IBM watsonx.ai Technical Essentials

Technical Hands-on Lab

Course code W7S169G

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This document contains instructions for all the guided exercises presented in the 'IBM watsonx.ai Technical Essentials' course. Use it for future reference or during the course workflow as guidance to perform the tasks.

To access the classroom environment, you log in to the IBM Cloud with your valid IBM Cloud credentials. You use the IBM's Software as a Service (SaaS) offering available in the IBM public cloud. If you do not currently have valid IBM Cloud credentials, the first exercise guides you to register for an IBM Cloud account to obtain your IBM Cloud credentials.

The rest of the prompt engineering exercises are done in the IBM public cloud by using the watsonx.ai platform.

Contents

1. Prepare the Lab Environment

Estimated time

20:00 minutes (to complete this section)

Overview

In this exercise, you set up your IBM Cloud account and log in to the watsonx platform. If you already have an account, you can skip the creation of an IBM Cloud account (Section 1.1 of this lab guide).

After the creation of an IBM Cloud account, you switch platforms and log in to the watsonx platform.

Objectives

After completing this exercise, you should have an existing IBM Cloud account and be logged in to watsonx.

To complete all exercises in this lab, you need to have a running instance of Watson Machine Learning. You create a Watson Machine Learning service by using the Lite plan and associate the service to a project.

At the end of this exercise, you have access to the wasonx.ai Prompt Lab.

Requirements

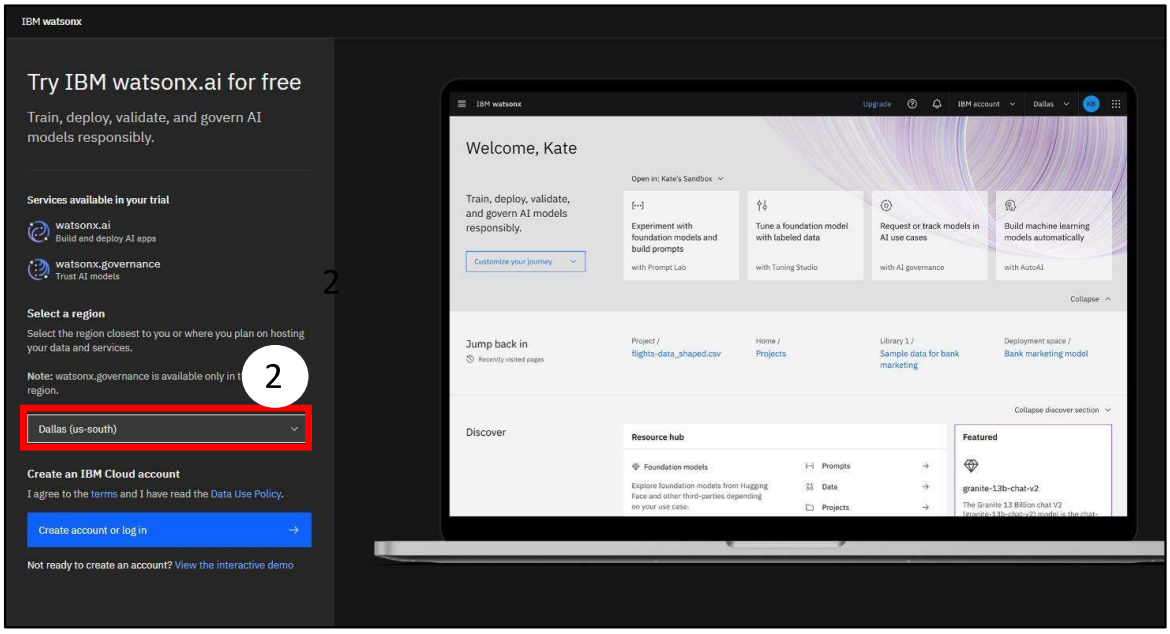
- A valid email address and password.
- Personal information such as name, country, and phone number.
- Billing and payment information.

1.1 Create an IBM Cloud account

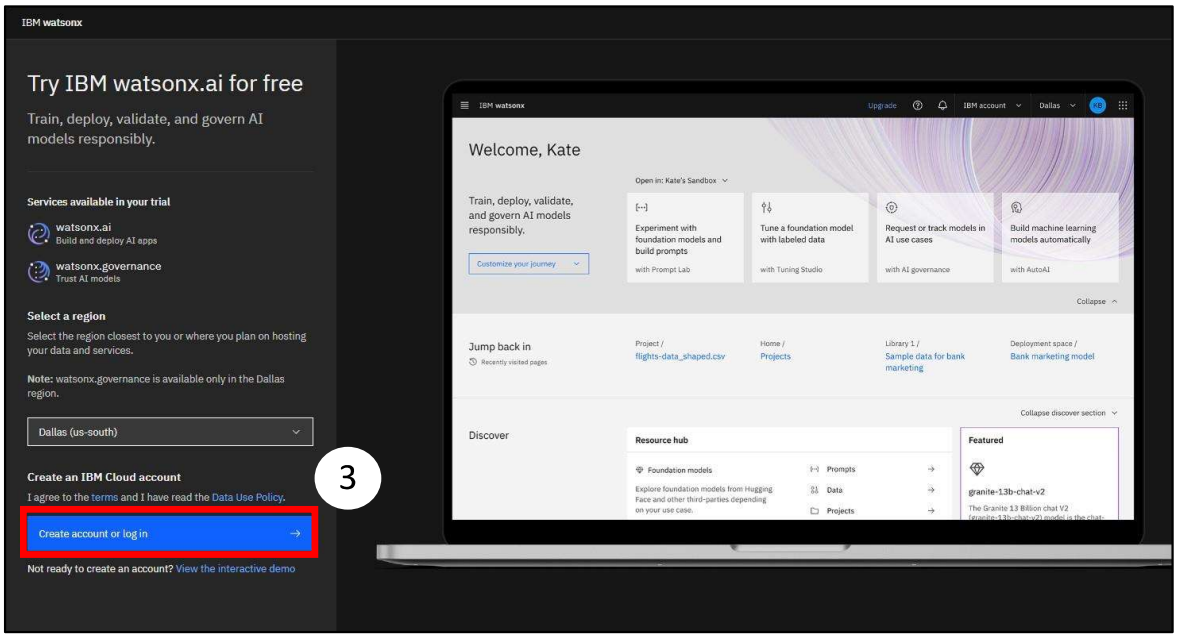
To get started, you need to get access to the lab environment in IBM Cloud.

1. If you currently have valid credentials to an IBM Cloud account, proceed to section 1.2 (Log in to watsonx). If you **do not** currently have valid IBM Cloud credentials, navigate to Try IBM watsonx.ai for free | IBM watsonx page and complete the registration process by following the steps in this section.

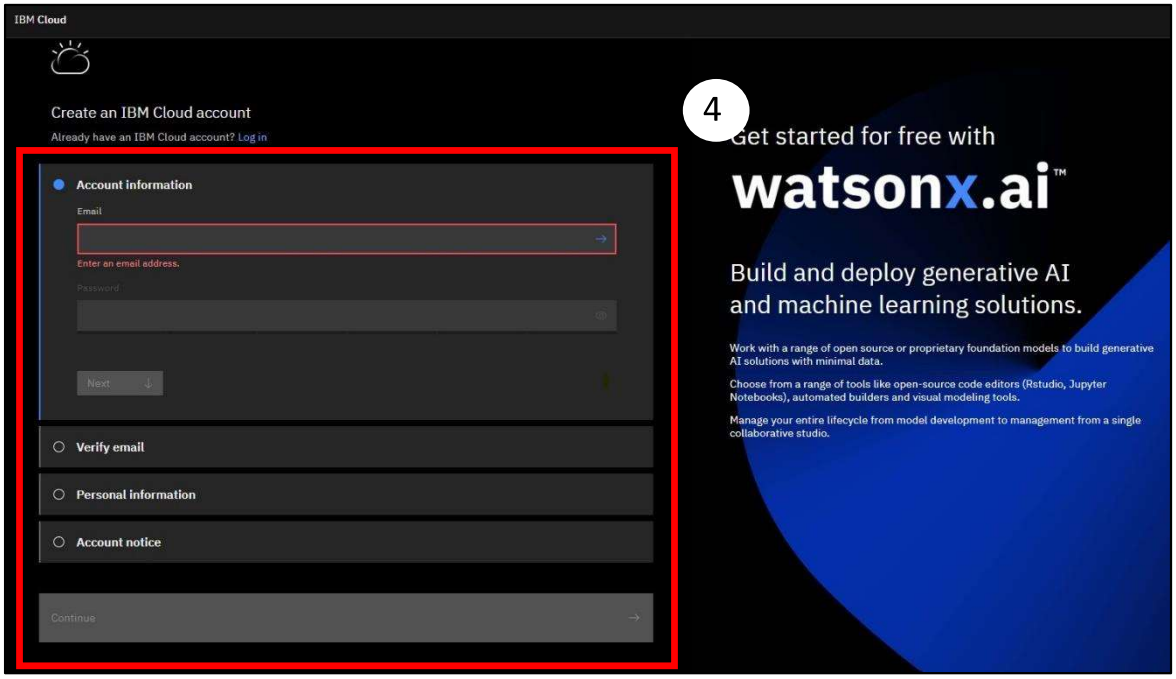
2. Click on the **Select a region** drop-down menu and select the **Dallas (us-south)** region.



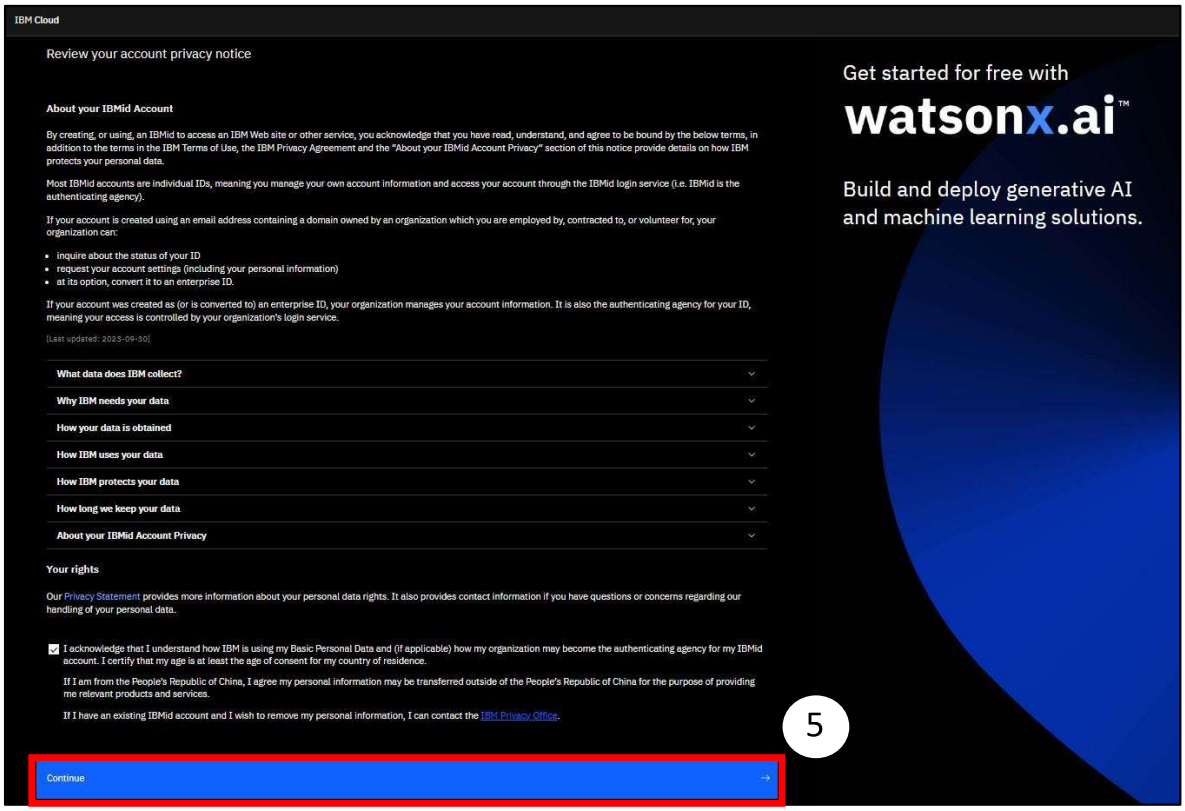
3. Click the **Create account or log in** button.



4. If you are not a current IBM Cloud account holder, complete the account information, verify your e-mail, accept the product terms and conditions, and click **Continue**. If you are an IBM Cloud account holder, log in to verify that your account is still active and continue with Section 1.2.

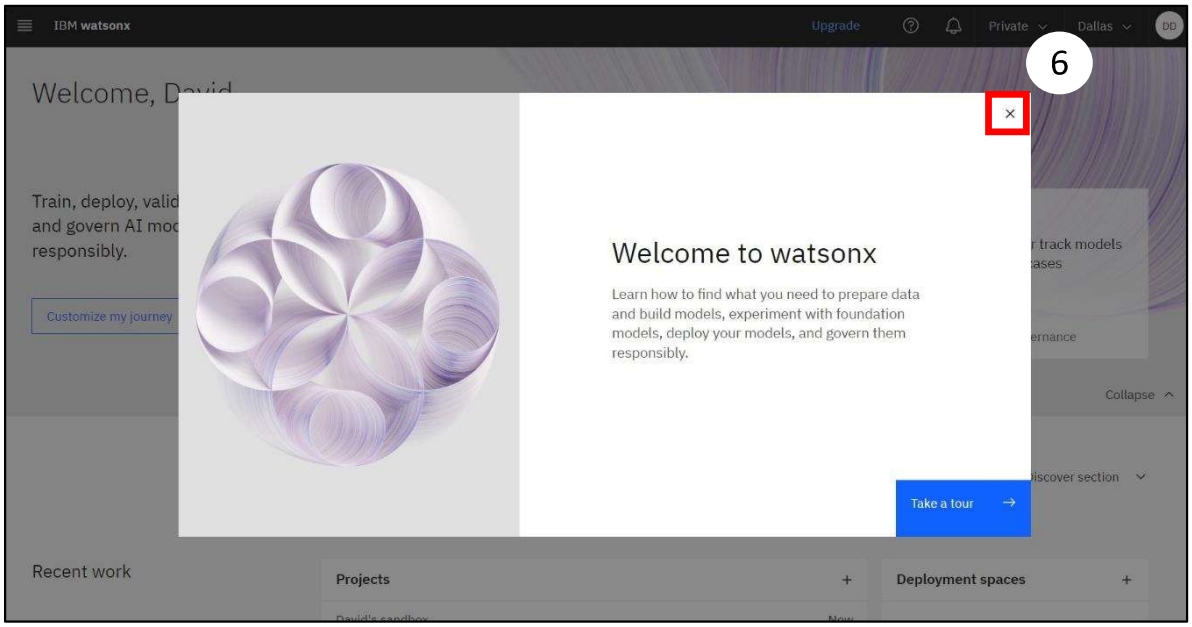


5. Review how IBM will use your personal data and click **Continue** (remember to record your **IBM Cloud credentials** for future use).



6. Select the **I Agree to the terms and data use policy** check box and close the **Welcome to**

watsonx window by clicking on the **x** in the upper-right corner of the window.



You successfully registered and logged in to **watsonx**.

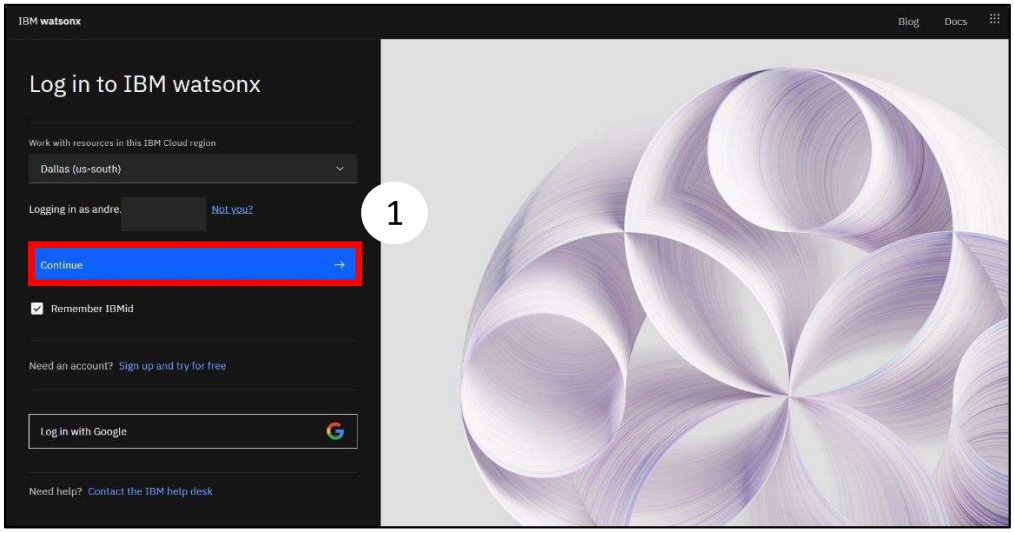
7. Continue with Section 1.3.

1.2 Log in to watsonx

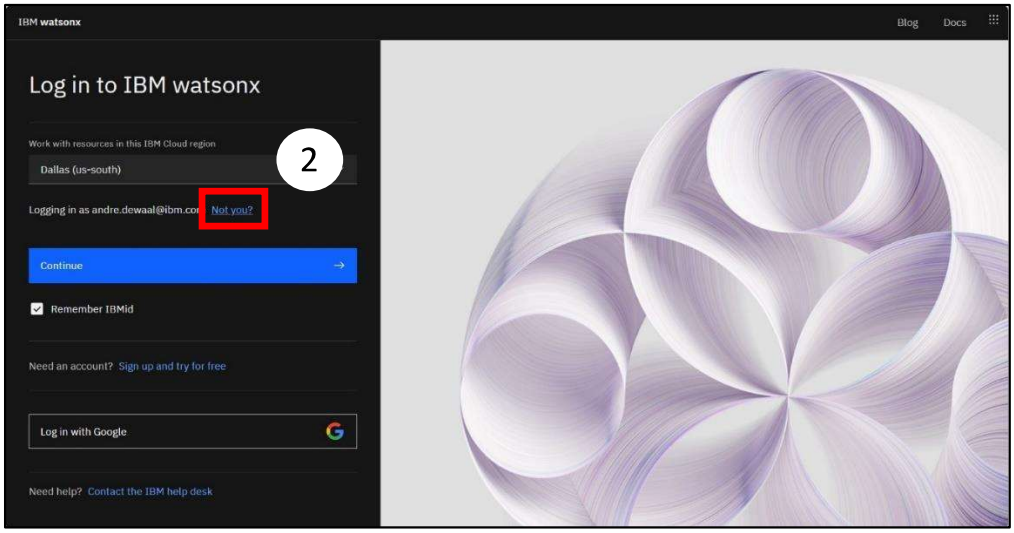
To get access to the lab environment, you log in to the watsonx platform.

1. Go to the IBM watsonx login page and log in with your **IBMid** and **password**. If the displayed credentials are correct, click **Continue** to log in to the watsonx platform and then proceed with step 4. Otherwise, continue with step 2.

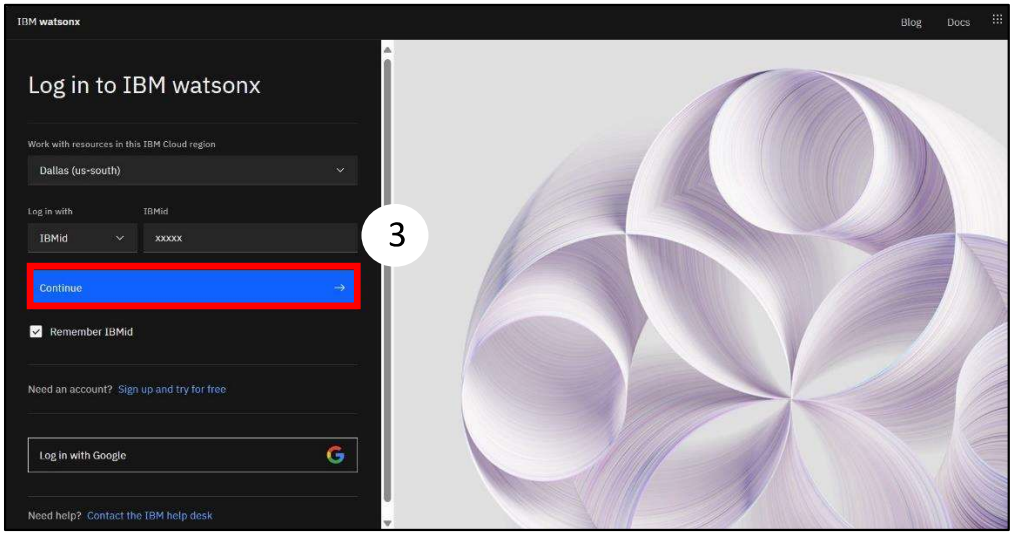
   Note: The number **x** in the black (or white) circle corresponds with the action that you need to perform in step **x** of this section of the lab. You are currently on step 1 of this section.



2. Click **Not you?** to take you to a log in screen where you can provide your IBM Cloud credentials to log in to watsonx.

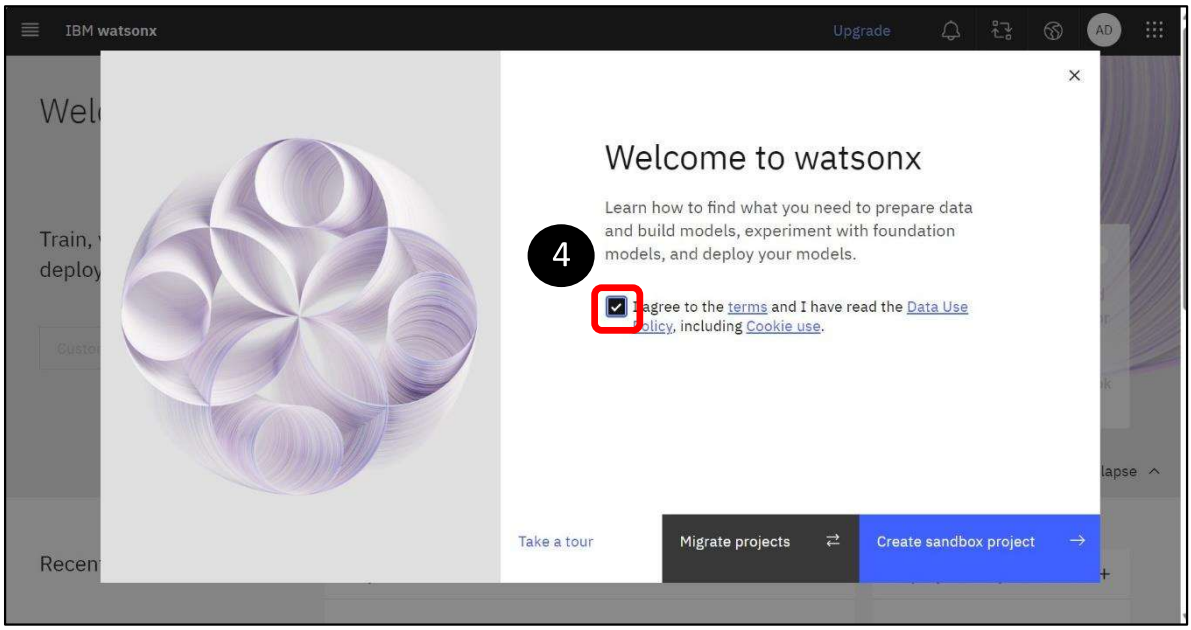


3. Fill in your IBM Cloud id in the **IBMid** text box (replace xxxxx with you Cloud id) and click **Continue** (provide your password if required).

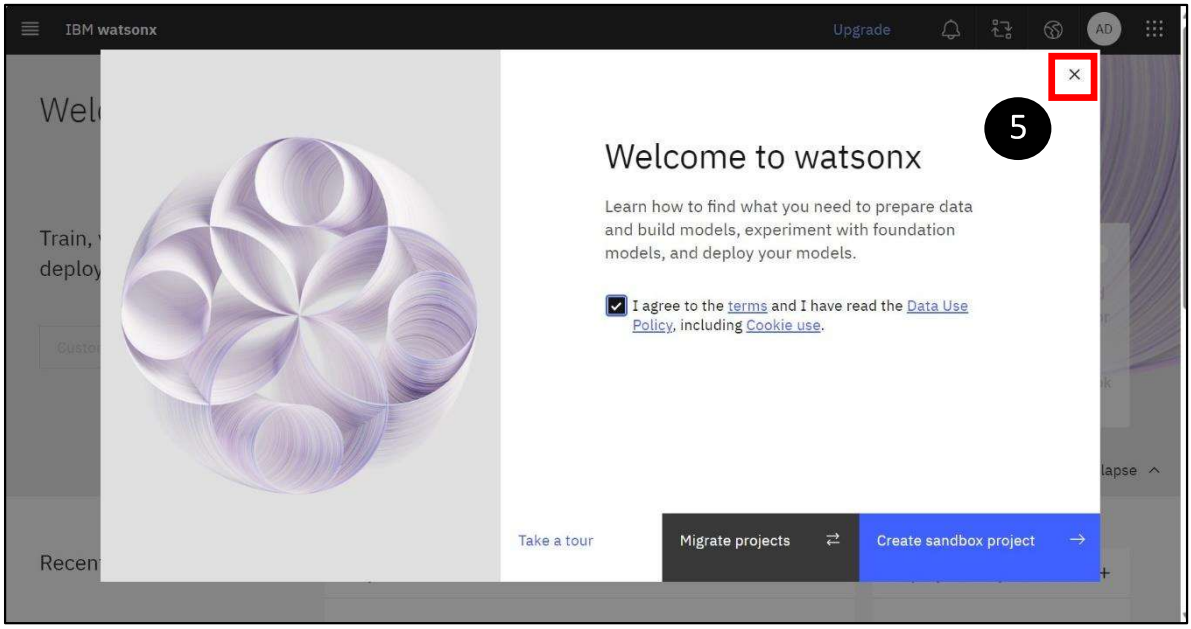


4. If this is the first time that you are logging in to the IBM watsonx platform, continue with this step. Otherwise, continue with step 7.

