



# SAP BTP/Hana and AWS Bedrock Workshop

Michael Lin

Sr. Solutions Architect  
Amazon Web Services



## Amazon Bedrock

The easiest way to build and scale generative AI applications with foundation models (FMs)

Choice of leading FMs through a single API

Model customization

Retrieval Augmented Generation (RAG)

Agents that execute multistep tasks

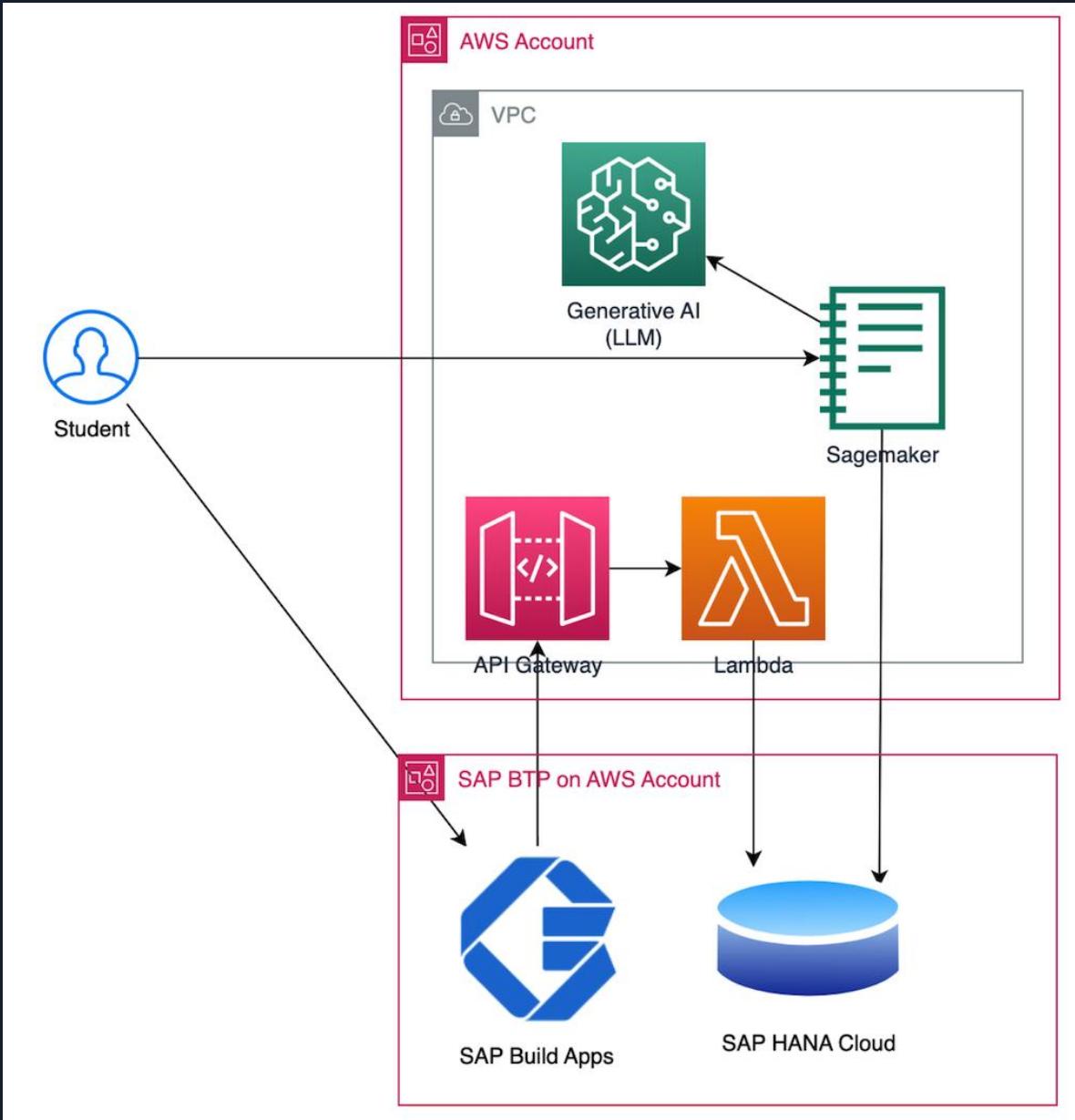
Security, privacy, and safety

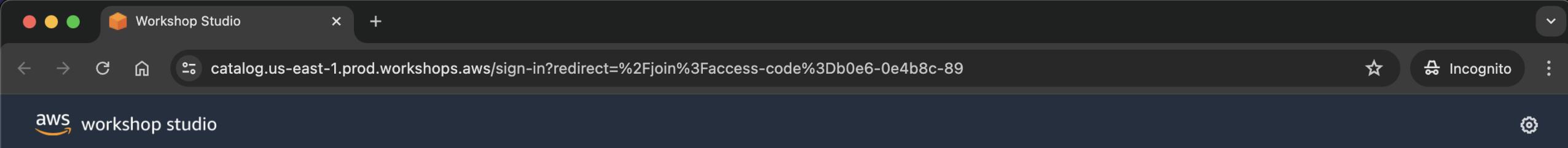


<https://reurl.cc/A24RZK>



<https://reurl.cc/qvr17N>





[Workshop Studio](#) > Sign in

## Sign in

Choose a preferred sign-in method

**Email one-time password (OTP)**

Enter your personal or corporate email to receive a one-time password

**AWS Builder ID**

Login with AWS Builder ID, a new personal profile for builders

**Amazon employee**

Login with your Amazon Corporate account. Only for Amazon Employees.

A screenshot of a web browser window. The title bar says "One-time email passcode". The address bar shows the URL: "login.us-east-1.auth.skillbuilder.aws/otp/input/response?redirect\_uri=https%3A%2F%2Fgandalf-prod.auth.us-east-1.amazoncognito.com%2Foauth2%2Fidpr...". The page content is an "One-time email passcode" form. It has a heading, a text input field with placeholder text, and two buttons at the bottom.

aws training and certification

English

## One-time email passcode

Send a passcode to the email below.

Email

[Back](#)[Send passcode](#)[Get help signing in](#)

A screenshot of a web browser window. The title bar shows the tab is titled "Verify one-time email passcode". The address bar contains the URL "login.us-east-1.auth.skillbuilder.aws/otp/challenge?redirect\_uri=https%3A%2F%2Fgandalf-prod.auth.us-east-1.amazoncognito.com%2Foauth2%2Fidprespo...". The page content is an "One-time email passcode" verification screen for AWS training and certification.

aws training and certification

English ▾

## One-time email passcode

We sent a passcode to michael.tw.lin@gmail.com. You should receive it within 5 minutes.

Passcode (9-digit) [Resend passcode](#)

529717102

Back

Sign in

[Get help signing in](#)

- Step 1  
Enter event access code
- Step 2  
**Review and join**

## Review and join

### Event details

Name	Start time	Duration	Level
TCC-Bedrock-Dryrun	7/27/2024 03:02 PM	72 hours	300

### Description

TCC-Bedrock-Dryrun

### Terms and Conditions

Read and accept before joining the event

Read and accept before joining the event:

1. By using AWS Workshop Studio for the relevant event, You agree to [the AWS Event Terms and Conditions](#), the [AWS Responsible AI Policy](#), and the [AWS Acceptable Use Policy](#).
2. If You are under 18 years old, you may participate in the relevant event using AWS Workshop Studio: (a) if You are at least the minimum age below based on the country or region in which You reside, and (b) with the involvement of a parent, guardian, or educator.



Country or region	Minimum age
All countries or regions not listed below (including the United States, Brazil, the United Kingdom, and India)	13
Canada, China, Republic of Korea (South Korea)	14
Australia	15

catalog.us-east-1.prod.workshops.aws/join

aws workshop studio

Philippines, Thailand, Turkey, and countries in Africa

3. You acknowledge and agree that You are using an AWS-owned account that You will only be able to access during the relevant event. You have no ownership rights over this AWS-owned account.

4. During the relevant event, while using this AWS-owned account, You will not use, import, input, or introduce any data, dataset, or other material that contains personal data, financial information, or any other data or materials that may be subject to laws and regulations (such as the General Data Protection Regulation or The Health Insurance Portability and Accountability Act of 1996).

5. If You find residual resources or materials in this AWS-owned account, You will notify your Event Operator immediately.

6. AWS, its affiliates, and any entities or persons acting on AWS's behalf reserves the right to terminate this AWS-owned account and to delete its contents at any time, without any notice to You.

7. During the relevant event, while using this AWS-owned account, You will not process or run any operation on any data other than test datasets or lab materials that have been approved by AWS.

8. You will not copy, import, export or otherwise create derivative works of materials provided by AWS for use outside of the relevant event.

9. AWS, its affiliates, and any entities or persons acting on AWS's behalf have no obligation to enable the transmission of Your materials through AWS Workshop Studio, and may, in their discretion, edit, block, refuse to post, or remove Your materials at any time, without notice to You.

10. If You access and use a service and/or third-party models that have their own terms during the relevant event, while in the AWS-owned account, You agree to review those terms and comply with them during the event.

11. If You are an AWS Partner using AWS Workshop Studio as part of Your participation in the AWS Partner Network Program, Your use of AWS Workshop Studio is governed by these terms, the AWS Partner Network Terms and Conditions, and the AWS Customer Agreement or other agreement with us governing your use of AWS Services.

12. Your use of AWS Workshop Studio will comply with these terms and all applicable laws. If You fail to comply with any of these terms, Your access to AWS Workshop Studio may be immediately terminated, without notice to You.

I agree with the Terms and Conditions

Cancel Previous Join event

catalog.us-east-1.prod.workshops.aws/join

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Philippines, Thailand, Turkey, and countries in Africa

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Cancel Previous Join event

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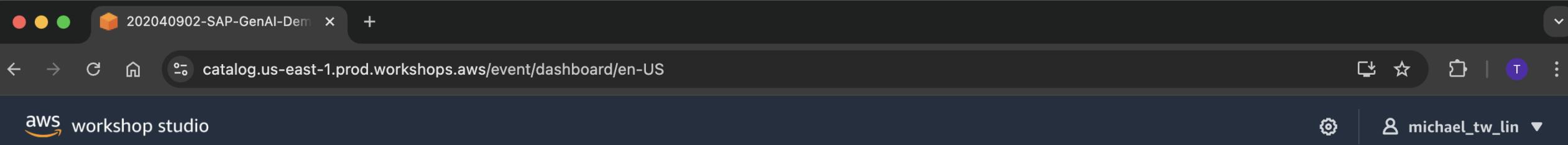
aws workshop studio

Philippines, Thailand, Turkey, and countries in Africa

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I agree with the Terms and Conditions

Cancel Previous Join event



## 20240902-SAP- GenAI-Demo

Generative AI with SAP BTP on AWS

▶ Introduction to Generative AI with  
SAP BTP on AWS

▶ Pre-Lab Exercises

▶ Lab Exercises

▶ Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS

AWS for SAP homepage

### ▼ AWS account access

[Open AWS console  
\(us-west-2\)](#)

[Get AWS CLI credentials](#)

[Get EC2 SSH key](#)

### ▼ Content preferences

Language

English

Event ends in 2 days 9 hours 48 minutes.

[Event dashboard](#) > Generative AI with SAP BTP on AWS

# 20240902-SAP-GenAI-Demo

## Event information

### Start time

9/01/2024 05:55 PM

### Duration

72 hours

### Accessible regions

us-west-2, us-east-1

### Description

20240902-SAP-GenAI-Demo

## Workshop

[Get started >](#)

### Title

New Insight with Generative AI and  
SAP BTP on AWS

### Complexity level

300

### AWS services

Amazon Bedrock, Amazon  
SageMaker, Amazon Q

### Topics

Business Applications, Machine  
Learning (ML/AI), Modernization

### Description

In this workshop, you will learn on how to benefit from AWS Generative AI (Sagemaker) offerings combined with SAP BTP on AWS services (HANA Cloud) to uncover new insight to your business data. By combining these SAP BTP and AWS, you can integrate and create value from data, extend your SAP and third-party solution landscapes, and unlock new business possibilities. This combination allows you to leverage the best of both worlds and differentiate your organization against the competition.

20240902-SAP-GenAI-Demo X Console Home | Console Home X +

catalog.us-east-1.prod.workshops.aws/event/dashboard/en-US/workshop/introduction/pre-requisite-1-sapbtptrialaccount

aws workshop studio michael\_tw\_lin

20240902-SAP-GenAI-Demo < X i

Event ends in 2 days 9 hours 43 minutes.

Event dashboard > Introduction to Generative AI with SAP BTP on AWS > Prerequisite - SAP BTP Trial subscription

## Prerequisite - SAP BTP Trial subscription

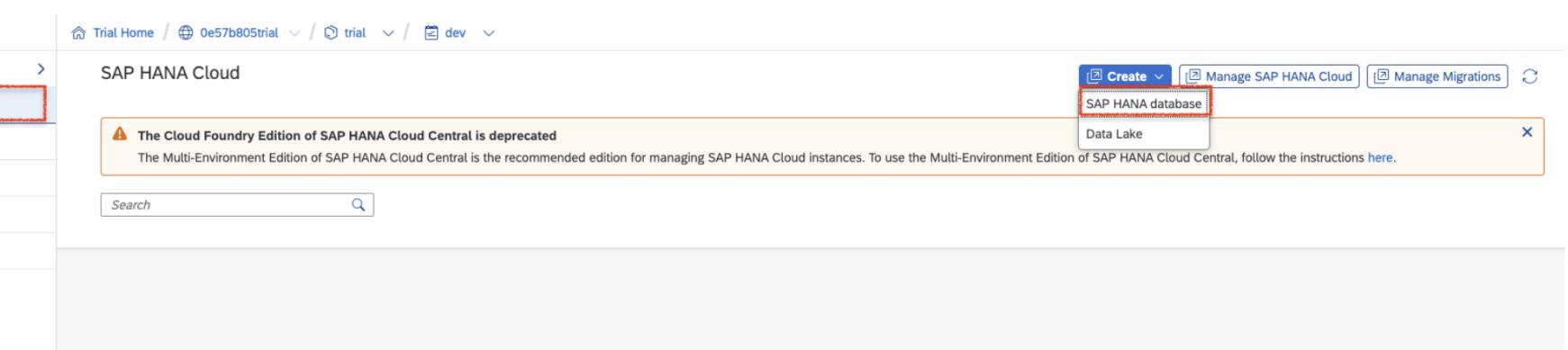
## Setup SAP BTP Trial Account and HANA Cloud subscription

1. In order for you to start the lab, you must have **SAP BTP Trial Account** and **HANA Cloud** subscription. To subscribe to **SAP BTP Trial Account**, you can follow the instruction in this link : <https://developers.sap.com/tutorials/hcp-create-trial-account.html>. Please note that this step will take sometime to provision.

2. Subscribe to **SAP HANA Cloud** within SAP BTP Trial Account: <https://account.hanatrial.ondemand.com>

3. Setup the SAP HANA Cloud : <https://developers.sap.com/tutorials/hana-cloud-mission-trial-2.html>

- Click **Create -> SAP HANA Database**



A screenshot of the SAP BTP Trial account interface. The left sidebar shows 'Services' with 'SAP HANA Cloud' selected, indicated by a red box and a red arrow pointing to it from the left margin. The main content area shows the 'SAP HANA Cloud' service page. A red box highlights the 'Create' button in the top right corner. A tooltip message says 'The Cloud Foundry Edition of SAP HANA Cloud Central is deprecated. The Multi-Environment Edition of SAP HANA Cloud Central is the recommended edition for managing SAP HANA Cloud instances. To use the Multi-Environment Edition of SAP HANA Cloud Central, follow the instructions [here](#)'. Below the message is a search bar and a 'Data Lake' button.

Workshop Preparation Step for Facilitator

Prerequisite - SAP BTP Trial subscription

Pre-Lab Exercises

Lab Exercises

Additional Lab Exercises

Clean Up

Summary

AWS account access

Open AWS console (us-west-2) 

Get AWS CLI credentials

Get EC2 SSH key

Content preferences

Language English ▾

**20240902-SAP-GenAI-Demo** ◀ Event ends in 2 days 9 hours 43 minutes. X  ⓘ

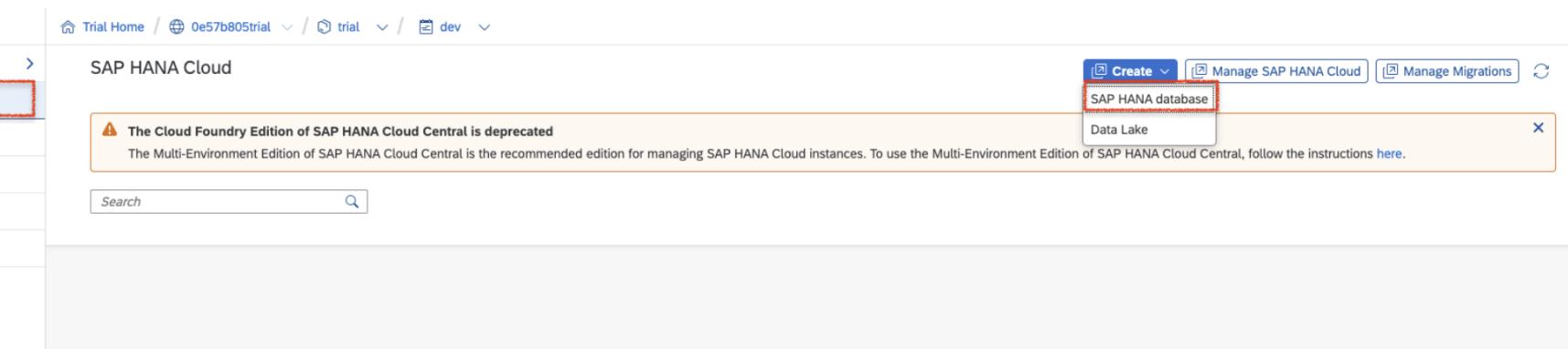
[Event dashboard](#) > [Introduction to Generative AI with SAP BTP on AWS](#) > [Prerequisite - SAP BTP Trial subscription](#)

## Prerequisite - SAP BTP Trial subscription

### Setup SAP BTP Trial Account and HANA Cloud subscription

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2. Subscribe to **SAP HANA Cloud** within SAP BTP Trial Account: <https://account.hanatrial.ondemand.com> ↗
3. Setup the SAP HANA Cloud : <https://developers.sap.com/tutorials/hana-cloud-mission-trial-2.html> ↗

- Click **Create -> SAP HANA Database**





Tutorial Navigator &gt;

Get an Account on SAP BTP Trial ▼

Feedback

Share

# Get an Account on SAP BTP Trial

Beginner 15 min. SAP Business Technology Platform, Beginner, Tutorial, Cloud

Sign up for a trial account on SAP BTP.

You will learn

- ✓ How to register on the SAP website
- ✓ How to start your SAP BTP Trial
- ✓ How to navigate to your sub-account and space
- ✓ Where to find information on three important Cloud Foundry areas: Applications, Service Marketplace, and Service Instances

**DJ Adams**

August 2, 2024

Created by



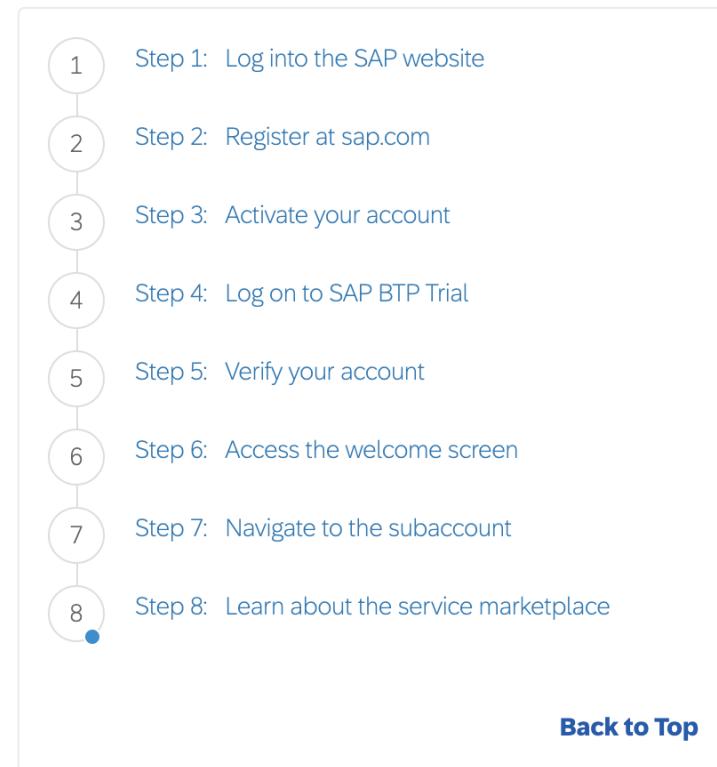
January 13, 2016

Contributors



▼

Open all Close all



STEP 1

## Log into the SAP website

202040902-SAP-GenAI-Demo < X ⓘ Event ends in 2 days 9 hours 43 minutes.

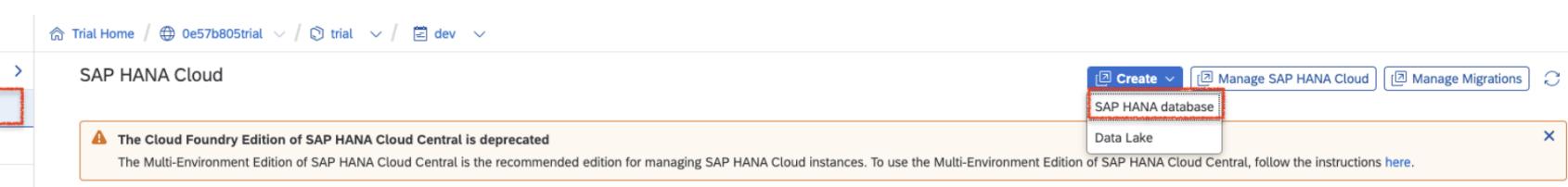
Event dashboard > Introduction to Generative AI with SAP BTP on AWS > Prerequisite - SAP BTP Trial subscription

## Prerequisite - SAP BTP Trial subscription

### Setup SAP BTP Trial Account and HANA Cloud subscription

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2. Subscribe to **SAP HANA Cloud** within SAP BTP Trial Account: <https://account.hanatrial.ondemand.com> ⓘ
3. Setup the SAP HANA Cloud : <https://developers.sap.com/tutorials/hana-cloud-mission-trial-2.html> ⓘ

- Click **Create -> SAP HANA Database**



Applications Services SAP HANA Cloud Routes Security Groups Events Members Trial Home / 0e57b805trial / trial / dev SAP HANA Cloud Create Manage SAP HANA Cloud Manage Migrations SAP HANA database Data Lake The Cloud Foundry Edition of SAP HANA Cloud Central is deprecated The Multi-Environment Edition of SAP HANA Cloud Central is the recommended edition for managing SAP HANA Cloud instances. To use the Multi-Environment Edition of SAP HANA Cloud Central, follow the instructions [here](#). Search

Content preferences Language English

Tutorial Navigator &gt;

Start Using SAP HANA Cloud Trial in SAP BTP Cockpit ▼

Feedback

Share

# Start Using SAP HANA Cloud Trial in SAP BTP Cockpit

Beginner 10 min. SAP HANA Cloud, Beginner, Tutorial, SAP BTP cockpit

Learn how to configure entitlements and create a subscription for SAP HANA Cloud.

You will learn

- ✓ How to add SAP HANA Cloud to an existing SAP BTP trial account
- ✓ How the SAP BTP cockpit is structured and where to find SAP HANA Cloud in it

**Christopher Kollhed**

July 30, 2024

Created by

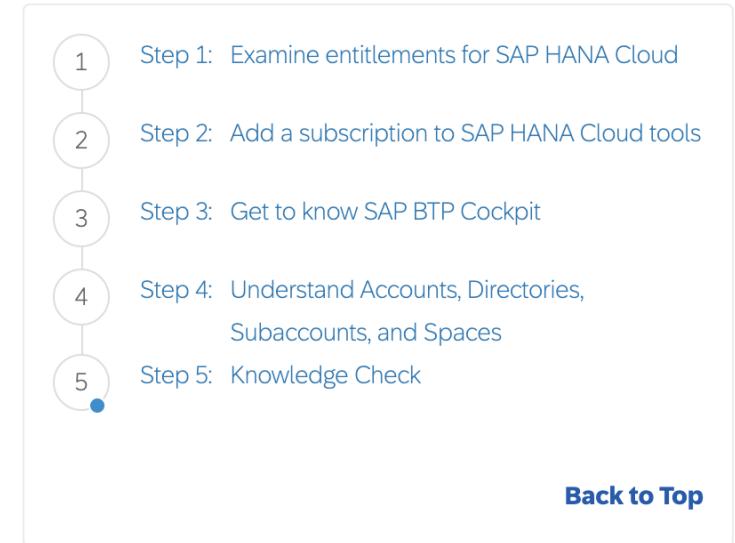


August 3, 2021

Contributors



▼



## Prerequisites

- You have signed up for an **SAP HANA Cloud trial account**

catalog.us-east-1.prod.workshops.aws/event/dashboard/en-US/workshop/introduction/pre-requisite-1-sapbtptrialaccount

aws workshop studio michael\_tw\_lin

202040902-SAP-GenAI-Demo < X ⓘ

Event ends in 2 days 9 hours 43 minutes.

