

Lab 2b: Build an Agent with watsonx.ai and crew

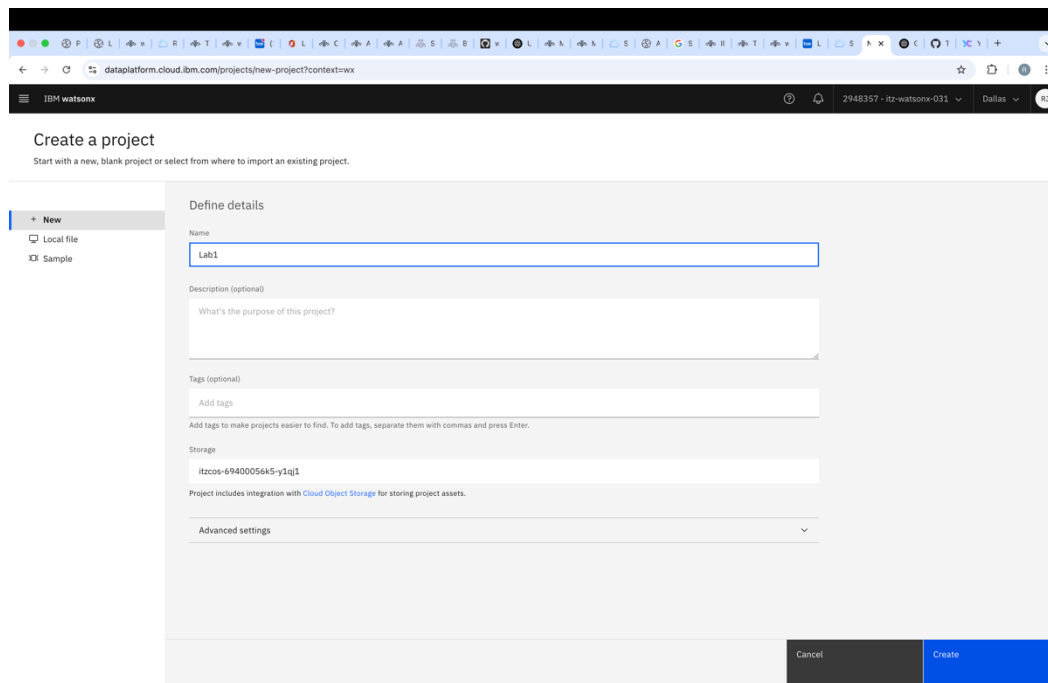
In this lab, you will build a **Sales Analyzer Agent** using **Watsonx.ai** and **Crew AI**. This agent will allow you to analyze historical sales data of products for procurement.

Note : Files used in lab can be downloaded from folder “Lab 2b”.

Steps to Create the Agent

Step 1: Create a Project

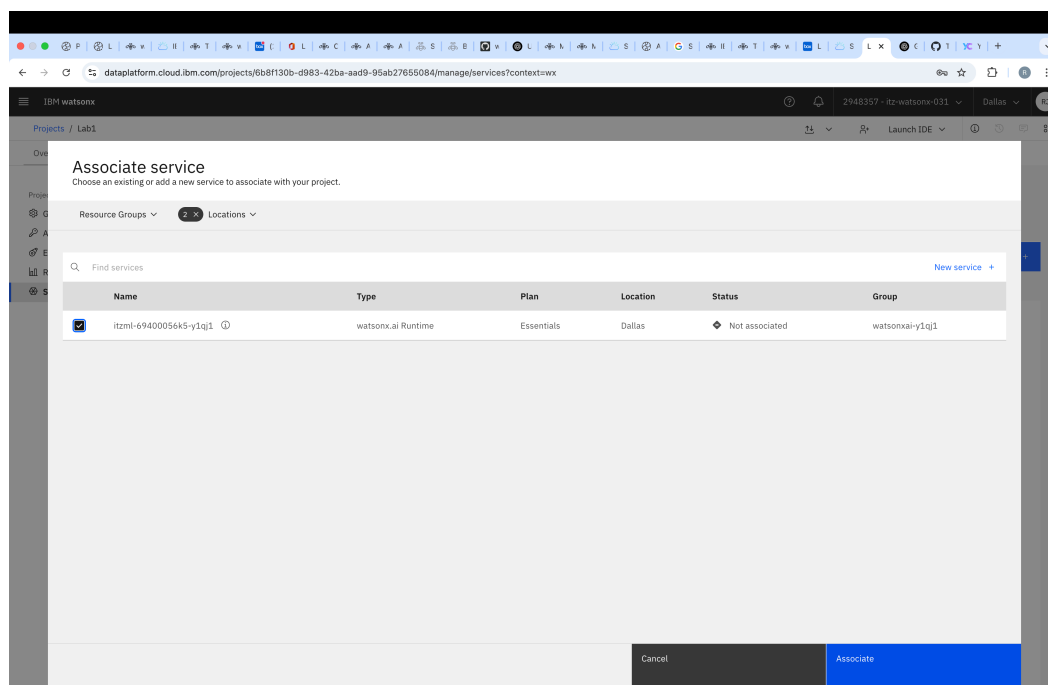
- If this is your first time using this account, you should create a project before using Agent Lab. You can use your existing project also.