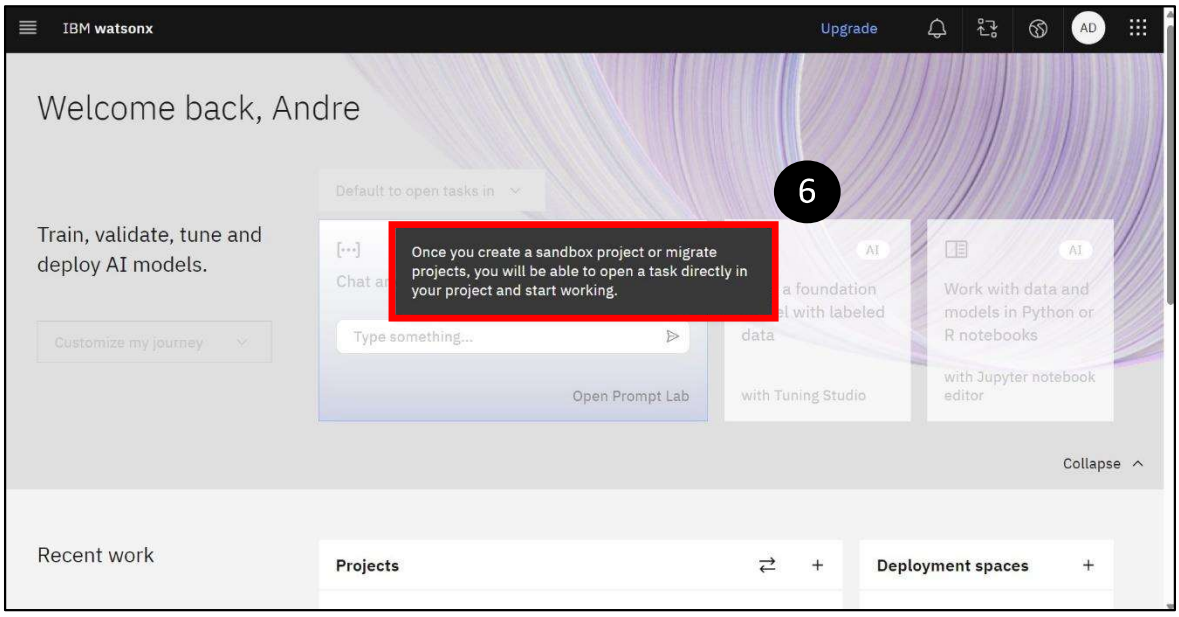
   You are greeted with a "**Welcome to watsonx**" message. Select the **Terms** checkbox.



5. Click the **x** in the upper-right quadrant of the page to close the **Welcome to watsonx** message.



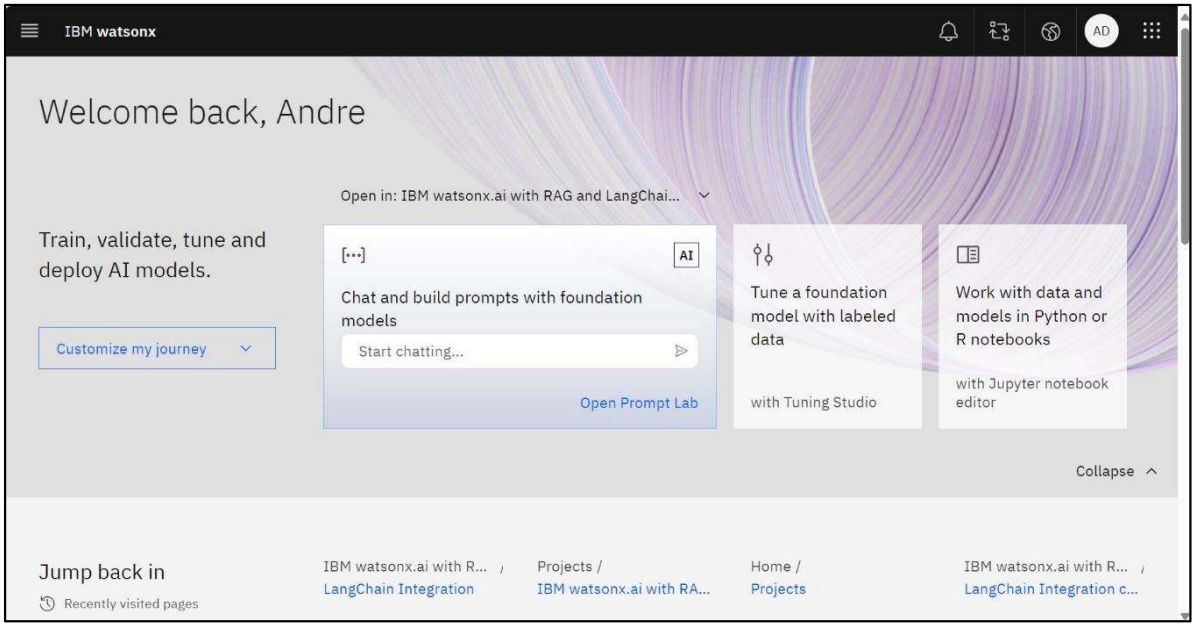
6. You are greeted by the **IBM watsonx** home page.



Note: You only get the warning message in the middle of the screen if you have never experimented with the Prompt Lab in watsonx. You create a project in section 1.2 that satisfies this requirement.

You successfully logged into the IBM watsonx platform. Continue with Section 1.3.

7. You are greeted by the **IBM watsonx** home page.



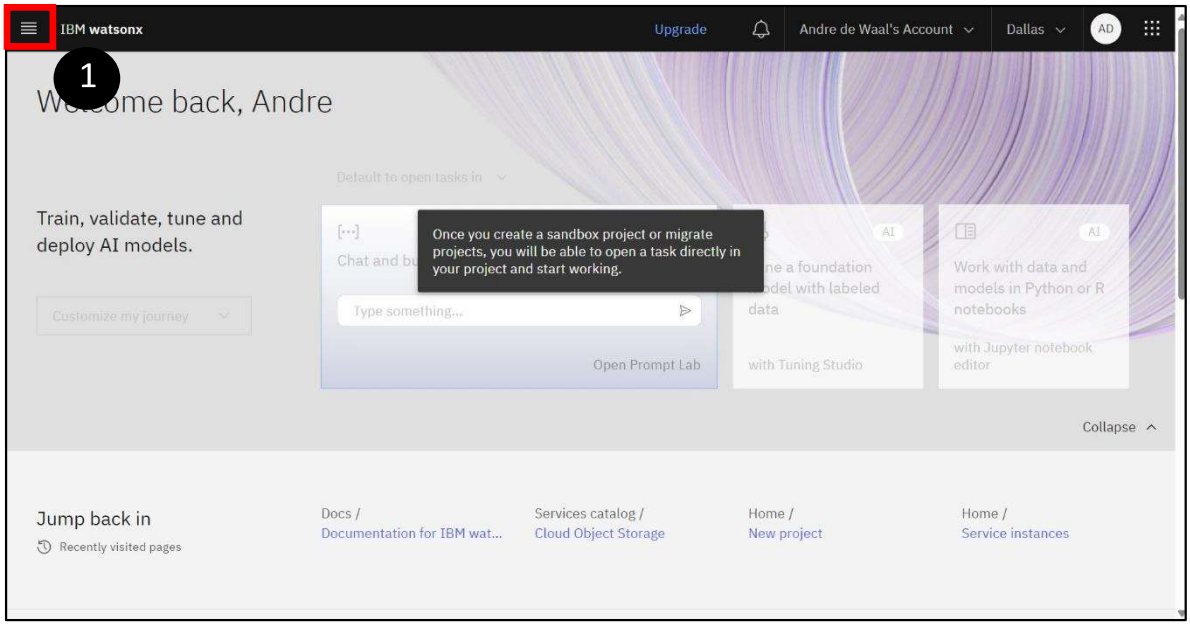
You successfully logged in to the watsonx platform.

1.3 Setting Up the Lab Environment

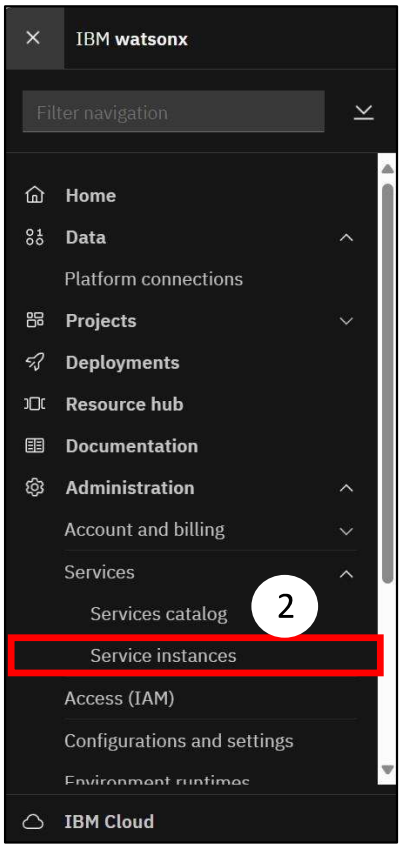
Before experimentation with the Prompt Lab can begin, a Watson Studio project needs to be created and a Watson Machine Learning instance needs to be associated to the project.

In this section, you create a Watson Studio project and associate a Watson Machine Learning service instance to a project.

1. Click the **Navigation Menu** (the four horizontal bars also known as the hamburger menu) in the upper-left quadrant of the screen.



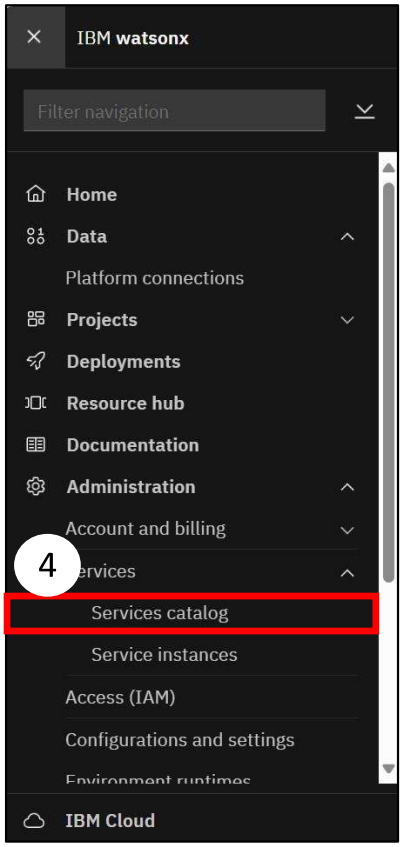
2. Expand the **Services** twistie (also called the expander arrow) and select **Services instances** from the options.



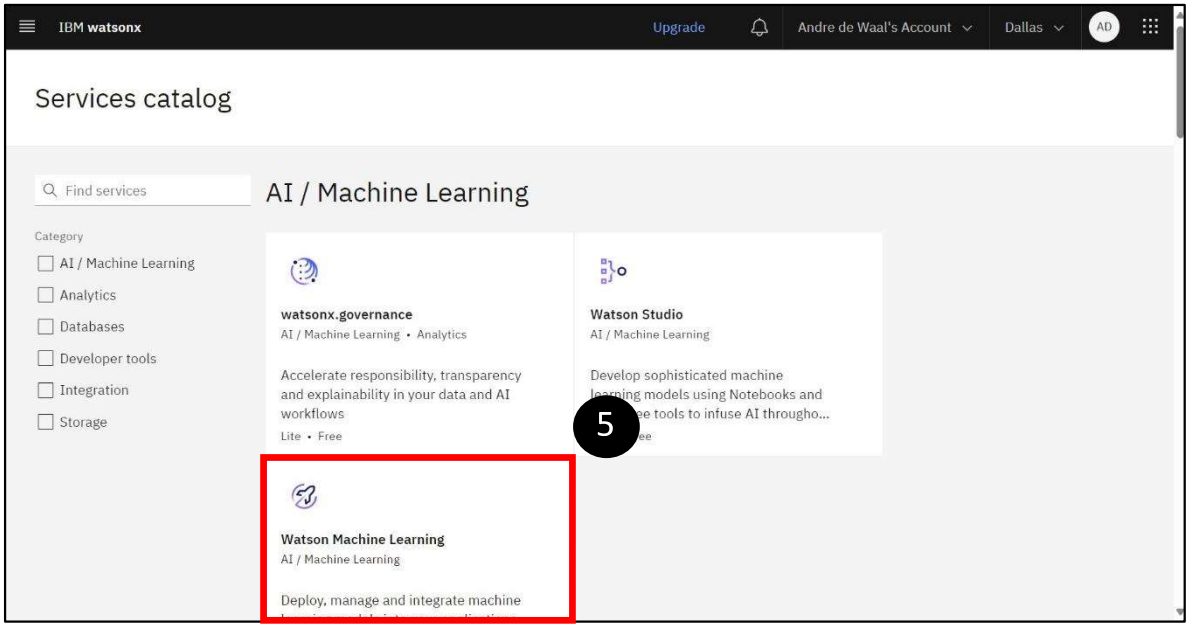
3. **Review** the service instances. If you have a **Watson Machine Learning** service instance running, click the **Main menu** icon to get back to the welcome screen and continue with

Step 8. Otherwise, continue with the next step to create a Watson Machine Learning instance.

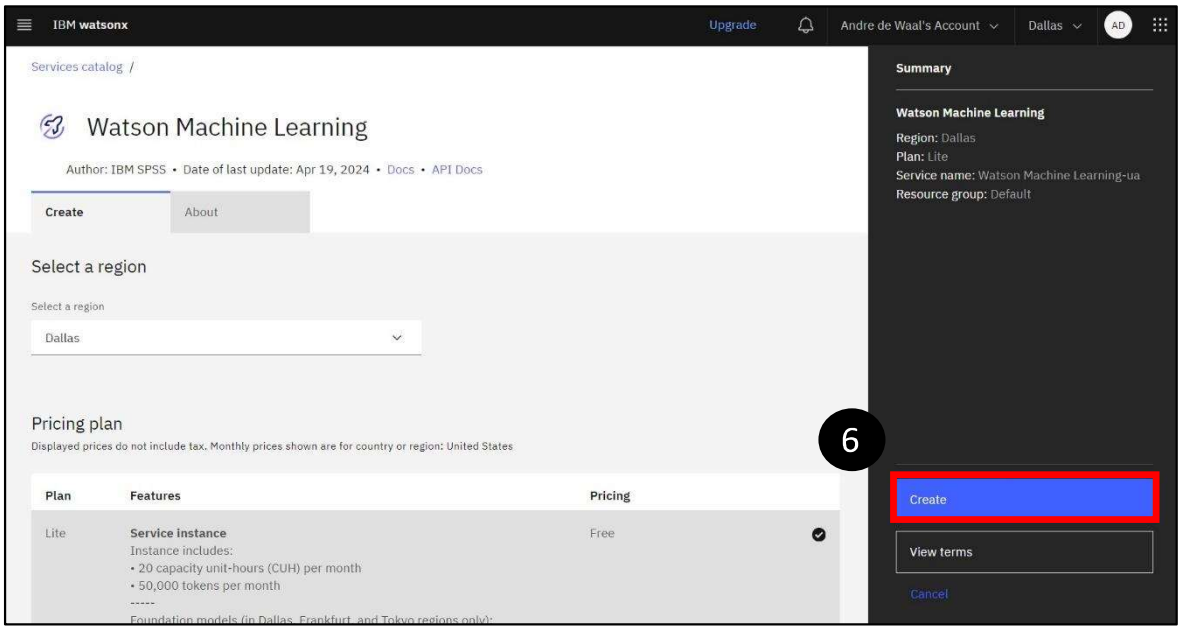
4. Expand the **Services** expander arrow and select **Services catalog** from the options.



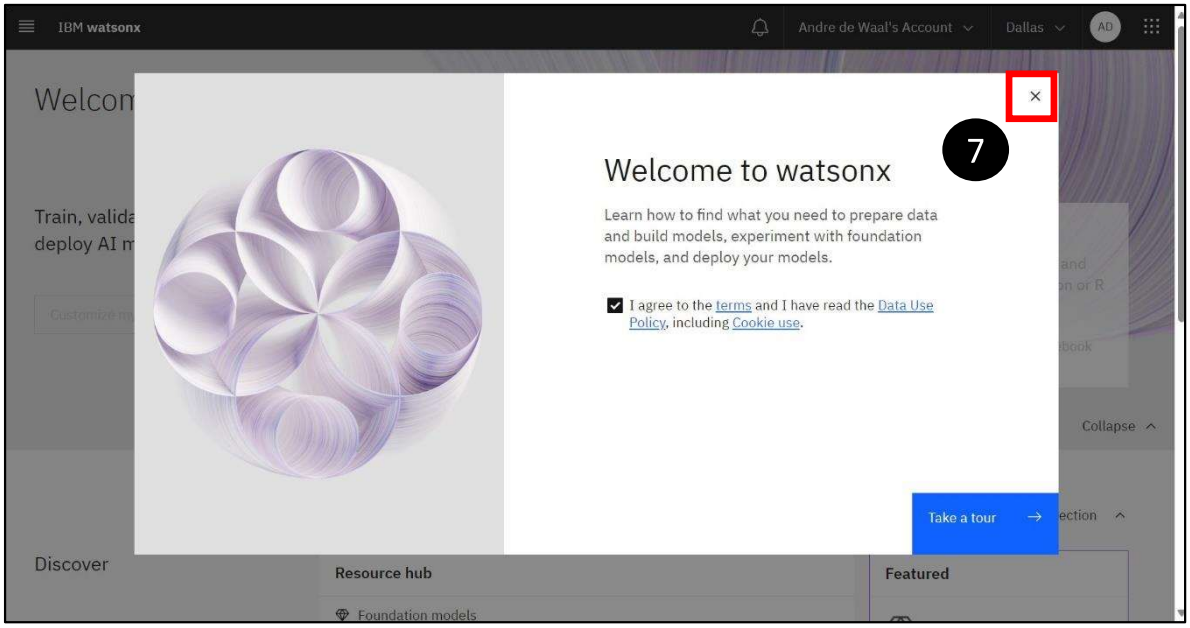
5. Select the **Watson Machine Learning** tile under the **AI / Machine** Learning section.



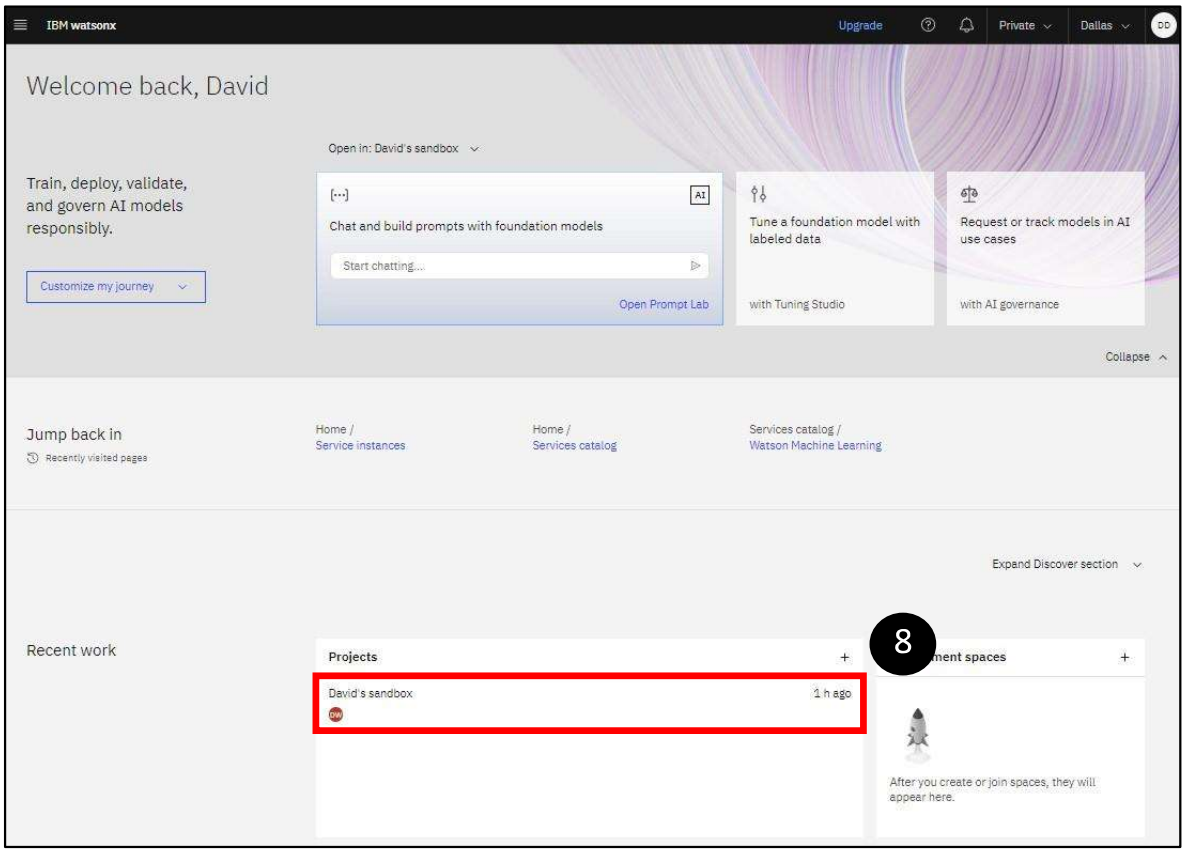
6. Verify that the **Lite** Plan is selected and click the blue **Create** button to create a Watson Machine Learning instance. If you already have an instance of Watson Machine Learning running, you can ignore this step.



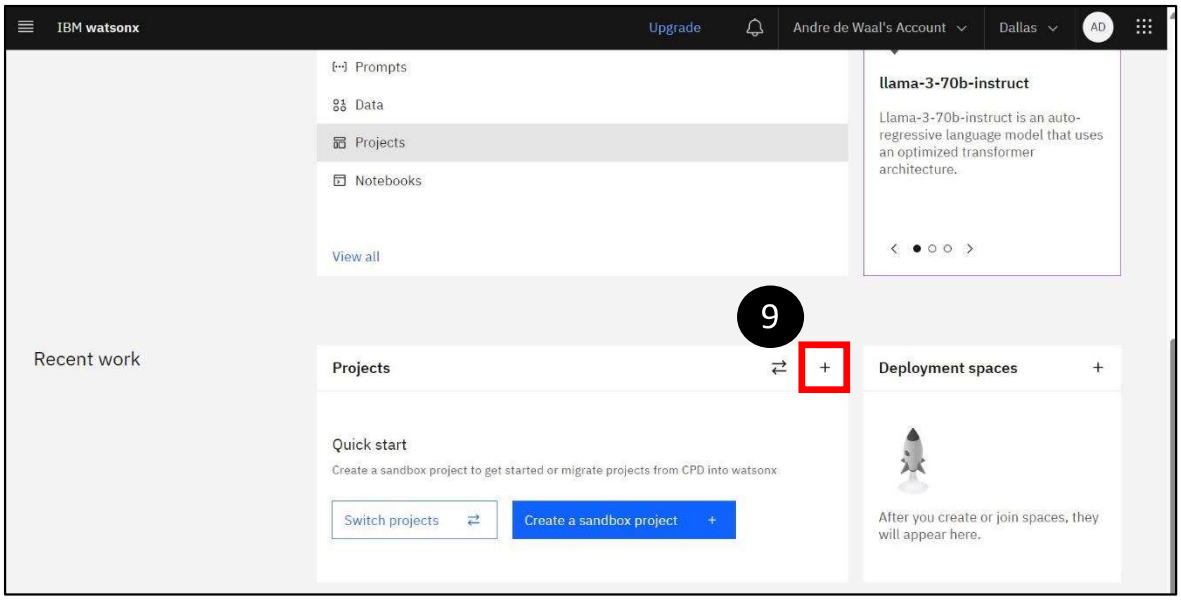
7. You might be greeted by the **Welcome to watsonx** pop up window. Click **x** to close the window.



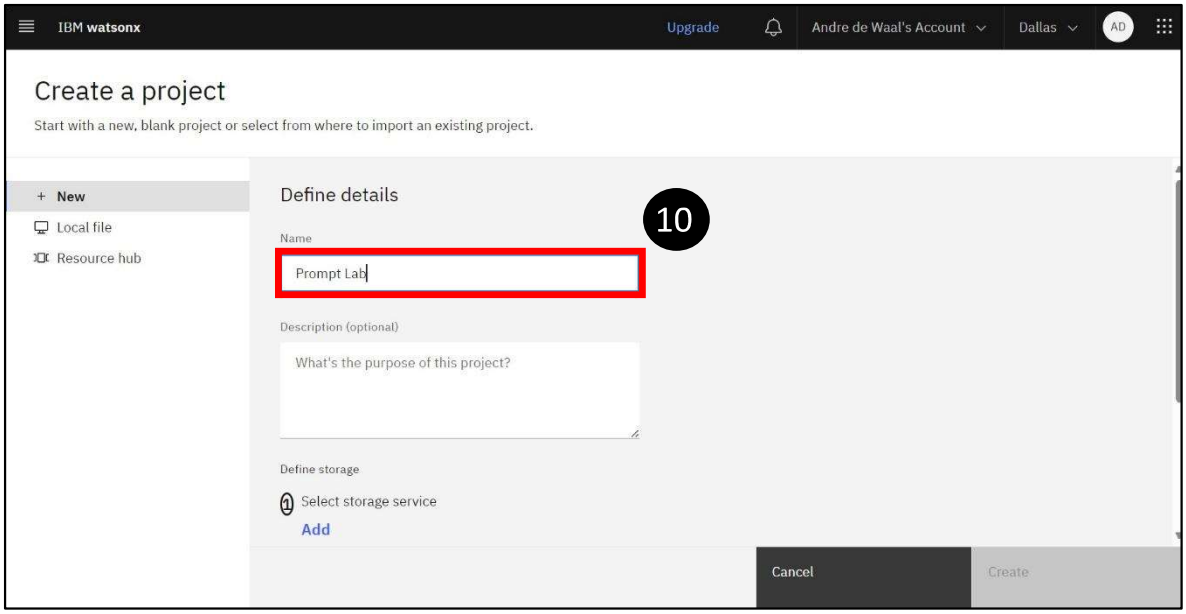
8. Scroll down to the **Recent work** section of the page. If you already have a Sandbox project created, click on the sandbox project to use it instead of creating a new project and continue with Step 15. Otherwise continue with the next step.