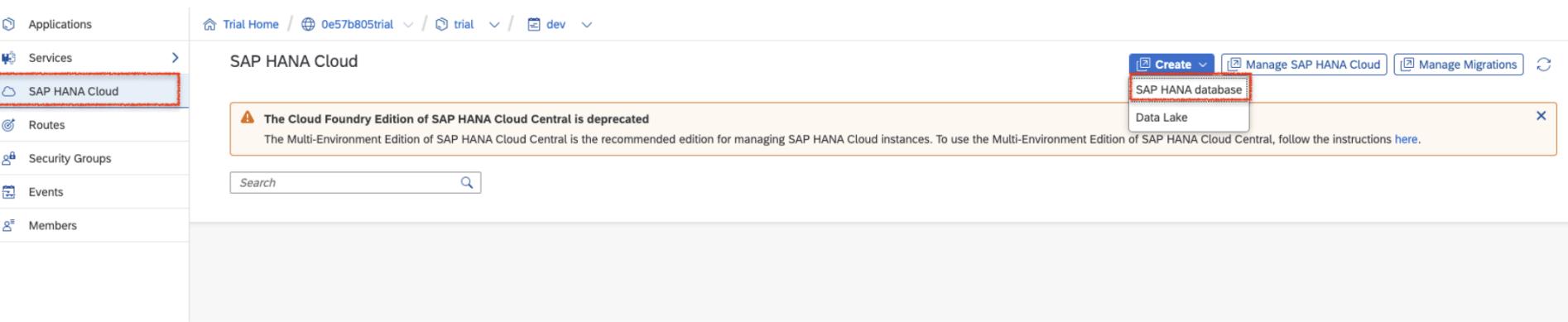
Event dashboard > Introduction to Generative AI with SAP BTP on AWS > Prerequisite - SAP BTP Trial subscription

## Prerequisite - SAP BTP Trial subscription

## Setup SAP BTP Trial Account and HANA Cloud subscription

1. In order for you to start the lab, you must have **SAP BTP Trial Account** and **HANA Cloud** subscription. To subscribe to **SAP BTP Trial Account**, you can follow the instruction in this link : <https://developers.sap.com/tutorials/hcp-create-trial-account.html> Please note that this step will take sometime to provision.
2. Subscribe to **SAP HANA Cloud** within SAP BTP Trial Account: <https://account.hanatrial.ondemand.com> 
3. Setup the SAP HANA Cloud : <https://developers.sap.com/tutorials/hana-cloud-mission-trial-2.html> 

- Click **Create -> SAP HANA Database**



Applications Trial Home / 0e57b805trial / trial / dev

Services >

- SAP HANA Cloud
- Routes
- Security Groups
- Events
- Members

SAP HANA Cloud

The Cloud Foundry Edition of SAP HANA Cloud Central is deprecated

Create Manage SAP HANA Cloud Manage Migrations

SAP HANA database Data Lake

Search

Language English

202040902-SAP-GenAI-Dem x SAP Universal ID x Start Using SAP HANA Cloud x Get an Account on SAP BTP T x Console Home | Console Hom x +

Back Forward Home Refresh Zoom In Zoom Out Star Print Copy T : More

# SAP Universal ID



## Sign in

linmicht@amazon.com

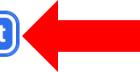
Sign in

Forgot password?

# Welcome to SAP BTP Trial

Learn how to create and deploy cloud apps and gain access to a comprehensive set of platform services.

[Go To Your Trial Account](#)



## Quick Tool Access



### SAP Business Application Studio

Develop business applications using SAP's next-generation, Web-based IDE



### CLI for BTP

Manage your trial account using the command-line interface



### APIs for SAP BTP

Manage, build, and extend the core capabilities of SAP BTP

## Start with Tutorials



### Build a Business Application Using CAP for Node.js

Extension Suite - Development Efficiency

Develop a business application using SAP Cloud Application Programming Model (CAP)



### Build Your First Business Process with SAP Build Process Automation

Extension Suite - Digital Experience

Develop, deploy and run the business process with intuitive low-code and no-code capabilities



### Request Product Details with an Integration Scenario

Integration Suite

Set up your own SAP Integration Suite tenant and deploy an integration scenario where you can request product details from an online webshop

SAP BTP Cockpit

Account Explorer

Resource Providers

Boosters

System Landscape

Entitlements >

Security >

Usage

Trial Home / 47bc960etrial

# Global Account: 47bc960etrial – Account Explorer

All: 0 directories, 1 subaccounts | Subdomain: 47bc960etrial-ga

Create

Switch Global Account

Delete Trial Account

Regions:

Search



All



v

Hide entities you don't have access to

Directories and Subaccounts

Subaccounts (1)



## Subaccounts



trial

...

Provider: Amazon Web Services (AWS)

Region: US East (VA)

Environment: Multi-Environment

- [Overview](#)
- [Services](#)
- [Cloud Foundry](#)
- [HTML5 Applications](#)
- [Connectivity](#)
- [Security](#)
- [Entitlements](#)
- [Usage Analytics](#)

## Subaccount: trial - Overview

[General](#) [Cloud Foundry Environment](#) [Kyma Environment](#) [Entitlements](#)

79

Entitlements



4

Instances and Subscriptions

Subdomain: **47bc960etrial**Provider: **Amazon Web Services (AWS)**Used for Production: **No**

Tenant ID:

**72aed7ff**Region: **US East (VA)**Beta Features: **Disabled**

Subaccount ID:

**i72aed7ff**Environment: **Multi-Environment**

Created By:

Created On: **28 Aug 2024, 15:30:47 (GMT+08:00)**Modified On: **28 Aug 2024, 15:31:02 (GMT+08:00)**

### Cloud Foundry Environment

API Endpoint: <https://api.47bc960etrial.cf>

Org Name:

Org ID:

**4b4c43d**Org Memory Limit: **4,096MB**[Manage environment instance](#)

### Spaces (1)

[Create Space](#)

Name	Applications	Service Instances
dev	0	0

## Overview

Services • ▼

Service Marketplace

Instances and Subscriptions

Cloud Foundry >

## HTML5 Applications

Connectivity >Security >

## Entitlements

## Usage Analytics

## Subaccount: trial - Overview

General Cloud Foundry Environment Kyma Environment Entitlements

79

Entitlements



4

Instances and Subscriptions

Subdomain: 47bc960etrial

Provider: Amazon Web Services (AWS)

Used for Production: No

Tenant ID: 061c8330-bb9c-4596-8bab-92da72aed7ff

Region: US East (VA)

Beta Features: Disabled

Subaccount ID: 061c8330-bb9c-4596-8bab-92da72aed7ff

Environment: Multi-Environment

Created By:

Created On: 28 Aug 2024, 15:30:47 (GMT+08:00)

Modified On: 28 Aug 2024, 15:31:02 (GMT+08:00)

## Cloud Foundry Environment

API Endpoint: <https://api.cf.us10-001.hana.ondemand.com>

Org Name: 47bc960etrial

Org ID: 21ed0f46-eaa6-4cac-9a10-9cc404b4c43d

Org Memory Limit: 4,096MB

## Spaces (1)

Create Space

Name	Applications	Service Instances	
dev	0	0	

Manage environment instance

# SAP BTP Cockpit

Trial Home / 47bc960etrial / trial

## Subaccount: trial - Instances and Subscriptions

All: 4

Service: Plan: Status:

Search All All All

[Subscriptions \(2\)](#) [Instances \(1\)](#) [Environments \(1\)](#)

Applications to which your subaccount is currently subscribed

Application	Plan	Created On	Changed On	Status
SAP HANA Cloud	tools	28 Aug 2024	28 Aug 2024	Subscribed
SAP Business Application Studio	trial	28 Aug 2024	28 Aug 2024	Subscribed

### Instances (1)

Service instances created in: [Cloud Foundry](#) | [Kyma/Kubernetes](#) | [Other environments](#)

Instance	Service	Plan	Runtime Environ...	Scope	Credentials	Status
----------	---------	------	--------------------	-------	-------------	--------

# SAP BTP Cockpit

26

Trial Home / 47bc960etrial / trial

## Subaccount: trial - Instances and Subscriptions

All: 4

Service: Plan: Status:

Search All All All

Subscriptions (2) Instances (1) Environments (1)

Applications to which your subaccount is currently subscribed

Application	Plan	Created On	Changed On	Status
SAP HANA Cloud	tools	28 Aug 2024	28 Aug 2024	Subscribed
SAP Business Application Studio	trial	28 Aug 2024	28 Aug 2024	Subscribed

Go to Application

Manage Roles

Add Labels

Delete

### Instances (1)

Service instances created in: Cloud Foundry | Kyma/Kubernetes | Other environments

Instance	Service	Plan	Runtime Environ...	Scope	Credentials	Status
----------	---------	------	--------------------	-------	-------------	--------

**HANA Cloud Central**

Search Commands

Last refreshed at 8:27:24 AM

**All Instances** ▼ Create Instance

Search: State: Notifications: Type: Version:

Instance ID or name Q ▼ ▼ ▼ ▼ ▼ ▼ Adapt Filters

^ X

**Instances (1) Subaccount Roles (2)**  Group Instances ▼ ⚙️

State	Name	Notifications	Runtime Environment	Memory	Storage	Compute	Scale-out	Replicas	Actions
<span>✓ Running</span>	aws-tech-summit		Other Environments	16 GB	80 GB	1 vCPUs	1 node	0 replicas	...

HANA Cloud Central

Search Commands

Last refreshed at 8:27:24 AM

All Instances ▼

Create Instance

Manage Configuration

Add Data Lake

**Open SQL Console**

Open Database Objects

Copy SQL Endpoint

Copy Instance ID

Copy Configuration

Apply Patch

Upgrade

Start Recovery

Recreate Instance

Create Template to Clone Instance

Take Instance Snapshot

Stop

Delete

Open in SAP HANA Cockpit

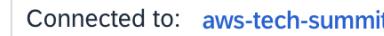
To monitor and administer

Instances (1) Subaccount Roles (2)

State	Name	Notifications	Runtime Environment	Memory	Storage	Compute
<span>✓ Running</span>	aws-tech-summit		Other Environments	16 GB	80 GB	1 vCPU

 SAP HANA Cloud Central  Search Commands 

Console 1 x aws-tech-summit x 

 Run |  Save |  Current Schema: DBADMIN  Connected to: aws-tech-summit  SAP HANA Database  Copy  Syntax Help  Info  ...  Editor  Library

1

No results

202040902-SAP-  
GenAI-Demo

## Generative AI with SAP BTP on AWS

▼ Introduction to Generative AI with  
SAP BTP on AWSWorkshop Preparation Step for  
FacilitatorPrerequisite - SAP BTP Trial  
subscription

## ► Pre-Lab Exercises

## ► Lab Exercises

## ► Additional Lab Exercises

Clean Up

Summary

## ▼ AWS account access

Open AWS console  
(us-west-2) 

Get AWS CLI credentials

Get EC2 SSH key

## ▼ Content preferences

Language

English 

Event ends in 2 days 9 hours 26 minutes.

```
1 #connect to the database
2 hdbsql -n <sqlendpoint>.hana.trial-us10.hanacloud.ondemand.com:443 -u DBADMIN -p <your_password>
```

Copied!



SAP BTP Cockpit

Trial Home / 6fdbab91etrial / trial / dev

SAP HANA Cloud

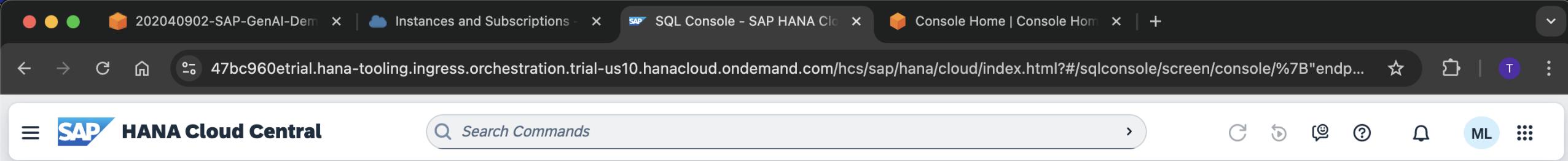
The Cloud Foundry Edition of SAP HANA Cloud Central is deprecated  
The Multi-Environment Edition of SAP HANA Cloud Central is the recommended  
Central, follow the instructions [here](#).

Search

SAP HANA Database Instance

hdbcloud  
Created  
Memory 30 GB CPU 2 vCPUs

Copy SQL Endpoint  
Copy Instance ID  
Open In SAP HANA Cloud Central  
To monitor landscape  
Open In SAP HANA Cockpit  
To monitor and administer  
Open In SAP HANA Database Explorer



## HANA Cloud Central

Search Commands

Console 1

aws-tech-summit



Run |

Save |

Current Schema: DBADMIN

Connected to: aws-tech-summit

SAP HANA Database



Syntax Help



Editor Library

1 #connect to the database

2 hdbsql -n <sqlendpoint>.hana.trial-us10.hanacloud.ondemand.com:443 -u DBADMIN -p <your\_password>

No results

## 202040902-SAP- GenAI-Demo

### Generative AI with SAP BTP on AWS

#### Introduction to Generative AI with SAP BTP on AWS

Workshop Preparation Step for  
Facilitator

**Prerequisite - SAP BTP Trial  
subscription**

► Pre-Lab Exercises

► Lab Exercises

► Additional Lab Exercises

Clean Up

Summary

#### AWS account access

[Open AWS console  
\(us-west-2\)](#)

[Get AWS CLI credentials](#)

[Get EC2 SSH key](#)

#### Content preferences

Language

English ▾

Event ends in 2 days 9 hours 25 minutes.

```
1 --Create USER1
2 CREATE USER USER1 PASSWORD <ChangePassword> no force_first_password_change;
3
4 --To verify that the user was created, enter the following command.
5 SELECT USER_NAME FROM USERS;
6
7 --Also notice that a schema with the same name is created for this user.
8 SELECT SCHEMA_NAME FROM SCHEMAS;
9
10 --Check USER1 Schema
11 CONNECT USER1 PASSWORD <ChangePassword>;
12 SELECT CURRENT_USER, CURRENT_SCHEMA FROM DUMMY;
13
14 --Create Tables and upload data
15 SET SCHEMA USER1;
16 CREATE COLUMN TABLE HOTELC
17     hno INTEGER PRIMARY KEY,
18     name NVARCHAR(50) NOT NULL,
19     address NVARCHAR(40) NOT NULL,
20     city NVARCHAR(30) NOT NULL,
21     state NVARCHAR(2) NOT NULL,
22     zip NVARCHAR(6)
23 );
24 CREATE COLUMN TABLE ROOMC
25     hno INTEGER,
26     type NVARCHAR(6),
27     free NUMERIC(3),
28     price NUMERIC(6, 2),
29     PRIMARY KEY (hno, type),
```

Copied!



202040902-SAP-  
GenAI-Demo

## Generative AI with SAP BTP on AWS

▼ Introduction to Generative AI with  
SAP BTP on AWSWorkshop Preparation Step for  
FacilitatorPrerequisite - SAP BTP Trial  
subscription

## ► Pre-Lab Exercises

## ► Lab Exercises

## ► Additional Lab Exercises

Clean Up

Summary

## ▼ AWS account access

Open AWS console  
(us-west-2) □

Get AWS CLI credentials

Get EC2 SSH key

## ▼ Content preferences

Language

English ▾

Event ends in 2 days 9 hours 25 minutes.

```
139
140 INSERT INTO CUSTOMER VALUES(1000, 'Mrs', 'Jenny', 'Porter', '1340 N. Ash Street, #3', '10580');
141 INSERT INTO CUSTOMER VALUES(1001, 'Mr', 'Peter', 'Brown', '1001 34th St., APT.3', '48226');
142 INSERT INTO CUSTOMER VALUES(1002, 'Company', NULL, 'Datasoft', '486 Maple St.', '90018');
143 INSERT INTO CUSTOMER VALUES(1003, 'Mrs', 'Rose', 'Brian', '500 Yellowstone Drive, #2', '75243');
144 INSERT INTO CUSTOMER VALUES(1004, 'Mrs', 'Mary', 'Griffith', '3401 Elder Lane', '20005');
145 INSERT INTO CUSTOMER VALUES(1005, 'Mr', 'Martin', 'Randolph', '340 MAIN STREET, #7', '60615');
146 INSERT INTO CUSTOMER VALUES(1006, 'Mrs', 'Sally', 'Smith', '250 Curtis Street', '75243');
147 INSERT INTO CUSTOMER VALUES(1007, 'Mr', 'Mike', 'Jackson', '133 BROADWAY APT. 1', '45211');
148 INSERT INTO CUSTOMER VALUES(1008, 'Mrs', 'Rita', 'Doe', '2000 Humboldt St., #6', '97213');
149 INSERT INTO CUSTOMER VALUES(1009, 'Mr', 'George', 'Howe', '111 B Parkway, #23', '75243');
150 INSERT INTO CUSTOMER VALUES(1010, 'Mr', 'Frank', 'Miller', '27 5th St., 76', '95054');
151 INSERT INTO CUSTOMER VALUES(1011, 'Mrs', 'Susan', 'Baker', '200 MAIN STREET, #94', '90018');
152 INSERT INTO CUSTOMER VALUES(1012, 'Mr', 'Joseph', 'Peters', '700 S. Ash St., APT.12', '92714');
153 INSERT INTO CUSTOMER VALUES(1013, 'Company', NULL, 'TOOLware', '410 Mariposa St., #10', '20019');
154 INSERT INTO CUSTOMER VALUES(1014, 'Mr', 'Antony', 'Jenkins', '55 A Parkway, #15', '20903');
155 INSERT INTO RESERVATION VALUES(1, 100, 1000, 11, 'single', '2020-12-24', '2020-12-27');
156 INSERT INTO RESERVATION VALUES(2, 110, 1001, 11, 'double', '2020-12-24', '2021-01-03');
157 INSERT INTO RESERVATION VALUES(3, 120, 1002, 15, 'suite', '2020-11-14', '2020-11-18');
158 INSERT INTO RESERVATION VALUES(4, 130, 1009, 21, 'single', '2019-02-01', '2019-02-03');
159 INSERT INTO RESERVATION VALUES(5, 150, 1006, 17, 'double', '2019-03-14', '2019-03-24');
160 INSERT INTO RESERVATION VALUES(6, 140, 1013, 20, 'double', '2020-04-12', '2020-04-30');
161 INSERT INTO RESERVATION VALUES(7, 160, 1011, 17, 'single', '2020-04-12', '2020-04-15');
162 INSERT INTO RESERVATION VALUES(8, 170, 1014, 25, 'suite', '2020-09-01', '2020-09-03');
163 INSERT INTO RESERVATION VALUES(9, 180, 1001, 22, 'double', '2020-12-23', '2021-01-08');
164 INSERT INTO RESERVATION VALUES(10, 190, 1013, 24, 'double', '2020-11-14', '2020-11-17');
165
166 INSERT INTO MAINTENANCE VALUES(10, 24, 'Replace pool liner and pump', '2019-03-21', 'Discount Pool Supplies');
167 INSERT INTO MAINTENANCE VALUES(11, 25, 'Renovate the bar area. Replace TV and speakers', '2020-11-29', 'TV and Audio Superstore');
168 INSERT INTO MAINTENANCE VALUES(12, 26, 'Roof repair due to storm', null, null);
169
```

# HANA Cloud Central

Search Commands

Console 1 × aws-tech-summit × +

Run | Save | Current Schema: DBADMIN Connected to: aws-tech-summit SAP HANA Database Syntax Help Editor Library

```
1 --Create USER1
2 CREATE USER USER1 PASSWORD <ChangePassword> no force_first_password_change;
3
4 --To verify that the user was created, enter the following command.
5 SELECT USER_NAME FROM USERS;
6
7 --Also notice that a schema with the same name is created for this user.
8 SELECT SCHEMA_NAME FROM SCHEMAS;
9
10 --Check USER1 Schema
11 CONNECT USER1 PASSWORD <ChangePassword>;
12 SELECT CURRENT_USER, CURRENT_SCHEMA FROM DUMMY;
13
14 --Create Tables and upload data
15 SET SCHEMA USER1;
16 CREATE COLUMN TABLE HOTELC
17   hno INTEGER PRIMARY KEY,
18   name NVARCHAR(50) NOT NULL,
19   address NVARCHAR(40) NOT NULL,
20   city NVARCHAR(30) NOT NULL,
21   state NVARCHAR(2) NOT NULL,
22   zip NVARCHAR(6)
```

No results

202040902-SAP-  
GenAI-Demo

Generative AI with SAP BTP on AWS

## Introduction to Generative AI with SAP BTP on AWS

## Workshop Preparation Step for Facilitator

## Prerequisite - SAP BTP Trial subscription

## Pre-Lab Exercises

## Lab Exercises

## Additional Lab Exercises

## Clean Up

## Summary

## ► AWS account access

[Open AWS console](#) (us-west-2) 

## Get AWS CLI credentials

## Get EC2 SSH key

## Content preferences

Language

English

**ⓘ Event ends in 2 days 9 hours 21 minutes**

```
153 INSERT INTO CUSTOMER VALUES(1013, 'Company', NULL, 'TOOLware', '410 Mariposa St., #10', '20019');
154 INSERT INTO CUSTOMER VALUES(1014, 'Mr', 'Antony', 'Jenkins', '55 A Parkway, #15', '20903');
155 INSERT INTO RESERVATION VALUES(1, 100, 1000, 11, 'single', '2020-12-24', '2020-12-27');
156 INSERT INTO RESERVATION VALUES(2, 110, 1001, 11, 'double', '2020-12-24', '2021-01-03');
157 INSERT INTO RESERVATION VALUES(3, 120, 1002, 15, 'suite', '2020-11-14', '2020-11-18');
158 INSERT INTO RESERVATION VALUES(4, 130, 1009, 21, 'single', '2019-02-01', '2019-02-03');
159 INSERT INTO RESERVATION VALUES(5, 150, 1006, 17, 'double', '2019-03-14', '2019-03-24');
160 INSERT INTO RESERVATION VALUES(6, 140, 1013, 20, 'double', '2020-04-12', '2020-04-30');
161 INSERT INTO RESERVATION VALUES(7, 160, 1011, 17, 'single', '2020-04-12', '2020-04-15');
162 INSERT INTO RESERVATION VALUES(8, 170, 1014, 25, 'suite', '2020-09-01', '2020-09-03');
163 INSERT INTO RESERVATION VALUES(9, 180, 1001, 22, 'double', '2020-12-23', '2021-01-08');
164 INSERT INTO RESERVATION VALUES(10, 190, 1013, 24, 'double', '2020-11-14', '2020-11-17');

165
166 INSERT INTO MAINTENANCE VALUES(10, 24, 'Replace pool liner and pump', '2019-03-21', 'Discount Pool Supplies');
167 INSERT INTO MAINTENANCE VALUES(11, 25, 'Renovate the bar area. Replace TV and speakers', '2020-11-29', 'TV and Audio Superstore');
168 INSERT INTO MAINTENANCE VALUES(12, 26, 'Roof repair due to storm', null, null);

169
170 --Create lower case public synonym for Langchain SQL Agents use case
171 CREATE PUBLIC SYNONYM hotel FOR USER1.HOTEL;
172 CREATE PUBLIC SYNONYM reservation FOR USER1.RESERVATION;
173 CREATE PUBLIC SYNONYM room FOR USER1.ROOM;
174 CREATE PUBLIC SYNONYM maintenance FOR USER1.MAINTENANCE;
175 CREATE PUBLIC SYNONYM customer FOR USER1.CUSTOMER;

176
177 --Verify the table entries
178 SELECT SCHEMA_NAME, OBJECT_NAME, OBJECT_TYPE, OWNER_NAME FROM "PUBLIC"."OWNERSHIP" WHERE OWNER_NAME = 'USER1';
179
180 SELECT * FROM USER1.HOTEL;
```

# SAP HANA Cloud Central

Search Commands

Console 1 x aws-tech-summit x +

Run | Save | Current Schema: USER1 Connected to: aws-tech-summit SAP HANA Database Syntax Help Editor Library

```
1 --Verify the table entries
2 SELECT SCHEMA_NAME, OBJECT_NAME, OBJECT_TYPE, OWNER_NAME FROM "PUBLIC"."OWNERSHIP" WHERE OWNER_NAME = 'USER1';
3
4 SELECT * FROM USER1.HOTEL;
```

Result 1 x Result 2 x Messages History

Result Set Rows: 30

	SCHEMA_NAME	OBJECT_NAME	OBJECT_TYPE	OWNER_NAME
1	USER1		SCHEMA	USER1
2	USER1	ROOM	TABLE	USER1
3	USER1	MAINTENANCE	TABLE	USER1
4	USER1	CUSTOMER	TABLE	USER1
5	USER1	HOTEL	TABLE	USER1

# SAP HANA Cloud Central

Search Commands

Console 1 × aws-tech-summit × +

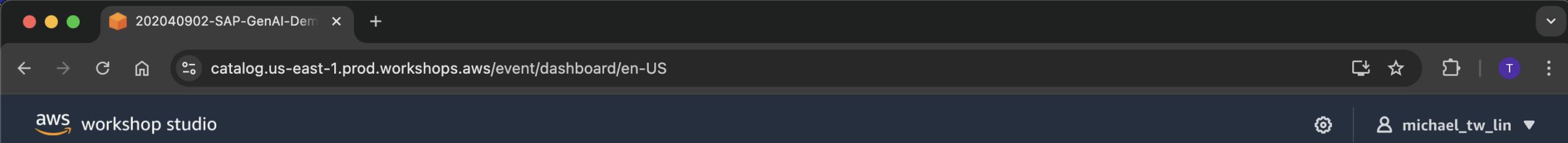
Run | Save | Current Schema: USER1 | Connected to: aws-tech-summit | SAP HANA Database | Syntax Help | i | ... | Editor | Library

```
1 --Verify the table entries
2 SELECT SCHEMA_NAME, OBJECT_NAME, OBJECT_TYPE, OWNER_NAME FROM "PUBLIC"."OWNERSHIP" WHERE OWNER_NAME = 'USER1';
3
4 SELECT * FROM USER1.HOTEL;
```

Result 1 × Result 2 × Messages History

Result Set Rows: 17

	HNO	NAME	ADDRESS	CITY	STATE	ZIP
1	10	Congress	155 Beechwood St.	Seattle	WA	20005
2	11	Regency	477 17th Avenue	Seattle	WA	20037
3	12	Long Island	1499 Grove Street	Long Island	NY	11788
4	13	Empire State	65 Yellowstone Dr.	Albany	NY	12203
5	14	Midtown	12 Barnard St.	New York	NY	10019



## 202040902-SAP-GenAI-Demo

Generative AI with SAP BTP on AWS

▶ Introduction to Generative AI with SAP BTP on AWS

▶ Pre-Lab Exercises

▶ Lab Exercises

▶ Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS

AWS for SAP homepage

### ▼ AWS account access

[Open AWS console  
\(us-west-2\)](#)

[Get AWS CLI credentials](#)

[Get EC2 SSH key](#)

### ▼ Content preferences

Language

English

Event ends in 2 days 9 hours 48 minutes.



