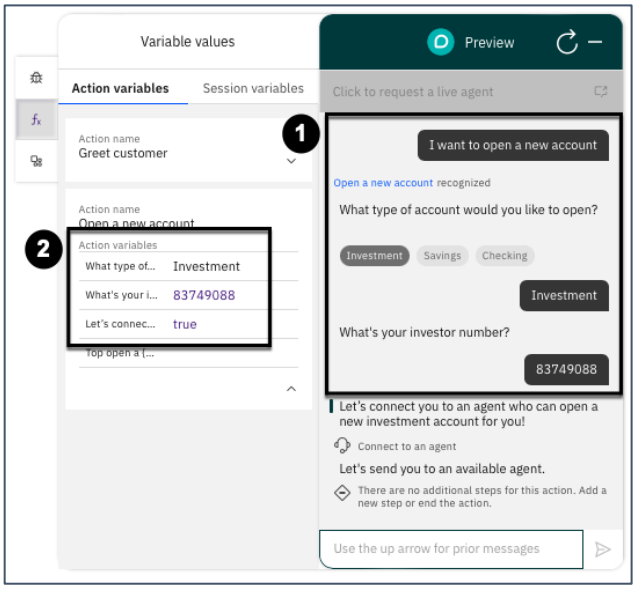
Slot-filling is a term that refers to storing information that the end user shares with the assistant. You can think of the assistant as storing each piece of information in a slot.

For example, open your assistant's Preview panel from the Actions page, or if you have an active chat window, hit **Refresh (1)** to start a new chat. Then, click the **f_x (2)** button. You will see each of the slots that the assistant maintains, which are filled over time with information from you (the builder), integrations, or the end user:



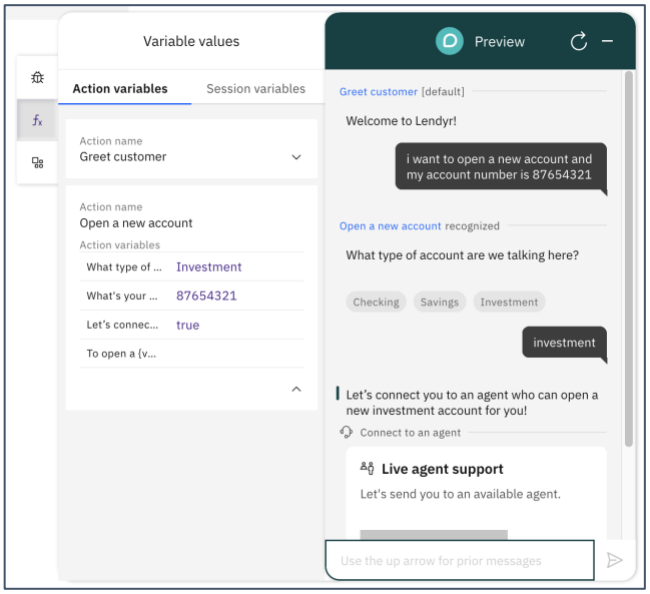
Enter the utterances shown below in the **Preview (1)**, and note how the slots get filled in the **Action variable window (2)**:

- "I want to open a new account"
- "Investment"
- "837479088"



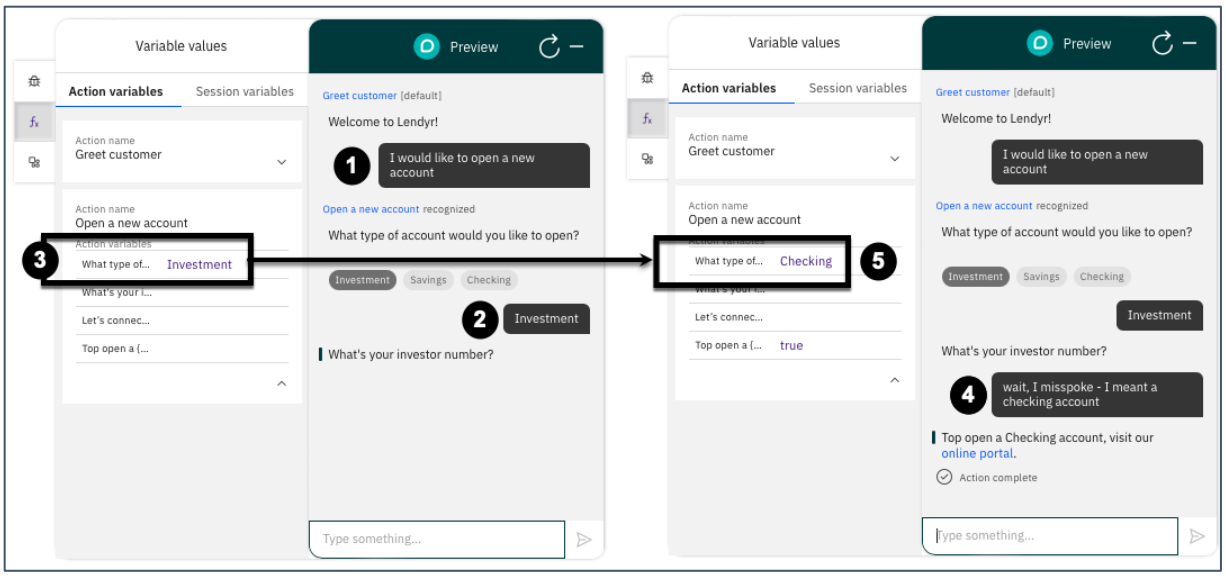
This, by itself, is not an artificial intelligence feature. Artificial intelligence comes in when the end user corrects themselves or provides information out of order or ahead of time.