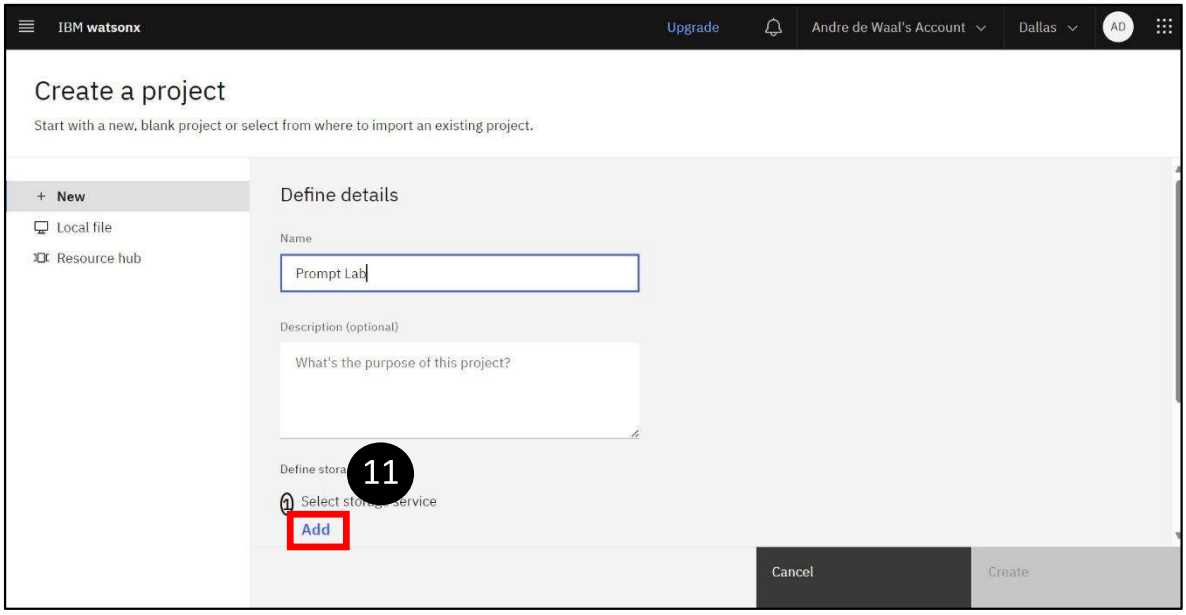
9. Scroll down in the **Recent work** section of the page and click **Create a new project** (+ in the upper-right of the projects area).



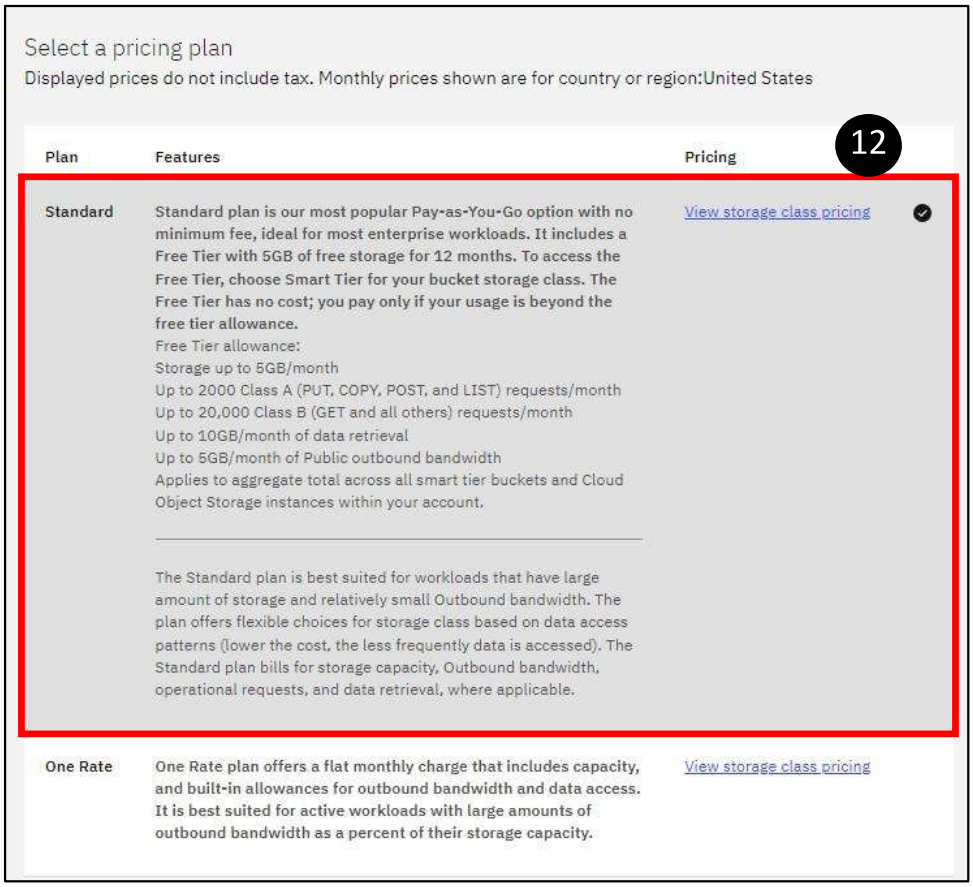
10. Enter **Prompt Lab** in the Name field.



11. Click **Add** to select a storage service. If you already have Cloud Object Storage configured (review the output of Step 3), it might be pre-selected, or you need to select from a list of available storage and continue with Step 14.



12. Scroll down and **select** the **Standard** Plan.

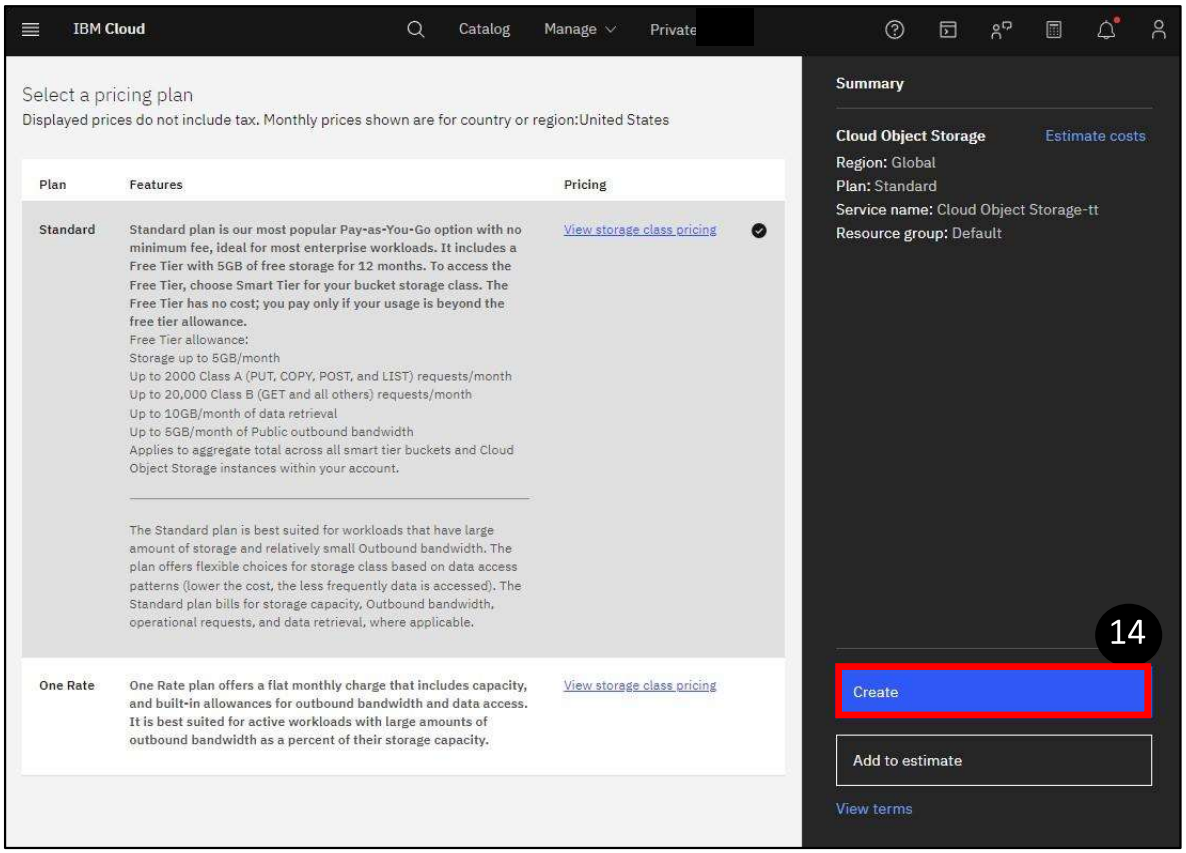


A small black circle with a tick mark will appear in the upper-right corner of the selected

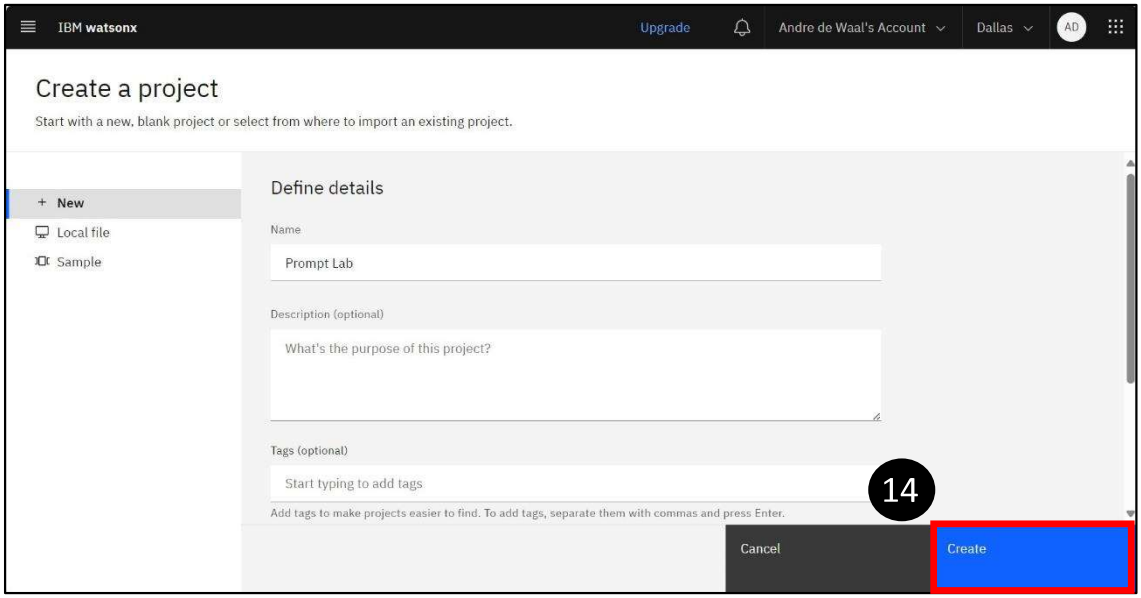
plan.

Note: From 1 July 2024 the Lite Plan for provisioning Cloud Object Storage is not available anymore. Select the Standard plan. If you do not want to pay for COS, stop and watch the recording in place of doing the lab!

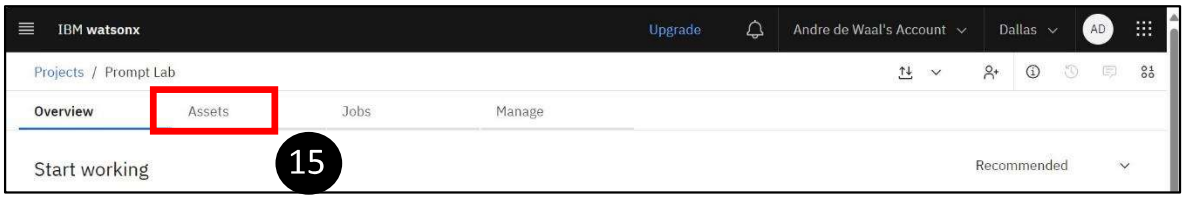
13. Click the **Create** button to create object storage.



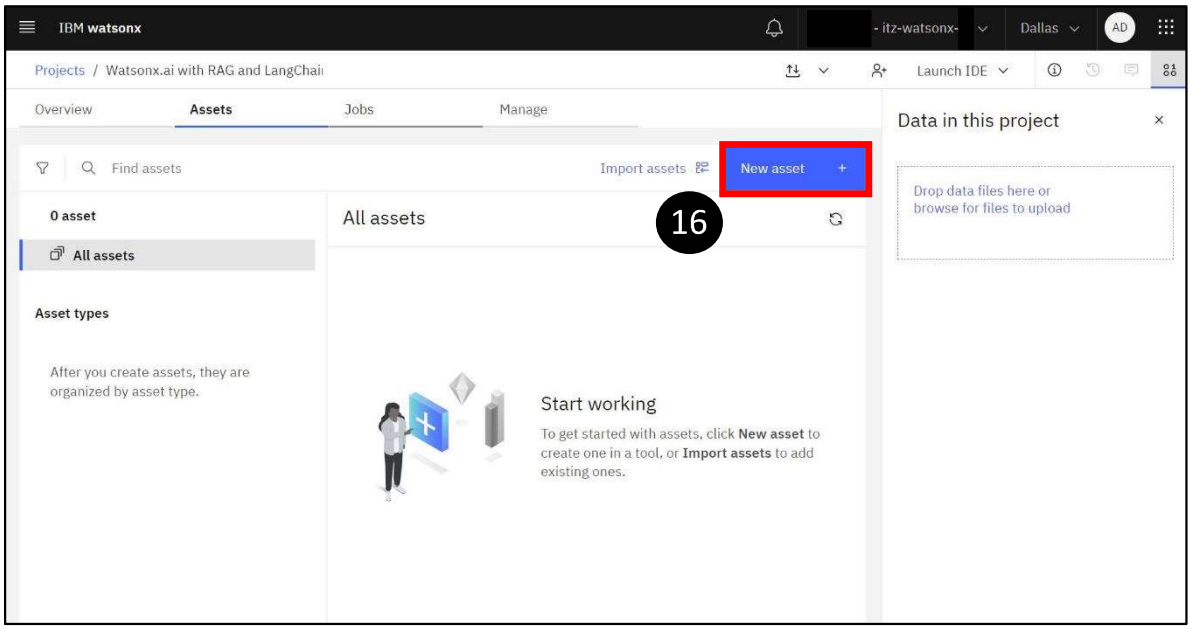
14. Click the **Create** button to create the Prompt Lab project and to attach the object storage to the project.



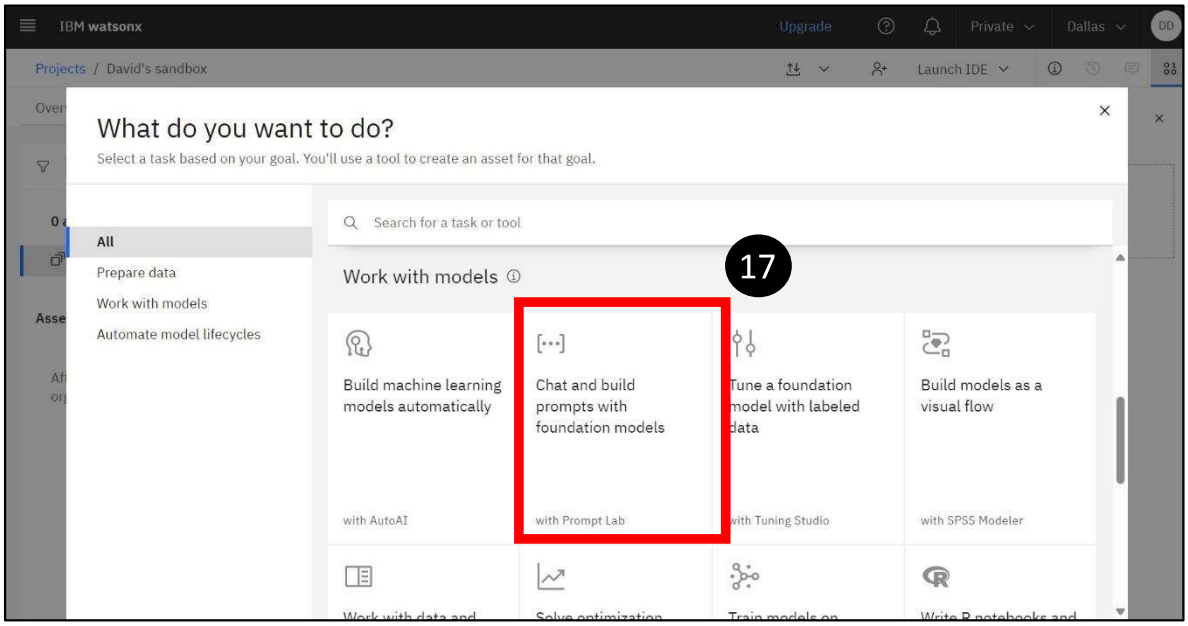
15. Select the **Assets** tab.



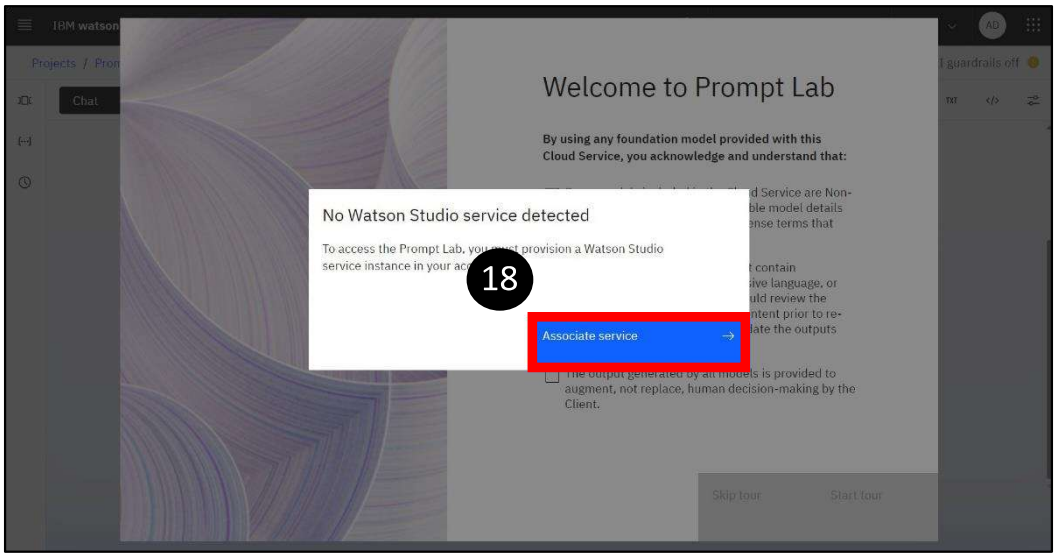
16. Note that the project currently has no assets. Click the blue **New asset** button.



17. Scroll down and select the **Chat and build prompts with foundation models** tile.

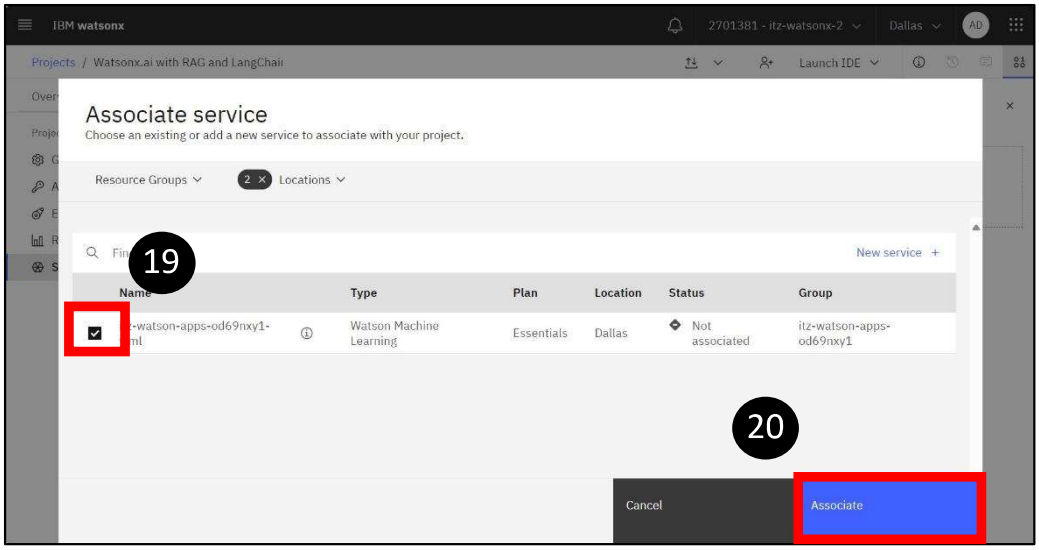


18. Depending on whether you created a Sandbox project or not, you may get the following message. If you created a Sandbox project, you have a Watson Machine Learning service associated with the project and you continue with Step 21. If no machine learning service instance is currently associated to this project, you get the following message. Although the Watson Machine Learning service exists, the service instance needs to be associated to your project to be able to experiment with the Prompt Lab. Click the blue **Associate service** button.

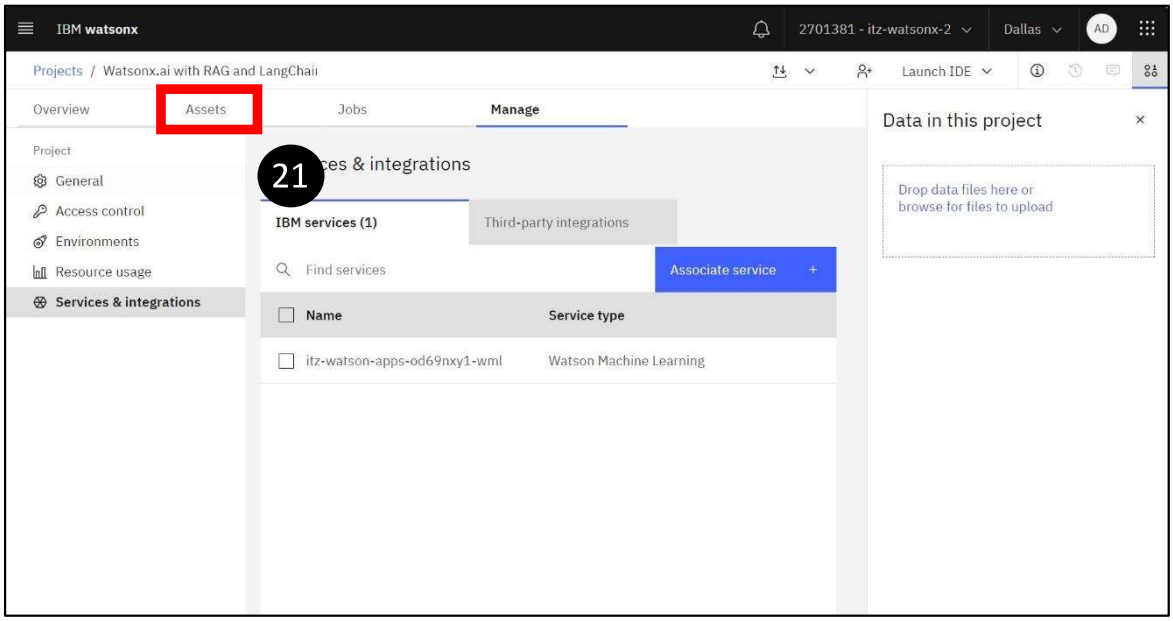


19. Select the **checkbox** next to your **Watson Machine Learning** service instance.

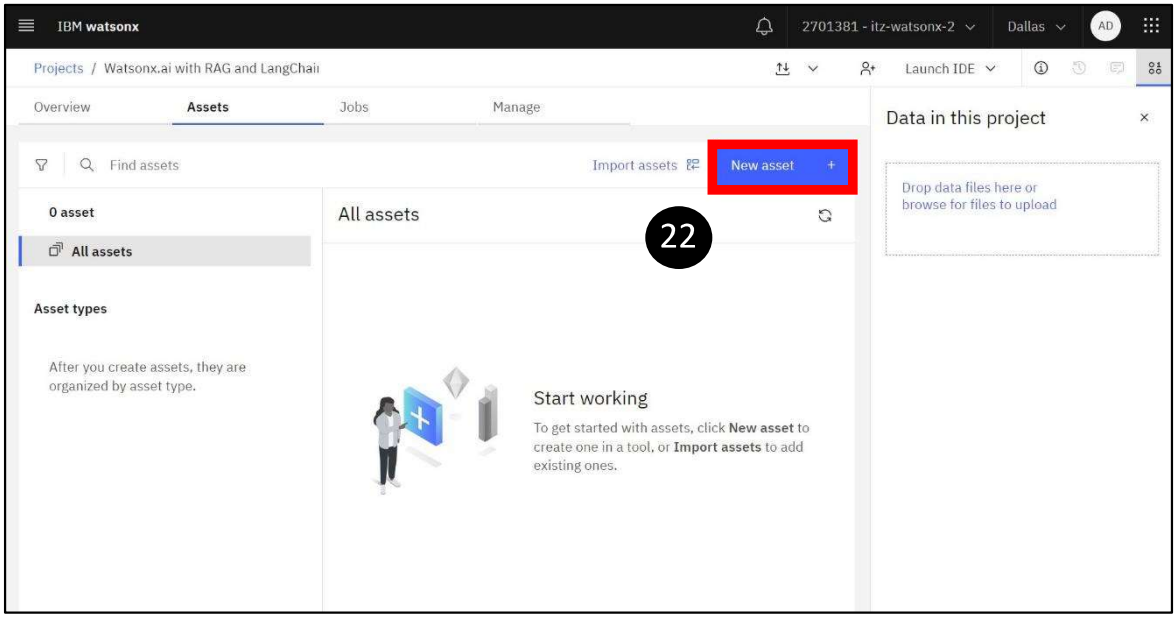
20. Click the blue **Associate** button.