[Event dashboard](#) > Generative AI with SAP BTP on AWS

# 202040902-SAP-GenAI-Demo

## Event information

### Start time

9/01/2024 05:55 PM

### Duration

72 hours

### Accessible regions

us-west-2, us-east-1

### Description

202040902-SAP-GenAI-Demo

[Get started >](#)

## Workshop

### Title

New Insight with Generative AI and SAP BTP on AWS

### Complexity level

300

### AWS services

Amazon Bedrock, Amazon SageMaker, Amazon Q

### Topics

Business Applications, Machine Learning (ML/AI), Modernization

### Description

In this workshop, you will learn on how to benefit from AWS Generative AI (Sagemaker) offerings combined with SAP BTP on AWS services (HANA Cloud) to uncover new insight to your business data. By combining these SAP BTP and AWS, you can integrate and create value from data, extend your SAP and third-party solution landscapes, and unlock new business possibilities. This combination allows you to leverage the best of both worlds and differentiate your organization against the competition.

Amazon Bedrock Workshop | TCC-Bedrock-Dryrun | Console Home | Console Home

us-west-2.console.aws.amazon.com/console/home?region=us-west-2

Services Search [Option+S] Oregon WSParticipantRole/Participant @ 1561-5387-8293

EC2 VPC RDS S3 Support Amazon SageMaker AWS DeepRacer CloudFormation

## Console Home

Reset to default layout + Add widgets

### Recently visited

- Support
- Service Quotas
- EC2
- IAM
- Amazon SageMaker
- Billing and Cost Management
- Amazon OpenSearch Service

View all services

### Applications (0)

Region: US West (Oregon)

us-west-2 (Current Region) Find applications < 1 >

Name	Description	Region	Originating account
No applications Get started by creating an application.			

Create application

Go to myApplications

### Welcome to AWS

Getting started with AWS

### AWS Health

Open issues

### Cost and usage

Current month costs Cost (\$)



## 202040902-SAP- GenAI-Demo

Generative AI with SAP BTP on AWS

Introduction to Generative AI with  
SAP BTP on AWS

Workshop Preparation Step for  
Facilitator

Prerequisite - SAP BTP Trial  
subscription

Pre-Lab Exercises

Pre Lab 1 Access AWS Workshop  
Studio for the hands on Lab

**Pre Lab 2 Launch Bedrock and  
Sagemaker Studio**

Lab Exercises

AWS account access

Open AWS console  
(us-west-2)

Get AWS CLI credentials

Get EC2 SSH key

Content preferences

Language

English

Event ends in 2 days 9 hours 19 minutes.

[Event dashboard](#) > [Pre-Lab Exercises](#) > [Pre Lab 2 Launch Bedrock and Sagemaker Studio](#)

# Pre Lab 2 Launch Bedrock and Sagemaker Studio

Please make sure that you are using **us-west-2** region in your AWS Console.

## Request for Anthropic and Stability AI bedrock access through Bedrock

In this workshop, we will be exploring the use of Anthropic Claude for LLM and Stable Diffusion for text to image generation, thus we need to request access to it.

1. Open AWS console and switch to AWS region you would like to use.

The screenshot shows the AWS Console Home page. At the top, there is a navigation bar with the AWS logo, a services menu, a search bar, and a region selector set to "Oregon". Below the navigation bar, the page title is "Console Home". There are two main sections: "Recently visited" and "Applications". The "Recently visited" section lists "Amazon SageMaker", "IAM", "Amazon Bedrock", and "CloudWatch". The "Applications" section shows "0" applications with a "Create application" button. A red arrow points from the text "Open AWS console and switch to AWS region you would like to use." to the "Oregon" region selector in the navigation bar.



## Console

Services (1)

Resources **New**

Documentation (2,676)

Knowledge Articles (12)



Support



Service Catalog



EC2



IAM



Amazon CloudWatch Metrics



Billing



Amazon CloudWatch Logs



Welcome



find valuable information to

Search results for 'bedrock'

## Services

Amazon Bedrock ☆

The easiest way to build and scale generative AI applications with foundation models (F...)

## Resources / for a focused search



## Introducing resource search

Enable to show cross-region resources for your account in search results. Takes less than 5 minutes to set up.

Dismiss

Go to Resource Explorer

## Documentation

See all 2,676 results ▶

## Amazon Bedrock

User Guide

## Add a data source to your app

User Guide

## Document history for the Amazon Bedrock Studio User Guide

User Guide

## What is Amazon Bedrock Studio?

Fault layout

+ Add widgets

Create application

⋮

&lt; 1 &gt;

Originating account

Application.

⋮

S

⋮

40

A screenshot of the AWS Bedrock console homepage. The browser tabs show "Amazon Bedrock Workshop", "TCC-Bedrock-Dryrun", "Amazon Bedrock | us-west-2", and "New Tab". The main content area features the Amazon Bedrock logo and the tagline: "The easiest way to build and scale generative AI applications with foundation models (FMs)". A prominent "Try Bedrock" button with an orange "Get started" button is visible. The navigation bar includes links for EC2, VPC, RDS, S3, Support, Amazon SageMaker, AWS DeepRacer, and CloudFormation. A red arrow points to the three-dot menu icon on the left side of the page.

# Amazon Bedrock

The easiest way to build and scale generative AI applications with foundation models (FMs)

Try Bedrock

Get started

Machine Learning

EC2 VPC RDS S3 Support Amazon SageMaker AWS DeepRacer CloudFormation

## Overview

Amazon Bedrock is a fully managed service that makes FMs from leading AI startups and Amazon available via an API, so you can choose from a wide range of FMs to find the model that is best suited for your use case. With Bedrock's serverless experience, you can get started quickly, privately customize FMs with your own data, and easily integrate and deploy them into your applications using the AWS tools without having to manage any infrastructure.

## Benefits

us-west-2.console.aws.amazon.com/bedrock/home?region=us-west-2#/

AWS Services Search [Option+S] Oregon WSParticipantRole/Participant @ 1561-5387-8293

EC2 VPC RDS S3 Support Amazon SageMaker AWS DeepRacer CloudFormation

## Amazon Bedrock

Machine Learning

# Amazon Bedrock

The easiest way to build and scale generative AI applications with foundation models (FMs)

Try Bedrock

Get started

Getting started

- Overview
- Examples
- Providers

Foundation models

- Base models
- Imported models [Preview](#)

Playgrounds

- Chat
- Text
- Image

Safeguards

- Guardrails
- Watermark detection

Builder tools

- Knowledge bases
- Agents
- Prompt management [Preview](#)
- Prompt flows [Preview](#)

Overview

Amazon Bedrock is a fully managed service that makes FMs from leading AI startups and Amazon available via an API, so you can choose from a wide range of FMs to find the model that is best suited for your use case. With Bedrock's serverless experience, you can get started quickly, privately customize FMs with your own data, and easily integrate and deploy them into your applications using the AWS tools without having to manage any infrastructure.

Benefits



us-west-2.console.aws.amazon.com/bedrock/home?region=us-west-2#/

aws Services Search [Option+S] | Oregon | WSParticipantRole/Participant @ 1561-5387-8293

EC2 VPC RDS S3 Support Amazon SageMaker AWS DeepRacer CloudFormation

Machine Learning

# Amazon Bedrock

The easiest way to build and scale generative AI applications with foundation models (FMs)

Try Bedrock

Get started

Base models

Imported models [Preview](#)

Playgrounds

- Chat
- Text
- Image

Safeguards

- Guardrails
- Watermark detection

Builder tools

- Knowledge bases
- Agents
- Prompt management [Preview](#)
- Prompt flows [Preview](#)

Assessment & deployment

- Model Evaluation
- Model access
- Bedrock Studio [Preview](#)
- Settings
- User guide

Overview

Amazon Bedrock is a fully managed service that makes FMs from leading AI startups and Amazon available via an API, so you can choose from a wide range of FMs to find the model that is best suited for your use case. With Bedrock's serverless experience, you can get started quickly, privately customize FMs with your own data, and easily integrate and deploy them into your applications using the AWS tools without having to manage any infrastructure.

## Benefits

Amazon Bedrock Workshop | TCC-Bedrock-Dryrun | Amazon Bedrock | us-west-2 | New Tab

us-west-2.console.aws.amazon.com/bedrock/home?region=us-west-2#/modelaccess

AWS Services Search [Option+S] Oregon WSParticipantRole/Participant @ 1561-5387-8293

EC2 VPC RDS S3 Support Amazon SageMaker AWS DeepRacer CloudFormation

## Amazon Bedrock

Getting started

- Overview
- Examples
- Providers

Foundation models

- Base models
- Custom models
- Imported models [Preview](#)

Playgrounds

- Chat
- Text
- Image

Safeguards

- Guardrails
- Watermark detection

Builder tools

- Knowledge bases
- Agents
- Prompt management [Preview](#)

### Amazon Bedrock > Model access

#### What is Model access?

To use Bedrock, account users with the correct IAM Permissions must enable access to available Bedrock foundation models (FMs). View all [Bedrock Model Terms](#) for [Bedrock FMs](#).

[Enable all models](#) [Enable specific models](#)

Visit [Amazon Bedrock Quotas](#) for a quick guide to the default quotas and limits that apply to Amazon Bedrock.



#### Base models (33)

Not seeing a model you're interested in? Check out all supported models by region [here](#).

Find model [Group by provider](#)

Models	Access status	Modality	EULA
▼ AI21 Labs (2)	0/2 access granted		
Jurassic-2 Ultra	Available to request	Text	<a href="#">EULA</a>
Jurassic-2 Mid	Available to request	Text	<a href="#">EULA</a>
▼ Amazon (6)	0/6 access granted		
Titan Embeddings G1 - Text	Available to request	Embedding	<a href="#">EULA</a>



- Step 1  
**Edit model access**
- Step 2  
Review and submit

## Edit model access

### Base models (33/33)

[Collapse all](#)

Not seeing a model you're interested in? Check out all supported models by region [here](#).

 Find model[Group by provider](#)

<input checked="" type="checkbox"/> Models	Access status	Modality	EULA
<input checked="" type="checkbox"/> ▼ AI21 Labs (2)	0/2 access granted		
<input checked="" type="checkbox"/> Jurassic-2 Ultra	<a href="#">Available to request</a>	Text	<a href="#">EULA</a>
<input checked="" type="checkbox"/> Jurassic-2 Mid	<a href="#">Available to request</a>	Text	<a href="#">EULA</a>
<input checked="" type="checkbox"/> ▼ Amazon (6)	0/6 access granted		
<input checked="" type="checkbox"/> Titan Embeddings G1 - Text	<a href="#">Available to request</a>	Embedding	<a href="#">EULA</a>
<input checked="" type="checkbox"/> Titan Text G1 - Lite	<a href="#">Available to request</a>	Text	<a href="#">EULA</a>
<input checked="" type="checkbox"/> Titan Text G1 - Express	<a href="#">Available to request</a>	Text	<a href="#">EULA</a>
<input checked="" type="checkbox"/> Titan Image Generator G1	<a href="#">Available to request</a>	Image	<a href="#">EULA</a>
<input checked="" type="checkbox"/> Titan Multimodal Embeddings G1	<a href="#">Available to request</a>	Embedding	<a href="#">EULA</a>
<input checked="" type="checkbox"/> Titan Text Embeddings V2	<a href="#">Available to request</a>	Embedding	<a href="#">EULA</a>
<input checked="" type="checkbox"/> ▼ Anthropic (5)	0/5 access granted		



us-west-2.console.aws.amazon.com/bedrock/home?region=us-west-2#/modelaccess

Services Search [Option+S]

EC2 VPC RDS S3 Support Amazon SageMaker AWS DeepRacer CloudFormation

Oregon WSParticipantRole/Participant @ 1561-5387-8293

		Available to request	Text	EULA
<input checked="" type="checkbox"/>	Llama 3.1 70B Instruct	Available to request	Text	EULA
<input checked="" type="checkbox"/>	Llama 3.1 8B Instruct	Available to request	Text	EULA
<input checked="" type="checkbox"/>	Llama 3 8B Instruct	Available to request	Text	EULA
<input checked="" type="checkbox"/>	Llama 3 70B Instruct	Available to request	Text	EULA
<input checked="" type="checkbox"/>	Llama 2 Chat 13B	Unavailable	Text	EULA
<input checked="" type="checkbox"/>	Llama 2 Chat 70B	Unavailable	Text	EULA
<input checked="" type="checkbox"/>	Llama 2 13B	Unavailable	Text	EULA
<input checked="" type="checkbox"/>	Llama 2 70B	Unavailable	Text	EULA
<input checked="" type="checkbox"/>	Mistral AI (4)	0/4 access granted		
<input checked="" type="checkbox"/>	Mistral Large (2407)	Available to request	Text	EULA
<input checked="" type="checkbox"/>	Mistral 7B Instruct	Available to request	Text	EULA
<input checked="" type="checkbox"/>	Mixtral 8x7B Instruct	Available to request	Text	EULA
<input checked="" type="checkbox"/>	Mistral Large (2402)	Available to request	Text	EULA
<input checked="" type="checkbox"/>	Stability AI (1)	0/1 access granted		
<input checked="" type="checkbox"/>	SDXL 1.0	Available to request	Image	EULA

Cancel Next

Amazon Bedrock Workshop | TCC-Bedrock-Dryrun | Amazon Bedrock | us-west-2 | New Tab

us-west-2.console.aws.amazon.com/bedrock/home?region=us-west-2#/modelaccess

aws Services Search [Option+S] | Oregon | WSParticipantRole/Participant @ 1561-5387-8293

EC2 VPC RDS S3 Support Amazon SageMaker AWS DeepRacer CloudFormation

Amazon Bedrock > Model access > Request model access

Step 1 Edit model access

Step 2 Review and submit

## Review and submit

### Step 1: Edit model access

Edit

#### Model access modifications (33)

Models	Modifications
Mistral Large (2407)	Request access
Jurassic-2 Ultra	Request access
Jurassic-2 Mid	Request access
Claude 3 Opus	Request access
Claude 3 Sonnet	Request access
Claude 3 Haiku	Request access
Claude	Request access
Claude Instant	Request access
SDXL 1.0	Request access
Command R+	Request access

A red arrow points downwards at the bottom right corner of the table.

aws

Services

Search [Option+S]



EC2



VPC



RDS



S3



Support



Amazon SageMaker



AWS DeepRacer



CloudFormation



Oregon ▾

WSParticipantRole/Participant @ 1561-5387-8293 ▾



## Model access modifications (33)

### Models

Llama 3 8B Instruct

### Modifications

Request access

Llama 3 70B Instruct

Request access

Llama 2 Chat 13B

Request access

Llama 2 Chat 70B

Request access

Llama 2 13B

Request access

Llama 2 70B

Request access

Mistral 7B Instruct

Request access

Mixtral 8x7B Instruct

Request access

Mistral Large (2402)

Request access

### Terms

By selecting Submit, you are requesting access to the selected third party models through the AWS Marketplace. By doing so, you agree to the seller's pricing terms and End User License Agreements (EULA), and the [Bedrock Service Terms](#). You also agree and acknowledge that AWS may share information about this transaction with the respective sellers, in accordance with the [AWS Privacy Notice](#).

AWS will issue invoices and collect payments from you on behalf of the seller through your AWS account. Your use of AWS services is subject to the [AWS Customer Agreement](#) or other agreements with AWS governing your use of such services.

Cancel

Previous

Submit



Services

Search

[Option+S]



Oregon ▾

WSParticipantRole/Participant @ 1561-5387-8293 ▾



## Model access modifications (33)

### Models

Llama 3 6B Instruct

### Modifications

Request access

Llama 3 70B Instruct

Request access

Llama 2 Chat 13B

Request access

Llama 2 Chat 70B

Request access

Llama 2 13B

Request access

Llama 2 70B

Request access

Mistral 7B Instruct

Request access

Mistral 8x7B Instruct

Request access

Mistral Large (2402)

Request access

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AWS will issue invoices and collect payments from you on behalf of the seller through your AWS account. Your use of AWS services is subject to the [AWS Customer Agreement](#) or other agreements with AWS governing your use of such services.

Cancel

Previous

Submit

Amazon Bedrock Workshop | TCC-Bedrock-Dryrun | Amazon Bedrock | us-west-2 | New Tab

us-west-2.console.aws.amazon.com/bedrock/home?region=us-west-2#/modelaccess

AWS Services Search [Option+S]

EC2 VPC RDS S3 Support Amazon SageMaker AWS DeepRacer CloudFormation

Amazon Bedrock

Getting started Overview Examples Providers

Foundation models Base models Custom models Imported models [Preview](#)

Playgrounds Chat Text Image

Safeguards Guardrails Watermark detection

Builder tools Knowledge bases Agents [Prompt management](#) [Preview](#)

**Access request for 7 models failed**

- Claude 3 Opus - Unauthorized to perform action due to private marketplace eligibility
- Command R+ - Unauthorized to perform action due to private marketplace eligibility
- Command R - Unauthorized to perform action due to private marketplace eligibility
- Llama 2 13B - Could not create agreement - Agreement already exists
- Llama 2 70B - Could not create agreement - Agreement already exists
- Llama 2 Chat 13B - Failed to create regional entitlement. Model not available at the moment. Try again later.
- Llama 2 Chat 70B - Failed to create regional entitlement. Model not available at the moment. Try again later.

Notifications [X 1](#) [A 0](#) [✓ 0](#) [i 1](#) [⋯ 0](#) [▼](#)

Amazon Bedrock > Model access

## What is Model access?

To use Bedrock, account users with the correct [IAM Permissions](#) must enable access to available Bedrock foundation models (FMs). View all [Bedrock Model Terms](#) for [Bedrock FMs](#).

[Modify model access](#)

Visit [Amazon Bedrock Quotas](#) for a quick guide to the default quotas and limits that apply to Amazon Bedrock.

## Base models (33)

Not seeing a model you're interested in? Check out all supported models by region [here](#).

[Find model](#) [Collapse all](#)

Group by provider [▼](#)

Models Access status Modality EULA



Amazon Bedrock Workshop | TCC-Bedrock-Dryrun | Amazon Bedrock | us-west-2 | New Tab

us-west-2.console.aws.amazon.com/bedrock/home?region=us-west-2#/modelaccess

AWS Services Search [Option+S] | Oregon | WSParticipantRole/Participant @ 1561-5387-8293

EC2 VPC RDS S3 Support Amazon SageMaker AWS DeepRacer CloudFormation

## Amazon Bedrock

Getting started

- Overview
- Examples
- Providers

Foundation models

- Base models
- Custom models
- Imported models [Preview](#)

Playgrounds

- Chat
- Text
- Image

Safeguards

- Guardrails
- Watermark detection

Builder tools

- Knowledge bases
- Agents
- Prompt management [Preview](#)

Model access updates submitted

It may take several minutes to receive or remove access to models. Meanwhile, you can use other Bedrock console pages. Once your access is updated, you can use the models in Bedrock. Refresh the base models table to view the updated statuses.

Amazon Bedrock > Model access

### What is Model access?

To use Bedrock, account users with the correct IAM Permissions must enable access to available Bedrock foundation models (FMs). View all [Bedrock Model Terms](#) for [Bedrock FMs](#).

[Modify model access](#)

Visit [Amazon Bedrock Quotas](#) for a quick guide to the default quotas and limits that apply to Amazon Bedrock.

### Base models (33)

Not seeing a model you're interested in? Check out all supported models by region [here](#).

[Find model](#) [Collapse all](#)

Models	Access status	Modality	EULA
AI21 Labs (2)	0/2 access granted		
Jurassic-2 Ultra	In Progress	Text	EULA
Jurassic-2 Mid	In Progress	Text	EULA

catalog.us-east-1.prod.workshops.aws/event/dashboard/en-US/workshop/pre-lab-exercises/pre-lab-1-access-sagemaker-studio

aws workshop studio michael\_tw\_lin

20240902-SAP-GenAI-Demo < X i

Event ends in 2 days 9 hours 19 minutes.

Event dashboard > Pre-Lab Exercises > Pre Lab 2 Launch Bedrock and Sagemaker Studio

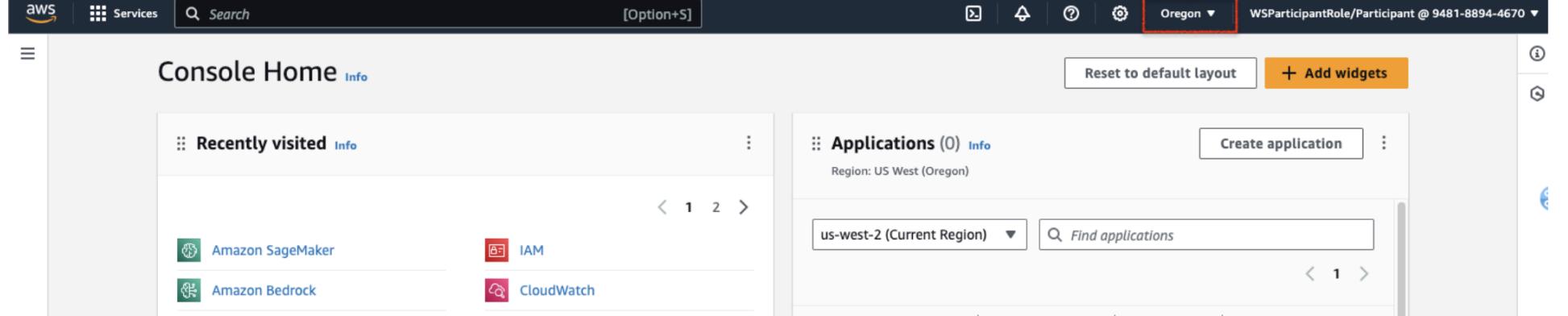
## Pre Lab 2 Launch Bedrock and Sagemaker Studio

**⚠ Please make sure that you are using **us-west-2** region in your AWS Console.**

## Request for Anthropic and Stability AI bedrock access through Bedrock

In this workshop, we will be exploring the use of Anthropic Claude for LLM and Stable Diffusion for text to image generation, thus we need to request access to it.