The screenshot shows the 'Create a project' page in the IBM watsonx web application. The browser address bar shows 'dataplatfom.cloud.ibm.com/projects/new-project?context=wx'. The page title is 'Create a project' with a subtitle 'Start with a new, blank project or select from where to import an existing project.' On the left, there is a sidebar with a '+ New' button and two options: 'Local file' and 'Sample'. The main area is titled 'Define details' and contains several form fields: 'Name' (with 'Lab1' entered), 'Description (optional)' (with the placeholder 'What's the purpose of this project?'), 'Tags (optional)' (with an 'Add tags' button and a note 'Add tags to make projects easier to find. To add tags, separate them with commas and press Enter.'), 'Storage' (with the value 'itcos-69400056k5-y1q1' and a note 'Project includes integration with Cloud Object Storage for storing project assets.'), and an 'Advanced settings' section with a dropdown arrow. At the bottom right, there are 'Cancel' and 'Create' buttons.

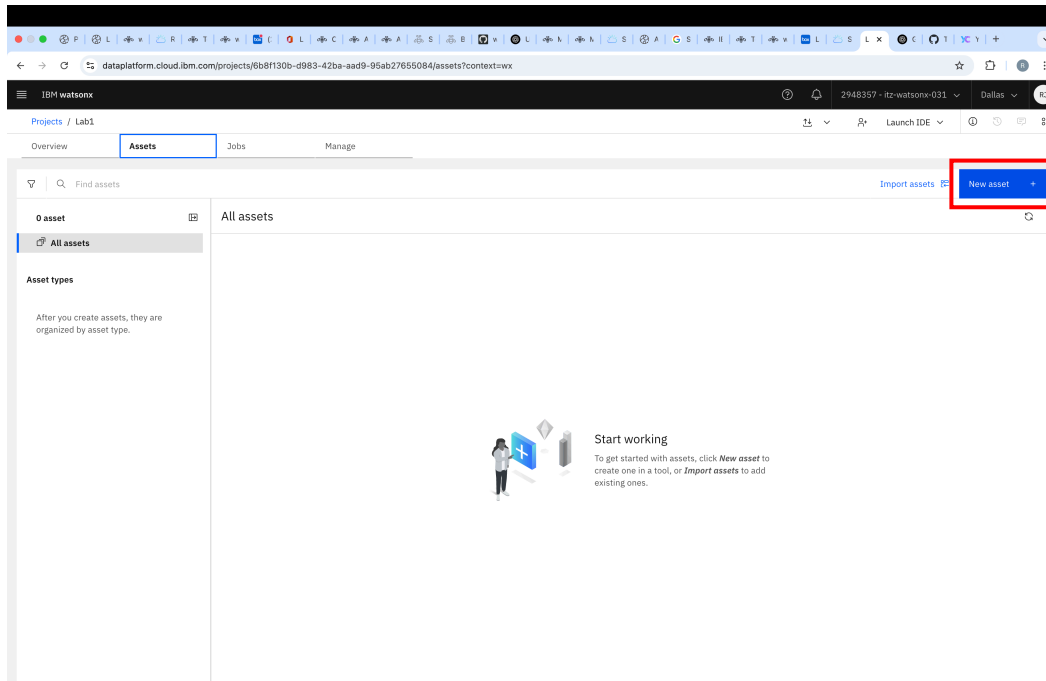
Step 2: Associate the Watsonx.ai Service (No need to repeat this step, if you already did previously)

- After creating the project, navigate to **Manage** → **Services & Integrations** → **Associate Service**.
- Select **Watsonx.ai** and associate it with your project.