Click **Refresh** and say "I want to open a new account and my investor account is 8875888", and then select "investment" for the type of account. Note that watsonx Assistant puts the investor number in its slot, even though in Section 2 you told watsonx Assistant to expect it in a subsequent Step:



What you just saw is information that was provided ahead of time, or out of the expected order. Regardless, watsonx Assistant's AI was able to process it, and populate the correct slots.
An end user may also wish to correct themselves, which is also a normal feature of human conversation. Click the **Refresh** icon, and try this conversation, also shown in the image below:

1. Say "I would like to open a new account".
2. Pick "Investment" as the type of account.
3. Note that "Investment" gets put in its respective slot.
4. Then, say "wait, I misspoke - I meant a checking account".
5. Note that watsonx Assistant replaces the value in the *type of account* slot.



You can now exit out of the debug mode. Simply click the ***fx*** icon again.

Practice, practice, practice

Altogether, disambiguation / ask clarifying questions, digression / change conversation topic, autolearning, and slot-filling allow end users to interact naturally with virtual assistants.

End users can say confusing things, interrupt themselves or interrupt the assistant, misspeak or misspell and then correct themselves, or share unsolicited information. None of this will cause them to run into a dead end with watsonx Assistant.

As someone learning to build with watsonx Assistant, you may be asked to demo watsonx Assistant's artificial intelligence features to someone else. For disambiguation and digression, this requires some creativity. You need to be able to think of plausible scenarios where an end user would provide an ambiguous input that prompts the assistant to **ask clarifying questions**. You need to be able to think of an action where an end user might reasonably **change the topic** once or twice before returning to complete the action.

Try it: Build a custom disambiguation and digression

Earlier in this section, you wrote a response to the following prompt:

> *Think about your industry and use cases. Brainstorm a few actions that end users might want to complete, then write down a few topic changes or quick Q&As for each action that they might interrupt with as they complete the action.*

Go back to your response to that prompt. Choose an action that end users might want to complete as well as a few topic changes or quick Q&A actions, then add them to your assistant.

As you build your own custom actions, make sure they can do the following:

- Reliably trigger disambiguation
    - Having trouble? Make sure the new actions have similar example phrases, with at least five example phrases each and similar verbs/nouns in their example phrases.
- Show the confidence scores the assistant calculates for actions in response to an input
- Reliably trigger digression, both leaving an action to go to a new action and then returning from the new action to the original action
- Do all the above in a way that fits into a plausible story and use case

If you were able to build an action based on your own use case, congratulations! You've customized the Lendyr demo for your own use case. Try practicing each of the features while telling the end user story.

Disabling digression and disambiguation

While digression and disambiguation are enabled by default for all actions, builders can enable or disable disambiguation and digression, either across the entire assistant or for specific actions.

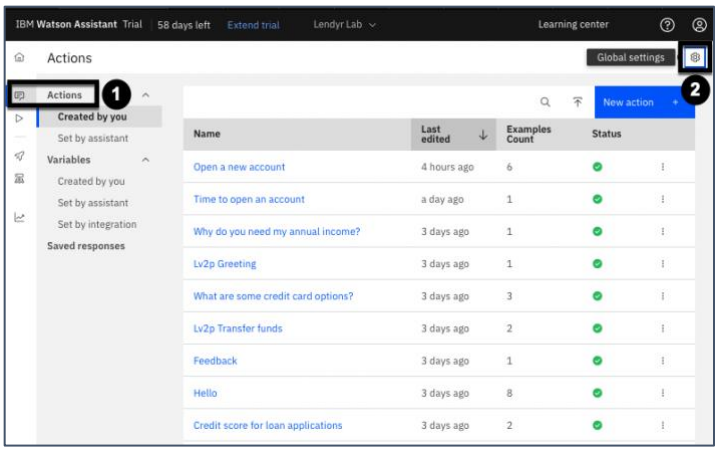
When disambiguation is disabled across the entire assistant, the assistant will never ask for clarification. It will either go to an action or tell the end user it does not understand their message. When disambiguation is disabled for a specific action, that action will never be suggested by the assistant as a potential option for the end user to choose from.