1. Open AWS console and switch to AWS region you would like to use.



AWS account access

- Open AWS console (us-west-2) 
- Get AWS CLI credentials
- Get EC2 SSH key

Content preferences

- Language English

## Console Home

myApplications

All services

Services (1)

Features (5)

Resources New

Documentation (11,895)

Knowledge Articles (48)

Marketplace (623)

Blogs (1,350)

Events (61)

Tutorials (23)

Search results for 'sagemaker'

## Services



Amazon SageMaker ☆

Build, Train, and Deploy Machine Learning Models

## Features

See all 5 results ▶

## SageMaker Studio

Amazon SageMaker feature

## Notebooks

IoT Analytics feature

## Autopilot

Amazon SageMaker feature

## Resources / for a focused search



## Introducing resource search

Enable cross-region resources for your account in search results. Takes less than 5 minutes to set up.

Dismiss

Go to Resource Explorer

Default layout

+ Add widgets

Create application



Find applications

&lt; 1 &gt;

Region ▾ | Region ▾ | Originati.

ations  
ng an application.

lication

lications

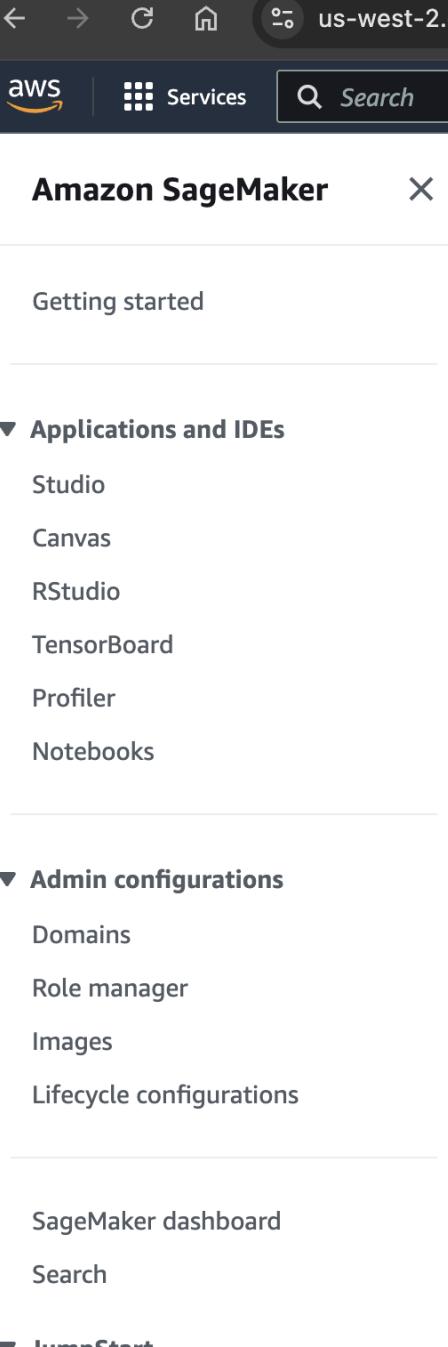


Cost (\$)



find valuable

Scheduled changes



Amazon SageMaker

Getting started

Applications and IDEs

- Studio
- Canvas
- RStudio
- TensorBoard
- Profiler
- Notebooks

Admin configurations

- Domains
- Role manager
- Images
- Lifecycle configurations

SageMaker dashboard

Search

JumpStart

us-west-2.console.aws.amazon.com/sagemaker/home?region=us-west-2#/landing

[Option+S]

MACHINE LEARNING

# Amazon SageMaker

## Build, train, and deploy machine learning models at scale

The quickest and easiest way to get ML models from idea to production.

### How it works

#### What is Amazon SageMaker?

Amazon SageMaker provides machine learning (ML) capabilities for data

New to SageMaker?

Quick setup for a single user 

This is perfect for first time users to try capabilities in just a few clicks.

**Set up for single user** 

---

Advanced setup for organizations

Customize capabilities, permissions, network, and more for your team to launch Studio.

**Set up for organizations**

Documentation

Getting started 

Tutorials

Documentation 

Developer Resources 

AWS Developer Forum 

us-west-2.console.aws.amazon.com/sagemaker/home?region=us-west-2#/studio

aws Services Search [Option+S] | Oregon | WSParticipantRole/Participant @ 6420-8731-8835

## Amazon SageMaker

MACHINE LEARNING

Getting started

Applications and IDEs

- Studio
- Canvas
- RStudio
- TensorBoard
- Profiler
- Notebooks

Admin configurations

- Domains
- Role manager
- Images
- Lifecycle configurations

SageMaker dashboard

Search

JumpStart

# Amazon SageMaker

Build, train, and deploy machine learning models at scale

The quickest and easiest way to get ML models from idea to production.

## How it works

### What is Amazon SageMaker?

Amazon SageMaker provides machine learning (ML) capabilities for data scientists and developers to prepare, build, train, and deploy high-quality ML models efficiently.

New user onboarding guide NEW

**SageMaker is being set up**

Setup is in progress. It takes a few minutes to configure a SageMaker domain and a studio user profile.

### Documentation

- Getting started
- Tutorials
- Documentation
- Developer Resources
- AWS Developer Forum
- Contact us

us-west-2.console.aws.amazon.com/sagemaker/home?region=us-west-2#/studio/d-usxvhffp6is6

aws Services Search [Option+S] Oregon WSParticipantRole/Participant @ 6420-8731-8835

**Automatic UI upgrade** Starting July 2024, domains with Studio Classic as the default experience will automatically upgrade to the new Studio, changing the default landing UI to the new Studio. Your data and notebooks remain unchanged. You can access Studio Classic and other apps through the new Studio interface. [Learn more](#)

**Preparing SageMaker Domain. Please do not close this browser tab.** We are configuring the resources needed by the domain. This is a one-time configuration and may take a few minutes. [X](#)

Amazon SageMaker > Domains > Domain: QuickSetupDomain-20240902T083726

## QuickSetupDomain-20240902T083726

### Domain details

Configure and manage the domain.

Domain settings User profiles Space management App Configurations Environment

#### General settings [Info](#)

Name QuickSetupDomain-20240902T083726	Status Pending	Domain ID d-usxvhffp6is6
Created Mon Sep 02 2024 08:38:01 GMT+0800 (Taipei Standard Time)	Last modified Mon Sep 02 2024 08:38:01 GMT+0800 (Taipei Standard Time)	VPC vpc-04eabce4f4996df94

**Authentication and permissions** [Edit](#)



us-west-2.console.aws.amazon.com/sagemaker/home?region=us-west-2#/studio/d-usxvhffp6is6

aws Services Search [Option+S] | Oregon | WSParticipantRole/Participant @ 6420-8731-8835

## Authentication and permissions

Authentication method: AWS Identity and Access Management (IAM)

Default execution role: arn:aws:iam::642087318835:role/service-role/AmazonSageMaker-ExecutionRole-20240902T083727

Space execution role: arn:aws:iam::642087318835:role/service-role/AmazonSageMaker-ExecutionRole-20240902T083727

## Network

Network mode: Public internet access

VPC: vpc-04eabce4f4996df94

Subnets:

- subnet-0f443c567dafbd291
- subnet-05b32db2832727fbdb
- subnet-0c1ea1f957b7ed5f1
- subnet-014caea6e0df9d324

Security groups: No security groups selected

## Storage configurations



## Authent

Services (11)

Authentication

Features (24)

AWS Identity

Resources New

Default exec

Documentation (59,524)

arn:aws:iam:

Knowledge Articles (445)

20240902T

Marketplace (863)

Blogs (1,850)

Events (12)

Network

Tutorials (1)

Network m

Public inter

Subnets

subnet-0f4

subnet-05b

subnet-0c1

subnet-014

Storage

Encryption key

Search results for 'iam'

## Services

See all 11 results ▾



IAM ☆

Manage access to AWS resources



IAM Identity Center ☆

Manage workforce user access to multiple AWS accounts and cloud applications



Resource Access Manager ☆

Share AWS resources with other accounts or AWS Organizations

## Features

See all 24 results ▾

## Groups



IAM feature

## Roles



IAM feature

## Roles Anywhere



IAM feature

## Resources / for a focused search

Default space size

Edit

SageMaker-ExecutionRole-

Edit

Edit



## Authent

Services (11)

Authentication (10)

AWS Identity (1)

Default exec (1)

arn:aws:iam:20240902T000000Z: (1)

Marketplace (863)

Blogs (1,850)

Events (12)

Tutorials (1)

## Network

Network man (1)

Public inter (1)

Subnets

subnet-0f4 (1)

subnet-05b (1)

subnet-0c1 (1)

subnet-014 (1)

## Storage

Encryption key

Search results for 'iam'

## Services

See all 11 results ▾



IAM

Man

Groups

Features

Services

Anywhe

Open Link in New Tab

Open Link in New Window

Open Link in Incognito Window

Save Link As...

Copy Link Address

Copy

Copy Link to Highlight

Search Google for "IAM"

Print...

Translate Selection to 中文 (繁體)

Inspect

Speech &gt;

Services &gt;

accounts and cloud applications

S Organizations

See all 24 results ▾

## Groups

IAM feature

## Roles

IAM feature

## Roles Anywhere

IAM feature

Default space size

Edit

Edit

Edit

us-east-1.console.aws.amazon.com/iam/home?region=us-west-2#/home

Services Search [Option+S] Global WSParticipantRole/Participant @ 6420-8731-8835

## Identity and Access Management (IAM)

Search IAM

### Dashboard

### IAM resources

Resources in this AWS Account

User groups	Users	Roles	Policies	Identity providers
0	1	45	5	0

A red arrow points to the '45' value in the Roles column.

### What's new

Updates for features in IAM

View all

- [AWS IAM Access Analyzer now offers policy checks for public and critical resource access.](#) 3 months ago
- [AWS IAM Access Analyzer now offers recommendations to refine unused access.](#) 3 months ago
- [AWS Launches Console-based Bulk Policy Migration for Billing and Cost Management Console Access.](#) 3 months ago
- [IAM Roles Anywhere now supports modifying the mapping of certificate attributes.](#) 5 months ago

more

### AWS Account

Account ID: 642087318835

Account Alias: Create

Sign-in URL for IAM users in this account: <https://642087318835.signin.aws.amazon.com/console>

### Tools

#### Policy simulator

The simulator evaluates the policies that you choose and determines the effective permissions for each of the actions that you specify.



Services

Search

[Option+S]



Global ▾

WSParticipantRole/Participant @ 6420-8731-8835 ▾

## Identity and Access Management (IAM)

Search IAM

Dashboard

## ▼ Access management

User groups

Users

## Roles

Policies

Identity providers

Account settings

## ▼ Access reports

Access Analyzer

External access

Unused access

Analyzer settings

Credential report

Organization activity

Service control policies

IAM &gt; Roles

Roles (45) Info

An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.

Search

&lt; 1 2 3 &gt;



<input type="checkbox"/>	Role name	▲ Trusted entities	Last activity
<input type="checkbox"/>	<a href="#">AmazonSageMaker-ExecutionRole-20240901T175970</a>	AWS Service: sagemaker	23 minutes ago
<input type="checkbox"/>	<a href="#">AmazonSageMaker-ExecutionRole-20240902T083727</a>	AWS Service: sagemaker	-
<input type="checkbox"/>	<a href="#">AmazonSagemakerCanvasBedrockRole-20240901T175969</a>	AWS Service: bedrock	-
<input type="checkbox"/>	<a href="#">AmazonSagemakerCanvasBedrockRole-20240902T083726</a>	AWS Service: bedrock	-
<input type="checkbox"/>	<a href="#">AmazonSageMakerCanvasEMRSExecutionAccess-20240901T175969</a>	AWS Service: emr-serverless	-
<input type="checkbox"/>	<a href="#">AmazonSageMakerCanvasEMRSExecutionAccess-20240902T083726</a>	AWS Service: emr-serverless	-
<input type="checkbox"/>	<a href="#">AmazonSagemakerCanvasForecastRole-20240901T175969</a>	AWS Service: forecast	-
<input type="checkbox"/>	<a href="#">AmazonSagemakerCanvasForecastRole-20240902T083726</a>	AWS Service: forecast	-
<input type="checkbox"/>	<a href="#">AmazonSageMakerServiceCatalogProductsApiGatewayRole</a>	AWS Service: apigateway	-
<input type="checkbox"/>	<a href="#">AmazonSageMakerServiceCatalogProductsCloudformationRole</a>	AWS Service: cloudformation	-
<input type="checkbox"/>	<a href="#">AmazonSageMakerServiceCatalogProductsCodeBuildRole</a>	AWS Service: codebuild	-
<input type="checkbox"/>	<a href="#">AmazonSageMakerServiceCatalogProductsCodePipelineRole</a>	AWS Service: codepipeline	-
<input type="checkbox"/>	<a href="#">AmazonSageMakerServiceCatalogProductsEventsRole</a>	AWS Service: events	-

us-east-1.console.aws.amazon.com/iam/home?region=us-west-2#/roles

Services Search [Option+S] Global WSParticipantRole/Participant @ 6420-8731-8835

## Identity and Access Management (IAM)

Search IAM

IAM > Roles

### Roles (45) Info

An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.

AmazonSageMaker-ExecutionRole-20240902T083727  Delete Create role

1 match

Role name	Trusted entities	Last activity
<a href="#">AmazonSageMaker-ExecutionRole-20240902T083727</a>	AWS Service: sagemaker	-

### Roles Anywhere Info

Authenticate your non AWS workloads and securely provide access to AWS services.

**Manage**

 Access AWS from your non AWS workloads  Operate your non AWS workloads using the same authentication and authorization strategy that you use within AWS.	 X.509 Standard  Use your own existing PKI infrastructure or use <a href="#">AWS Certificate Manager Private Certificate Authority</a> to authenticate identities.	 Temporary credentials  Use temporary credentials with ease and benefit from the enhanced security they provide.
--	---	---

us-east-1.console.aws.amazon.com/iam/home?region=us-west-2#/roles

aws Services Search [Option+S] Global WSParticipantRole/Participant @ 6420-8731-8835 ▾

## Identity and Access Management (IAM)

Search IAM

Dashboard

Access management

User groups

Users

**Roles**

Policies

Identity providers

Account settings

Access reports

Access Analyzer

External access

Unused access

Analyzer settings

Credential report

Organization activity

Service control policies

IAM > Roles

### Roles (45) Info

An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.

Search: AmazonSageMaker-ExecutionRole-20240902T083727

1 match

<input type="checkbox"/>	Role name	<input type="checkbox"/>	Trusted entities	Last activity
<input type="checkbox"/>	<a href="#">AmazonSageMaker-ExecutionRole-20240902T083727</a>	<input type="checkbox"/>	AWS Service: sagemaker	-

### Roles Anywhere Info

Authenticate your non AWS workloads and securely provide access to AWS services.

**Manage**



**Access AWS from your non AWS workloads**  
Operate your non AWS workloads using the same authentication and authorization strategy that you use within AWS.



**X.509 Standard**  
Use your own existing PKI infrastructure or use [AWS Certificate Manager Private Certificate Authority](#) to authenticate identities.



**Temporary credentials**  
Use temporary credentials with ease and benefit from the enhanced security they provide.

Red arrow pointing to the Role name column of the selected role row.





us-east-1.console.aws.amazon.com/iam/home?region=us-west-2#/roles/details/AmazonSageMaker-ExecutionRole-20240902T083727/createPolicy

Services Search [Option+S] Global WSParticipantRole/Participant @ 6420-8731-8835

IAM > Roles > AmazonSageMaker-ExecutionRole-20240902T083727 > Create policy

Step 1 Specify permissions Info

Add permissions by selecting services, actions, resources, and conditions. Build permission statements using the JSON editor.

Step 2 Review and create

Policy editor Visual JSON Actions ▾

▼ Select a service  
Specify what actions can be performed on specific resources in a service.

Service Choose a service

+ Add more permissions

Cancel Next

us-east-1.console.aws.amazon.com/iam/home?region=us-west-2#/roles/details/AmazonSageMaker-ExecutionRole-20240902T083727/createPolicy

Services Search [Option+S] Global WSParticipantRole/Participant @ 6420-8731-8835

IAM > Roles > AmazonSageMaker-ExecutionRole-20240902T083727 > Create policy

Step 1 Specify permissions Info

Add permissions by selecting services, actions, resources, and conditions. Build permission statements using the JSON editor.

Step 2 Review and create

Policy editor

Visual **JSON** Options ▾

1 {  
2     "Version": "2012-10-17",  
3     "Statement": [  
4         {  
5             "Sid": "Statement1",  
6             "Effect": "Allow",  
7             "Action": ,  
8             "Resource": ]  
9     ]  
10 }  
11 }

Edit statement Statement1 Remove

Add actions

Choose a service  Filter services

Available

- AMP
- API Gateway
- API Gateway V2
- ASC
- Access Analyzer
- Account
- Activate
- Alexa for Business

catalog.us-east-1.prod.workshops.aws/event/dashboard/en-US/workshop/pre-lab-exercises/pre-lab-1-access-sagemaker-studio

aws workshop studio michael\_tw\_lin

202040902-SAP-GenAI-Demo

Generative AI with SAP BTP on AWS

- Introduction to Generative AI with SAP BTP on AWS
  - Workshop Preparation Step for Facilitator
  - Prerequisite - SAP BTP Trial subscription
- Pre-Lab Exercises
  - Pre Lab 1 Access AWS Workshop Studio for the hands on Lab
  - Pre Lab 2 Launch Bedrock and Sagemaker Studio**

AWS account access

- Open AWS console (us-west-2)
- Get AWS CLI credentials
- Get EC2 SSH key

Content preferences

Language English

Event ends in 2 days 9 hours 14 minutes.

- Click **JSON Policy Editor**, copy paste the below code, then click **Next**

```
1 {  
2     "Version": "2012-10-17",  
3     "Statement": [  
4         {  
5             "Sid": "Statement2",  
6             "Effect": "Allow",  
7             "Action": [  
8                 "bedrock:*"  
9             ],  
10            "Resource": [  
11                "*"  
12            ]  
13        }  
14    ]  
15 }
```

Copied!

- Type **MyBedrockPolicy**, then click **Create Policy**

Policy details

Policy name  
Enter a meaningful name to identify this policy.  
**MyBedrockPolicy**

Maximum 128 characters. Use alphanumeric and '+,-,.,@-' characters.

us-east-1.console.aws.amazon.com/iam/home?region=us-west-2#/roles/details/AmazonSageMaker-ExecutionRole-20240902T083727/createPolicy

Services Search [Option+S] Global WSParticipantRole/Participant @ 6420-8731-8835

IAM > Roles > AmazonSageMaker-ExecutionRole-20240902T083727 > Create policy

Step 1 Specify permissions Info

Add permissions by selecting services, actions, resources, and conditions. Build permission statements using the JSON editor.

Step 2 Review and create

**Policy editor**

Visual JSON Actions ▾

1 {  
2 "Version": "2012-10-17",  
3 "Statement": [  
4 {  
5 "Sid": "Statement2",  
6 "Effect": "Allow",  
7 "Action": [  
8 "bedrock:\*"  
9 ],  
10 "Resource": [  
11 "\*"  
12 ]  
13 }  
14 ]  
15 }

**Edit statement**

Select a statement

Select an existing statement in the policy or add a new statement.

+ Add new statement





```
VERSION: 2012-10-17,  
3 ▼ "Statement": [  
4 ▼   {  
5     "Sid": "Statement2",  
6     "Effect": "Allow",  
7     "Action": [  
8       "bedrock:*"  
9     ],  
10    "Resource": [  
11      "*"  
12    ]  
13  }  
14 ]  
15 ]
```

+ Add new statement

JSON Ln 15, Col 1

10124 of 10240 characters remaining

🛡 Security: 0 ✖ Errors: 0 ⚠ Warnings: 0 🌐 Suggestions: 0

Cancel

Next



us-east-1.console.aws.amazon.com/iam/home?region=us-west-2#/roles/details/AmazonSageMaker-ExecutionRole-20240902T083727/createPolicy

Services Search [Option+S] Global WSParticipantRole/Participant @ 6420-8731-8835

IAM > Roles > AmazonSageMaker-ExecutionRole-20240902T083727 > Create policy

Step 1 Specify permissions

Step 2 Review and create

## Review and create Info

Review the permissions, specify details, and tags.

### Policy details

**Policy name**  
Enter a meaningful name to identify this policy.  
  
Maximum 128 characters. Use alphanumeric and '+,.@-\_ ' characters.

### Permissions defined in this policy Info Edit

Permissions defined in this policy document specify which actions are allowed or denied. To define permissions for an IAM identity (user, user group, or role), attach a policy to it

Search

**Allow (1 of 421 services)**

Show remaining 420 services

Service	Access level	Resource	Request condition
Bedrock	Full access	All resources	None

Cancel Previous Create policy



catalog.us-east-1.prod.workshops.aws/event/dashboard/en-US/workshop/pre-lab-exercises/pre-lab-1-access-sagemaker-studio

aws workshop studio michael\_tw\_lin

202040902-SAP-GenAI-Demo

Event ends in 2 days 9 hours 14 minutes.

- Type **MyBedrockPolicy**, then click **Create Policy**

### Policy details

Policy name  
Enter a meaningful name to identify this policy.  
**MyBedrockPolicy**

Maximum 128 characters. Use alphanumeric and '+=-,.@-\_ ' characters.

#### Permissions defined in this policy Info

Permissions defined in this policy document specify which actions are allowed or denied. To define permissions for an IAM identity (user, user group, or role), attach a policy to it.

Search

Allow (2 of 403 services)

Show remaining 401 services

Service	Access level	Resource	Request condition
<a href="#">Bedrock</a>	Full access	All resources	None
<a href="#">STS</a>	Limited: Write	RoleName  string like  Crossaccountbedrock	None

Cancel Previous **Create policy**

7. Open your [Amazon Sagemaker Console](#), and choose your user profile **userXX** or **defaultXX** then click **Open Studio**

Generative AI with SAP BTP on AWS

Introduction to Generative AI with SAP BTP on AWS

Workshop Preparation Step for Facilitator

Prerequisite - SAP BTP Trial subscription

Pre-Lab Exercises

Pre Lab 1 Access AWS Workshop Studio for the hands on Lab

**Pre Lab 2 Launch Bedrock and Sagemaker Studio**

AWS account access

Open AWS console (us-west-2) [Open](#)

Get AWS CLI credentials

Get EC2 SSH key

Content preferences

Language English ▾

us-east-1.console.aws.amazon.com/iam/home?region=us-west-2#/roles/details/AmazonSageMaker-ExecutionRole-20240902T083727/createPolicy

Services Search [Option+S] Global WSParticipantRole/Participant @ 6420-8731-8835

IAM > Roles > AmazonSageMaker-ExecutionRole-20240902T083727 > Create policy

Step 1 Specify permissions

Step 2 Review and create

## Review and create Info

Review the permissions, specify details, and tags.

### Policy details

**Policy name**  
Enter a meaningful name to identify this policy.  
 ←

Maximum 128 characters. Use alphanumeric and '+,.,@-\_ ' characters.

### Permissions defined in this policy Info Edit

Permissions defined in this policy document specify which actions are allowed or denied. To define permissions for an IAM identity (user, user group, or role), attach a policy to it

Search

**Allow (1 of 421 services)**

Show remaining 420 services

Service	Access level	Resource	Request condition
Bedrock	Full access	All resources	None

Cancel Previous Create policy

us-east-1.console.aws.amazon.com/iam/home?region=us-west-2#/roles/details/AmazonSageMaker-ExecutionRole-20240902T083727/createPolicy

Services Search [Option+S] Global WSParticipantRole/Participant @ 6420-8731-8835

IAM > Roles > AmazonSageMaker-ExecutionRole-20240902T083727 > Create policy

Step 1 Specify permissions

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Enter a meaningful name to identify this policy.  
 Maximum 128 characters. Use alphanumeric and '+,.,@-\_ ' characters.

### Permissions defined in this policy Info Edit

Permissions defined in this policy document specify which actions are allowed or denied. To define permissions for an IAM identity (user, user group, or role), attach a policy to it

Search

**Allow (1 of 421 services)**

Show remaining 420 services

Service	Access level	Resource	Request condition
Bedrock	Full access	All resources	None

Cancel Previous Create policy





us-east-1.console.aws.amazon.com/iam/home?region=us-west-2#/roles/details/AmazonSageMaker-ExecutionRole-20240902T083727?section=permissions

Services Search [Option+S] Global WSParticipantRole/Participant @ 6420-8731-8835

## Identity and Access Management (IAM)

Search IAM

### Access management

- Dashboard
- User groups
- Users
- Roles**
- Policies
- Identity providers
- Account settings

### Access reports

- Access Analyzer
- External access
- Unused access
- Analyzer settings

Credential report

Organization activity

Service control policies

Policy MyBedrockPolicy created.