Step 3: Add a New Asset

- Go to the **Assets** tab and click **New Asset**.

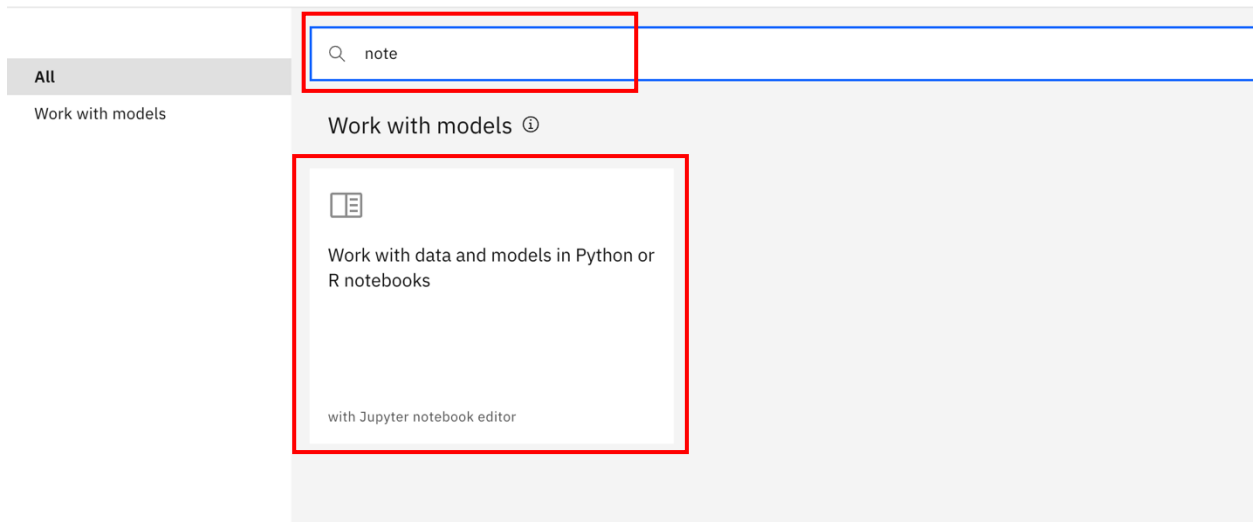


Step 4: Create the notebooks

- Search for "Work with data and models in Python or R notebooks" and click to create a notebook.

What do you want to do?

Select a task based on your goal. You'll use a tool to create an asset for that goal.



Step 5: Upload the files

- Click on **Local File**.
- Upload notebook for vector index creation using the **Browse** option.
 - SalesAnalysis.ipynb
 - SalesAnalysis_query.ipynb
- Click on **Create** to create the notebook.

Work with data and models in Python or R notebooks

Define the details to create a notebook asset and open it in the Jupyter notebook editor tool.

The screenshot shows a web interface for creating a notebook asset. On the left, a sidebar contains three options: '+ New', 'Sample', and 'Local file' (which is highlighted with a red rectangle). The main area is titled 'Denne details' and contains a 'Local asset' field with 'salesAnalysis.ipynb', a 'Name' field with 'salesAnalysis', and a 'Description (optional)' text area. To the right, under 'Denne configuration', there is a 'Select runtime' dropdown menu showing 'Runtime 24.1 on Python 3.11 XS (2 vCPU 8 GB RAM)'. Below this, a note states: 'The selected runtime has 2 vCPU and 8 GB RAM. It consumes 1 capacity unit per hour. [Learn more](#) about capacity unit hours and watsonx.ai Studio pricing plans.' At the bottom right, there are two buttons: 'Cancel' and 'Create' (highlighted with a red rectangle).

Work with data and models in Python or R notebooks

Define the details to create a notebook asset and open it in the Jupyter notebook editor tool.

This screenshot shows the same web interface but at the 'Browse' step. The sidebar on the left is identical, with 'Local file' highlighted. The main area now features a large dashed box containing an illustration of a person dropping a file into a bin. To the right of the illustration, the text reads: 'Drop IPYNB file here or browse for file to upload. Add a notebook (IPYNB) file that contains your notebook. You can only upload files up to 52 MB.' Below this text is a blue 'Browse' button. At the bottom right, the 'Cancel' and 'Create' buttons are visible, with 'Create' being disabled (grayed out).