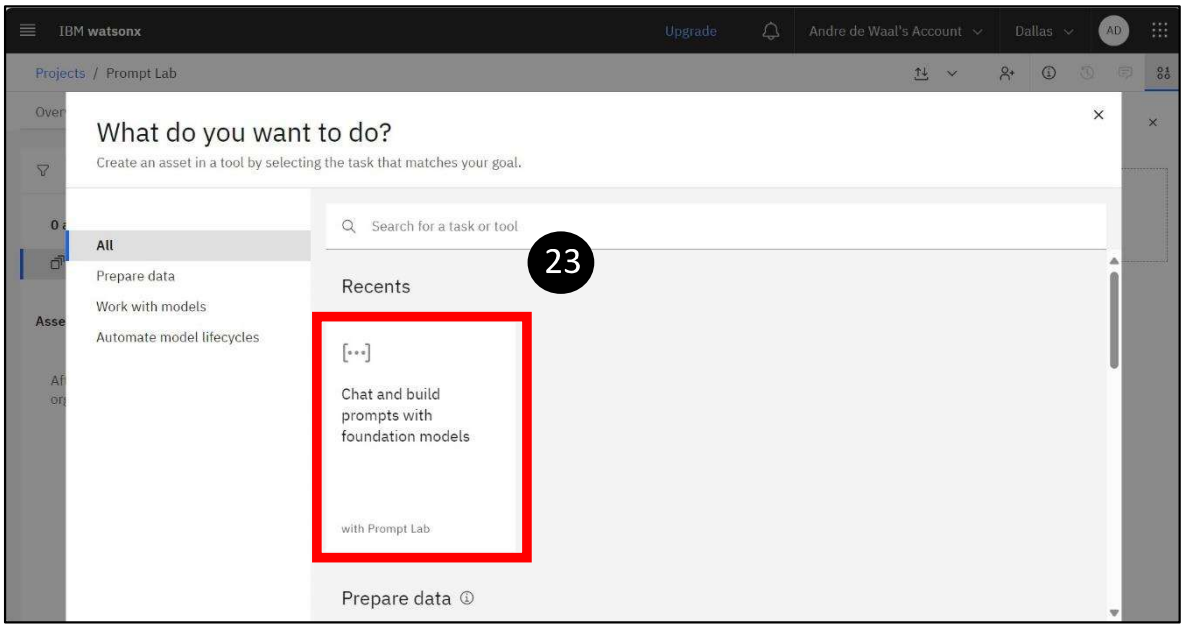
21. Select the **Assets** tab to get back to the project assets screen.



22. The assets screen displays. Notice that you still have no assets associated with this project. Click the blue **New asset** button.

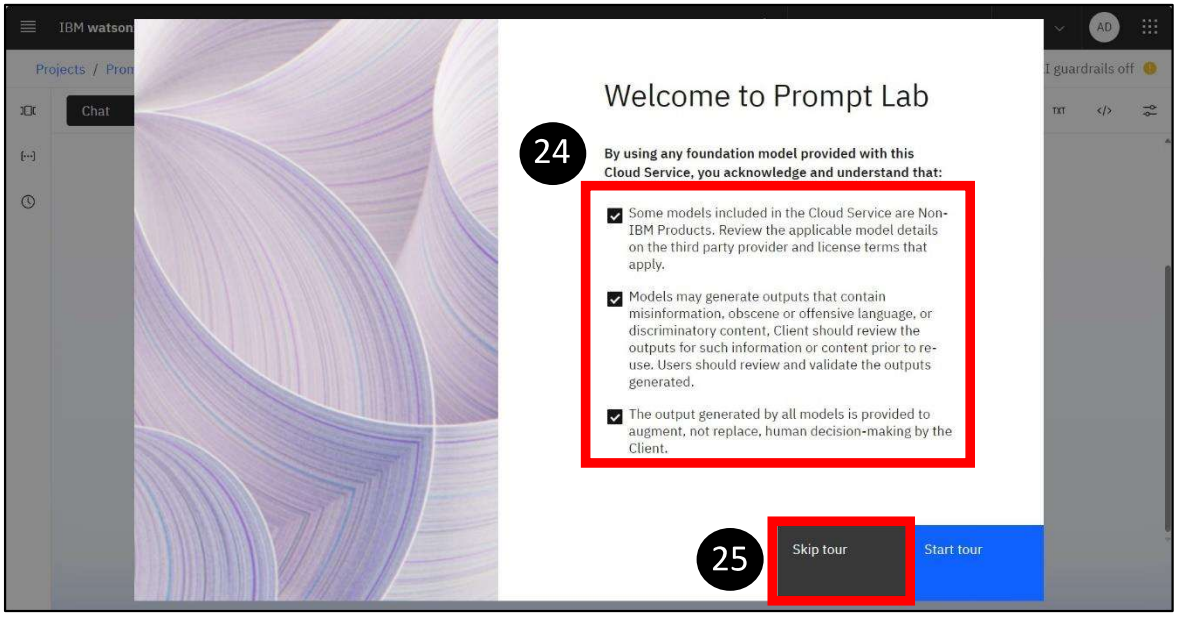


23. Scroll down and select the **Chat and build prompts with foundation models** tile.

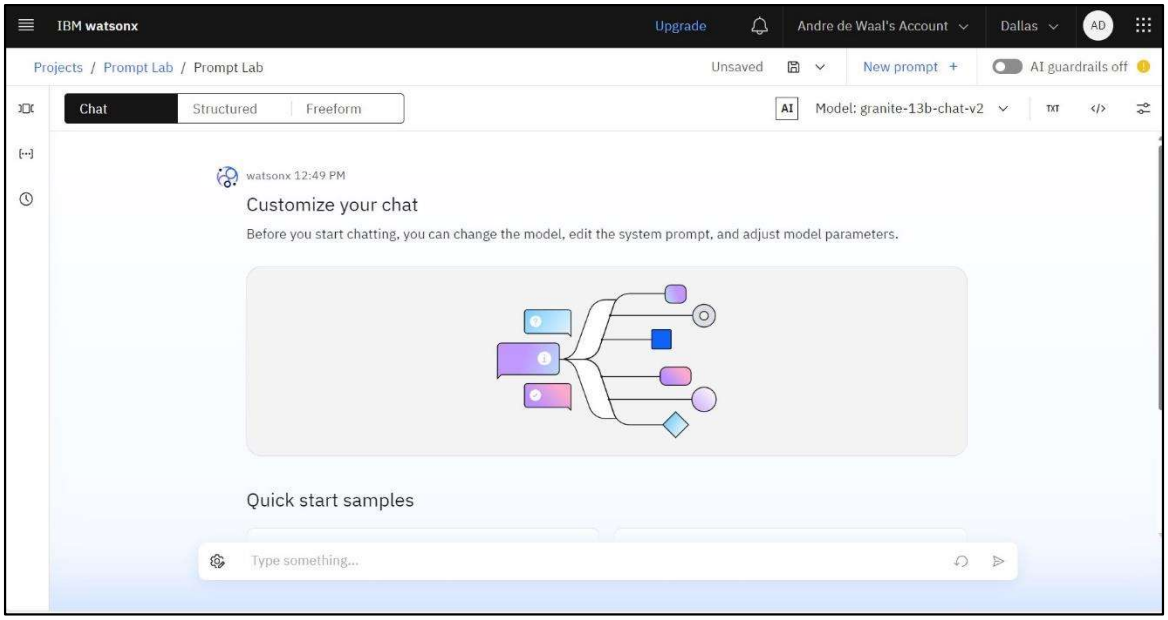


24. Select the 3 **check boxes** to accept the conditions to use this service.

25. Click the black **Skip tour** button.



The Prompt Lab opens.



The Prompt Lab, the Tuning Studio, and Jupyter Notebooks with Python code are now available for solving several use cases.

2. Prompt engineering

Estimated time

30:00 minutes (to complete this section)

Overview

This exercise covers the following tasks:

- Experimenting with the prompt Lab
- Creating a series of ever more complex prompts
- Inspecting the Python code that the Prompt Lab generates
- Changing the default Prompt Lab settings

Objectives

This exercise introduces you to the Prompt Lab in watsonx. First, you experiment with simple prompts to get a feel for the environment. Second, you create more elaborate prompts to steer the underlying foundation model in the right direction. Third, you inspect the underlying Python code generated by the lab. Fourth, you change the underlying foundation model and experiment with different lab settings.

After this exercise, you should be able to set up and experiment with prompts in the Prompt Lab.

Requirements

- Access to IBM Cloud Pak for Data, IBM watsonx.
- Knowledge of working with graphical user interfaces.
- Working knowledge of Python and Jupyter Notebooks.

2.1 Writing your first prompt

Verify that you are still logged in to the IBM Cloud and watsonx. If not, go back to Exercise 1 and revisit how to log in to the IBM Cloud and watsonx.

In this exercise you assume the role of Erik, the AI Specialist, and you follow along as he explores watsonx.ai. Erik is new to prompt engineering, so he first explores the watsonx.ai interface with some basic prompts and gradually increases the complexity of the prompts as he gains more experience.

After the exercise, you will be able to recommend some use cases for generative AI and foundation models to the company.

Section 1. Zero-shot prompting

In this section, you are an AI specialist who creates a couple of basic prompts. Creating basic prompts without any examples or any other additional information is also referred to as zero-shot prompting.

You can create prompts in a structured or a freeform way. Using the structured approach, you give the model instructions on what to do, examples of how to format the response, and text that you want the model to process. All this information is then concatenated to form a prompt that is passed to the selected foundation model. In the freeform approach, your text is formatted in one text box.

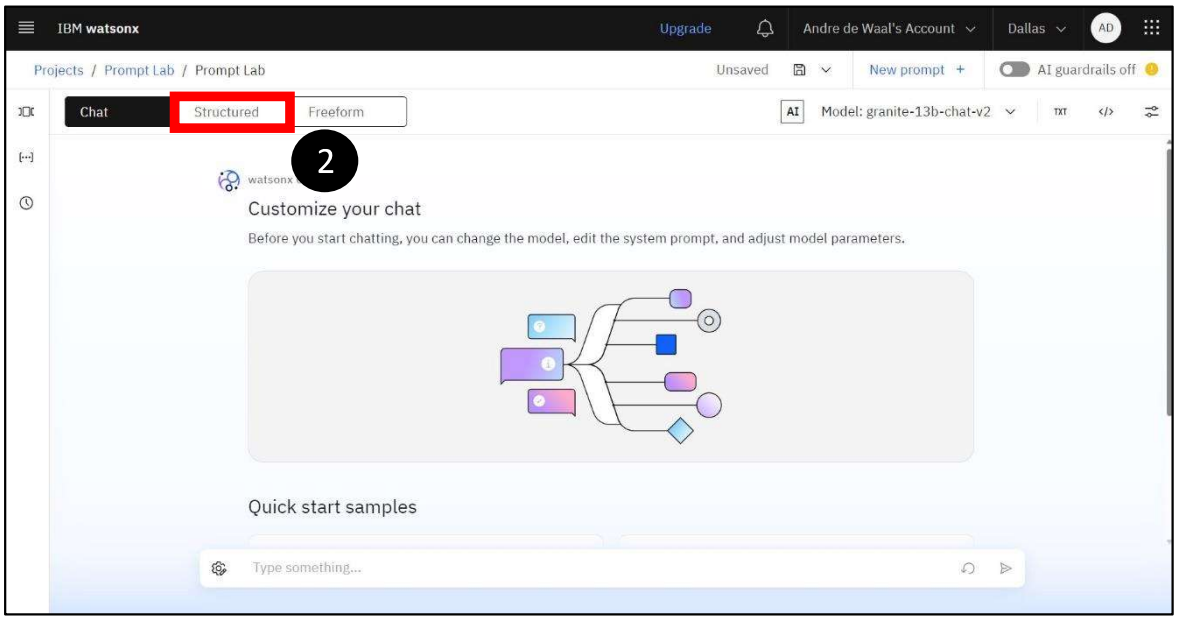
Since you new to prompt engineering, you starts with the structured approach and interface (which is the default option when you open the Prompt Lab).

1. Click **AI Guardrails** in the upper-right quadrant to set **AI guardrails on**.

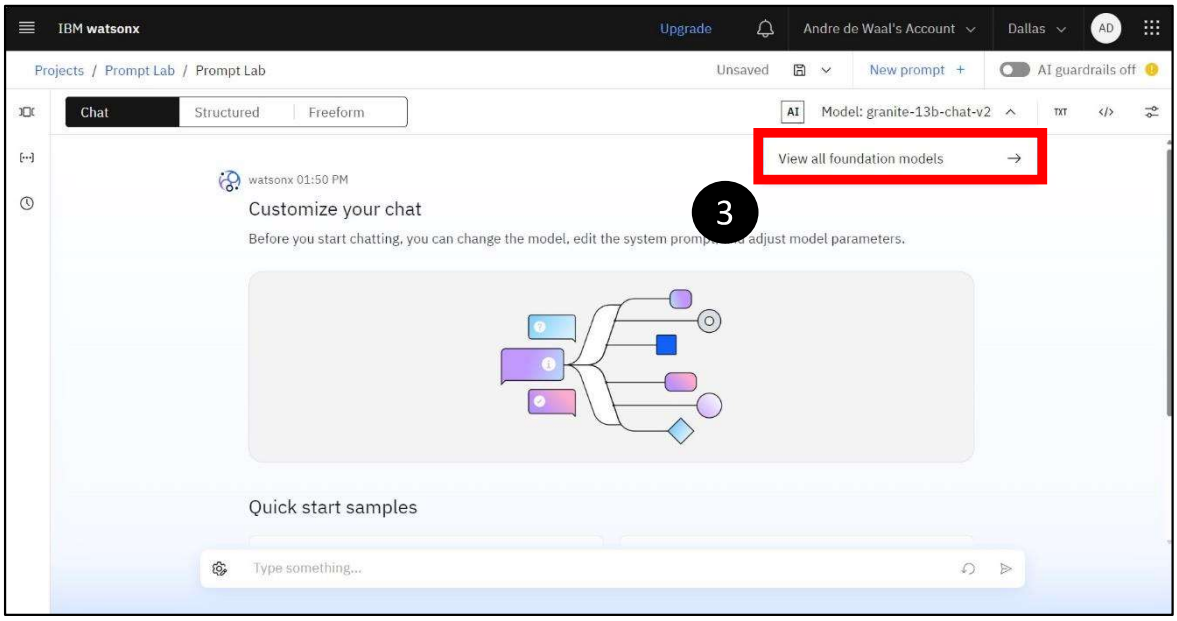
   

   This setting removes any potentially harmful input and output text, such as hate speech, abuse, or profanity (HAP). The default setting is for the guardrails to be off (no filtering of input or output text).

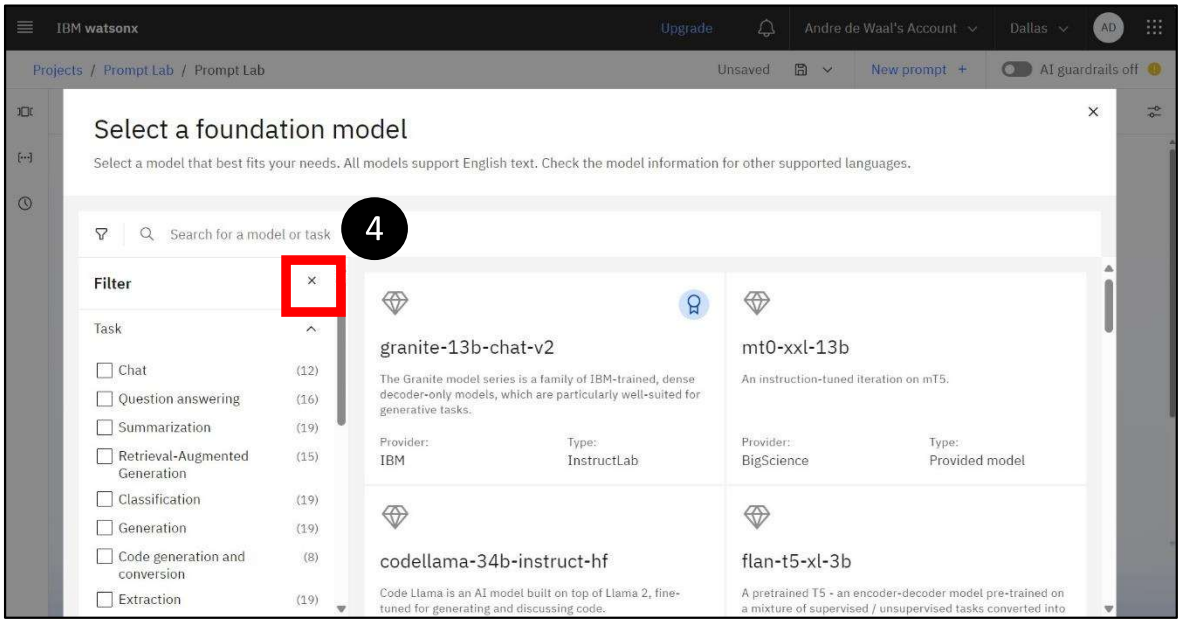
2. Select the **Structured** interface.



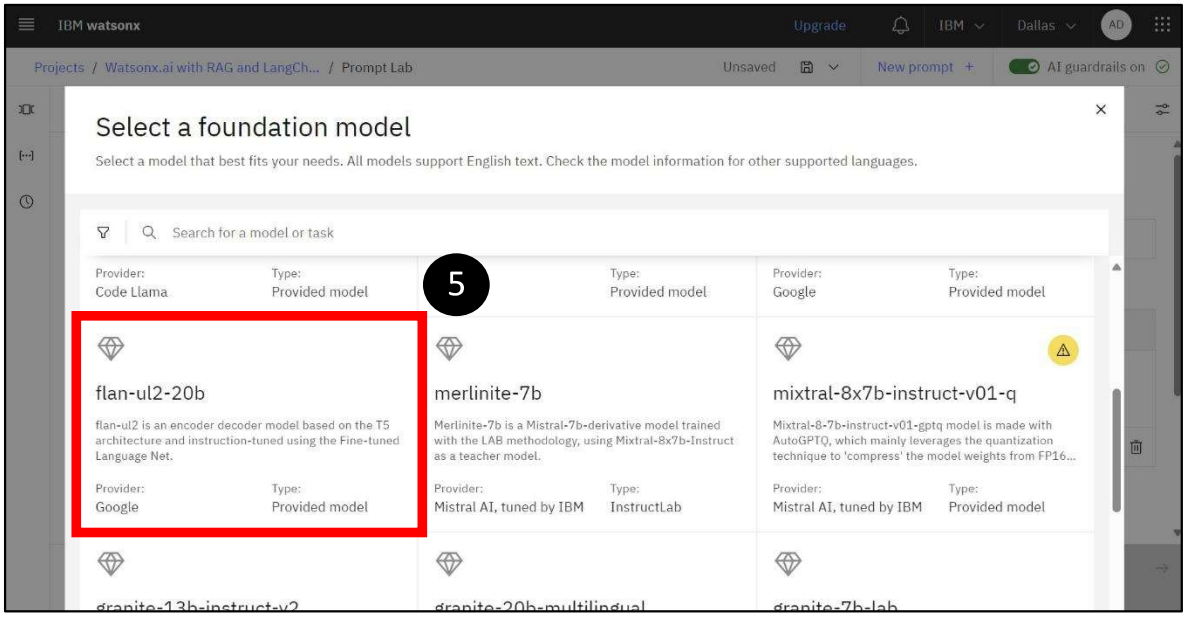
3. Expand the model menu and select **View all foundation models**.



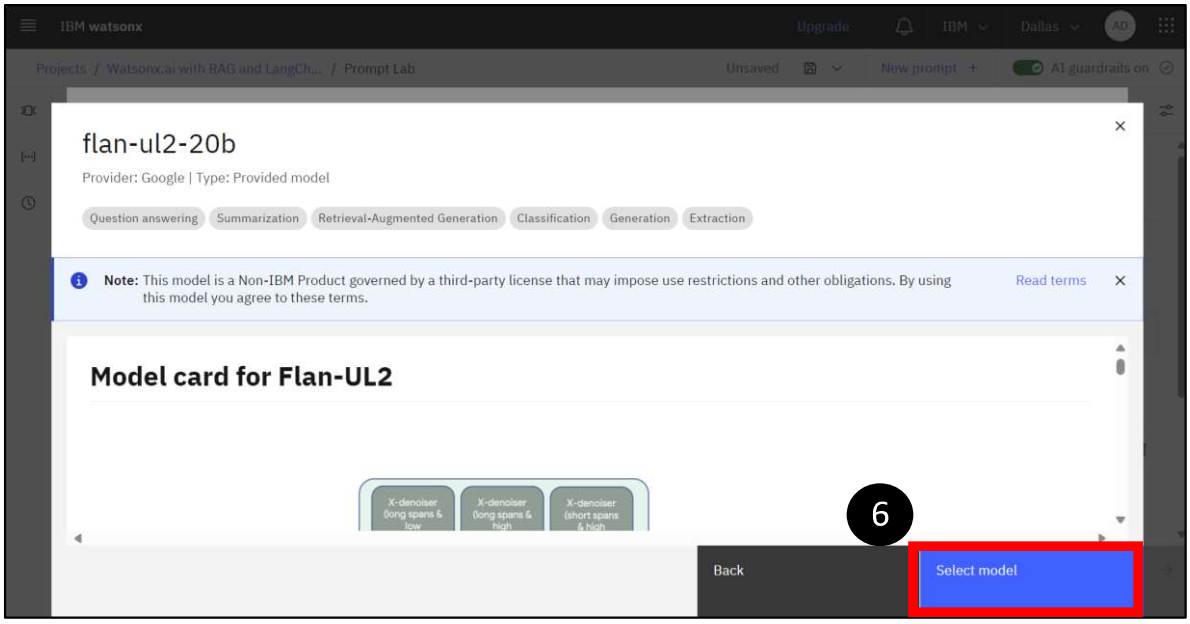
4. If you see the Filter panel, close the panel by clicking the **x** next to Filter.



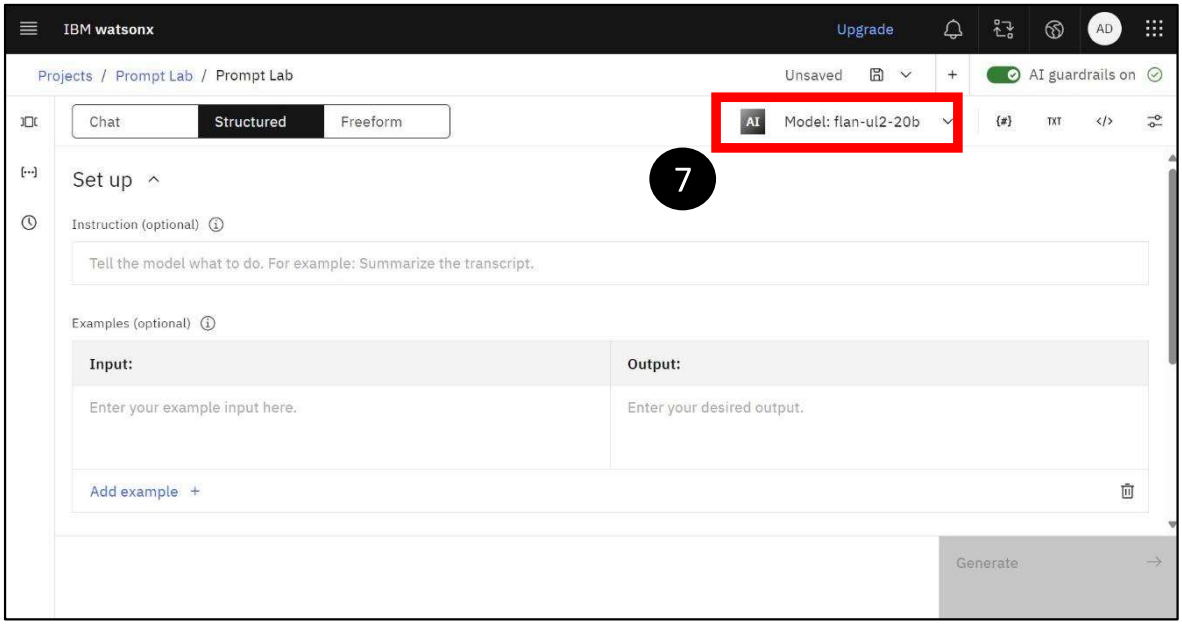
5. Scroll down and select the **flan-ul2-20b** model tile from the available foundation models.



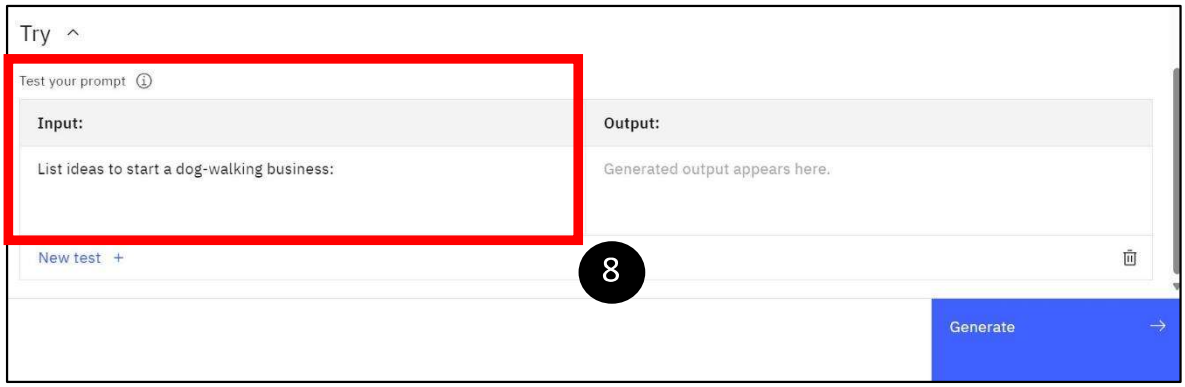
6. Inspect the flan-ul2-20b model card and click the blue **Select model** button.



7. Your Prompt Lab is updated. **Verify** that the **flan-ul2-20b** foundation model is the selected model for this Prompt session.



8. Scroll to the bottom of the displayed Prompt Lab page and type in the following prompt in the **Input:** text box under the **Try** section: **List ideas to start a dog-walking business:**



9. Click the blue **Generate** button.

The output of the foundation model is given in the **Output:** text box. Inspect the output.

The response is underwhelming. After exploring the sample prompts from the IBM Documentation [Tips for writing foundation model prompts: prompt engineering — Docs | IBM watsonx,](#) You decide to take "baby steps" and gradually increase the complexity of the prompt, incorporating what he learned from studying the tips for writing prompts.