Policy name	Type	Attached entities
<a href="#">AmazonSageMaker-ExecutionPolicy-...</a>	Customer managed	1
<a href="#">AmazonSageMakerCanvasAIServi...</a>	AWS managed	2
<a href="#">AmazonSageMakerCanvasDataPr...</a>	AWS managed	2
<a href="#">AmazonSageMakerCanvasFullAcc...</a>	AWS managed	2
<a href="#">AmazonSageMakerFullAccess</a>	AWS managed	3
<a href="#">MyBedrockPolicy</a>	Customer inline	0

#### MyBedrockPolicy

Copy JSON Edit

```
1 {  
2   "Version": "2012-10-17",  
3   "Statement": [  
4     {  
5       "Sid": "Statement2",  
6       "Effect": "Allow",  
7       "Action": [  
8         "bedrock:*"  
9       ],  
10      "Resource": [  
11        "*"  
12      ]  
13    }  
14  ]  
15}
```

us-west-2.console.aws.amazon.com/sagemaker/home?region=us-west-2#/studio/d-usxvhffp6is6

Services Services Q iam X

Automatic UI upgrade Learn more

The SageMaker Domain is ready Choose your user name, then choose Launch app to get started.

Amazon SageMaker > Domains > Domain: QuickSetupDomain-20240902T083726

QuickSetupDomain-20240902T083726

Domain details

Configure and manage the domain.

Domain settings User profiles Space management App Configurations Environment

General settings Info

Name QuickSetupDomain-20240902T083726	Status Ready	Domain ID d-usxvhffp6is6
Created Mon Sep 02 2024 08:38:01 GMT+0800 (Taipei Standard Time)	Last modified Mon Sep 02 2024 08:40:50 GMT+0800 (Taipei Standard Time)	VPC vpc-04eabce4f4996df94

Authentication and permissions Edit

A red arrow points from the text "Choose your user name, then choose Launch app to get started." to the "Launch app" button.

us-west-2.console.aws.amazon.com/sagemaker/home?region=us-west-2#/studio/d-usxvhffp6is6

aws Services Q iam X

Automatic UI upgrade Learn more X

Starting July 2024, domains with Studio Classic as the default experience will automatically upgrade to the new Studio, changing the default landing UI to the new Studio. Your data and notebooks remain unchanged. You can access Studio Classic and other apps through the new Studio interface.

The SageMaker Domain is ready X

Choose your user name, then choose Launch app to get started.

Amazon SageMaker > Domains > Domain: QuickSetupDomain-20240902T083726

## QuickSetupDomain-20240902T083726

### Domain details

Configure and manage the domain.

Domain settings User profiles Space management App Configurations Environment

#### General settings Info

Name QuickSetupDomain-20240902T083726	Status <span style="color: green;">Ready</span>	Domain ID d-usxvhffp6is6
Created Mon Sep 02 2024 08:38:01 GMT+0800 (Taipei Standard Time)	Last modified Mon Sep 02 2024 08:40:50 GMT+0800 (Taipei Standard Time)	VPC vpc-04eabce4f4996df94

Authentication and permissions Edit

us-west-2.console.aws.amazon.com/sagemaker/home?region=us-west-2#/studio-landing

Services Services Q iam X

AWS Oregon WSParticipantRole/Participant @ 6420-8731-8835

## Amazon SageMaker

Getting started

Applications and IDEs

- Studio ←
- Canvas
- RStudio
- TensorBoard
- Profiler
- Notebooks

Admin configurations

- Domains
- Role manager
- Images
- Lifecycle configurations

SageMaker dashboard

Search

JumpStart

# Amazon SageMaker

# SageMaker Studio

The first fully integrated development environment (IDE) for machine learning.

## Get Started

Select Domain

QuickSetupDomain-20240902T083726

Select user profile

default-20240902T083726

Open Studio

## How it works

### What is Studio?

Amazon SageMaker Studio provides a single, web-based visual interface where you can perform all ML development steps, improving data science team productivity by up to 10x. SageMaker Studio gives you complete access, control, and visibility into each step required to build, train, and deploy models.

Get Started with SageMaker

### Pricing (US)

With Amazon SageMaker Studio, you pay only for what you use. Authoring, training and hosting is billed by the second, with no minimum fees and no upfront commitments.

us-west-2.console.aws.amazon.com/sagemaker/home?region=us-west-2#/studio-landing

Services Services Q iam X

AWS Oregon WSParticipantRole/Participant @ 6420-8731-8835

## Amazon SageMaker

Getting started

Applications and IDEs

- Studio
- Canvas
- RStudio
- TensorBoard
- Profiler
- Notebooks

Admin configurations

- Domains
- Role manager
- Images
- Lifecycle configurations

SageMaker dashboard

Search

JumpStart

# SageMaker Studio

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Amazon SageMaker X

Getting started

▼ Applications and IDEs

- Studio
- Canvas
- RStudio
- TensorBoard
- Profiler
- Notebooks

▼ Admin configurations

- Domains
- Role manager
- Images
- Lifecycle configurations

SageMaker dashboard

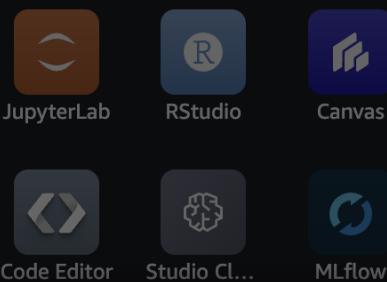
Search

JumpStart

We are redirecting you to domain d-usxvhffp6is6 now...



## Applications (6)



Home

Running instances

Data

Auto ML

Experiments

Jobs

Pipelines

Models

JumpStart

Deployments

Collapse Menu

## Home

Launch new workflows, open getting started materials, and view the latest feature updates

## Onboarding

To get the most ou

Take the tour

Quick tour highlights features and how to experience. See locate the tools

[Take the tour >](#)

Not ready to use th



Welcome to the new

## SageMaker Studio

We've built a new experience to empower you and your work.

Want to take a quick tour?

[Skip Tour for now](#)[Take a quick tour](#)

Are you an existing Studio Classic user and looking to migrate your data and notebooks? Click here to learn how.

## Overview

Start a new ML wor



studio-d-usxvhffp6is6.studio.us-west-2.sagemaker.aws/home?tab=Overview

SageMaker Studio

Provide feedback

Applications (6)

- JupyterLab
- RStudio
- Canvas
- Code Editor
- Studio Cl...

# Home

Launch new workflows, open getting started materials, and view the latest feature updates

## Onboarding plan

Access your Studio Classic data x

Pick up where you left off and access your Studio Classic data from within the updated Studio experience.

Quick tour highlights where you can find key features and how to navigate the new experience. See what's new and where to locate the tools you need to be productive.

Take the tour >

Migrate data and notebooks

Bring your previous work into the new experience. Transfer notebooks, data sources, and other artifacts so they remain accessible as you adopt the new environment.

Learn more ↗

Access your Studio Classic data

Pickup where you left off and access your Studio Classic data from within the updated Studio experience.

View Studio Classic

Not ready to use the new experience? Revert to Studio Classic experience in domain settings. Learn more ↗

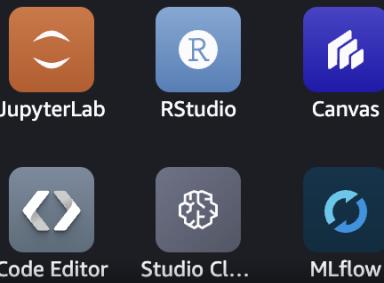
Overview Getting started What's new

### Overview

Start a new ML workflow or jump back into your workflow



## Applications (6)



Home

Running instances

Data

Auto ML

Experiments

Jobs

Pipelines

Models

JumpStart

Deployments

# Home

Launch new workflows, open getting started materials, and view the latest feature updates

## Onboarding plan

To get the most out of the new Studio experience, explore the onboarding steps below.

## Take the tour

Quick tour highlights where you can find key features and how to navigate the new experience. See what's new and where to locate the tools you need to be productive.

[Take the tour >](#)

## Migrate data and notebooks

Bring your previous work into the new experience. Transfer notebooks, data sources, and other artifacts so they remain accessible as you adopt the new environment.

[Learn more ↗](#)

## Access your Studio Classic data

Pickup where you left off and access your Studio Classic data from within the updated Studio experience.

[View Studio Classic](#)

Not ready to use the new experience? Revert to Studio Classic experience in domain settings. [Learn more ↗](#)

[Overview](#)[Getting started](#)[What's new](#)

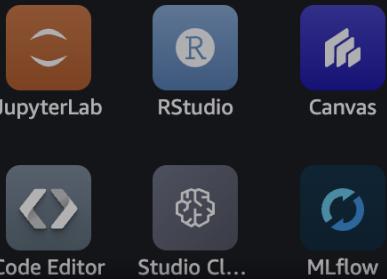
## Overview

Start a new ML workflow or jump back into your workflow





## Applications (6)



Home

Running instances

Data

Auto ML

Experiments

Jobs

Pipelines

Models

JumpStart

Deployments

## Home

Launch new workflows, open getting started materials, and view the latest feature updates

Overview

Getting started

What's new

## Access onboarding



You can access your onboarding plan again from the Getting started tab.

Your workflow



## JupyterLab

Create, manage, and run durable instances of JupyterLab using spaces

[View JupyterLab spaces >](#)

## Code Editor

Based on Code-OSS, Visual Studio Code Open Source

Create, manage, and run durable instances of Code Editor using spaces

[View Code Editor spaces >](#)

## ▼ Prebuilt and automated solutions

Deploy built-in algorithms, prebuilt solutions, and example notebooks. Build models and prepare data from a visual interface.



## JumpStart

Quickly deploy, fine-tune, and evaluate pre-trained models



## Model evaluations

Evaluate LLMs for model quality and responsibility



## AutoML

Automatically build, train, and tune models



Applications (6)

- JupyterLab
- RStudio
- Canvas
- Code Editor
- Studio CI...
- MLflow

[Home](#)[Running instances](#)[Data](#)[Auto ML](#)[Experiments](#)[Jobs](#)[Pipelines](#)[Models](#)[JumpStart](#)[Deployments](#)[Collapse Menu](#)

# Home

Launch new workflows, open getting started materials, and view the latest feature updates

[Overview](#)[Getting started](#)[What's new](#)

## Overview

Start a new ML workflow or jump back into your workflow



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Applications (6)

- JupyterLab
- RStudio
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- Studio Cl...
- MLflow

[Home](#)[Running instances](#)[Data](#)[Auto ML](#)[Experiments](#)[Jobs](#)[Pipelines](#)[Models](#)[JumpStart](#)[Deployments](#)[Collapse Menu](#)

# Home

Launch new workflows, open getting started materials, and view the latest feature updates

[Overview](#)[Getting started](#)[What's new](#)

## Overview

Start a new ML workflow or jump back into your workflow



### JupyterLab

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Applications (6)

- JupyterLab
- RStudio
- Canvas
- Code Editor
- Studio Cl...
- MLflow

Home

Running instances

Data

Auto ML

Experiments

Jobs

Pipelines

Models

JumpStart

Deployments

Collapse Menu

# JupyterLab

+ Create JupyterLab space

## About

JupyterLab is the latest web-based IDE for notebooks, code, and data. You can select your image and instance to harness the power of AWS when running your machine learning applications.

[See features](#) | [Quick start guide](#)

Search...

Filter spaces: Running

Name	Application	Status	Type	Last modified	Action
------	-------------	--------	------	---------------	--------

No JupyterLab spaces

You don't have any JupyterLab spaces to display.

0 results

Results are cached

Refresh

Go to page

Page 0 of 0 < >

## Introducing spaces New

JupyterLab and Code Editor now come with durable instances that allow for faster startup, privacy options, and configurable storage.

[Learn more](#)





Applications (6)



JupyterLab



RStudio



Canvas



Code Editor



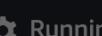
Studio Cl...



MLflow



Home



Running instances



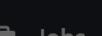
Data



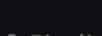
Auto ML



Experiments



Jobs



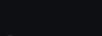
Pipelines



Models



JumpStart



Deployments

Collapse Menu

# JupyterLab

[+ Create JupyterLab space](#)

## About

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### Create JupyterLab space

[X](#)

#### Name

Search

Enter a name (1-62 characters) using letters, numbers, and dashes only.

0/63

#### Sharing

 Private

The space and application will only be accessible by you

 Share with my domain

Allow all users in your domain to access and use the application.

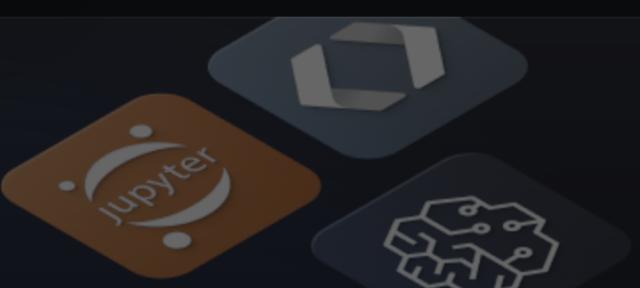
[Cancel](#)[Create space](#)

0 results

last modified	Action
to page	Page 0 of 0 < >

## Introducing spaces New

JupyterLab and Code Editor now come with durable instances that allow for faster startup, privacy options, and configurable storage.

[Learn more ↗](#)



Applications (6)



JupyterLab



RStudio



Canvas



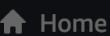
Code Editor



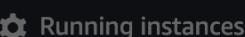
Studio Cl...



MLflow



Home



Running instances



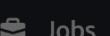
Data



Auto ML



Experiments



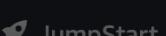
Jobs



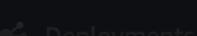
Pipelines



Models



JumpStart



Deployments

Collapse Menu

# JupyterLab

[+ Create JupyterLab space](#)

## About

JupyterLab is the latest web-based IDE for notebooks, code, and data. You can select your image and instance to harness the power of AWS when running your machine learning applications.

### Create JupyterLab space

[X](#)**Name**

advantech-demo-20240902



Enter a name (1-62 characters) using letters, numbers, and dashes only.

23/63

**Sharing** Private

The space and application will only be accessible by you

 Share with my domain

Allow all users in your domain to access and use the application.

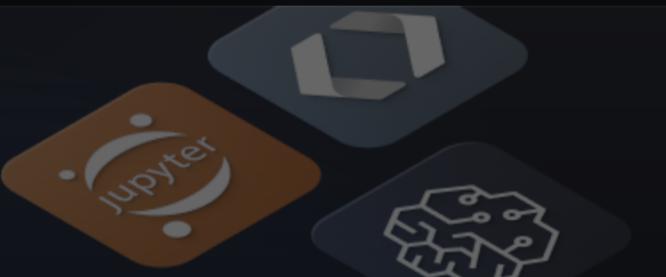
[Cancel](#)[Create space](#)

0 results

last modified	Action
to page	Page 0 of 0 < >

## Introducing spaces New

JupyterLab and Code Editor now come with durable instances that allow for faster startup, privacy options, and configurable storage.

[Learn more ↗](#)

studio-d-usvhffp6is6.studio.us-west-2.sagemaker.aws/jupyterlab/advantech-demo-20240902

SageMaker Studio > Jupyterlab > Advantech Demo 20240902

Provide feedback

Applications (6)

- JupyterLab
- RStudio
- Canvas
- Code Editor
- Studio Cl...
- MLflow

jupyter advantech-demo-20240902 Private

JupyterLab • 5 GB • ml.t3.medium

Status: Creating

Instance: ml.t3.medium

Image: SageMaker Distribution 1.10

Run space

Space Settings New

A space is a named, self-contained, durable storage container (like a filesystem), to which an app can be attached.

Storage (GB): 5

Attach custom EFS filesystem - optional: None

Lifecycle Configuration: No Script

Learn about Spaces

Home

Running instances

Data

Auto ML

Experiments

Jobs

Pipelines

Models

JumpStart

studio-d-usvhffp6is6.studio.us-west-2.sagemaker.aws/jupyterlab/advantech-demo-20240902

SageMaker Studio > JupyterLab > Advantech Demo 20240902 Provide feedback User icon

Applications (6)

- JupyterLab
- RStudio
- Canvas
- Code Editor
- Studio Cl...
- MLflow

Space Settings New Learn about Spaces

A space is a named, self-contained, durable storage container (like a filesystem), to which an app can be attached.

Storage (GB)  Attach custom EFS filesystem - optional  Lifecycle Configuration

Enter a value from 5 to 100 GB. Please contact your administrator for larger storage volume.



Applications (6)

- JupyterLab
- RStudio
- Canvas
- Code Editor
- Studio Cl...
- MLflow

# jupyter advantech-demo-20240902 Private

JupyterLab • 5 GB • ml.t3.medium

Status: Run space Updating Instance: ml.t3.large Image: SageMaker Distribution 1.10

## Space Settings New

A space is a named, self-contained, durable storage container (like a filesystem), to which an app can be attached.

Storage (GB) 5	Attach custom EFS filesystem - optional None	Lifecycle Configuration No Script
-------------------	---	--------------------------------------

Enter a value from 5 to 100 GB. Please contact your administrator for larger storage volume.

Updating space: advantech-demo-20240902, please stay on this page X

Home

Running instances

Data

Auto ML

Experiments

Jobs

Pipelines

Models

JumpStart

Deployments

Collapse Menu

studio-d-usvhffp6is6.studio.us-west-2.sagemaker.aws/jupyterlab/advantech-demo-20240902

SageMaker Studio > Jupyterlab > Advantech Demo 20240902

Provide feedback

Applications (6)

- JupyterLab
- RStudio
- Canvas
- Code Editor
- Studio Cl...
- MLflow

advantech-demo-20240902

jupyter Private

JupyterLab • 5 GB • ml.t3.large

Status: Running

Stop space

Open JupyterLab

Image: SageMaker Distribution 1.10

Space Settings New

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Home

Running instances

Data

Auto ML

Experiments

Jobs

Pipelines

Models

JumpStart

vfboabkwln6zti.studio.us-west-2.sagemaker.aws/jupyterlab/default/lab

File Edit View Run Kernel Git Tabs Settings Help

default-20240902T083726 / advantech-demo-20240902

+ Filter files by name

Launcher

Notebook

- Python 3 (ipykernel)
- Glue PySpark
- Glue Spark
- SparkMagic PySpark
- SparkMagic Spark

Console

- Python 3 (ipykernel)
- Glue PySpark
- Glue Spark
- SparkMagic PySpark
- SparkMagic Spark

Other

- Terminal
- Text File
- Markdown File
- Python File
- Notebook Jobs
- Show Contextual Help

Would you like to receive official Jupyter news?

## ▼ Lab Exercises

[Lab 1. Query SAP HANA Cloud](#) [Lab 2. Integrate Generative AI \(Claude\) with SAP HANA Cloud](#)[Lab 3. Analyze SAP Report using Generative AI](#)[Lab 4. Build GenAI API using Lambda and API Gateway](#)[Lab 5. Using SAP Build Apps to interact with GenAI API](#)

## ► Additional Lab Exercises

[Clean Up](#)[Summary](#)[Get Started with SAP on AWS](#) [AWS for SAP homepage](#) [SAP on AWS Technical Documentation](#) 

## ► AWS account access

## ▼ Content preferences

Language

English  Event ends in 2 days 9 hours 7 minutes.  [Event dashboard](#) > [Lab Exercises](#) > [Lab 1. Query SAP HANA Cloud](#)

# Lab 1. Query SAP HANA Cloud

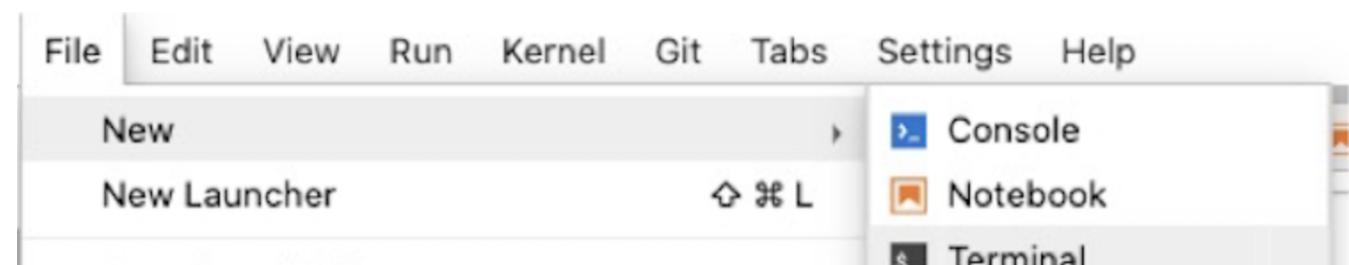
## Learning Objective

By the end of this lab, you will be able to:

- Identify the necessary components to connect SageMaker Studio Notebook to SAP HANA Cloud, including the SAP HANA driver, credentials, and connection string
- Use the SAP HANA Python library to establish a connection from a SageMaker Studio Notebook to SAP HANA Cloud
- Troubleshoot common errors when connecting SageMaker Studio Notebook to SAP HANA Cloud

## Connecting to SAP HANA Cloud from Sagemaker Studio

1. Choose File -> New -> Terminal.



SAP JupyterLab interface showing the "File" menu open with the "Terminal" option selected.

The "File" menu is open, and the "Terminal" option is highlighted with a red arrow. Other options in the menu include "Console", "Notebook", "Text File", "Markdown File", and "Python File".

The main workspace displays several kernel icons:

- Python 3 (ipykernel)
- Glue PySpark
- Glue Spark
- SparkMagic PySpark
- SparkMagic Spark

Below these, there are sections for "Console" and "Other" kernels:

- Python 3 (ipykernel)
- Glue PySpark
- Glue Spark
- SparkMagic PySpark
- SparkMagic Spark

At the bottom, there are icons for "Terminal", "Text File", "Markdown File", "Python File", "Notebook Jobs", and "Show Contextual Help".

A tooltip at the bottom right asks: "Would you like to receive official Jupyter news?"