Step 6: Configure the notebook

- Key in the required info to run the notebook
- Create an IBM Cloud API key or get it from the team and update the `api_key` to initialize the llm. Also verify the `api_base` value is as per your watsonx instance.
- `DB_PASSWORD` can be found in “DB Connection Details.boxnote” in the Lab 2b folder

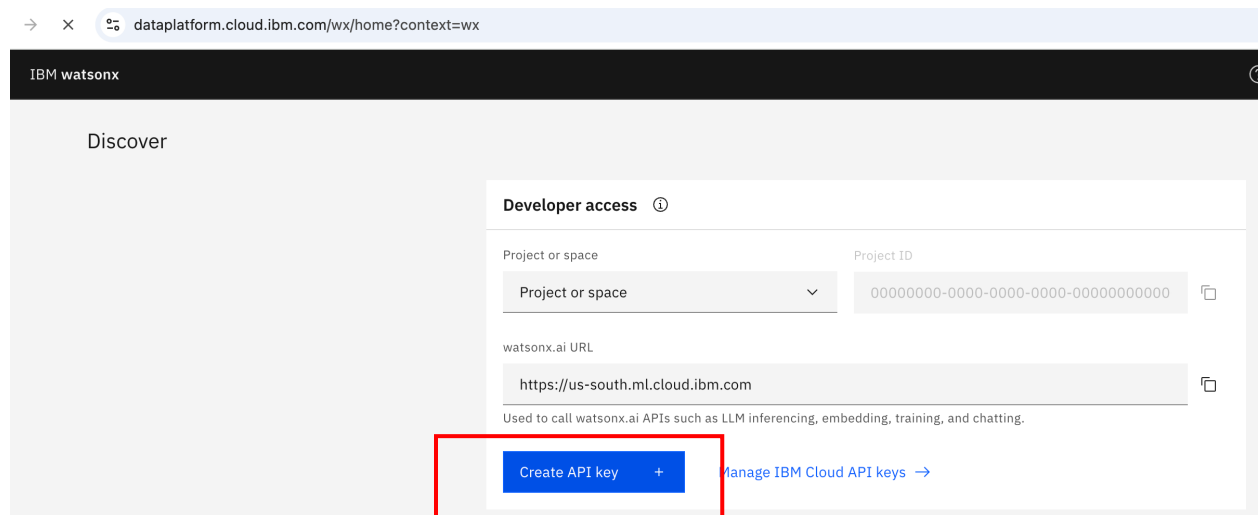
```
[*]: DB_URL = "cb0cfae7-372d-4047-9bf9-882289cd9910.blijti4d0v0nkr55oei0.databases.appdomain.cloud"
      DB_PORT = "32240"
      DB_NAME = "marcht3db"
      DB_USER = "ibm_cloud_d2c0138f_5cb3_499e_8043_6a959fb57913"
      DB_PASSWORD = input("Enter password for the user:")
```

Enter password for the user:

```
[9]: nl2sql = NL2SQLTool(db_uri=f"postgresql://{DB_USER}:{DB_PASSWORD}@{DB_URL}:{DB_PORT}/{DB_NAME}")
```

```
•[10]: # Initialize LLM
      llm_db = LLM(
          api_key="YOUR-API-KEY",
          api_base = "https://us-south.ml.cloud.ibm.com",
          model="watsonx/meta-llama/llama-3-3-70b-instruct",
          params={
              "decoding_method": "greedy",
              "max_new_tokens": 15000,
              "temperature": 0,
              "repetition_penalty": 1.05
          }
      )
```

- You can create an API key on the homepage. You can save the `api_key` in a file on your local machine for future use.



Step 7: Run the notebook

- Follow the cells of the notebook to create and run your sales analyzer agent. Some sample queries are already put as comment to test the outcome.


```
#Example Question 1: sales of Xtralife for last 3 months
#Example Question 2: Percentage change of monthly sales of Xtralife every month
user_question = input("Enter question: ")

query_agent=create_dbagent()
generation_task = create_generation_task(query_agent, user_question)

generation_crew = Crew(
    agents=[query_agent],
    tasks=[generation_task],
    verbose=True
)

crew_output = generation_crew.kickoff()
print ("Answer:..... \n" ,crew_output)
```

Enter question: Percentage change of monthly sales of Xtralife every month

 **Congratulations! You have successfully created an AI-powered Sales analyzer Agent powered by watsonx.ai and crew.ai. Happy Coding!** 