When digression is disabled across the entire assistant, the assistant will never allow an end user to change the topic. The end user must finish their current action before moving to a new topic. When digression is disabled for a specific action, the assistant will not allow the end user to change topics to or from that specific action.

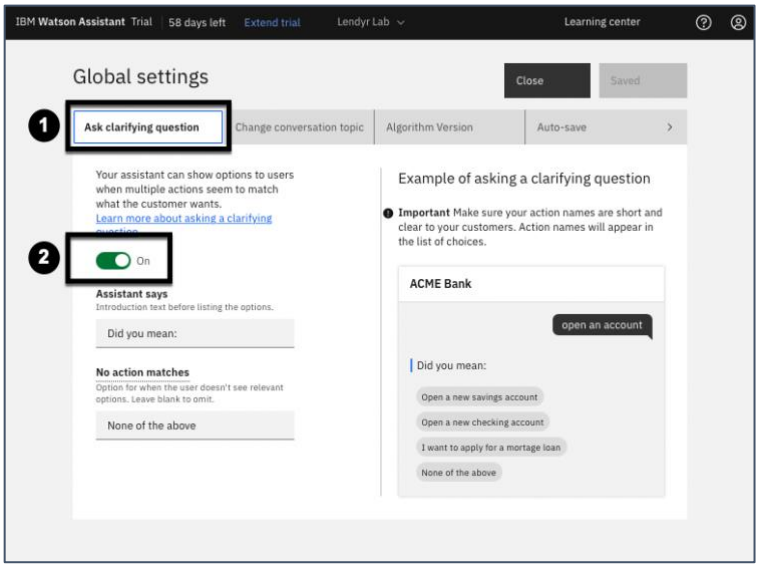
Take a minute to think about why a builder might want to disable disambiguation across the entire assistant. How about disabling it across some specific actions? What about disabling digression across the entire assistant? How about disabling digression for some specific actions? Write down your thoughts.

Write your answer above or, to see others' answers, submit your answer here.

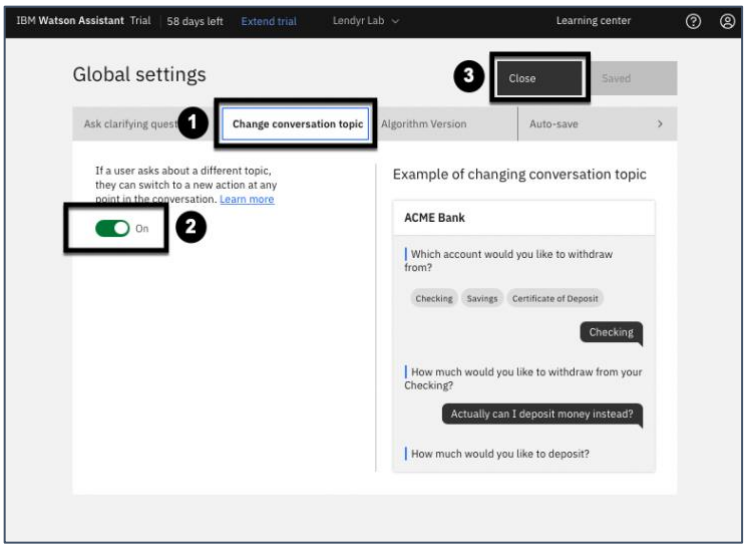
Now practice disabling disambiguation and digression for your assistant. As shown below, go to the **Actions (1)** page, then click the gear icon in the top right to open the **Global settings (2)**.