+    +    ↑    ↻

Launcher Terminal 1 +

sagemaker-user@default:~\$

Filter files by name

File /

Name	Last Modified
------	---------------

- ▼ Lab Exercises
- Lab 1. Query SAP HANA Cloud
  - Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud
  - Lab 3. Analyze SAP Report using Generative AI
  - Lab 4. Build GenAI API using Lambda and API Gateway
  - Lab 5. Using SAP Build Apps to interact with GenAI API

► Additional Lab Exercises

- Clean Up
- Summary

Get Started with SAP on AWS

AWS for SAP homepage

SAP on AWS Technical Documentation

► AWS account access

▼ Content preferences

Language

English

Event ends in 2 days 9 hours 7 minutes.

```
cd /opt/conda/bin/  
./pip install boto3 hdbcli
```

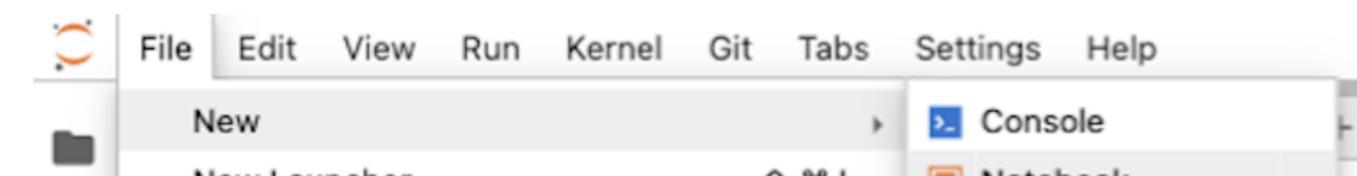
You may encounter an error like below, but you can disregard this for now.

```
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the source of the following dependency conflicts.  
spyder 5.3.3 requires pyqt5<5.16, which is not installed.  
spyder 5.3.3 requires pyqtwebengine<5.16, which is not installed.  
distributed 2022.7.0 requires tornado<6.2,>=6.0.3, but you have tornado 6.3.3 which is incompatible.  
panel 0.13.1 requires bokeh<2.5.0,>=2.4.0, but you have bokeh 3.2.2 which is incompatible.  
spyder 5.3.3 requires ipython<8.0.0,>=7.31.1, but you have ipython 8.15.0 which is incompatible.  
spyder 5.3.3 requires pylint<3.0,>=2.5.0, but you have pylint 3.0.0a7 which is incompatible.
```

### 3. Install the trusted SSL Certificate of SAP HANA Cloud

```
mkdir ~/.ssl  
wget --no-check-certificate https://cacerts.digicert.com/DigiCertGlobalRootCA.crt.pem -O ~/.ssl/DigiCertGlobalRootCA.crt.pem  
wget --no-check-certificate https://cacerts.digicert.com/DigiCertSHA2SecureServerCA-2.crt.pem -O ~/.ssl/DigiCertSHA2SecureServerCA-2.c
```

### 4. Go back to your Jupyterlab Notebook, Choose File -> New -> Notebook.



File Edit View Run Kernel Git Tabs Settings Help

default-20240902T083726 / advantech-demo-20240902

+ - C

Filter files by name

Name Last Modified

Launcher Terminal 1

```
sagemaker-user@default:~$ cd /opt/conda/bin/
./pip install boto3 hdbcli
Requirement already satisfied: boto3 in /opt/conda/lib/python3.10/site-packages (1.34.131)
Collecting hdbcli
  Downloading hdbcli-2.21.31-cp34-abi3-manylinux1_x86_64.whl.metadata (6.1 kB)
Requirement already satisfied: botocore<1.35.0,>=1.34.131 in /opt/conda/lib/python3.10/site-packages (from boto3) (1.34.131)
Requirement already satisfied: jmespath<2.0.0,>=0.7.1 in /opt/conda/lib/python3.10/site-packages (from boto3) (1.0.1)
Requirement already satisfied: s3transfer<0.11.0,>=0.10.0 in /opt/conda/lib/python3.10/site-packages (from boto3) (0.10.2)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /opt/conda/lib/python3.10/site-packages (from botocore<1.35.0,>=1.34.131->boto3) (2.9.0)
Requirement already satisfied: urllib3!=2.2.0,<3,>=1.25.4 in /opt/conda/lib/python3.10/site-packages (from botocore<1.35.0,>=1.34.131->boto3) (1.26.19)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.10/site-packages (from python-dateutil<3.0.0,>=2.1->botocore<1.35.0,>=1.34.131->boto3) (1.16.0)
  Downloading hdbcli-2.21.31-cp34-abi3-manylinux1_x86_64.whl (10.9 MB)
    10.9/10.9 MB 113.5 MB/s eta 0:00:00
Installing collected packages: hdbcli
Successfully installed hdbcli-2.21.31
sagemaker-user@default:/opt/conda/bin$
```

## ▼ Lab Exercises

[Lab 1. Query SAP HANA Cloud](#)

Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud

Lab 3. Analyze SAP Report using Generative AI

Lab 4. Build GenAI API using Lambda and API Gateway

Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS

AWS for SAP homepage

SAP on AWS Technical Documentation

## ► AWS account access

## ▼ Content preferences

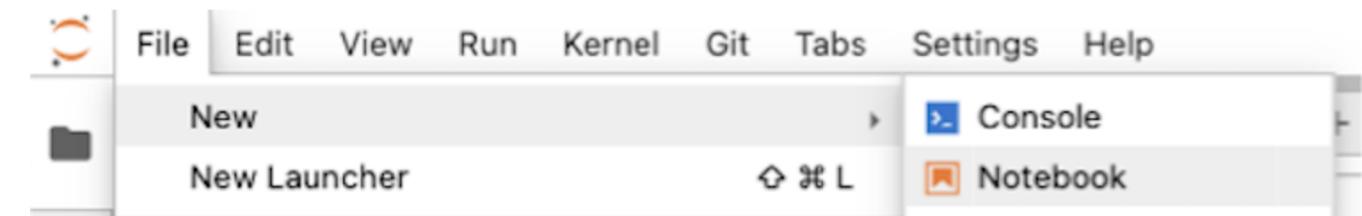
Language

English

Event ends in 2 days 9 hours 6 minutes.

**3. Install the trusted SSL Certificate of SAP HANA Cloud**

```
mkdir ~/.ssl  
wget --no-check-certificate https://cacerts.digicert.com/DigiCertGlobalRootCA.crt.pem -O ~/.ssl/DigiCertGlobalRootCA.crt.pem  
wget --no-check-certificate https://cacerts.digicert.com/DigiCertSHA2SecureServerCA-2.crt.pem -O ~/.ssl/DigiCertSHA2SecureServerCA-2.c
```

**4. Go back to your Jupyterlab Notebook, Choose File -> New -> Notebook.****5. Click Plus (+) button to add cells, then you can type the code into the cells section-by-section, then you click Play to see the outcome for each.**

For kernel, you can choose Python 3 (ipykernel).

```
1 #Import your dependencies  
2 from hdbcli import dbapi
```



Please change the user, password and sql endpoint in the below code.

File Edit View Run Kernel Git Tabs Settings Help

default-20240902T083726 / advantech-demo-20240902

+ Terminal 1 +

```
Requirement already satisfied: boto3 in /opt/conda/lib/python3.10/site-packages (1.34.131)
Collecting hdbcli
  Downloading hdbcli-2.21.31-cp34-abi3-manylinux1_x86_64.whl.metadata (6.1 kB)
Requirement already satisfied: botocore<1.35.0,>=1.34.131 in /opt/conda/lib/python3.10/site-packages (from boto3) (1.34.131)
Requirement already satisfied: jmespath<2.0.0,>=0.7.1 in /opt/conda/lib/python3.10/site-packages (from boto3) (1.0.1)
Requirement already satisfied: s3transfer<0.11.0,>=0.10.0 in /opt/conda/lib/python3.10/site-packages (from boto3) (0.10.2)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /opt/conda/lib/python3.10/site-packages (from botocore<1.35.0,>=1.34.131->boto3) (2.9.0)
Requirement already satisfied: urllib3!=2.2.0,<3,>=1.25.4 in /opt/conda/lib/python3.10/site-packages (from botocore<1.35.0,>=1.34.131->boto3) (1.26.19)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.10/site-packages (from python-dateutil<3.0.0,>=2.1->botocore<1.35.0,>=1.34.131->boto3) (1.16.0)
  Downloading hdbcli-2.21.31-cp34-abi3-manylinux1_x86_64.whl (10.9 MB)
    10.9/10.9 MB 113.5 MB/s eta 0:00:00
Installing collected packages: hdbcli
Successfully installed hdbcli-2.21.31
sagemaker-user@default:/opt/conda/bin$ mkdir ~/.ssl
wget --no-check-certificate https://cacerts.digicert.com/DigiCertGlobalRootCA.crt.pem -O ~/.ssl/DigiCertGlobalRootCA.crt.pem
wget --no-check-certificate https://cacerts.digicert.com/DigiCertSHA2SecureServerCA-2.crt.pem -O ~/.ssl/DigiCertSHA2SecureServerCA-2.crt.pem
--2024-09-02 00:48:59-- https://cacerts.digicert.com/DigiCertGlobalRootCA.crt.pem
Resolving cacerts.digicert.com (cacerts.digicert.com)... 192.229.211.108, 2606:2800:21f:e650:1228:c9d5:7af4:5a5b
Connecting to cacerts.digicert.com (cacerts.digicert.com)|192.229.211.108|:443... connected.
WARNING: cannot verify cacerts.digicert.com's certificate, issued by 'CN=DigiCert Global G2 TLS RSA SHA256 2020 CA1,O=DigiCert Inc,C=US':
  Unable to locally verify the issuer's authority.
HTTP request sent, awaiting response... 200 OK
Length: 1338 (1.3K) [application/x-pem-file]
Saving to: '/home/sagemaker-user/.ssl/DigiCertGlobalRootCA.crt.pem'

/home/sagemaker-user/.ssl/DigiCertG 100%[=====] 1.31K --.-KB/s in 0s

2024-09-02 00:48:59 (86.7 MB/s) - '/home/sagemaker-user/.ssl/DigiCertGlobalRootCA.crt.pem' saved [1338/1338]

--2024-09-02 00:48:59-- https://cacerts.digicert.com/DigiCertSHA2SecureServerCA-2.crt.pem
Resolving cacerts.digicert.com (cacerts.digicert.com)... 192.229.211.108, 2606:2800:21f:e650:1228:c9d5:7af4:5a5b
Connecting to cacerts.digicert.com (cacerts.digicert.com)|192.229.211.108|:443... connected.
WARNING: cannot verify cacerts.digicert.com's certificate, issued by 'CN=DigiCert Global G2 TLS RSA SHA256 2020 CA1,O=DigiCert Inc,C=US':
  Unable to locally verify the issuer's authority.
HTTP request sent, awaiting response... 200 OK
Length: 1790 (1.7K) [application/x-pem-file]
Saving to: '/home/sagemaker-user/.ssl/DigiCertSHA2SecureServerCA-2.crt.pem'

/home/sagemaker-user/.ssl/DigiCertS 100%[=====] 1.75K --.-KB/s in 0s

2024-09-02 00:48:59 (122 MB/s) - '/home/sagemaker-user/.ssl/DigiCertSHA2SecureServerCA-2.crt.pem' saved [1790/1790]

sagemaker-user@default:/opt/conda/bin$
```

File Edit View Run Kernel Git Tabs Settings Help

New New Launcher Open from Path... Open from URL... New View for New Console for Activity Close Tab Shutdown Terminal Close All Tabs Save Save As... Save All Reload from Disk Revert to Checkpoint... Rename... Duplicate Download Save and Export Notebook As... Save Current Workspace As... Save Current Workspace Print... Log Out

Console Notebook Terminal Text File Markdown File Python File

Terminal 1

```
: boto3 in /opt/conda/lib/python3.10/site-packages (1.34.131)
: cp34-abi3-manylinux1_x86_64.whl.metadata (6.1 kB)
: botocore<1.35.0,>=1.34.131 in /opt/conda/lib/python3.10/site-packages (from boto3) (1.34.131)
: jmespath<2.0.0,>=0.7.1 in /opt/conda/lib/python3.10/site-packages (from boto3) (1.0.1)
: s3transfer<0.11.0,>=0.10.0 in /opt/conda/lib/python3.10/site-packages (from boto3) (0.10.2)
: python-dateutil<3.0.0,>=2.1 in /opt/conda/lib/python3.10/site-packages (from botocore<1.35.0,>=1.34.131->boto3)

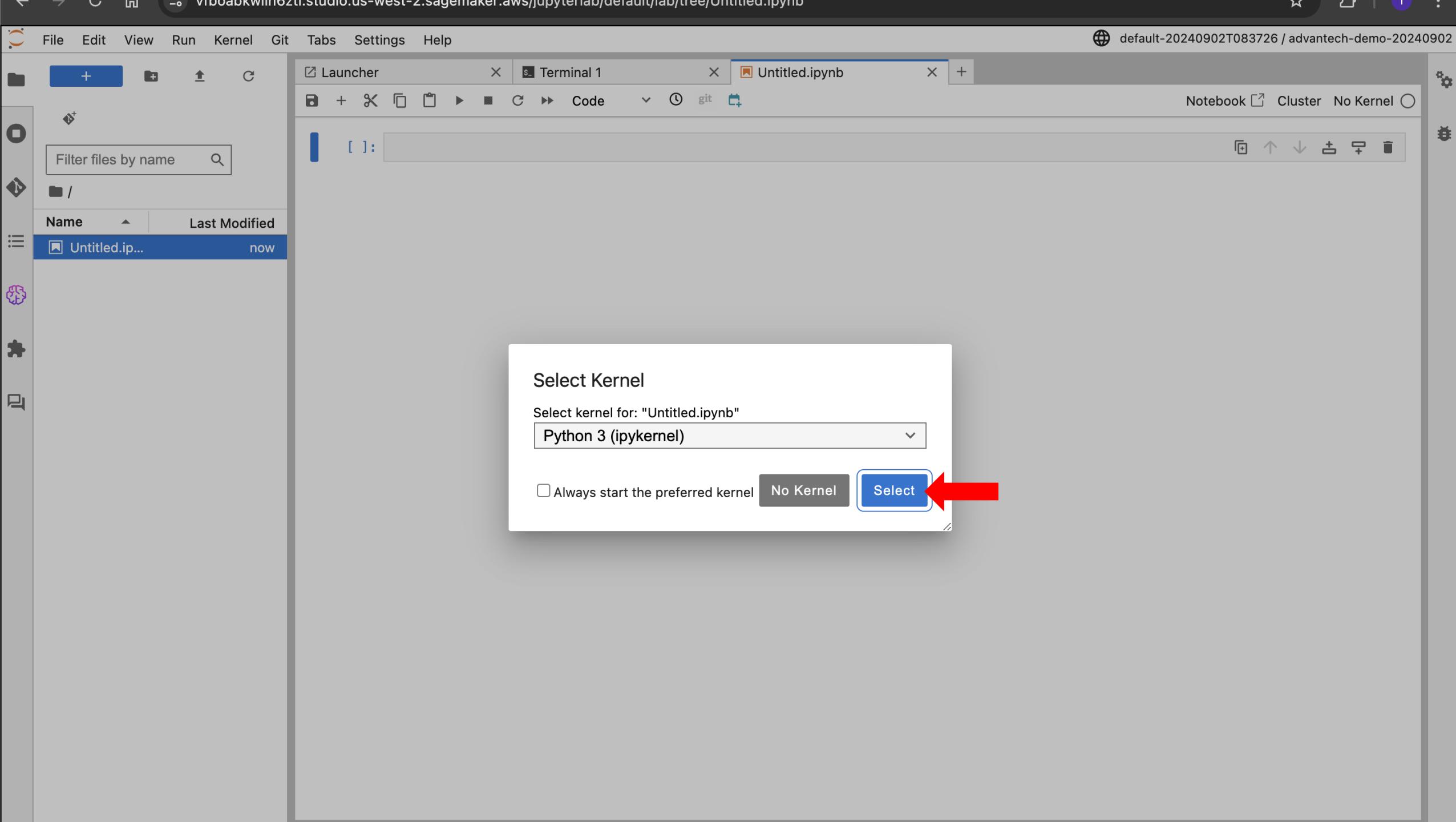
Requirement already satisfied: urllib3!=2.2.0,<3,>=1.25.4 in /opt/conda/lib/python3.10/site-packages (from botocore<1.35.0,>=1.34.131->boto3) (1.25.4)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.10/site-packages (from python-dateutil<3.0.0,>=2.1->botocore<1.35.0,>=1.34.131->boto3) (1.16.0)
  Reading hdbcli-2.21.31-cp34-abi3-manylinux1_x86_64.whl (10.9 MB)
    10.9/10.9 MB 113.5 MB/s eta 0:00:00
  Linking collected packages: hdbcli
  Successfully installed hdbcli-2.21.31
sager-user@default:/opt/conda/bin$ mkdir ~/.ssl
sager-user@default:/opt/conda/bin$ curl -k https://cacerts.digicert.com/DigiCertGlobalRootCA.crt.pem -o ~/ssl/DigiCertGlobalRootCA.crt.pem
sager-user@default:/opt/conda/bin$ curl -k https://cacerts.digicert.com/DigiCertSHA2SecureServerCA-2.crt.pem -o ~/ssl/DigiCertSHA2SecureServerCA-2.crt.pem
2024-09-02 00:48:59 -- https://cacerts.digicert.com/DigiCertGlobalRootCA.crt.pem
2024-09-02 00:48:59 -- https://cacerts.digicert.com/DigiCertSHA2SecureServerCA-2.crt.pem
  Connecting to cacerts.digicert.com (cacerts.digicert.com)|192.229.211.108|:2606:2800:21f:e650:1228:c9d5:7af4:5a5b
  Connecting to cacerts.digicert.com (cacerts.digicert.com)|192.229.211.108|:443... connected.
  G: cannot verify cacerts.digicert.com's certificate, issued by 'CN=DigiCert Global G2 TLS RSA SHA256 2020 CA1,O=DigiCert Inc,C=US'
  Please locally verify the issuer's authority.
  Request sent, awaiting response... 200 OK
  1338 (1.3K) [application/x-pem-file]
  Saving to: '/home/sagemaker-user/.ssl/DigiCertGlobalRootCA.crt.pem'

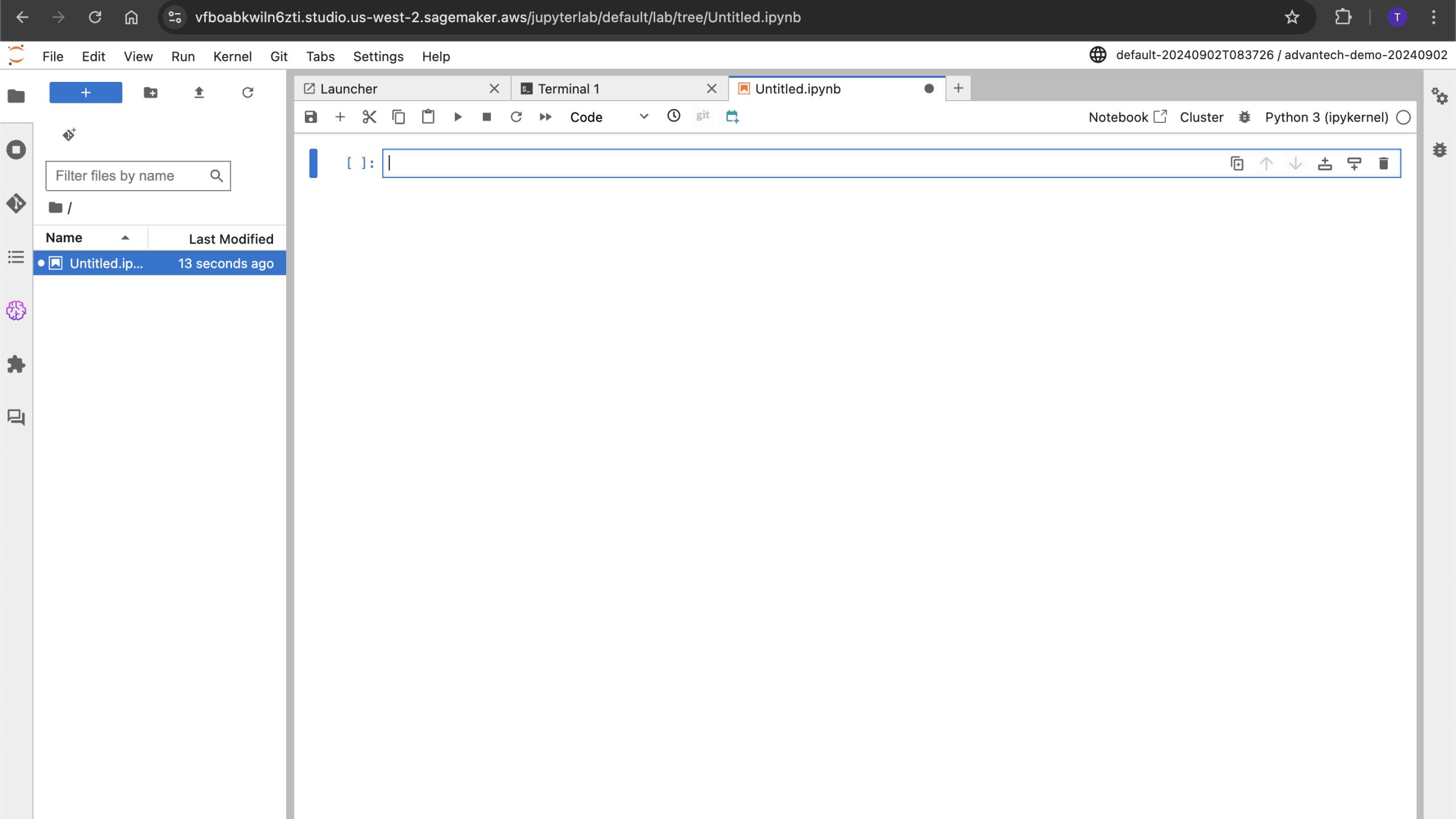
sager-user@default:/opt/conda/bin$ curl -k https://cacerts.digicert.com/DigiCertGlobalRootCA.crt.pem -o ~/ssl/DigiCertGlobalRootCA.crt.pem
2024-09-02 00:48:59 (86.7 MB/s) - '/home/sagemaker-user/.ssl/DigiCertGlobalRootCA.crt.pem' saved [1338/1338]

  Connecting to cacerts.digicert.com (cacerts.digicert.com)|192.229.211.108|:2606:2800:21f:e650:1228:c9d5:7af4:5a5b
  Connecting to cacerts.digicert.com (cacerts.digicert.com)|192.229.211.108|:443... connected.
  G: cannot verify cacerts.digicert.com's certificate, issued by 'CN=DigiCert Global G2 TLS RSA SHA256 2020 CA1,O=DigiCert Inc,C=US'
  Please locally verify the issuer's authority.
  Request sent, awaiting response... 200 OK
  1790 (1.7K) [application/x-pem-file]
  Saving to: '/home/sagemaker-user/.ssl/DigiCertSHA2SecureServerCA-2.crt.pem'

/home/sagemaker-user/.ssl/DigiCertS 100%[=====] 1.75K ---KB/s in 0s
2024-09-02 00:48:59 (122 MB/s) - '/home/sagemaker-user/.ssl/DigiCertSHA2SecureServerCA-2.crt.pem' saved [1790/1790]

sager-user@default:/opt/conda/bin$
```





vfboabkwln6zti.studio.us-west-2.sagemaker.aws/jupyterlab/default/lab/tree/Untitled.ipynb

File Edit View Run Kernel Git Tabs Settings Help default-20240902T083726 / advantech-demo-20240902

+ Filter files by name

Launcher Terminal 1 Untitled.ipynb

Code git

Cluster Python 3 (ipykernel)

Close Tab ⌘ W

Close All Other Tabs

Close All Tabs

Close Tabs to Right

New Console for Notebook

Rename Notebook...

Duplicate Notebook

Delete Notebook

New View for Notebook

Show in File Browser

Shift+Right Click for Browser Menu

+

Filter files by name

Name Last Modified

Untitled.ip... 20 seconds ago

A screenshot of a JupyterLab interface on a web browser. The top navigation bar includes File, Edit, View, Run, Kernel, Git, Tabs, Settings, and Help. The title bar shows the URL and the current workspace path: vfboabkwln6zti.studio.us-west-2.sagemaker.aws/jupyterlab/default/lab/tree/Untitled.ipynb. The top right corner displays the session ID: default-20240902T083726 / advantech-demo-20240902.

The left sidebar contains several icons: a circular arrow, a plus sign, a folder, an upward arrow, a downward arrow, a magnifying glass, a brain icon, a puzzle piece, and a speaker icon. Below these are file management controls: a search bar labeled "Filter files by name" and a list of files. The list is sorted by "Name" and "Last Modified". A single file, "Untitled.ipynb", is selected, showing its last modified time as "31 seconds ago".

The main workspace shows three tabs: "Launcher", "Terminal 1", and "Untitled.ipynb". The "Untitled.ipynb" tab is active. The notebook interface includes a toolbar with various icons for code, output, and file operations, and a code editor area with a status bar indicating "git".

A modal dialog box titled "Rename File" is displayed in the center. It shows the "File Path" as "Untitled.ipynb" and the "New Name" field containing "Untitled.ipynb". There are "Cancel" and "Rename" buttons at the bottom of the dialog.