Information: Each time you enter a prompt, your "input tokens" and "generated tokens" will update in the lower-left quadrant of the interface. Tokens are an important concept to understand as they constrain the performance of your model and determine the cost of using foundation models. Tokens are not a 1:1 match with words in natural language. On average, one token is equal to 4 characters. Before sending your prompt to a model, the prompt's text is tokenized or broken into smaller subsets of characters than can be better understood by the model. The correlation between words and tokens is complex. A single word might be broken into multiple tokens, depending on context (such as where the word appears in a sentence, or what the surrounding words are). Spaces, newline characters, and punctuation might be included in tokens. The way words are broken into tokens varies from language to language and from model to model.

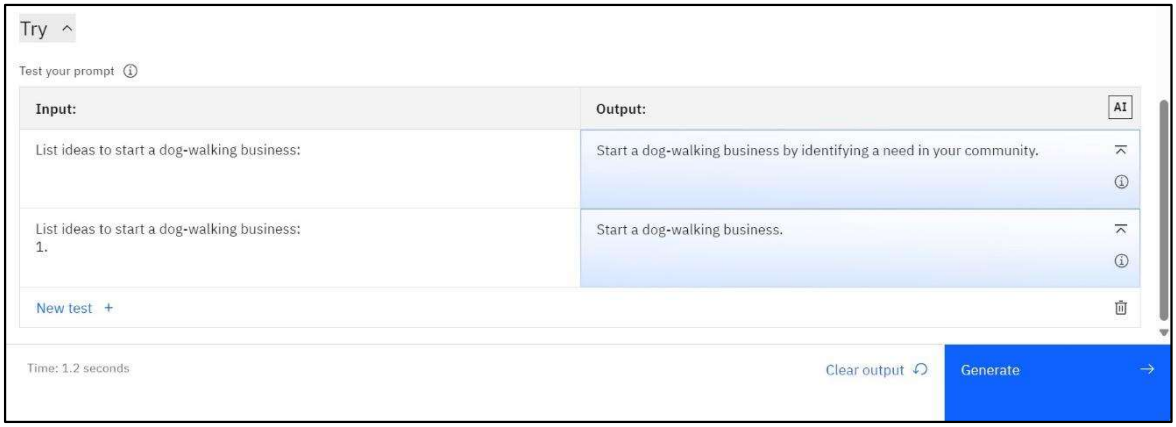
Important: It is important to monitor your token usage to know how much information you are feeding into the model with each prompt, and how much text is generated for you. Depending on the model selected in Prompt Builder, you see a max of 2048 or 4096 tokens. Keep in mind that the more expressive you are with your prompt instructions, the less room the model has to respond back to you. The number of tokens used (input plus generated text) can be found in the lower-left quadrant of the interface.

10. A good way to receive a structured response is to include a cue to start the response in the input structure. For example, add the two characters, "1.", to the prompt on a new line. This small change might improve the response. Click **New test +** underneath your prompt.

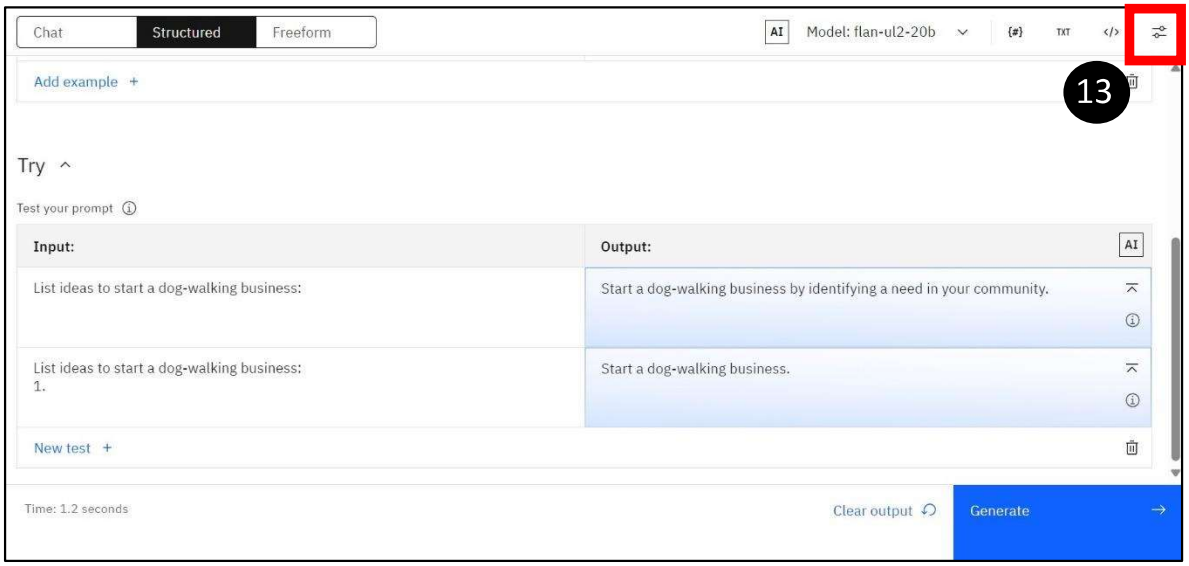
11. Type in the following prompt in the **Input:** text box under the **Try** section:
List ideas to start a dog-walking business:
1.

12. Click the blue **Generate** button.

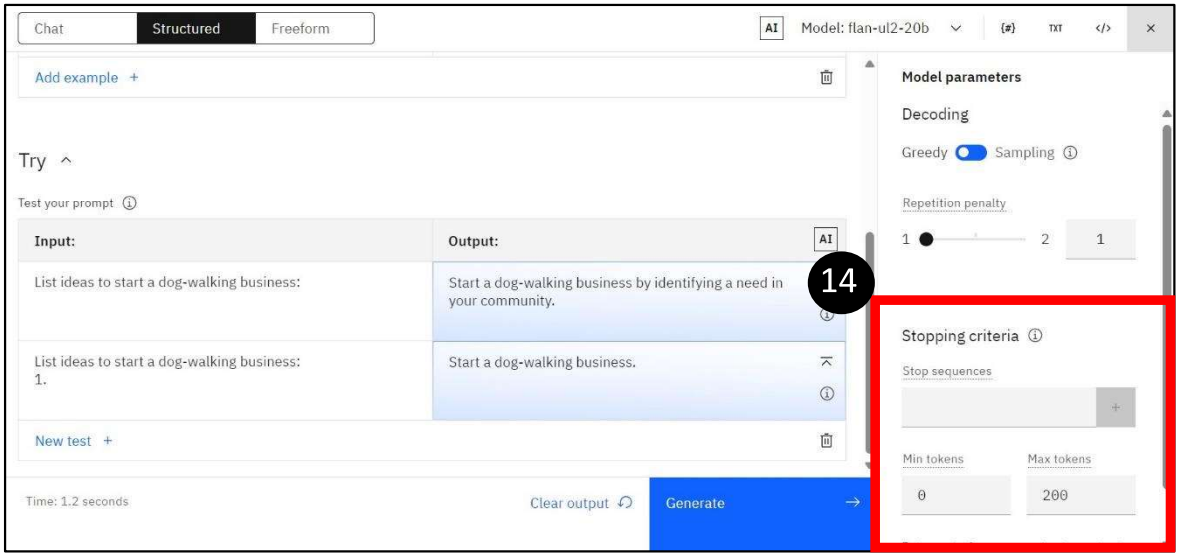
The response is still underwhelming. You decide to investigate the current model parameters and their effect on the response.



13. Click the **Model parameters** icon in the upper-right quadrant (two horizontal lines with offset circles).

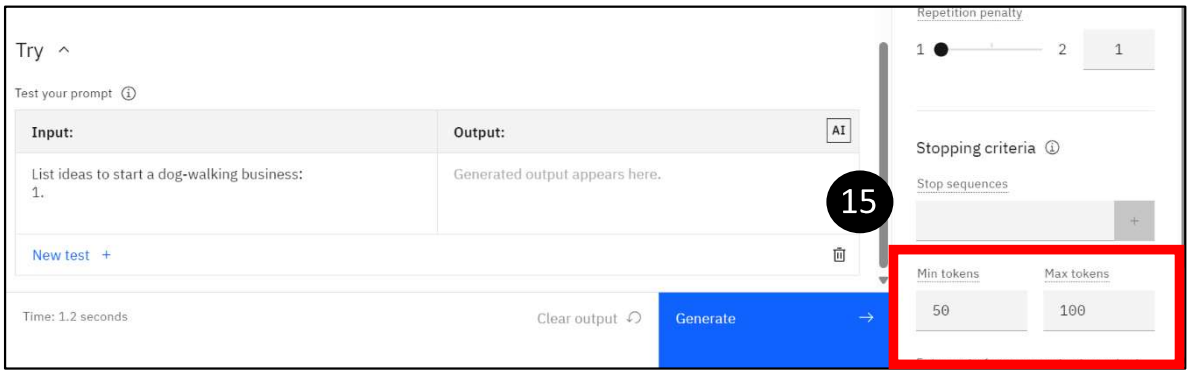


14. Scroll down and inspect the Stopping criteria section.

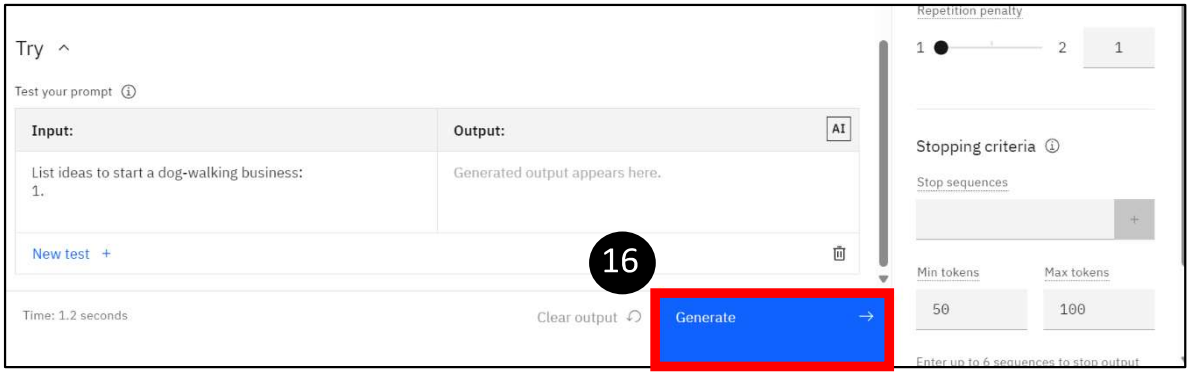


The reason for the short result might be the minimum and the maximum number of tokens settings. The **Min tokens** is set to **0**, which does not force the model to generate a lengthy response (on average 1 token is equivalent to 4 characters).

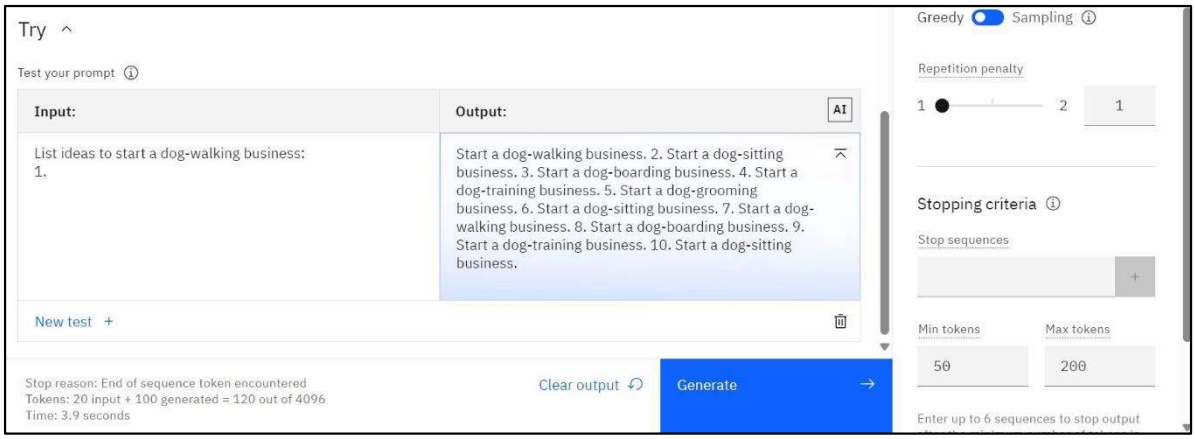
15. Delete the previous prompts and add a new test with the same prompt as the one you just used (with the **1.** added). Change the **Min tokens** value to **50** and the **Max tokens** to **100** to "force" the foundation model to generate a longer response (more characters).



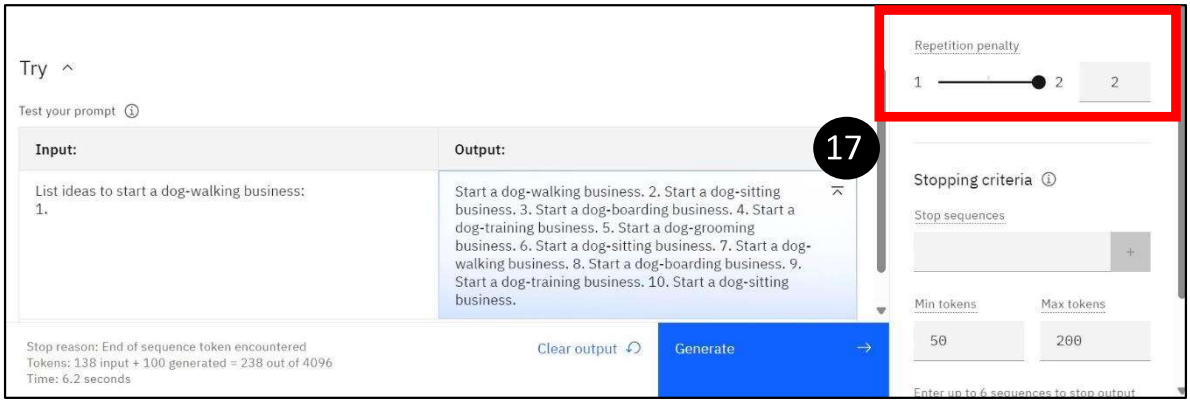
16. Click the blue **Generate** button.



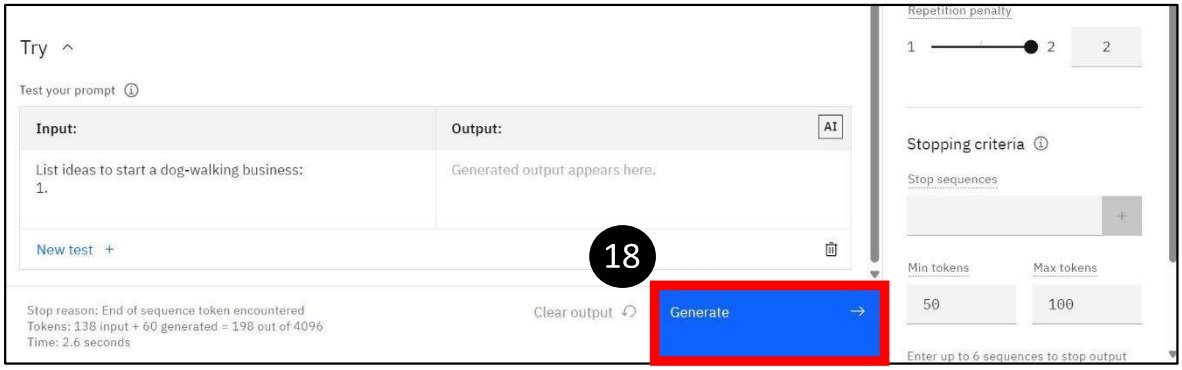
The results improved somewhat, but there is much repetition of the output **Start a dog-... business**, in the response.



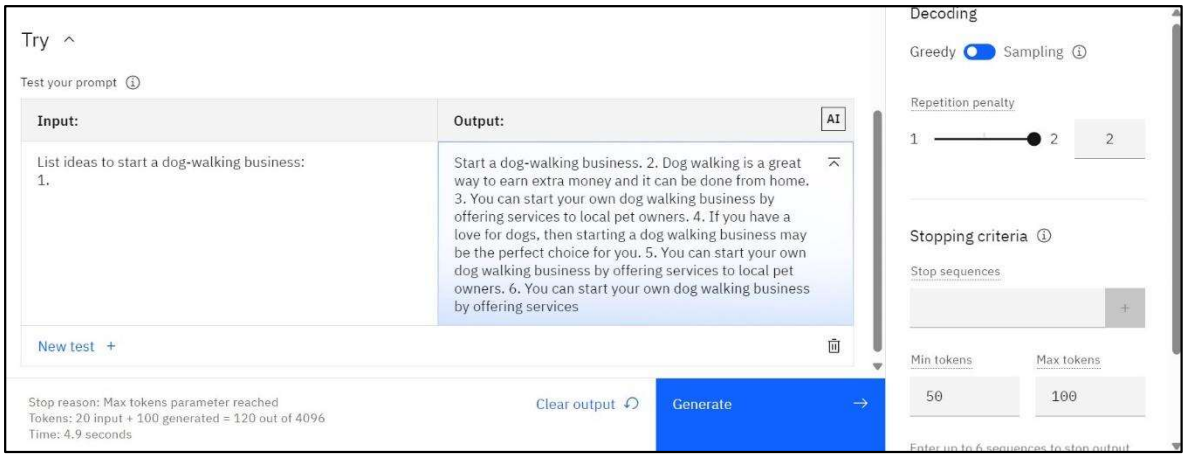
17. After further consideration, you decide to increase the Repetition penalty from **1** to **2**. Changing the Repetition penalty in the Model parameters panel from **1** to **2** attempts to minimize repetition. Slide the **Repetition penalty slider** from **1** to **2**, or directly type in **2** in the Repetition penalty numeric box (beside the slider).



18. Clear the output (next to the Generate button) and click the blue **Generate** button.



As you can see, increasing the repetition penalty parameter creates a dramatic improvement over the previous responses.



Section 2: Single-shot and two-shot prompting

You also learned from reading the *Tips for writing foundation model prompts* that adding examples might improve the LLM response. To receive a higher-quality response, you should provide an example of the kind of response you want. This approach is called *single-shot* or *one-shot* prompting.

1. In the **Setup** section, Under **Examples**, add the expected Input and Output on starting a lemonade business:

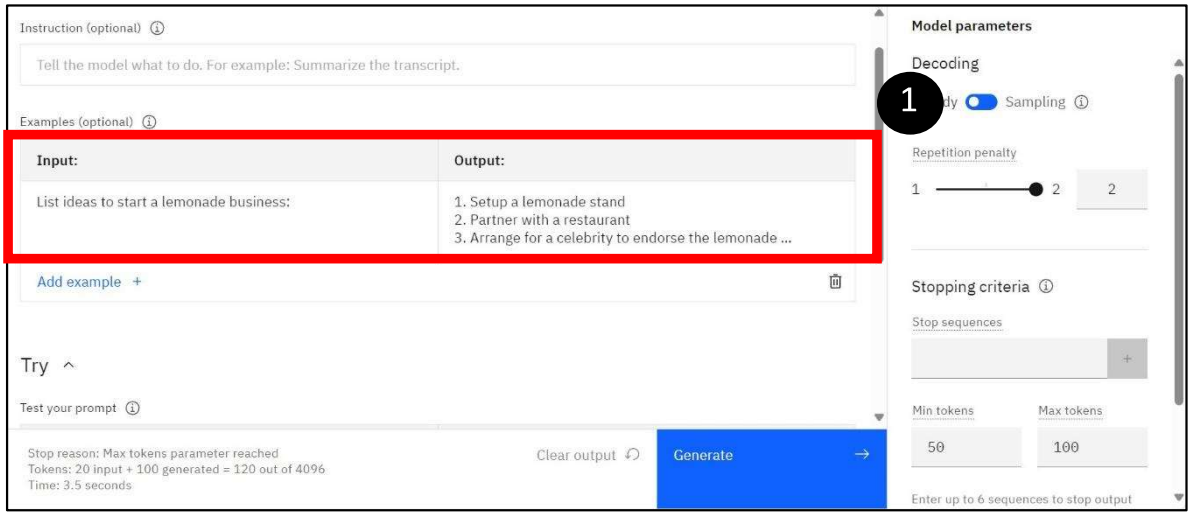
   Input: **List ideas to start a lemonade business:**

   Output:

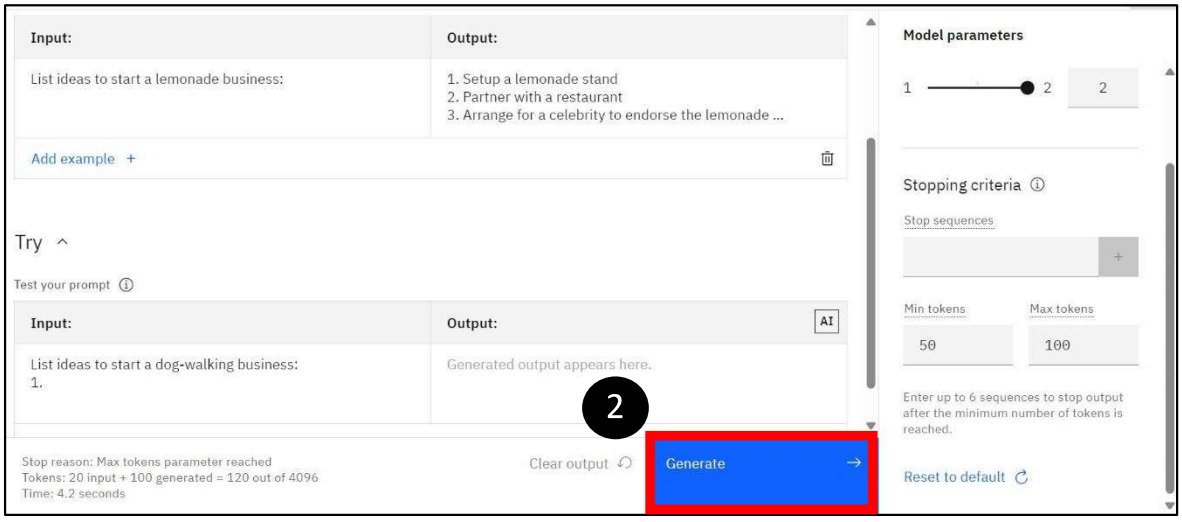
   1. Setup a lemonade stand

   2. Partner with a restaurant

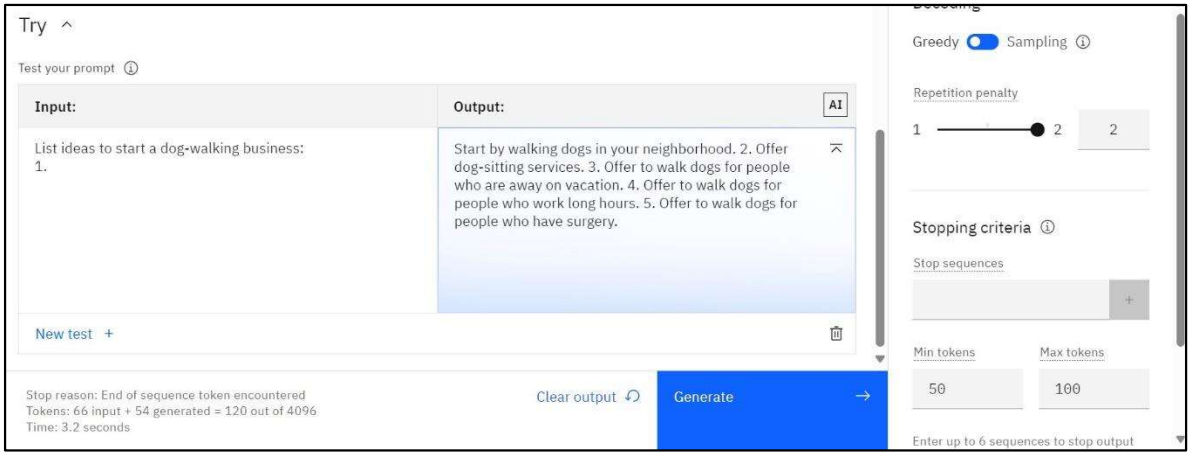
3. Arrange for a celebrity to endorse the lemonade stand



2. Clear the output (next to the Generate button) and click **Generate**.



The response is more concise, but not necessarily an improvement over the previous response.



3. Add another example to this section, this time on how to start a landscaping business. Click the **Add example +** button (below the **List ideas to start a dog-walking business**: example) to add space for a new example.