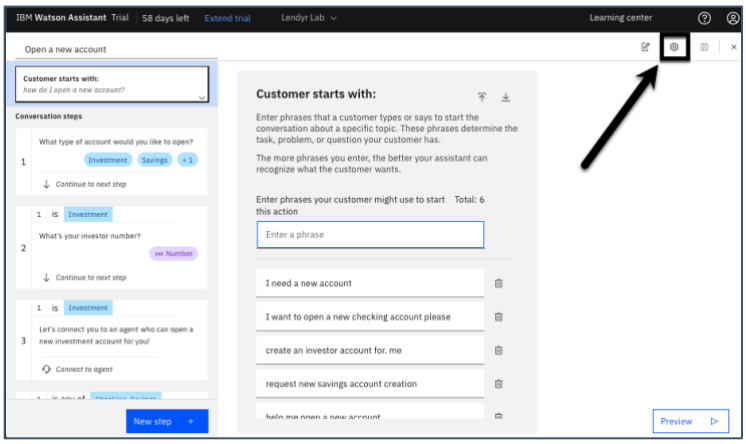
The global settings window opens directly on the **Ask clarifying question (1)** tab. This is where you can toggle disambiguation **On** or **Off (2)** for all actions. Leave it On for now.



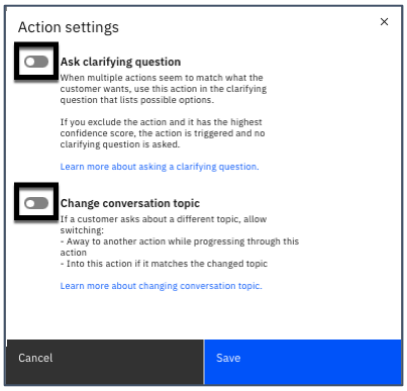
Next, move to the **Change conversation topic (1)** tab, shown below. This is where you can toggle digression **On** or **Off (2)** for all actions. Leave it On. You will test turning both features off for an individual action, instead. Hit **Close (3)** to return to the **Actions** window.



Now, practice disabling disambiguation and digression for a specific action. Click on the "Open a new account" action, then click on the **Action settings** icon:

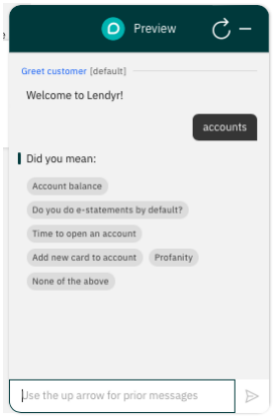


Then, switch both toggles to **Off**, and hit **Save**:



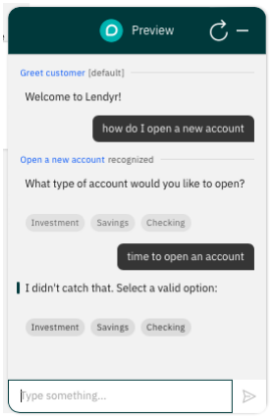
Note: It was important to leave disambiguation and digression enabled in the global settings, otherwise the toggles for specific actions would have been locked in the **off** position.

Now, go back to the **Preview** panel, and try these brief conversations. Type “accounts”:



Note that on the left, the “How do I open a new account” action is not shown as a suggestion – this is because you just excluded it from disambiguation.

Now, Refresh the chat, and type “how do I open a new account”. Then, instead of responding to the assistant’s question of what type of an account you want to open, try to force a digression by saying “time to open an account:”



Note that it does not let you digress when you ask how long it takes to open an account.

Note: Toggle both features back on if you intend to continue using your demo outside of this lab.

The power of out-of-the-box AI

What is the value of these features to an organization?

For a builder, watsonx Assistant's artificial intelligence is accessible. Each of these artificial intelligence features are available in watsonx Assistant out of the box and are *enabled and functional* as soon as a builder starts authoring actions. The Preview panel's debug mode and variable values make it easy to track the artificial intelligence as it influences the behavior of the assistant. A builder can toggle features on or off at the assistant or action level with the click of a button.

For a developer, watsonx Assistant's artificial intelligence requires minimal configuration, maintenance, and training. Disambiguation, digression, slot-filling, and confidence scores all work off the same example phrases, which a builder can provide. Note that an organization's team of builders will often include various subject matter experts (SMEs), who are a great resource for providing accurate and comprehensive example phrases. Autolearning improves the assistant's performance automatically. Each of these features can be controlled in the user interface, so a developer is not required to manage them via an API.

For a product manager who owns an organization's virtual assistant implementation, the accessibility means that they do not need to staff a team of data scientists and machine learning engineers to launch and scale their assistant. IBM watsonx Assistant's scalability drives down their total cost of ownership and out of the box accessibility accelerates their time to value.

Great work! That concludes this section of the lab. In the next section, you will learn about key success metrics for virtual assistants and how to track these using watsonx Assistant's analytics features.

For those interested in watsonx Assistant's artificial intelligence features, later sections of this series explore intelligent search and suggestions, expressive voice models, and more configurable artificial intelligence features available in watsonx Assistant.

Report an issue

Report an issue, share feedback, or request a change or addition to the hands-on lab here.