+    +    ↑    C

Launcher Terminal 1 Untitled.ipynb

Notebook Cluster Python 3 (ipykernel)

Filter files by name

Name Last Modified

Untitled.ip... 31 seconds ago

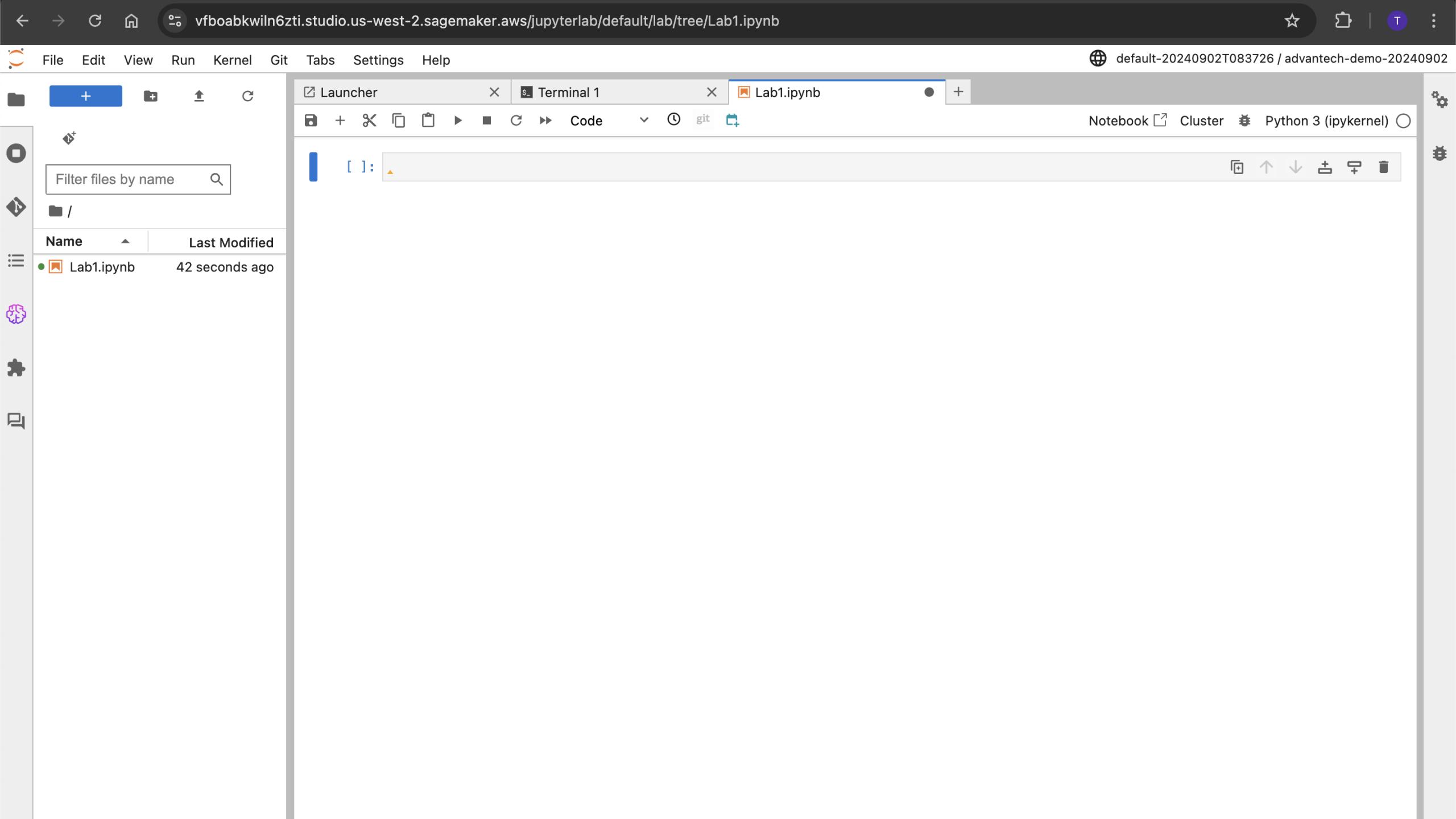
[ ]:

Renew File

File Path  
Untitled.ipynb

New Name

Cancel Rename



## ▼ Lab Exercises

[Lab 1. Query SAP HANA Cloud](#)

Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud

Lab 3. Analyze SAP Report using Generative AI

Lab 4. Build GenAI API using Lambda and API Gateway

Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS

AWS for SAP homepage

SAP on AWS Technical Documentation

## ► AWS account access

## ▼ Content preferences

Language

English

Event ends in 2 days 9 hours 4 minutes.

```
1 #Import your dependencies
2 from hdbcli import dbapi
```

Please change the user, password and sql endpoint in the below code.

```
1 #Initialize your connection
2 conn = dbapi.connect(
3     address='<changesqlendpoint.hana.trial-us10.hanacloud.ondemand.com>',
4     port='443',
5     user='<ChangeUser>',
6     password='<ChangePassword>',
7     encrypt=True,
8     sslValidateCertificate=True
9 )
10 #If no errors, print connected
11 print('connected\n')
```

```
1 cursor = conn.cursor()
2 sql_command = "select * from USER1.HOTEL;"
3 cursor.execute(sql_command)
4 rows = cursor.fetchall()
5 for row in rows:
6     for col in row:
```

Copied!



The screenshot shows a Jupyter Notebook interface with the following components:

- Top Bar:** File, Edit, View, Run, Kernel, Git, Tabs, Settings, Help.
- Right Panel (Notebook Area):**
  - Tab Bar:** Launcher, Terminal 1, Lab1.ipynb (active tab).
  - Toolbar:** +, - (close), up, down, refresh, Code, git, Notebook, Cluster, Python 3 (ipykernel).
  - Code Cell [1]:**

```
#Import your dependencies
from hdbcli import dbapi
```
  - Code Cell [ ]:** (empty cell)
  - Bottom Toolbar:** up, down, plus, minus, copy, paste, delete.
- Left Panel (File Browser):**
  - File Filter:** Filter files by name (with a search icon).
  - File List:** Name (sorted), Last Modified.
    - Lab1.ipynb (modified 1 minute ago)
- Bottom Status Bar:** Python 3 (ipykernel) idle, Fully initialized, Instance MEM 24%, Amazon S3, Cookie Preferences, Mode: Edit, In 1 Out 1, Lab1.ipynb - 1.

## ▼ Lab Exercises

[Lab 1. Query SAP HANA Cloud](#)

Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud

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## ► AWS account access

## ▼ Content preferences

Language

English

Event ends in 2 days 9 hours 4 minutes.

Copied!

```
1 #Initialize your connection
2 conn = dbapi.connect(
3     address='<changesqlendpoint.hana.trial-us10.hanacloud.ondemand.com>',
4     port='443',
5     user='<ChangeUser>',
6     password='<ChangePassword>',
7     encrypt=True,
8     sslValidateCertificate=True
9 )
10 #If no errors, print connected
11 print('connected\n')
```



```
1 cursor = conn.cursor()
2 sql_command = "select * from USER1.HOTEL;"
3 cursor.execute(sql_command)
4 rows = cursor.fetchall()
5 for row in rows:
6     for col in row:
7         print ("%s" % col, end = " ")
8     print ("")
9 cursor.close()
10 conn.close()
```



5. After you click play on all the cells, you will see the result as below. Congratulation !!

The screenshot shows a Jupyter Notebook interface with the following details:

- Header:** The title bar includes tabs for "202040902-SAP-", "Instances and Sub", "SQL Console - SAP", "SageMaker Studio", "Advantech Demo 2", "Lab1.ipynb - Jupyter", and "AmazonSageMake".
- Toolbar:** Standard Jupyter Notebook toolbar with File, Edit, View, Run, Kernel, Git, Tabs, Settings, Help, and a plus sign for creating new cells.
- Left Sidebar:** A file browser with a search bar ("Filter files by name") and a list of files. The file "Lab1.ipynb" is selected and highlighted, showing it was last modified "1 minute ago".
- Central Area:** The main workspace contains two code cells:
  - [1]: 

```
#Import your dependencies
from hdbcli import dbapi
```
  - [ ]: 

```
#Initialize your connection
conn = dbapi.connect(
    address='<changesqlendpoint.hana.trial-us10.hanacloud.ondemand.com>',
    port='443',
    user='<ChangeUser>',
    password='<ChangePassword>',
    encrypt=True,
    sslValidateCertificate=True
)
#If no errors, print connected
print('connected\n')
```
- Right Sidebar:** Includes tabs for "Launcher", "Terminal 1", and "Lab1.ipynb". It also shows notebook, cluster, and Python 3 (ipykernel) status, along with various configuration icons.

# SAP HANA Cloud Central

 Search Commands

Instances

Last refreshed at 8:27:24 AM

## All Instances ▼

[Create Instance](#)

Search: State: Notifications: Type: Version:

 Instance ID or name     [Adapt Filters](#)[Instances \(1\)](#) [Subaccount Roles \(2\)](#) Group Instances 

State	Name	Notifications	Runtime Environment	Memory	Storage	Compute	Scale-out	Replicas	Actions
<b>aws-tech-summit</b>									
Running	aws-tech-summit	Other Environments	16 GB	80 GB	1 vCPUs	1 node	0 replicas	...	

# SAP HANA Cloud Central

 Search Commands

Instances

Last refreshed at 8:27:24 AM

## All Instances ▼

[Create Instance](#)

Search:

State:

Notifications:

Type:

[Instances \(1\)](#) [Subaccount Roles \(2\)](#)

State	Name	Notifications	Runtime Environment	Memory	Storage	Compute
<span style="color: green;">✓ Running</span>	aws-tech-summit		Other Environments	16 GB	80 GB	1 vCPU

[Manage Configuration](#)[Add Data Lake](#)[Filter](#)[Open SQL Console](#)[Open Database Objects](#)[Copy SQL Endpoint](#)[Up](#) [Down](#)[Copy Instance ID](#)[Copy Configuration](#)[Apply Patch](#)[Upgrade](#)[Start Recovery](#)[Recreate Instance](#)[Create Template to Clone Instance](#)[Take Instance Snapshot](#)[Stop](#)[Delete](#)[Open in SAP HANA Cockpit](#)[To monitor and administer](#)

The screenshot shows a Jupyter Notebook interface with the following details:

- Header:** The title bar includes tabs for "202040902-SAP-", "Instances and Sub", "Instances - SAP H...", "SageMaker Studio", "Advantech Demo 2", "Lab1.ipynb - Jupyter", and "AmazonSageMake...".
- Toolbar:** Standard Jupyter Notebook menu items: File, Edit, View, Run, Kernel, Git, Tabs, Settings, Help.
- Left Sidebar:** A file browser with a search bar ("Filter files by name") and a list of files. The file "Lab1.ipynb" is selected and highlighted.
- Central Area:** The main workspace contains two code cells:
  - [1]: 

```
#Import your dependencies
from hdbcli import dbapi
```
  - [2]: 

```
#Initialize your connection
conn = dbapi.connect(
    address='da59',
    port='443',
    user='I_1',
    password='          2024',
    encrypt=True,
    sslValidateCertificate=True
)
#If no errors, print connected
print('connected\n')
```
- Bottom:** A command line interface (CLI) with a prompt "[ ]:" and various navigation and editing keys.

## ▼ Lab Exercises

## Lab 1. Query SAP HANA Cloud

Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud

Lab 3. Analyze SAP Report using Generative AI

Lab 4. Build GenAI API using Lambda and API Gateway

Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS 

AWS for SAP homepage 

SAP on AWS Technical Documentation 

## ► AWS account access

## ▼ Content preferences

Language

English

Event ends in 2 days 9 hours 2 minutes.

```
1 cursor = conn.cursor()
2 sql_command = "select * from USER1.HOTEL;"
3 cursor.execute(sql_command)
4 rows = cursor.fetchall()
5 for row in rows:
6     for col in row:
7         print ("%s" % col, end = " ")
8     print ("")
9 cursor.close()
10 conn.close()
```

Copied!

5. After you click play on all the cells, you will see the result as below. Congratulation !!

File Edit View Run Kernel Git Tabs Settings Help

+    C



Filter files by name 



Name  Last Modified

Lab1.ipynb  

           git 

```
)  
#If no errors, print connected  
print('connected\n')
```

connected

The screenshot shows a Jupyter Notebook interface with the following details:

- Header:** The title bar includes tabs for "202040902-SAP-", "Instances and Sub", "Instances - SAP H...", "SageMaker Studio", "Advantech Demo 2", "Lab1.ipynb - Jupyter", and "AmazonSageMake...".
- Toolbar:** Standard Jupyter Notebook menu items: File, Edit, View, Run, Kernel, Git, Tabs, Settings, Help.
- Left Sidebar:** A file browser with a search bar ("Filter files by name") and a list of files. The file "Lab1.ipynb" is selected and highlighted.
- Central Area:** Three tabs are visible: "Launcher", "Terminal 1", and "Lab1.ipynb". The "Lab1.ipynb" tab is active.
- Code Block:** The code cell [3] contains the following Python script:

```
[3]: cursor = conn.cursor()
sql_command = "select * from USER1.HOTEL;"
cursor.execute(sql_command)
rows = cursor.fetchall()
for row in rows:
    for col in row:
        print ("%s" % col, end = " ")
    print("")
```
- Output:** The output of the code is a list of hotel entries, each numbered from 10 to 26, followed by their names and addresses.

Number	Address
10	Congress 155 Beechwood St. Seattle WA 20005
11	Regency 477 17th Avenue Seattle WA 20037
12	Long Island 1499 Grove Street Long Island NY 11788
13	Empire State 65 Yellowstone Dr. Albany NY 12203
14	Midtown 12 Barnard St. New York NY 10019
15	Eighth Avenue 112 8th Avenue New York NY 10019
16	Lake Michigan 354 OAK Terrace Chicago IL 60601
17	Airport 650 C Parkway Rosemont IL 60018
18	Sunshine 200 Yellowstone Dr. Clearwater FL 33575
19	Beach 1980 34th St. Daytona Beach FL 32018
20	Atlantic 111 78th St. Deerfield Beach FL 33441
21	Long Beach 35 Broadway Long Beach CA 90804
22	Indian Horse 16 MAIN STREET Palm Springs CA 92262
23	Star 13 Beechwood Place Hollywood CA 90029
24	River Boat 788 MAIN STREET New Orleans LA 70112
25	Ocean Star 45 Pacific Avenue Atlantic City NJ 08401
26	Bella Ciente 1407 Marshall Ave Longview TX 75601
- Bottom:** A toolbar with icons for cell operations like run, edit, and delete.



- ▼ Lab Exercises
- Lab 1. Query SAP HANA Cloud
  - Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud**
  - Lab 3. Analyze SAP Report using Generative AI
  - Lab 4. Build GenAI API using Lambda and API Gateway
  - Lab 5. Using SAP Build Apps to interact with GenAI API

► Additional Lab Exercises

- Clean Up
- Summary

Get Started with SAP on AWS 

AWS for SAP homepage 

SAP on AWS Technical Documentation 

► AWS account access

▼ Content preferences

Language

English

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[Event dashboard](#) > [Lab Exercises](#) > **Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud**

## Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud

### Learning Objective

By the end of this lab, you will be able to:

- Explain the benefits of connecting SageMaker Studio Notebook to SAP HANA Cloud for accessing data for machine learning models
- Explain Claude, an LLM capable of generating SQL queries from natural language prompts with langchain
- How to get access to the Claude LLM into SageMaker Studio Notebook using Amazon Bedrock
- Pass text descriptions and requests to Claude to generate equivalent SQL queries with prompt engineering
- Connect the generated SQL queries to SAP HANA Cloud to retrieve requested data through SQLAlchemy
- Evaluate the performance of Claude for text-to-SQL with SAP HANA Cloud data
- Troubleshoot errors when connecting SageMaker Studio Notebook to SAP HANA Cloud and running Claude via Bedrock

### Lab 2.1. Integrate Claude LLM with SAP HANA Cloud with Langchain, SQLAlchemy, Sagemaker and Bedrock

#### 1. Choose File -> New -> Notebook

Download the [myutils.zip](#) to your computer. Drag and drop the **myutils.zip** to the root folder of your Notebook

## ▼ Lab Exercises

Lab 1. Query SAP HANA Cloud

**Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud**

Lab 3. Analyze SAP Report using Generative AI

Lab 4. Build GenAI API using Lambda and API Gateway

Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS

AWS for SAP homepage

SAP on AWS Technical Documentation

## ► AWS account access

## ▼ Content preferences

Language

English

Exit event

Event ends in 2 days 9 hours 1 minute.

X

?

Download the **myutils.zip** on your computer. Drag and drop the **myutils.zip** to the root folder of your Notebook.

The screenshot shows a Jupyter Notebook interface. On the left, there's a sidebar with icons for file operations (New, Open, Save, etc.), a search bar for 'Filter files by name', and a list of files. The list includes 'Lab1.ipynb', 'Lab2.2.ipynb', 'Lab2.3.ipynb', 'Lab2.ipynnb' (with a blue background), 'myutils.zip' (selected and highlighted with a blue background), and 'Untitled.ipynb'. The main area shows a code cell [1]: with the following content:

```
#This Notebook will show the integration between
!pip install -q langchain langchain_aws boto3 aw
!pip install -q sqlalchemy-hana langchain_experi
```

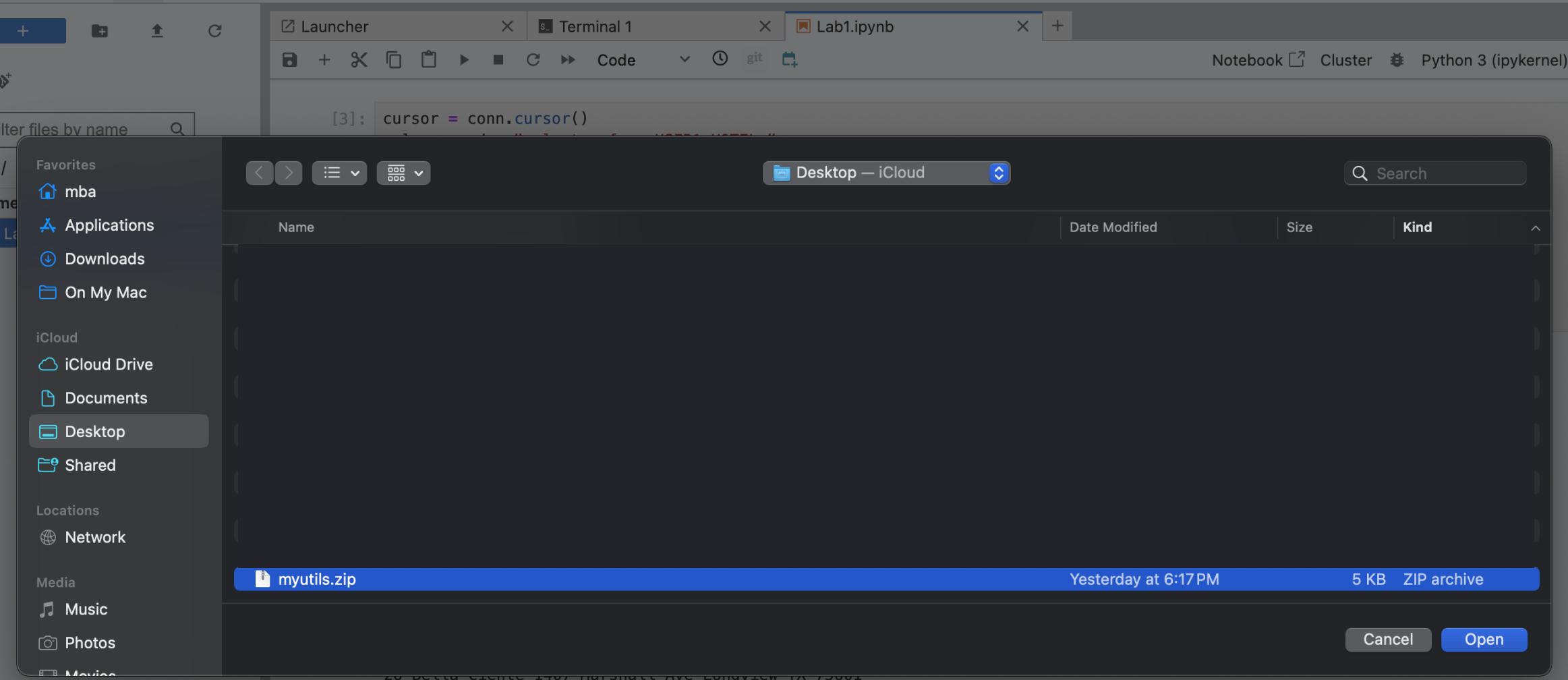
Below the code cell is a status bar with three colored dots (red, yellow, green) and the text 'WIP'. To the right of the code cell is a sidebar with sections for 'Favourites', 'Downloads' (containing 'myutils.zip'), 'Desktop', 'Applications', and 'Recents'.

2. Click **Plus (+)** button to add cells, then you can type the code into the cells section-by-section, then you click **Play** to see the outcome for each.

A screenshot of a Jupyter Notebook interface. The top navigation bar shows tabs for various projects and environments. The current tab is "Lab1.ipynb". On the left, there's a sidebar with icons for file operations and a file browser showing "Lab1.ipynb" was uploaded 1 minute ago. A red arrow points to the "Upload Files" button in the sidebar. The main area displays a Python script (Lab1.ipynb) and its execution output. The code uses a cursor to select data from a database table and prints it row by row. The output lists 26 hotel entries with their names, addresses, and zip codes.

```
[3]: cursor = conn.cursor()
sql_command = "select * from USER1.HOTEL;"
cursor.execute(sql_command)
rows = cursor.fetchall()
for row in rows:
    for col in row:
        print ("%s" % col, end = " ")
    print ("")
cursor.close()
conn.close()

10 Congress 155 Beechwood St. Seattle WA 20005
11 Regency 477 17th Avenue Seattle WA 20037
12 Long Island 1499 Grove Street Long Island NY 11788
13 Empire State 65 Yellowstone Dr. Albany NY 12203
14 Midtown 12 Barnard St. New York NY 10019
15 Eighth Avenue 112 8th Avenue New York NY 10019
16 Lake Michigan 354 OAK Terrace Chicago IL 60601
17 Airport 650 C Parkway Rosemont IL 60018
18 Sunshine 200 Yellowstone Dr. Clearwater FL 33575
19 Beach 1980 34th St. Daytona Beach FL 32018
20 Atlantic 111 78th St. Deerfield Beach FL 33441
21 Long Beach 35 Broadway Long Beach CA 90804
22 Indian Horse 16 MAIN STREET Palm Springs CA 92262
23 Star 13 Beechwood Place Hollywood CA 90029
24 River Boat 788 MAIN STREET New Orleans LA 70112
25 Ocean Star 45 Pacific Avenue Atlantic City NJ 08401
26 Bella Ciente 1407 Marshall Ave Longview TX 75601
```



The screenshot shows a Jupyter Notebook interface with the following details:

- File Explorer (Left):** A sidebar showing a file tree. It includes a search bar labeled "Filter files by name". The tree shows two items:
  - Lab1.ipynb (modified 1 minute ago)
  - myutils.zip (modified 4 seconds ago)A red arrow points to the "myutils.zip" item.
- Code Editor (Right):** A tab titled "Lab1.ipynb" is active. The code cell [3] contains the following Python script:

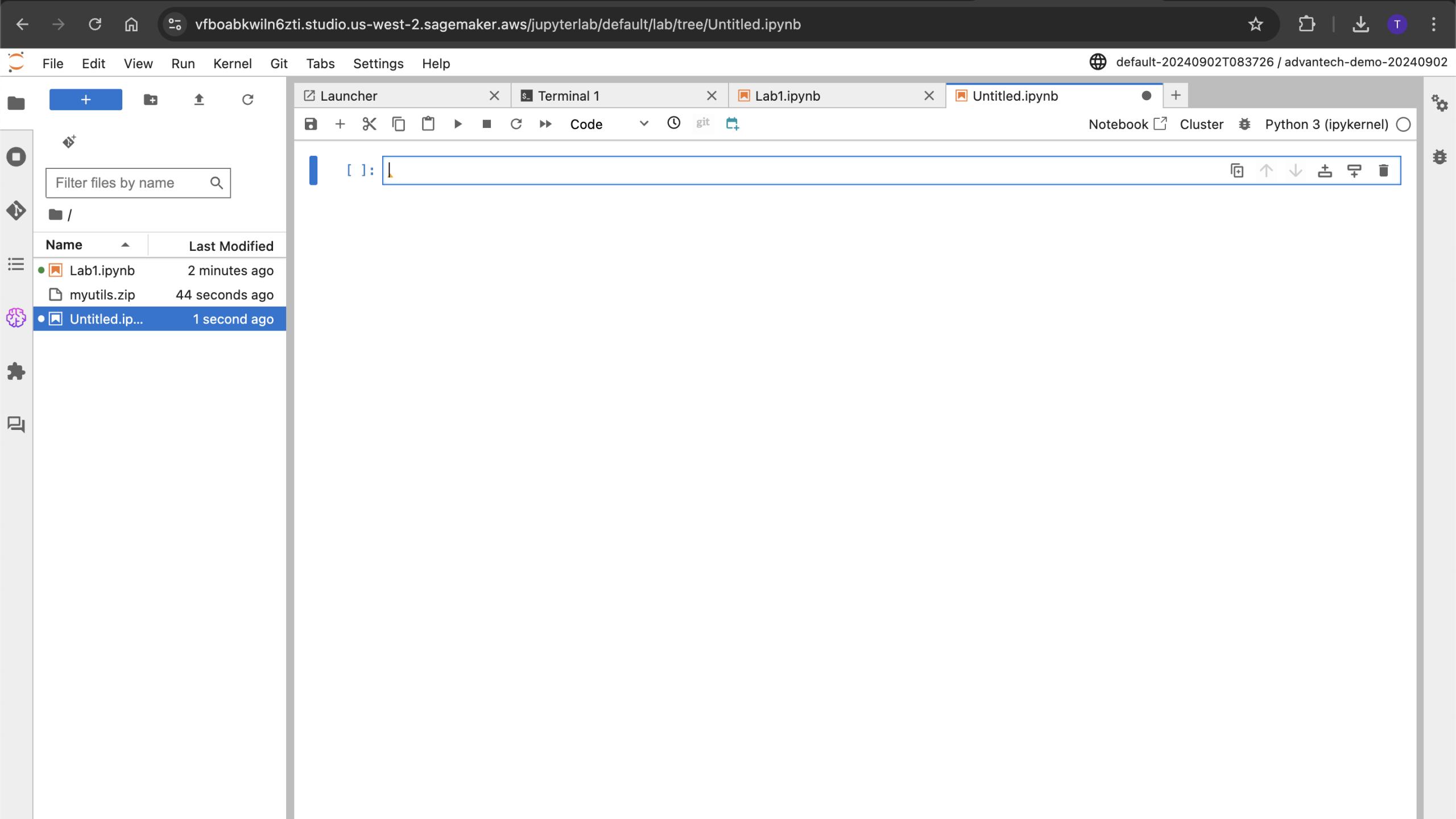
```
cursor = conn.cursor()
sql_command = "select * from USER1.HOTEL;"
cursor.execute(sql_command)
rows = cursor.fetchall()
for row in rows:
    for col in row:
        print ("%s" % col, end = " ")
    print ("")
cursor.close()
conn.close()
```
- Output (Bottom):** The output of the code execution is displayed below the code cell, listing 26 hotel entries with their names and addresses.