4. Under **Examples**, add the expected **Input** and **Output** on starting a lemonade business:

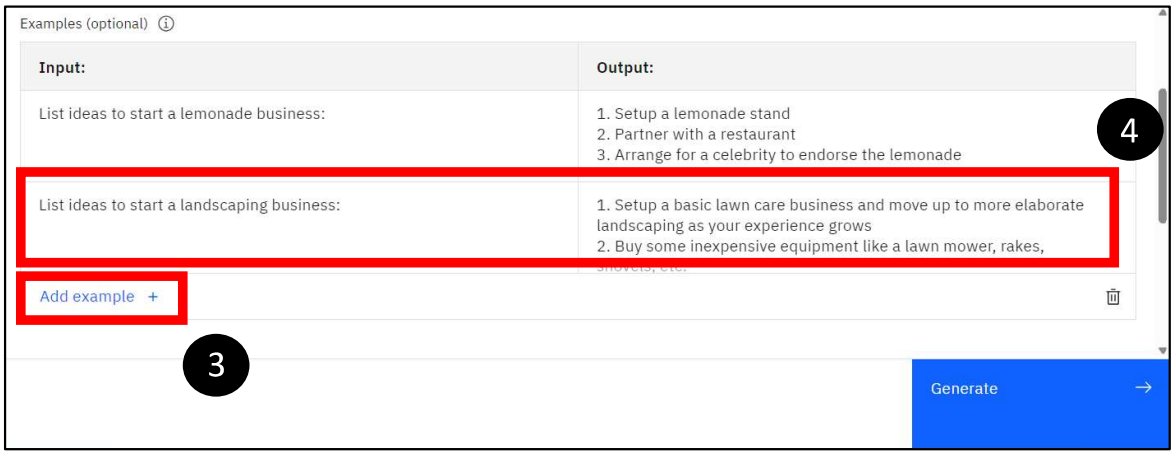
   Input: **List ideas to start a landscaping business:**

   Output:

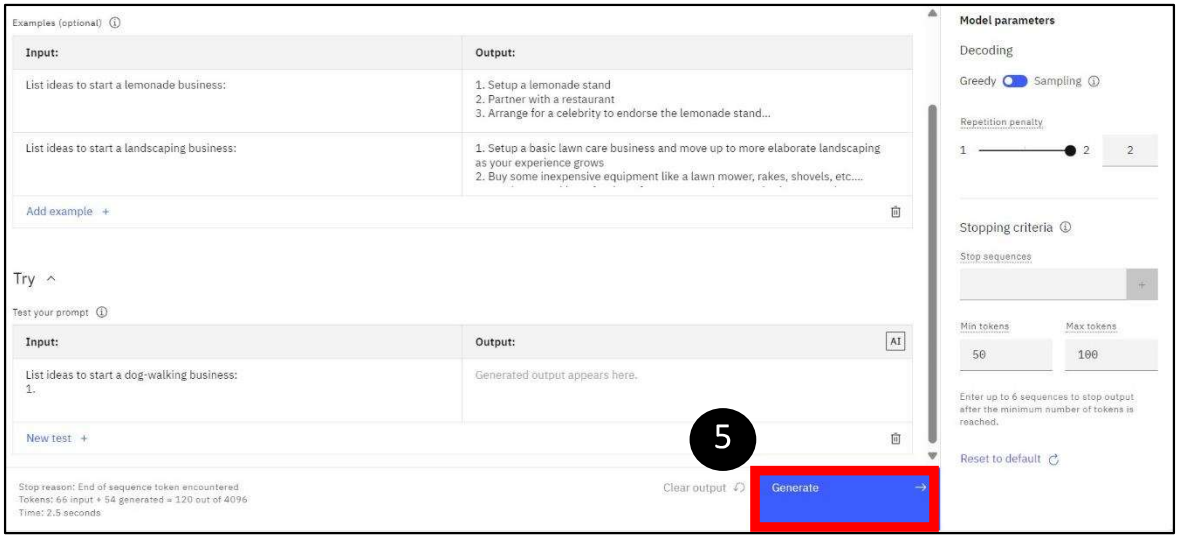
   1. Setup a basic lawn care business and move up to more elaborate landscaping as your experience grows

   2. Buy some inexpensive equipment like a lawn mower, rakes, shovels, etc.

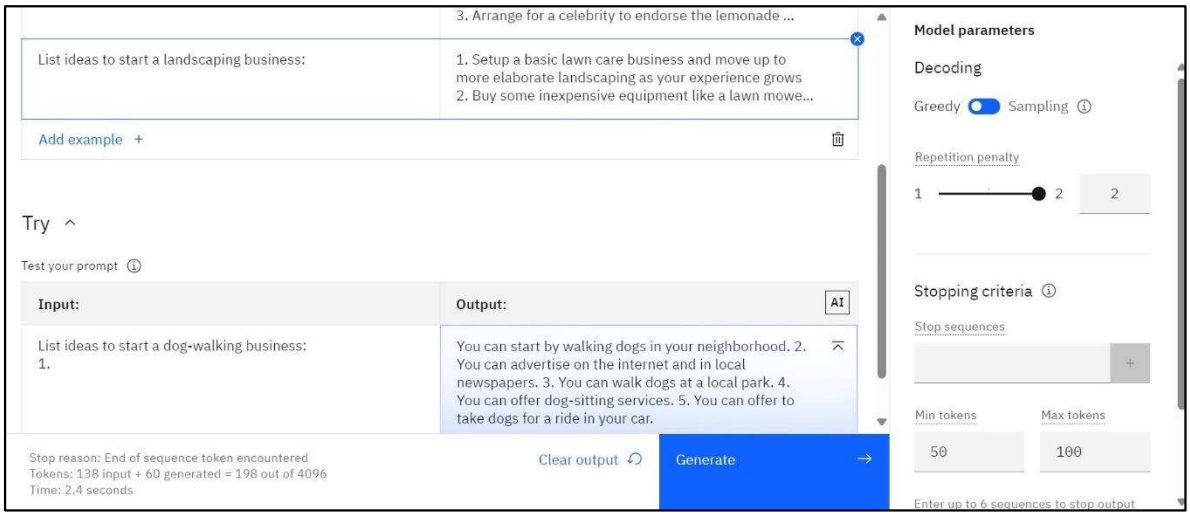
   3. Purchase used lawn furniture from estate sales or yard sales at very low cost



5. Clear the output (next to the Generate button) and click the blue **Generate** button.



The result is even better and contains more creative ideas. The response contains a lot of detail, and it is well structured.

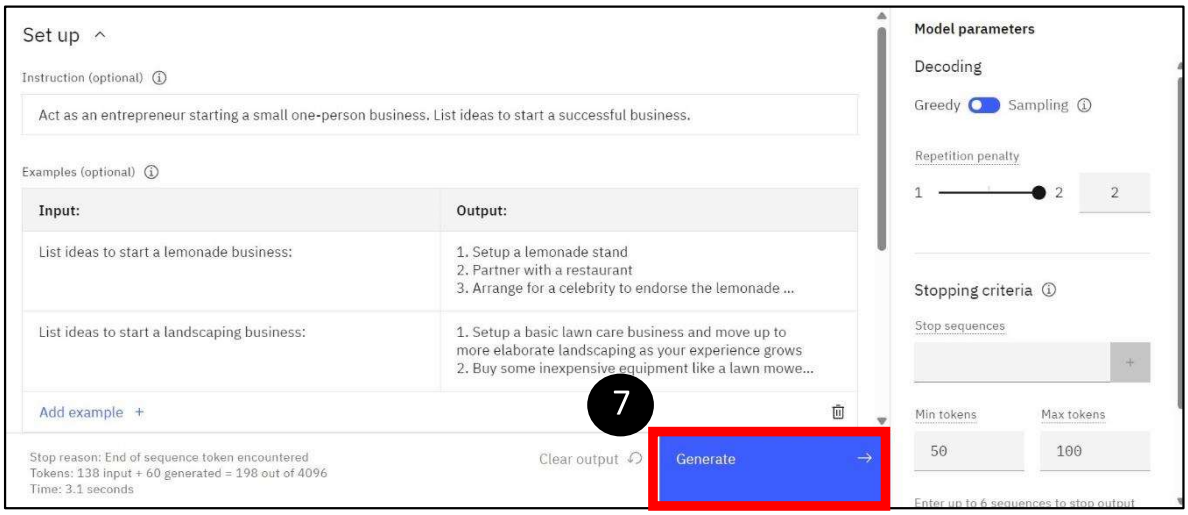


6. Reviewing the Prompt Lab interface and thinking back to the tips for writing good prompts, you noticed that you did not provide any instructions in the Instruction optional box. An instruction is an imperative statement that tells the model what to do. In this case, the imperative statement refers to an unconditional action to be taken by the foundation model. Add the following instruction to the **Instruction (optional)** box:

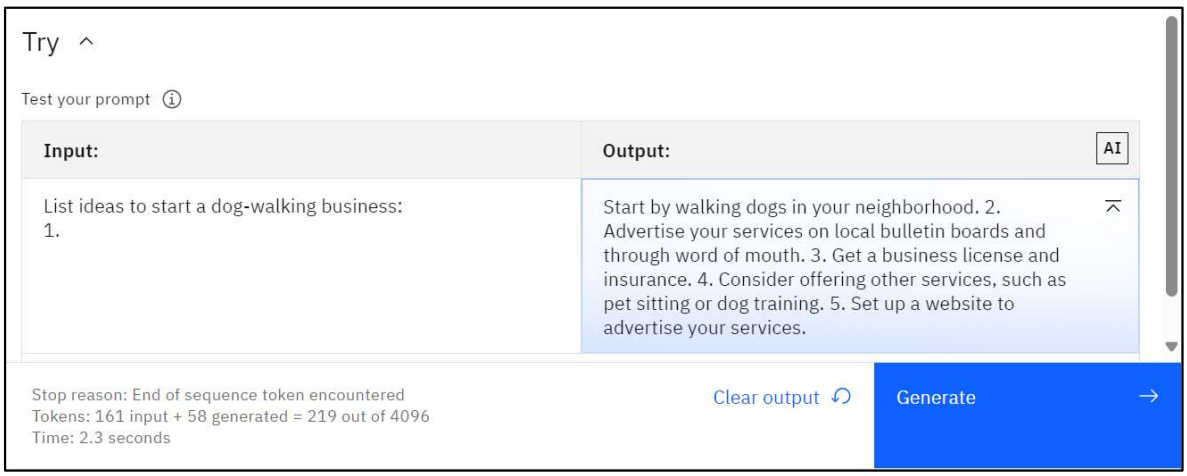
   Act as an entrepreneur starting a small one-person business. List ideas to start a successful business.

   The important keywords trying to steer the model in the right direction are “Act”, “entrepreneur”, “one-person” and “successful”.

7. Clear the output and click the blue **Generate** button.



The results are now from the perspective of an entrepreneur starting a small one-person business. It contains some innovative ideas and practical advice for starting a dog-walking business.

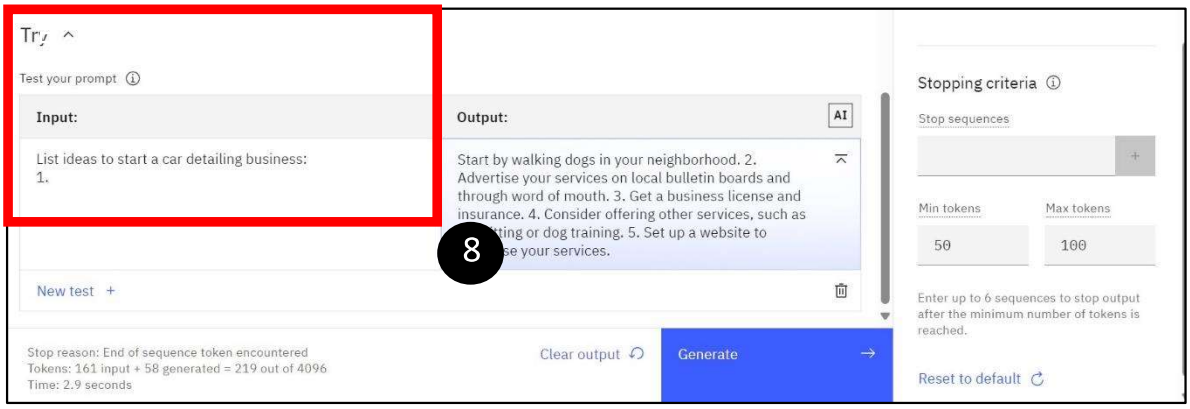


8. It is always a good idea to test your prompt on multiple examples before you assume that the prompt is working as intended. For this reason, you decide to give the foundation model one more prompt to test its effectiveness in teasing out responses from the foundation model. You decide to prompt the foundation model to list ideas to start a car detailing business.

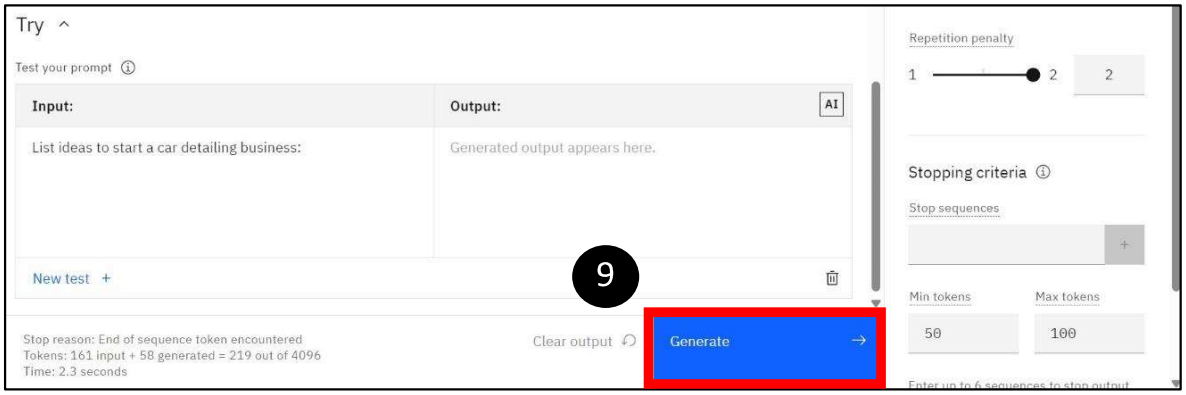
   Type in the following prompt in the **Input:** text box under the **Try** section:

   List ideas to start a car detailing business:

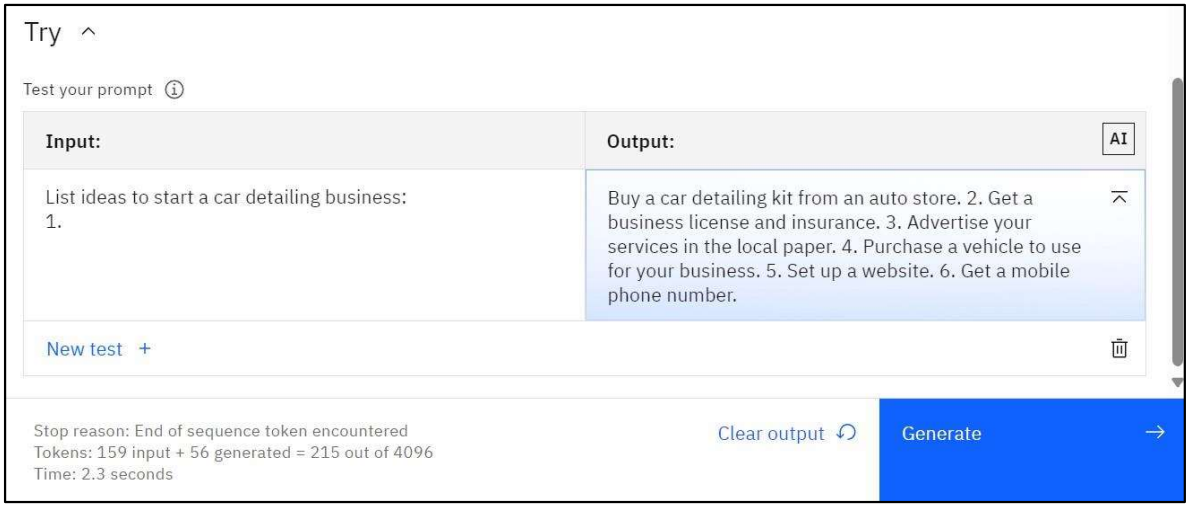
   1.



9. Clear the output (next to the Generate button) and click the blue **Generate** button.

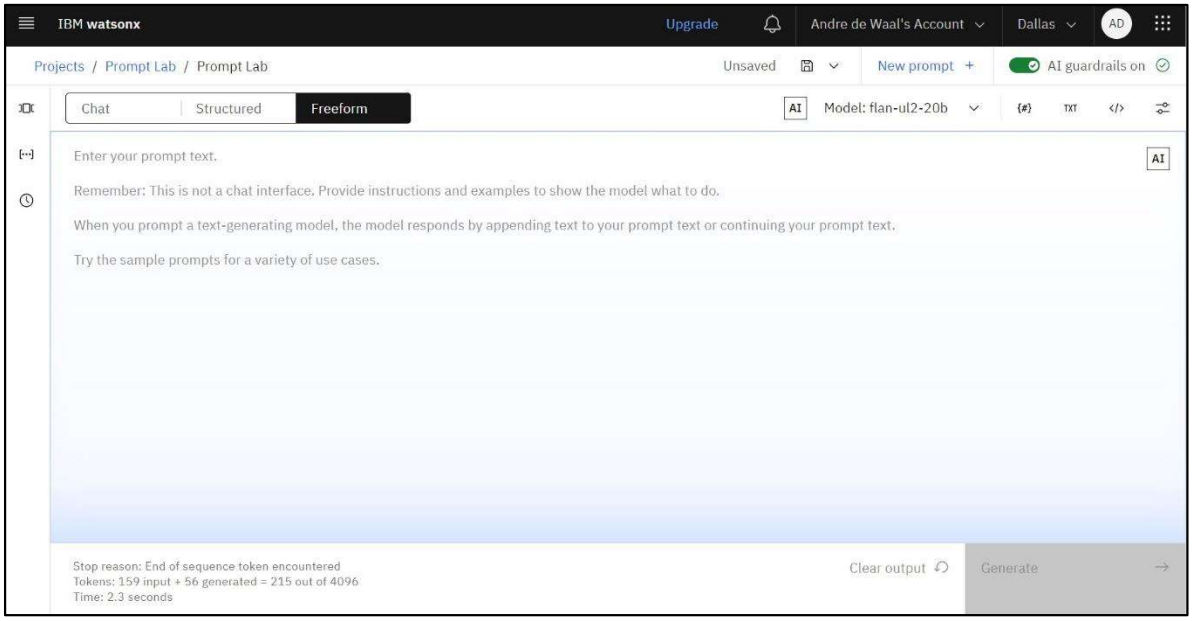


The response is appropriate, and you are delighted with you progress.



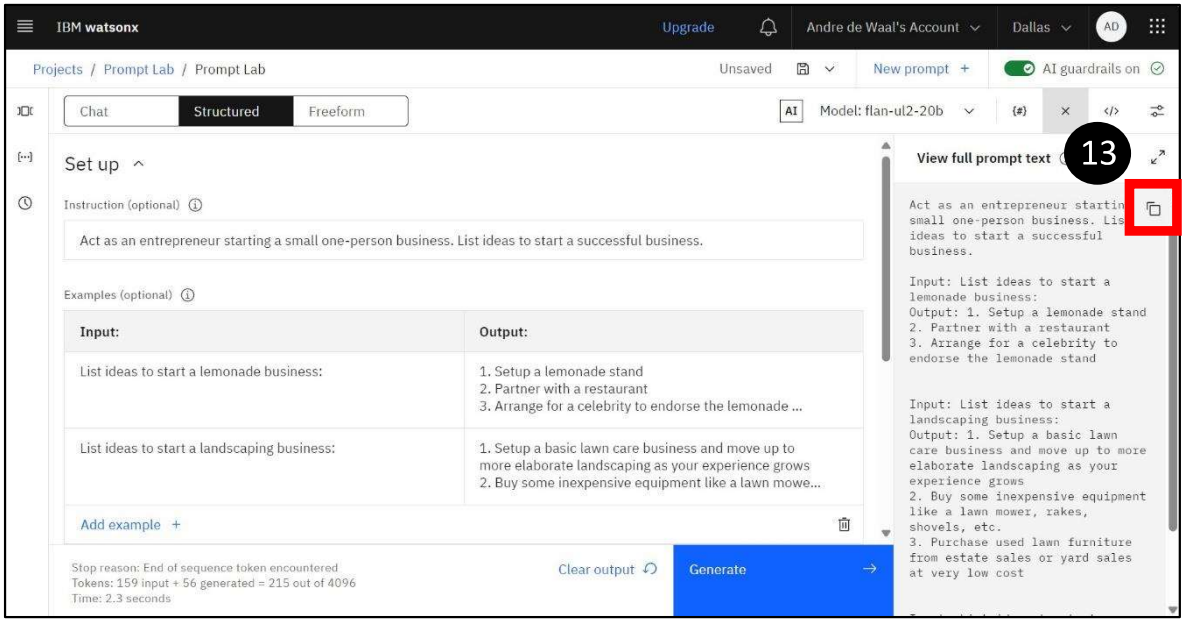
10. At the beginning of the prompt engineering exercise, you saw that there are three ways to construct your prompt: using the Structured or the Freeform interface as well as using the Chat interface. You have so far focused on the Structured way of creating a prompt and now it is time to explore the Freeform tab. Select the **Freeform** tab to switch interfaces.

The interface changes and you can provide your prompt in freeform format containing instructions as well as examples that you previously entered in the Structured interface.

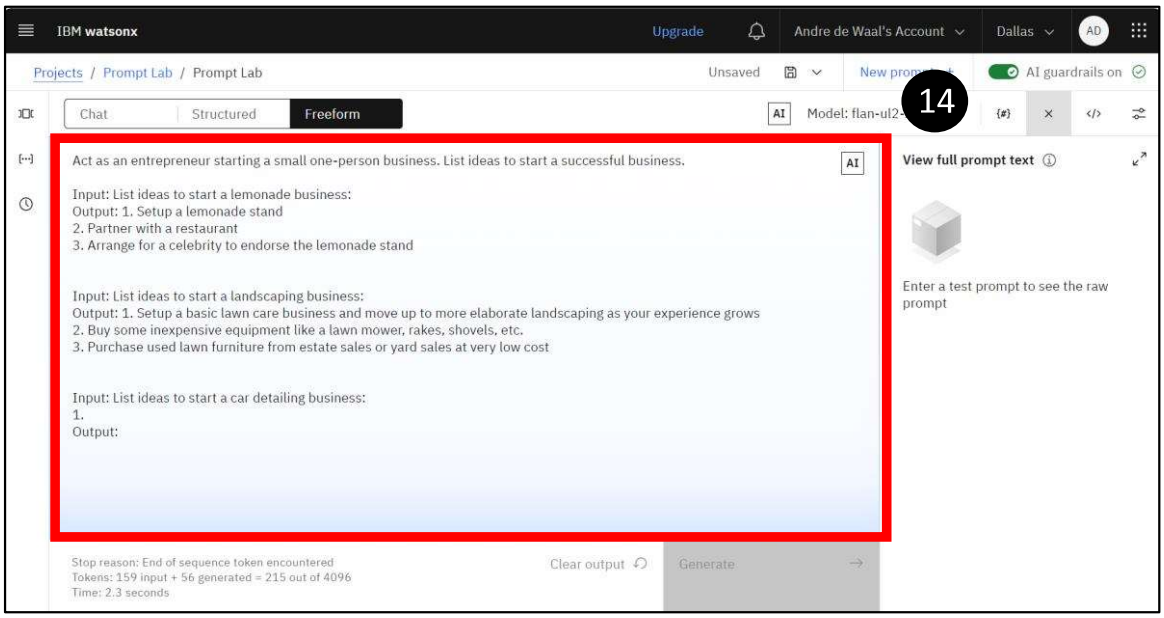


11. Select the **Structured** Interface.
12. Select the **TXT** tab in the upper right quadrant of the interface to view the full prompt text.

13. The panel contains the prompt in text format. Copy the full prompt text to the clipboard by clicking on the **Copy to clipboard** button.

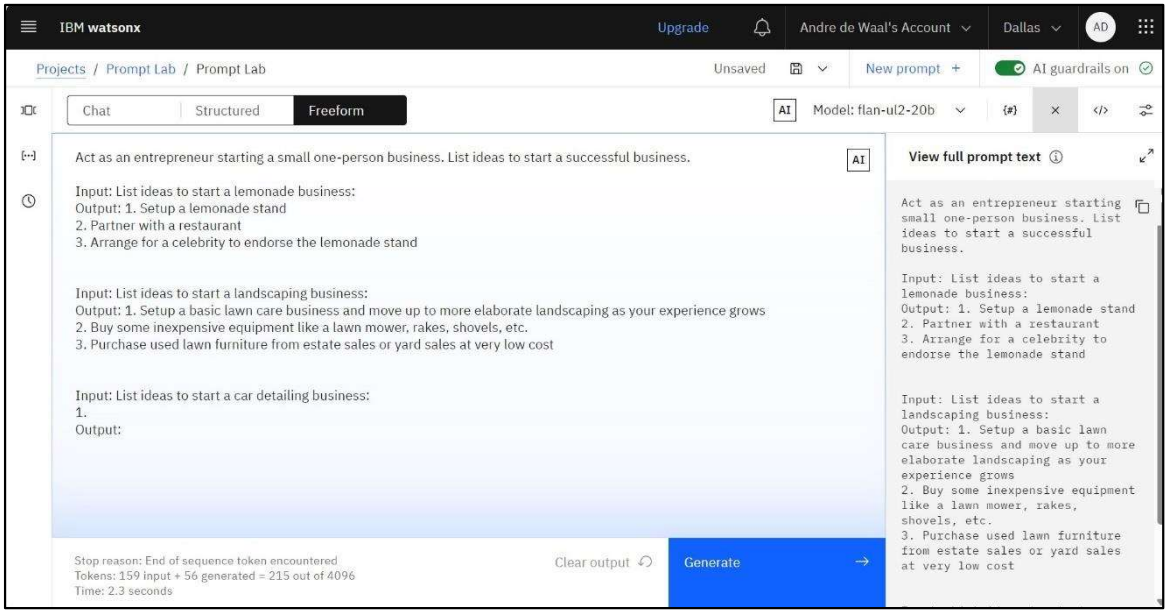


14. Switch to the Freeform interface and paste the **full prompt text** into the Freeform interface.

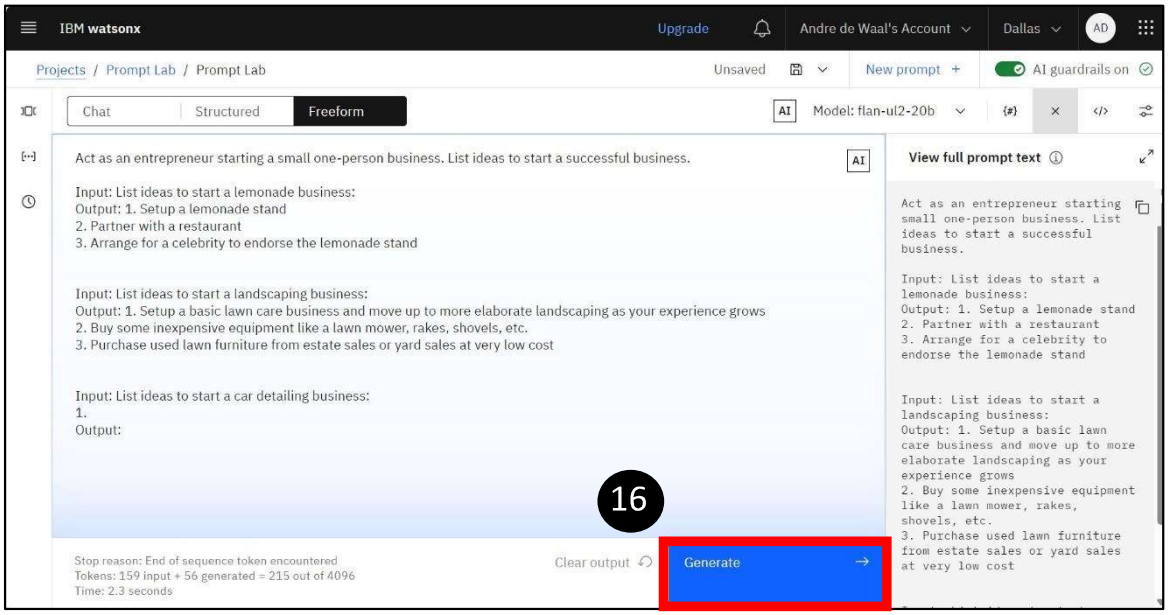


15. Press **Enter** to confirm that your prompt is accepted.

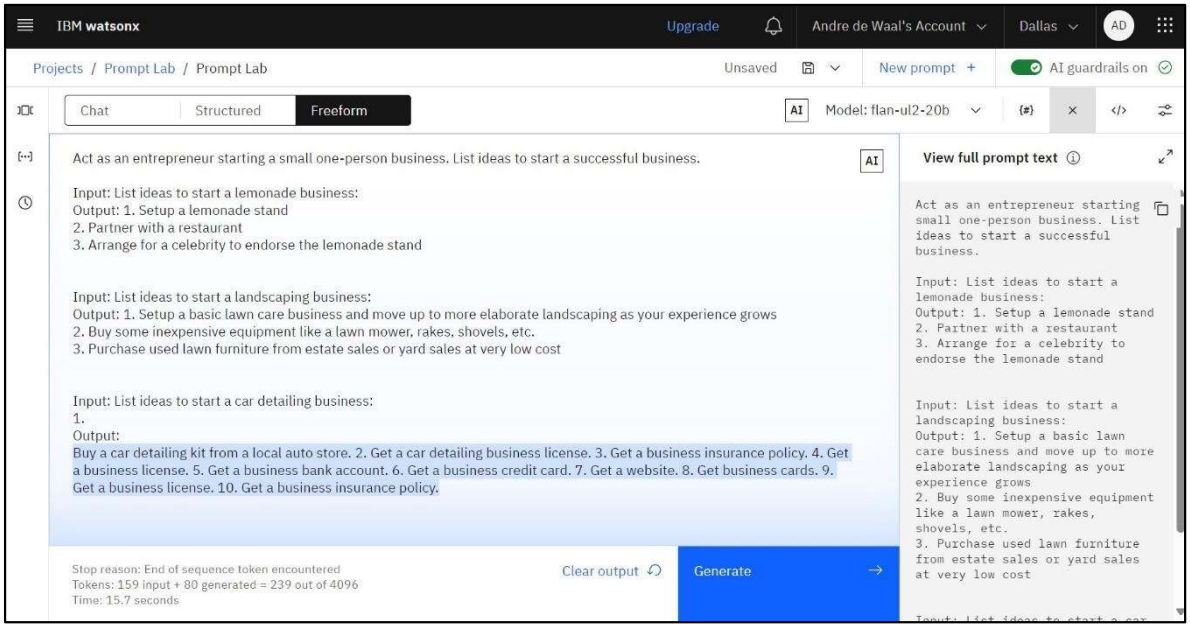
    The **Generate** button becomes active.



16. Click the blue **Generate** button.

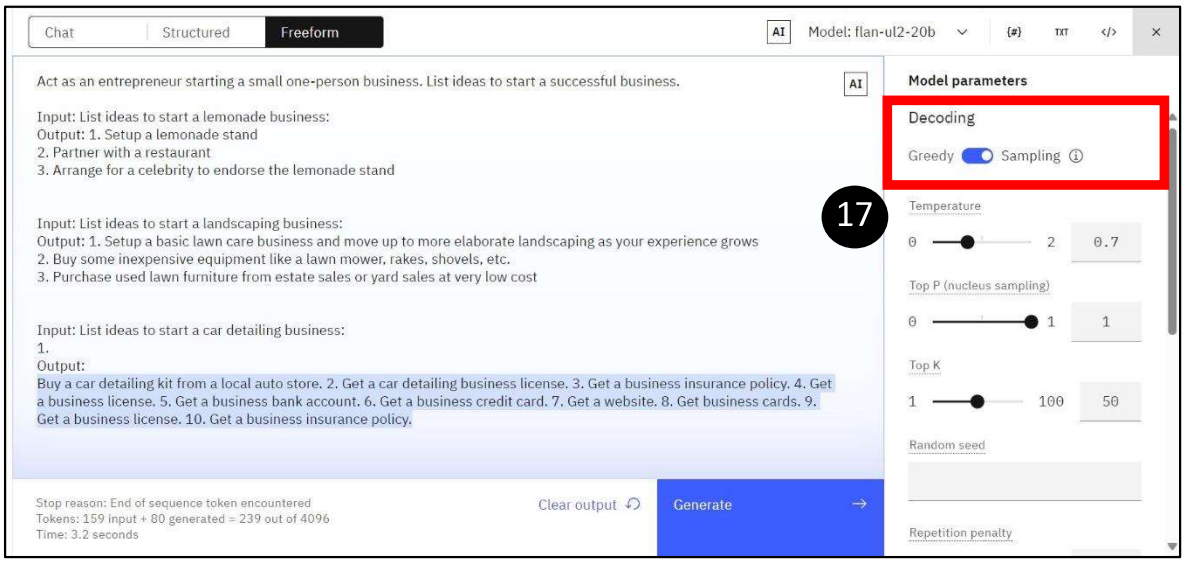


The response is very similar to what was generated using the Structured interface. Due to the non-deterministic nature of LLMs, your output may not always be the same as what is given in this guide.

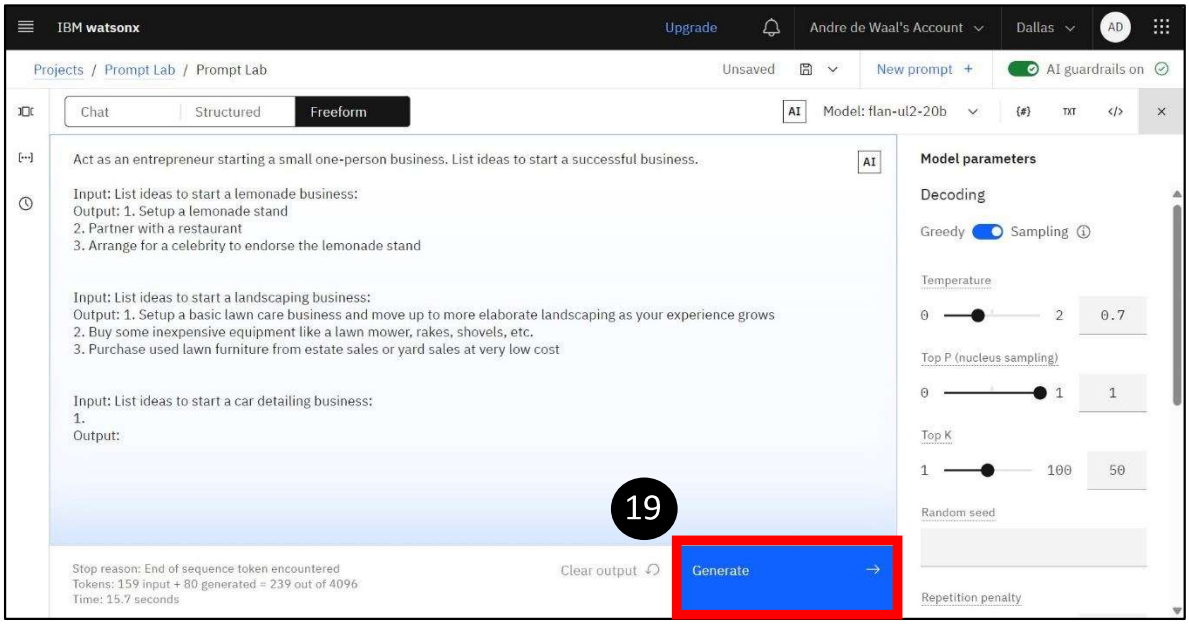


After you become familiar with the Prompt Lab, it might be easier, faster, and as you can see more convenient to construct the prompt in the unstructured or freeform way. The response from the foundation model is unaffected by which interface you prefer, but the response may be affected by your prompt lab settings.

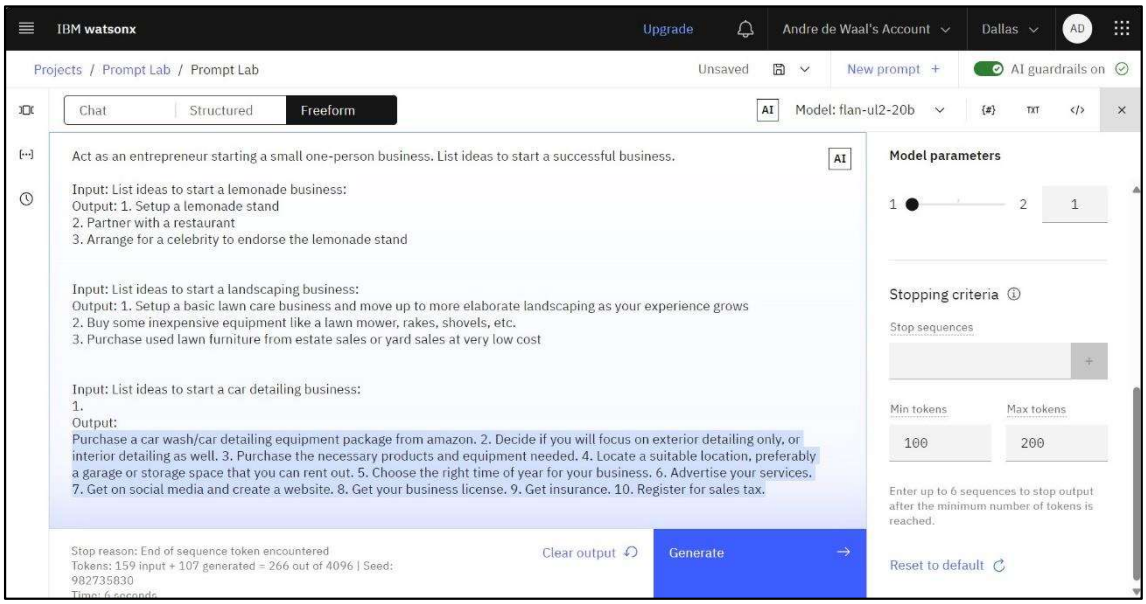
17. If you would like to generate alternative responses, change the **Decoding** parameter from **Greedy** to **Sampling**. Selecting **Sampling** instructs the foundation model to customize the variability of word selection. This setting change lets the model create alternative responses instead of re-creating a previous response. Select the **Model parameters** tab and select **Sampling** under the **Decoding** section.



18. Scroll down in the Model parameters panel and change the **Min tokens** to **100** and the **Max tokens** to **200.**
19. Clear the output and click the blue **Generate** button.



The LLM's completion response is good given the short instruction and two examples.

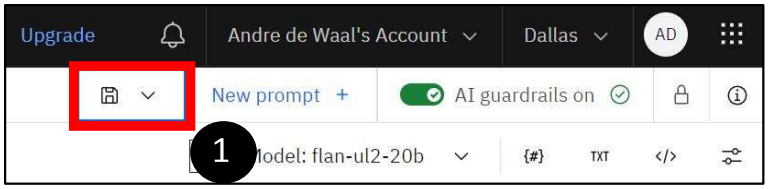


Important: After you set the decoding parameter to **Sampling**, your responses might be different from what is given in this course. This result is as expected as more variability in word selection might lead to different responses. This non-deterministic behavior is inherent in LLMs.

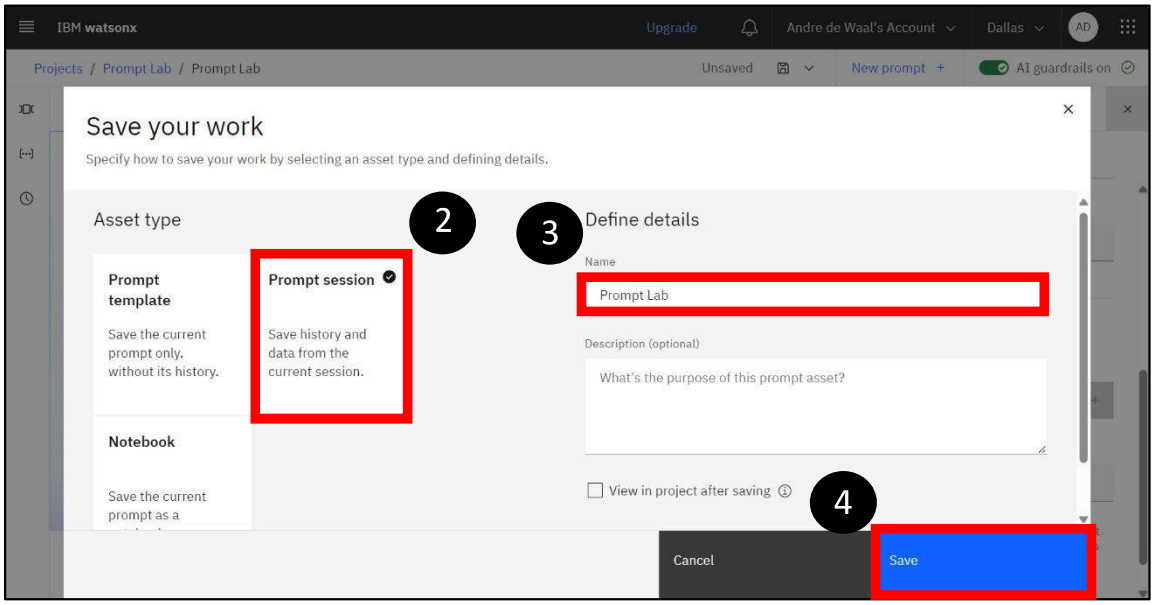
Section 3: Inspect the foundation model Python code

You also interested in seeing the Python code that was generated in the background. By watsonx.ai Studio to interact with the LLM.

1. Expand the **Save menu** expander arrow (disk drive) and select the **Save as** in the upper-right quadrant of the interface.

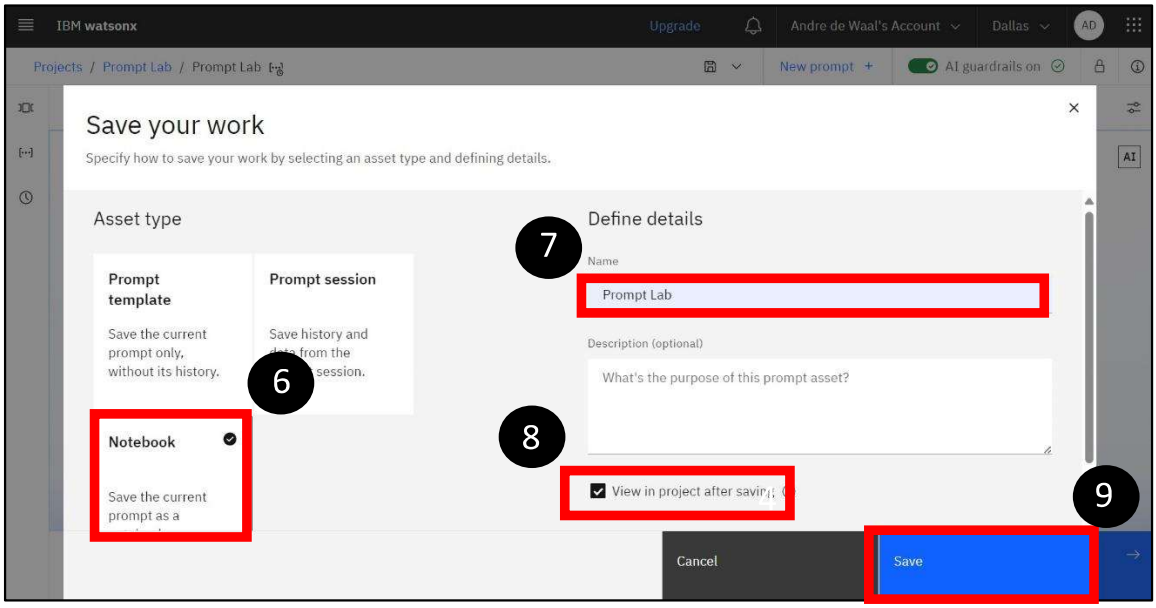


2. Select the **Prompt session** tile.
3. In the **Name** field give the session a descriptive name such as **Prompt Lab**.
4. Click **Save** to save the Prompt Session.

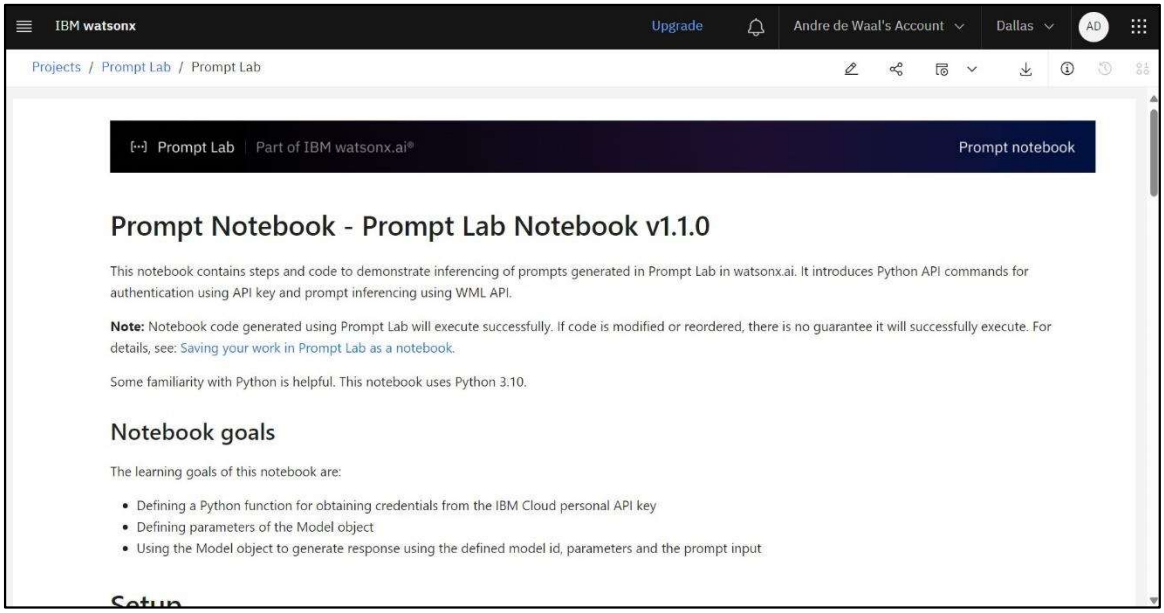


5. Expand the **Save menu** expander arrow (disk drive) and select the **Save as** in the upper-right quadrant of the interface.

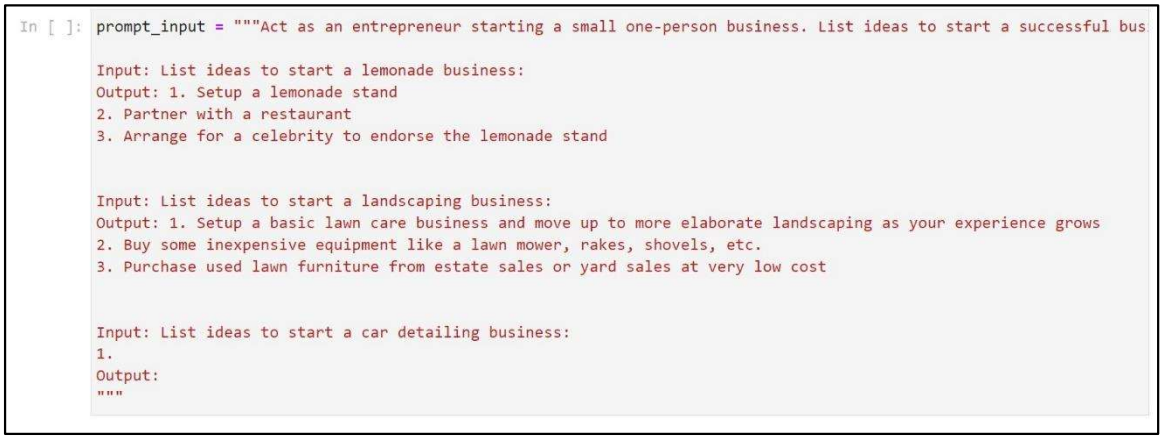
6. Select the **Notebook** tile.
7. In the **Name** field give the notebook a descriptive name such as **Prompt Lab**.
8. Select the **View in project after saving** check box.
9. Click **Save** to save the Prompt Session.



The Notebook opens and you can inspect the code, modify the code, and use the notebook as a template for other Prompt Lab experiments.



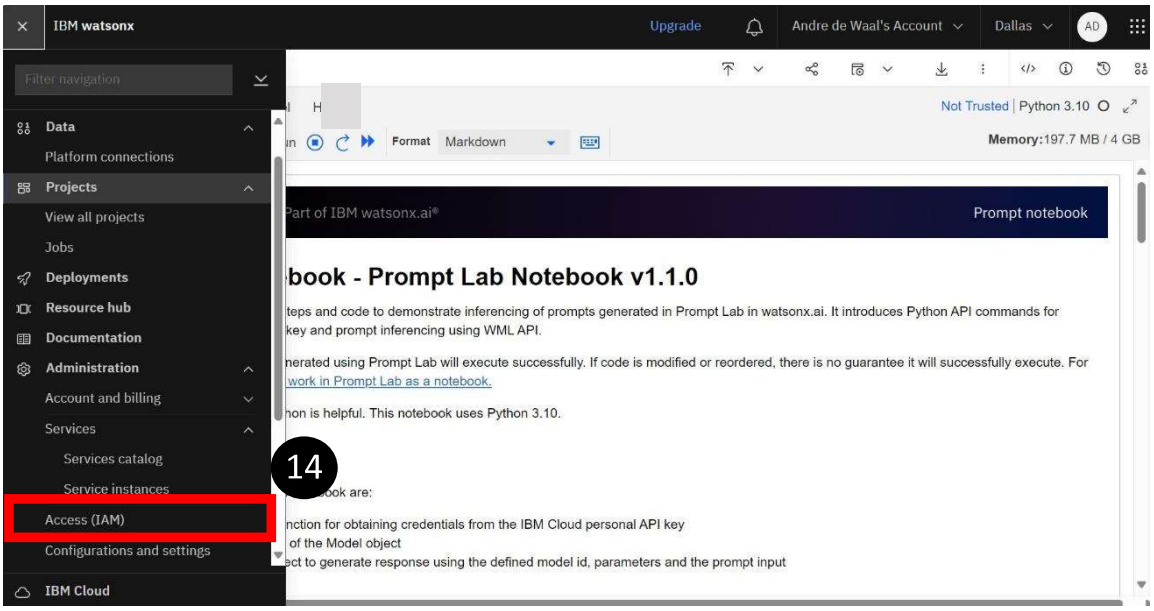
10. **Scroll down** to the **Defining the inferencing input** section (cell 6) of the Jupyter Notebook to see the Python prompt equivalent of what you input as text in the Prompt Lab in watsonx.ai Studio.



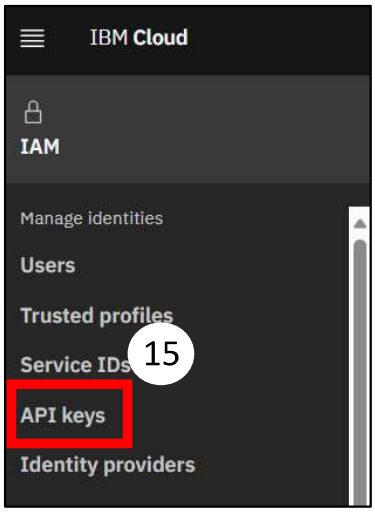
11. Click the **Edit** icon (pencil) in the upper-right quadrant of the interface.

The runtime for the Prompt Lab Jupyter Notebook instantiates (stands up).

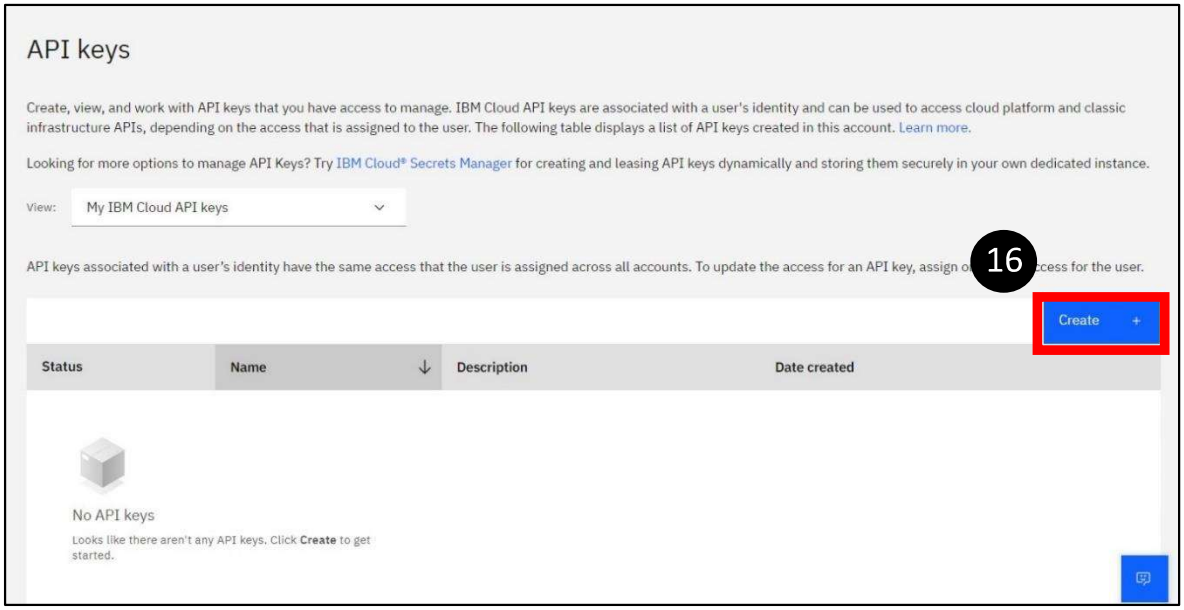
12. **Retrieve** your API key (for more information on how to generate your IBM Cloud personal API key, click the Documentation link).
13. Click the **Navigation Menu** (the four horizontal bars also known as the hamburger menu) in the upper-left quadrant of the screen.
14. Select **Access (IAM)** in the left panel.



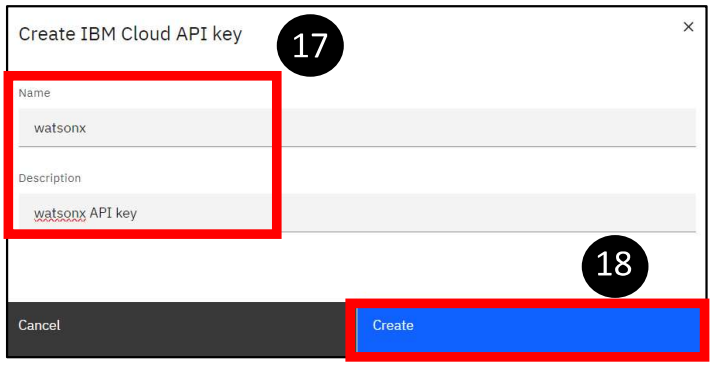
15. Select **API keys** from the menu on the left.

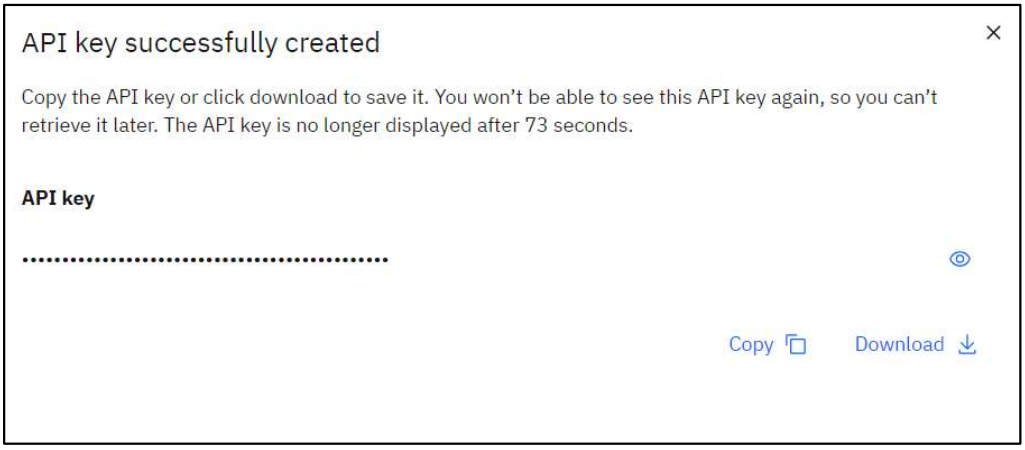


16. Click **Create**.

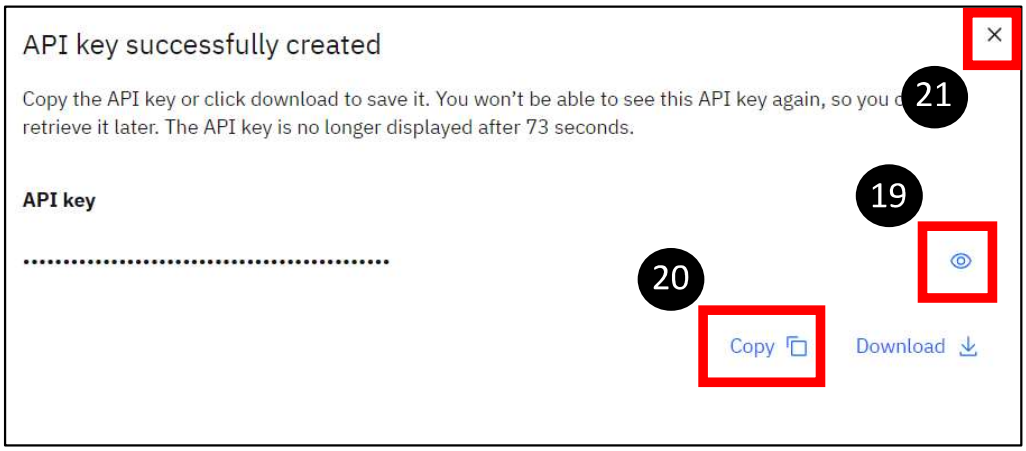


17. Enter a **name** and **description** in the corresponding fields, for example as **watsonx** and **watsonx API key**.
18. Click **Create**. The API key is generated.

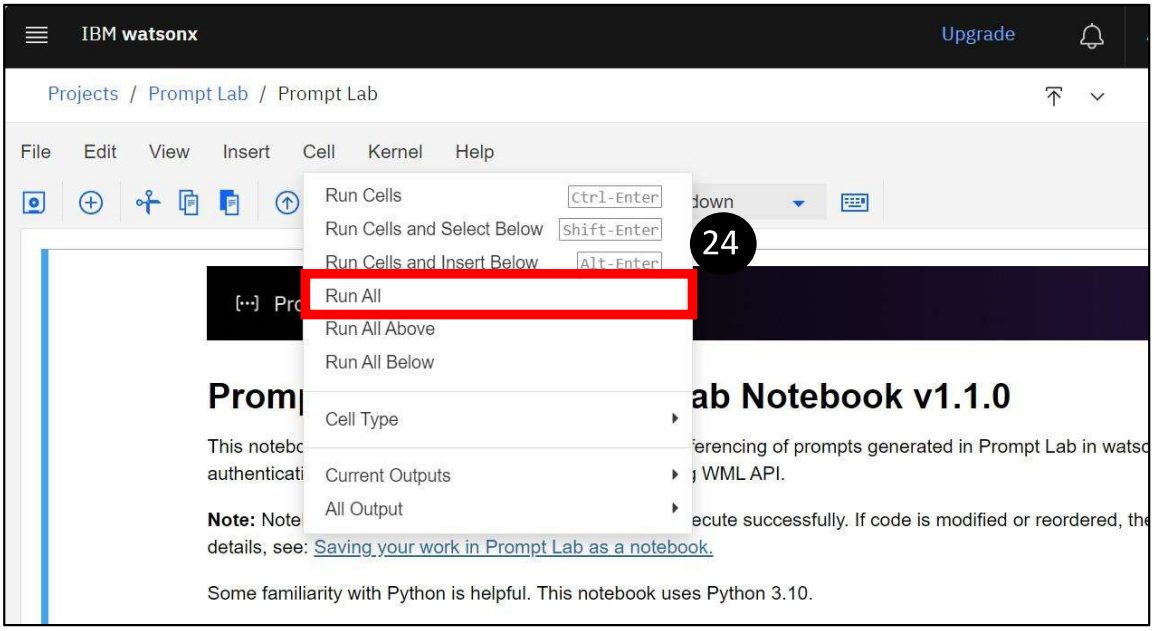




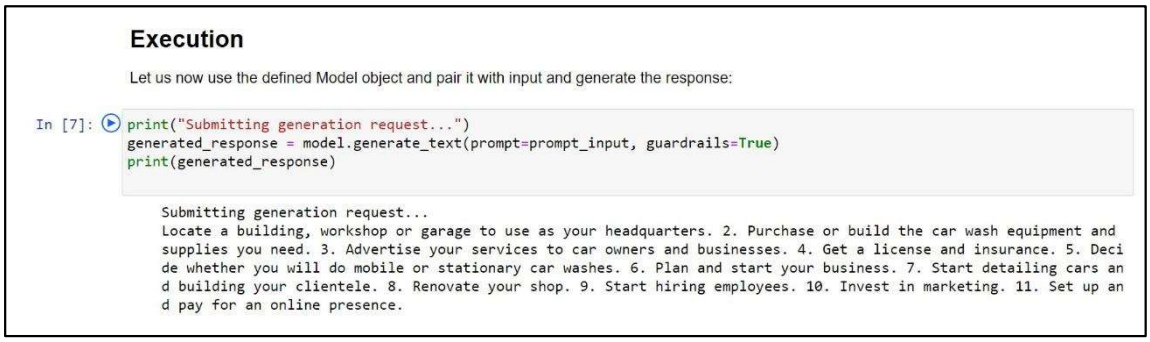
19. Click the **Show** (eye icon) on the far right to display your API key.
20. Click **Copy** to copy your API key. It is a good idea to save your API key as you may need it for future use.
21. Press **x** to close the dialog box.



22. Click the **Prompt Lab --- Prompt Lab | IBMwatson** tab in your browser to return to the watsonx GUI and your Jupyter Notebook.
23. Click the **edit** icon (underlined pencil) in the upper-right quadrant of your screen to Instantiate the Python runtime for the Prompt Lab.
24. Click **Cell** to expand the Cell menu and then select **Run All** to run the notebook.



25. Paste your API key in the browser when asked and press **Enter**.
26. The rest of the Notebook is run, and the following response is generated.

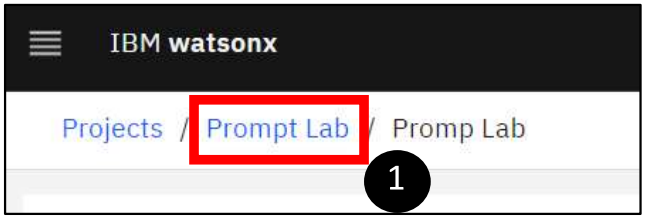


You might notice that the response is slightly different from what you got previously as the **Decoding** parameter is set to **Sampling**. The response is acceptable.

Section 4: Model options and tokens

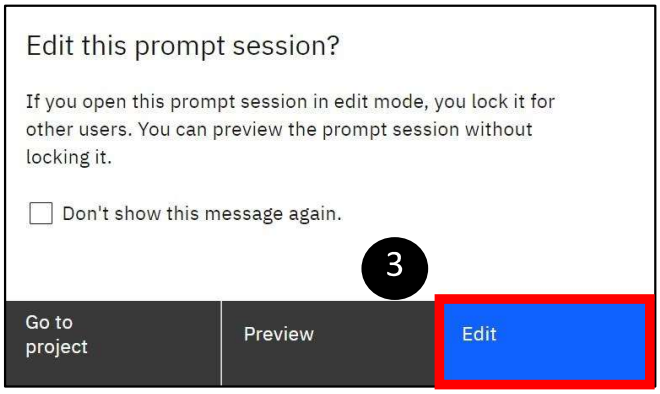
Different foundation models might also generate different responses to a prompt. This difference is expected as the models might have different architectures, a different number of parameters, and the models might have been trained on different data sets.

1. Click the **Prompt Lab** in the upper left quadrant of your project to get back to your Prompt Lab Project.



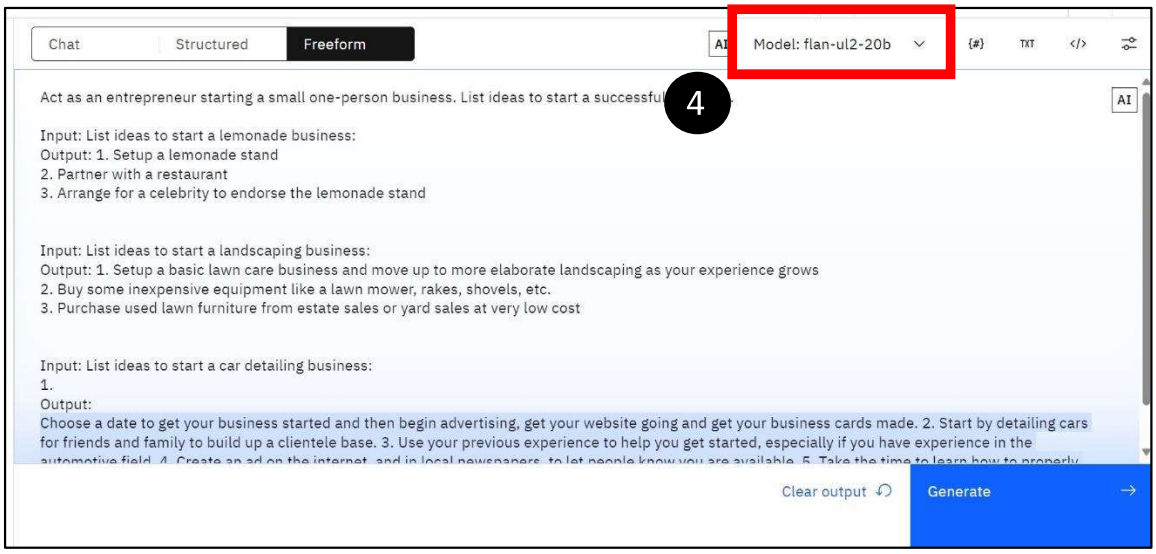
2. Click on the **Prompt Lab Prompt Session** under the **Assets** tab to select your Prompt Session.

3. Click **Edit** to edit the Prompt Session

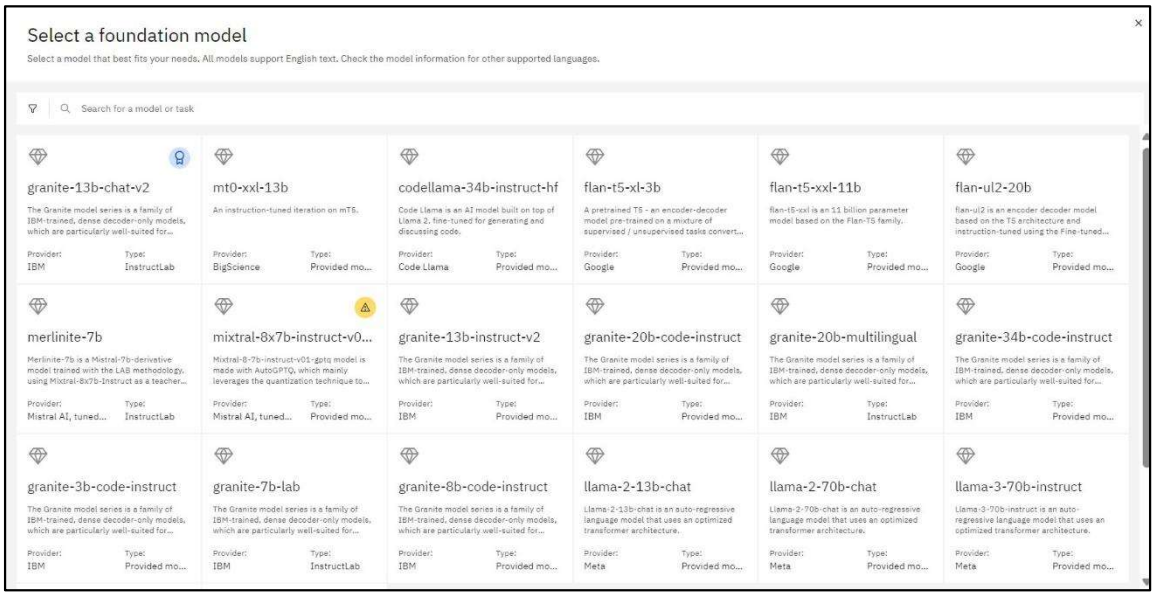


You returned to your **Freeform** prompt session.

4. Click the current foundation model **flan-ul2-20b** and select **View all foundation models** to see a list of the currently available foundation models.



The following models are available (this list change over time and new models are added and removed from watsonx.ai).

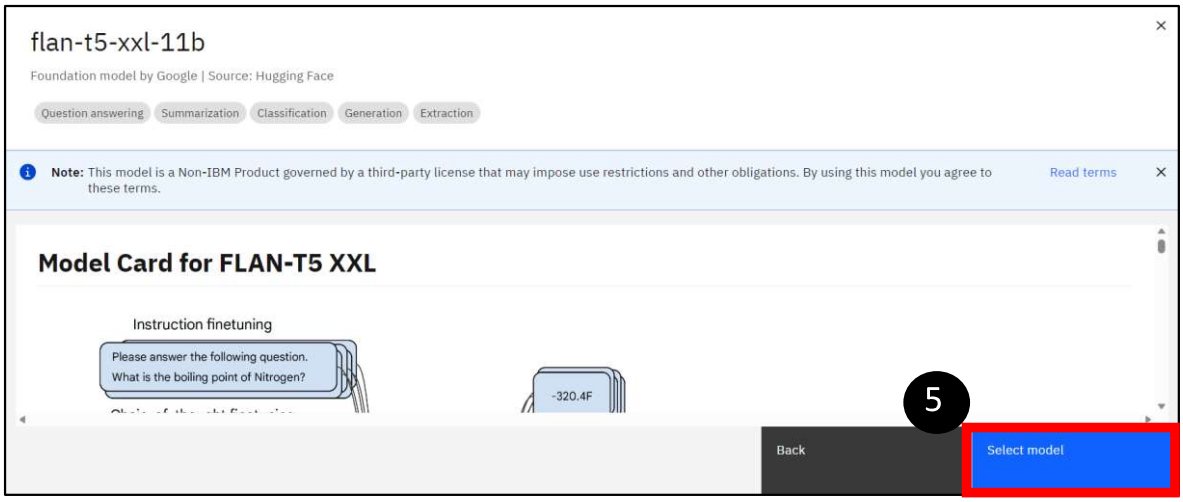


For example, **Flan-ul2-20b** is a general foundation model with 20 billion parameters and it is suitable for zero-shot and few-shot prompt engineering in watsonx.ai's Prompt Lab.

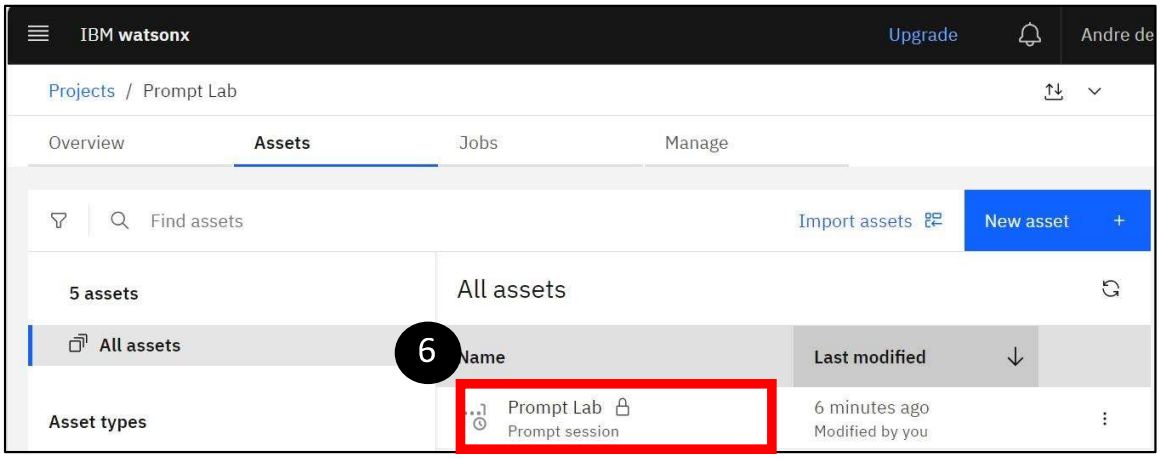
Sometimes, you might also need to experiment with a more complex model if the response to your prompt is unsatisfactory. You might also need to explore different types of models based on different architectures, such as Encoder-Decoder or Decoder-only models (these are types of transformers, the technology behind foundation models).

Models might also be trained on different data sets, and in different languages. Inspect the documentation before selecting a particular model.

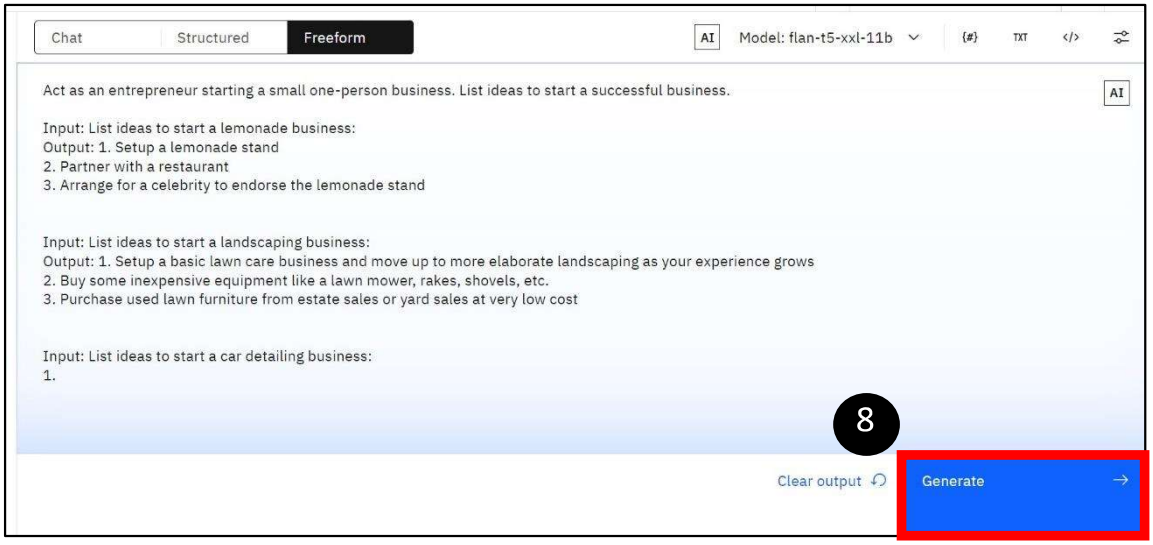
5. In many cases you can get similar results that use a smaller model (which might save resources). Click on the **flan-t5-xxl-11b** tile to select a smaller model (11 billion parameters), still based on the same underlying model family (Flan-T5). Read the model card, then click **Select model**.



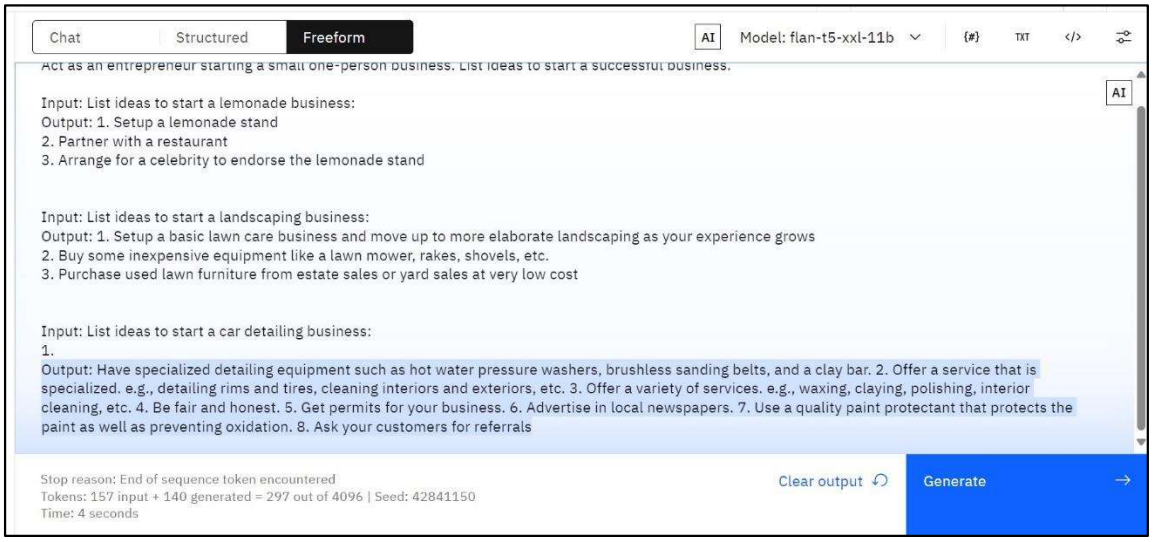
6. Navigate back to the **Prompt Lab** by selecting the **Prompt Lab Prompt Session** asset from the **Assets** tab.



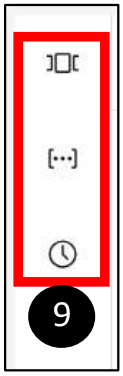
7. Click **Edit** to edit the Prompt Session. You are back at your Prompt Session.
8. Remove the previous response from the Prompt Lab and click **Generate** to generate a new response.



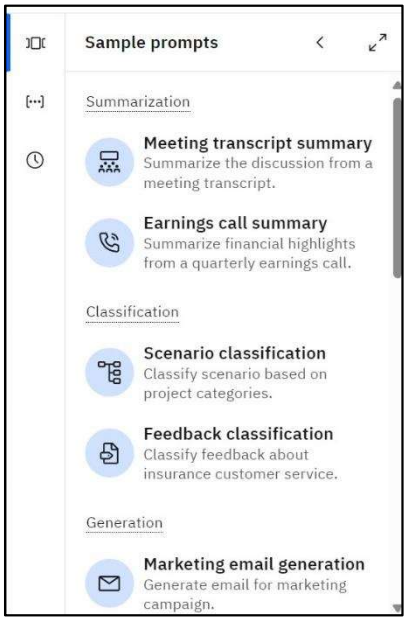
The LLM generates the response using the smaller model. The response is not a lot different from that generated by the larger model and may be acceptable for your use cases. You can do some more experiments to evaluate this model for future use.



9. Click on the **Sample prompts**, **Saved prompts,** and **History icons** in the left panel of your prompt session to get additional information on tasks you can perform with suggested prompts, saved prompts, and a history of your current prompt session.



The **Sample prompts** might be useful for suggesting more tasks that a foundation model might solve, and how to get started with a particular task.



The last task for you is to recommend to your manager how this new technology might be used in their company. This recommendation is covered in the next exercise.

End of exercise

3. Exercise review and wrap-up

In the exercises, you used the functionality available in IBM watsonx to build prompts in the Prompt Lab. You started with a basic prompt (zero-shot prompting) and iterated until you had a prompt that performed well on a couple of examples. During each successive iteration, you improved the cue, added more examples, and finally added an imperative statement (called an instruction) to improve your prompt. You also looked at the Prompt Lab settings and adjusted several settings to steer the foundation model toward generating the wanted responses.

You took a journey to explore foundation models in the watsonx platform. The only question remaining is how your knowledge can benefit your company in their quest to use the power of foundation models.

After careful consideration, you identified at least four use cases where foundation models can possibly be used successfully in the company:

1. Generating marketing emails to customers.
2. Answering health product-related questions.
3. Doing sentiment analysis of survey responses.
4. Classifying survey responses into different categories, such as product, price, quality, etc., for further action.

Now you will prepare a presentation on his findings and share it with colleagues and management.

After completing these exercises, you should have all the necessary skills to use the Prompt Lab successfully in watsonx.