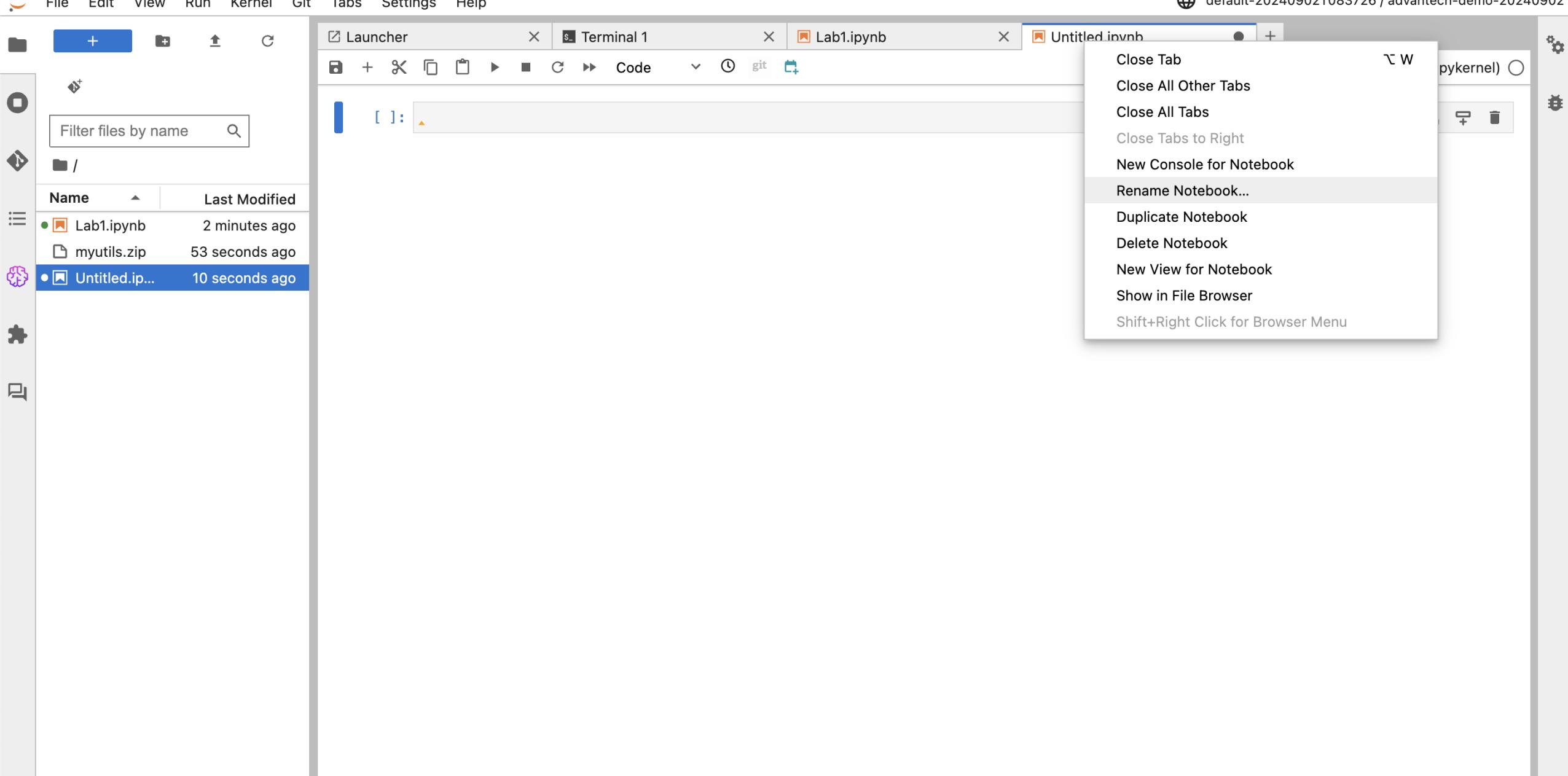
Index	Address
10	Congress 155 Beechwood St. Seattle WA 20005
11	Regency 477 17th Avenue Seattle WA 20037
12	Long Island 1499 Grove Street Long Island NY 11788
13	Empire State 65 Yellowstone Dr. Albany NY 12203
14	Midtown 12 Barnard St. New York NY 10019
15	Eighth Avenue 112 8th Avenue New York NY 10019
16	Lake Michigan 354 OAK Terrace Chicago IL 60601
17	Airport 650 C Parkway Rosemont IL 60018
18	Sunshine 200 Yellowstone Dr. Clearwater FL 33575
19	Beach 1980 34th St. Daytona Beach FL 32018
20	Atlantic 111 78th St. Deerfield Beach FL 33441
21	Long Beach 35 Broadway Long Beach CA 90804
22	Indian Horse 16 MAIN STREET Palm Springs CA 92262
23	Star 13 Beechwood Place Hollywood CA 90029
24	River Boat 788 MAIN STREET New Orleans LA 70112
25	Ocean Star 45 Pacific Avenue Atlantic City NJ 08401
26	Bella Ciente 1407 Marshall Ave Longview TX 75601

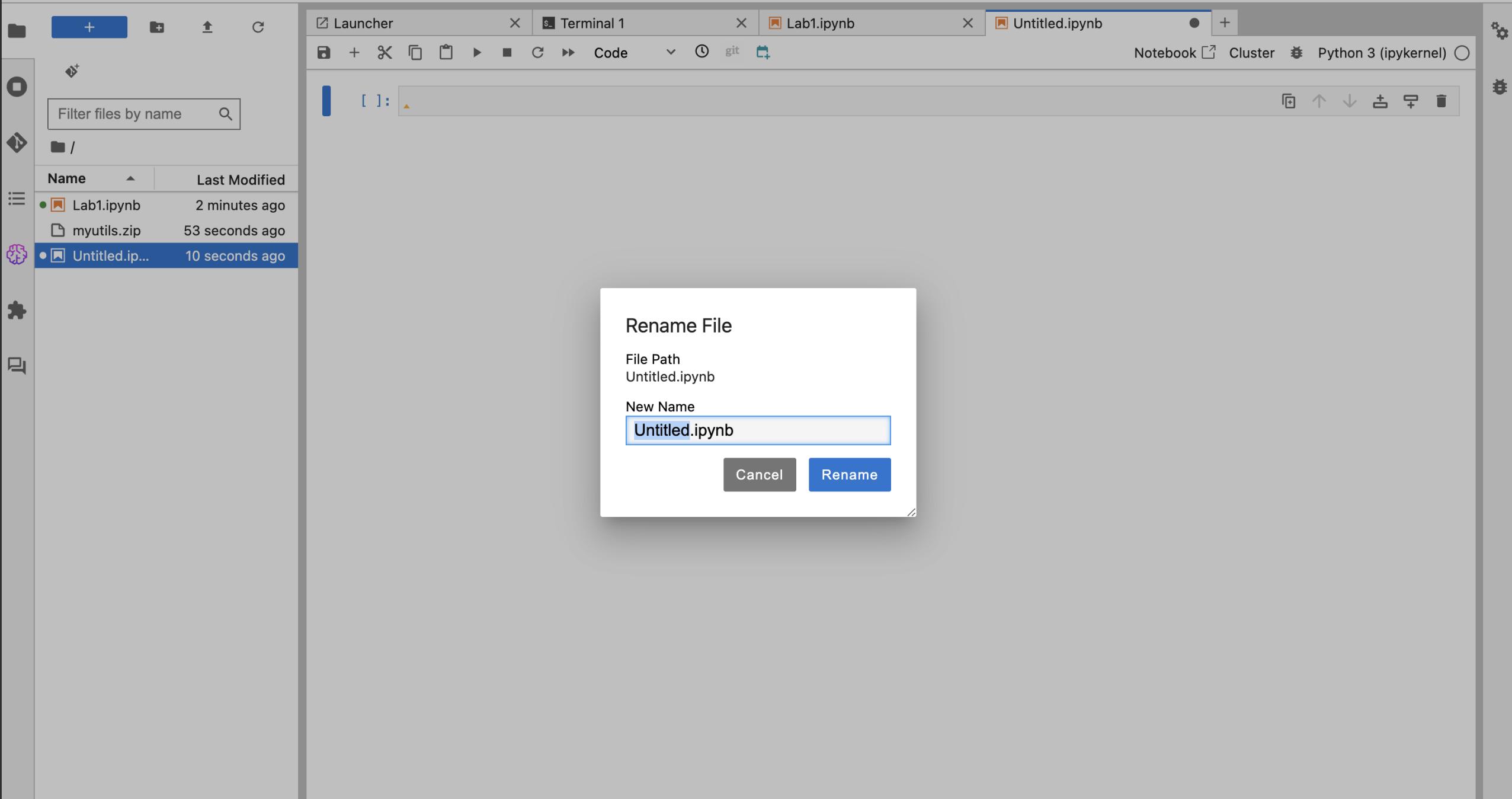
The screenshot shows a Jupyter Notebook interface with a context menu open over a code cell. The menu is titled 'File' and includes options like 'New', 'Console', 'Notebook', 'Terminal', 'Text File', 'Markdown File', and 'Python File'. A red arrow points to the 'Notebook' option. The code cell contains Python code for querying a database and printing results. The results show a list of addresses from various locations.

```
for()
    select * from USER1.HOTEL;"_command)
rows = cursor.fetchall()
for row in rows:
    for col in row:
        print ("%s" % col, end = " ")
    print ("")
cursor.close()
conn.close()

10 Congress 155 Beechwood St. Seattle WA 20005
11 Regency 477 17th Avenue Seattle WA 20037
12 Long Island 1499 Grove Street Long Island NY 11788
13 Empire State 65 Yellowstone Dr. Albany NY 12203
14 Midtown 12 Barnard St. New York NY 10019
15 Eighth Avenue 112 8th Avenue New York NY 10019
16 Lake Michigan 354 OAK Terrace Chicago IL 60601
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24 River Boat 788 MAIN STREET New Orleans LA 70112
25 Ocean Star 45 Pacific Avenue Atlantic City NJ 08401
26 Bella Ciente 1407 Marshall Ave Longview TX 75601
```







+    -    ⌂    ⌄    ⌅    ⌆

Filter files by name

📁 /

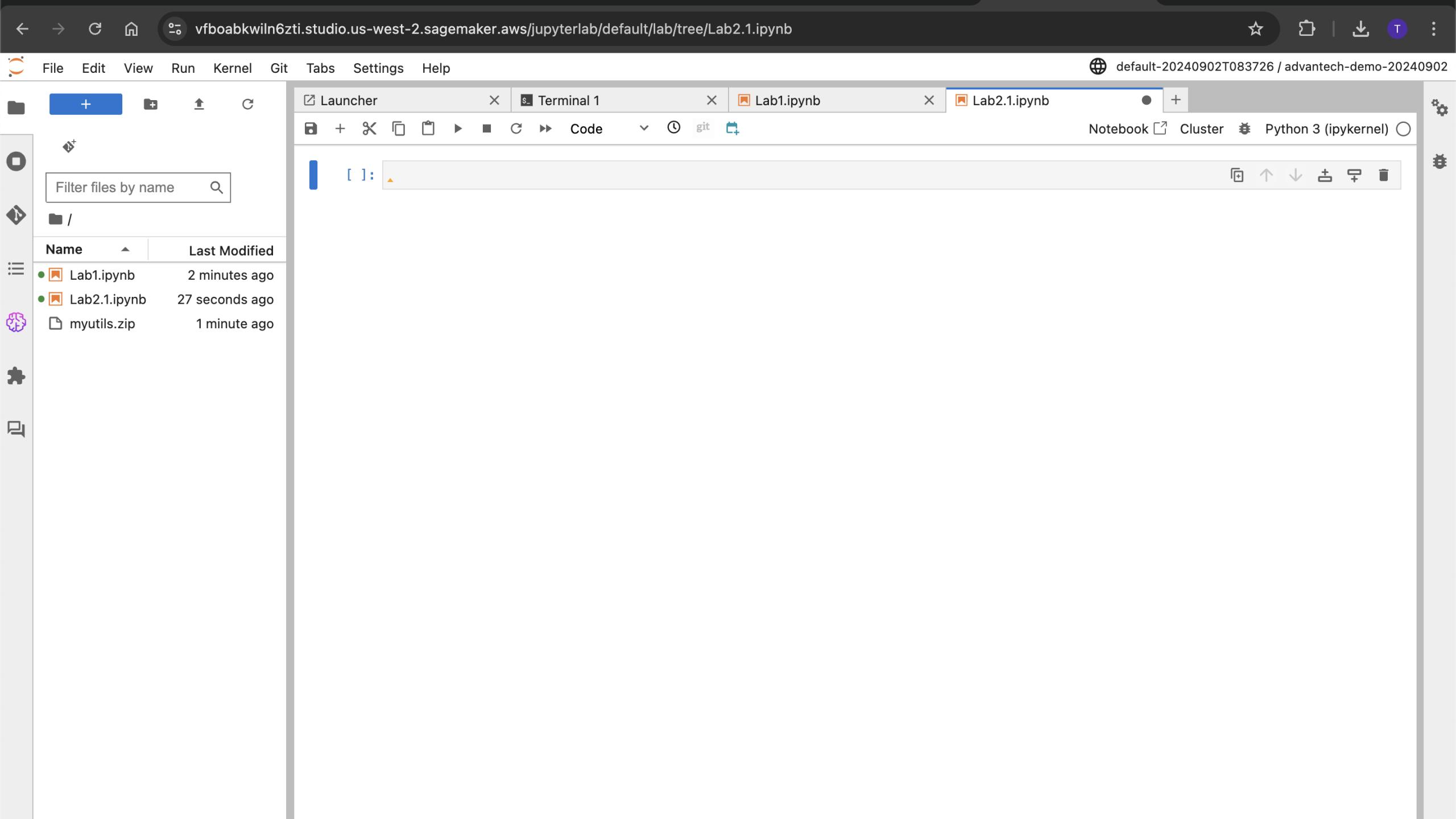
Name	Last Modified
Lab1.ipynb	2 minutes ago
myutils.zip	1 minute ago
Untitled.ip... (selected)	20 seconds ago

Renew File

File Path  
Untitled.ipynb

New Name

Cancel    Rename





## ▼ Lab Exercises

Lab 1. Query SAP HANA Cloud

**Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud**

Lab 3. Analyze SAP Report using Generative AI

Lab 4. Build GenAI API using Lambda and API Gateway

Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS

AWS for SAP homepage

SAP on AWS Technical Documentation

## ► AWS account access

## ▼ Content preferences

Language

English

Event ends in 2 days 8 hours 59 minutes.

```
1 #This Notebook will show the integration between Generative AI with SAP HANA Cloud
2 !pip install -q langchain langchain_aws boto3 awscli botocore
3 !pip install -q sqlalchemy-hana langchain_experimental hdbcli
```

Copied!

```
1 #Setup boto3 client to access bedrock in a shared AWS Account
2 import json
3 import os
4 import sys
5 import boto3
6 import botocore
7
8 module_path = "/home/sagemaker-user/myutils.zip"
9 sys.path.append(os.path.abspath(module_path))
10 from myutils import bedrock, print_ww
11
12 # ---- ▲ Un-comment and edit the below lines as needed for your AWS setup ▲ -----
13 os.environ["AWS_DEFAULT_REGION"] = "us-west-2"
14 # os.environ["AWS_PROFILE"] = "<YOUR_PROFILE>"
15 # os.environ["BEDROCK_ASSUME_ROLE"] = "arn:aws:iam:<SharedAWSAccount>:role/Crossaccountbedrock" # E.g. "arn:aws:..."
16
17
18 boto3_bedrock = bedrock.get_bedrock_client(
19     assumed_role=os.environ.get("BEDROCK_ASSUME_ROLE", None),
20     region=os.environ.get("AWS_DEFAULT_REGION", None),
21     runtime=True
22 )
```



vfoabkwln6zti.studio.us-west-2.sagemaker.aws/jupyterlab/default/lab/tree/Lab2.1.ipynb

File Edit View Run Kernel Git Tabs Settings Help default-20240902T083726 / advantech-demo-20240902

+ Filter files by name

Name	Last Modified
Lab1.ipynb	3 minutes ago
Lab2.1.ipynb	1 minute ago
myutils.zip	1 minute ago

[1]: *#This Notebook will show the integration between Generative AI with SAP HANA Cloud*

```
!pip install -q langchain langchain_aws boto3 awscli botocore
!pip install -q sqlalchemy-hana langchain_experimental hdbcli
```

ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the source of the following dependency conflicts.

aiobotocore 2.13.1 requires botocore<1.34.132,>=1.34.70, but you have botocore 1.34.162 which is incompatible.

sagemaker 2.227.0 requires boto3<2.0,>=1.34.142, but you have boto3 1.34.131 which is incompatible.

[ ]:

## ▼ Lab Exercises

Lab 1. Query SAP HANA Cloud

**Lab 2. Integrate Generative AI  
(Claude) with SAP HANA Cloud**Lab 3. Analyze SAP Report using  
Generative AILab 4. Build GenAI API using  
Lambda and API GatewayLab 5. Using SAP Build Apps to  
interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS

AWS for SAP homepage

SAP on AWS Technical  
Documentation 

## ► AWS account access

## ▼ Content preferences

Language

English ▼ⓘ Event ends in 2 days 8 hours 58 minutes.

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```
1 #Setup boto3 client to access bedrock in a shared AWS Account
2 import json
3 import os
4 import sys
5 import boto3
6 import botocore
7
8 module_path = "/home/sagemaker-user/myutils.zip"
9 sys.path.append(os.path.abspath(module_path))
10 from myutils import bedrock, print_ww
11
12 # ---- ▲ Un-comment and edit the below lines as needed for your AWS setup ▲ -----
13 os.environ["AWS_DEFAULT_REGION"] = "us-west-2"
14 # os.environ["AWS_PROFILE"] = "<YOUR_PROFILE>"
15 # os.environ["BEDROCK_ASSUME_ROLE"] = "arn:aws:iam:<SharedAWSAccount>:role/Crossaccountbedrock" # E.g. "arn:aws:..."
16
17
18 boto3_bedrock = bedrock.get_bedrock_client(
19     assumed_role=os.environ.get("BEDROCK_ASSUME_ROLE", None),
20     region=os.environ.get("AWS_DEFAULT_REGION", None),
21     runtime=True
22 )
```

```
1 import langchain
2 from langchain.sql_database import SQLDatabase
3 from langchain_experimental.sql import SQLDatabaseChain
4 from langchain.prompts.prompt import PromptTemplate
```



Launcher Terminal 1 Lab1.ipynb Lab2.1.ipynb

Notebook Cluster Python 3 (ipykernel)

Filter files by name

Name Last Modified

- Lab1.ipynb 3 minutes ago
- Lab2.1.ipynb 1 minute ago
- myutils.zip 2 minutes ago

```
[1]: #This Notebook will show the integration between Generative AI with SAP HANA Cloud
!pip install -q langchain langchain_aws boto3 awscli botocore
!pip install -q sqlalchemy-hana langchain_experimental hdbcli

ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the source of the following dependency conflicts.
aiobotocore 2.13.1 requires botocore<1.34.132,>=1.34.70, but you have botocore 1.34.162 which is incompatible.
sagemaker 2.227.0 requires boto3<2.0,>=1.34.142, but you have boto3 1.34.131 which is incompatible.
```

```
[ ]: #Setup boto3 client to access bedrock in a shared AWS Account
import json
import os
import sys
import boto3
import botocore

module_path = "/home/sagemaker-user/myutils.zip"
sys.path.append(os.path.abspath(module_path))
from myutils import bedrock, print_ww

# ---- ⚠️ Un-comment and edit the below lines as needed for your AWS setup ⚠️ ----
os.environ["AWS_DEFAULT_REGION"] = "us-west-2"
# os.environ["AWS_PROFILE"] = "<YOUR_PROFILE>"
# os.environ["BEDROCK_ASSUME_ROLE"] = "arn:aws:iam::<SharedAWSAccount>:role/Crossaccountbedrock" # E.g. "arn:aws:..."
```

```
boto3_bedrock = bedrock.get_bedrock_client(
    assumed_role=os.environ.get("BEDROCK_ASSUME_ROLE", None),
    region=os.environ.get("AWS_DEFAULT_REGION", None),
    runtime=True
)
```

## ▼ Lab Exercises

- Lab 1. Query SAP HANA Cloud
  - Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud**
  - Lab 3. Analyze SAP Report using Generative AI
  - Lab 4. Build GenAI API using Lambda and API Gateway
  - Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

- ## Clean Up Summary

Get Started with SAP on AWS

AWS for SAP homepage 

SAP on AWS Technical Documentation 

## ► AWS account access

## ▼ Content preferences

Language

English

 Event ends in 2 days 8 hours 57 minutes

```
1 import langchain
2 from langchain.sql_database import SQLDatabase
3 from langchain_experimental.sql import SQLDatabaseChain
4 from langchain.prompts.prompt import PromptTemplate
5 from langchain_aws.llms.sagemaker_endpoint import LLMContentHandler
6 from langchain_aws import SagemakerEndpoint
7 from langchain_aws import BedrockLLM
8 from urllib.parse import quote
9 import sqlalchemy
10 from sqlalchemy import create_engine
11 from sqlalchemy.orm import sessionmaker
12 from sqlalchemy import create_engine, select, Table, MetaData, Column, String
13 import hdbcli
14 import json
```

```
1 #Next step is to prepare the template for prompt and input to be used by the Generative AI
2 table_info_ar = [
3     "Table Hotel has fields Name, Address, City, State, Zip code.",
4     "Table Room has fields Free or Available, Price.",
5     "Table Customer has fields Customer Number, title, first name, name, address, zip code.",
6     "Table Reservation has fields Reservation Number,Arrival Date, Departure Date.",
7     "Table Maintenance has fields Description, Date performed, Performed by."
8 ]
9 table_info = "\n".join(table_info_ar)
10
11 _DEFAULT_TEMPLATE_ar = [
```

The screenshot shows a Jupyter Notebook interface with the following details:

- Header:** The title bar displays the URL: `vfbobakwln6zti.studio.us-west-2.sagemaker.aws/jupyterlab/default/lab/tree/Lab2.1.ipynb`.
- File Menu:** File, Edit, View, Run, Kernel, Git, Tabs, Settings, Help.
- Toolbar:** Includes icons for file operations like New, Open, Save, and a search bar labeled "Filter files by name".
- File Explorer:** Shows a list of files in the current directory:
  - Lab1.ipynb (4 minutes ago)
  - Lab2.1.ipynb (1 minute ago) - This file is selected.
  - myutils.zip (2 minutes ago)
- Terminal:** A terminal tab titled "Terminal 1" is visible at the top.
- Notebook Tabs:** Tabs for "Lab1.ipynb" and "Lab2.1.ipynb" are shown.
- Code Cell:** The main content area contains a code cell with the following Python code:

```
[ ]: import langchain
from langchain.sql_database import SQLDatabase
from langchain_experimental.sql import SQLDatabaseChain
from langchain.prompts.prompt import PromptTemplate
from langchain_aws.llms.sagemaker_endpoint import LLMContentHandler
from langchain_aws import SagemakerEndpoint
from langchain_aws import BedrockLLM
from urllib.parse import quote
import sqlalchemy
from sqlalchemy import create_engine
from sqlalchemy.orm import sessionmaker
from sqlalchemy import create_engine, select, Table, MetaData, Column, String
import hdbcli
import json
```
- Right Panel:** Includes a "Notebook" section with "Cluster" and "Python 3 (ipykernel)" options, and a gear icon for settings.

## ▼ Lab Exercises

Lab 1. Query SAP HANA Cloud

**Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud**

Lab 3. Analyze SAP Report using Generative AI

Lab 4. Build GenAI API using Lambda and API Gateway

Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS ↗AWS for SAP homepage ↗SAP on AWS Technical Documentation ↗

## ► AWS account access

## ▼ Content preferences

Language

English

Event ends in 2 days 8 hours 57 minutes.

```
1 #Next step is to prepare the template for prompt and input to be used by the Generative AI
2 table_info_ar = [
3     "Table Hotel has fields Name, Address, City, State, Zip code.",
4     "Table Room has fields Free or Available, Price.",
5     "Table Customer has fields Customer Number, title, first name, name, address, zip code.",
6     "Table Reservation has fields Reservation Number,Arrival Date, Departure Date.",
7     "Table Maintenance has fields Description, Date performed, Performed by."
8 ]
9 table_info = "\n".join(table_info_ar)
10
11 _DEFAULT_TEMPLATE_ar = [
12     "Given an input question, create a syntactically correct {dialect} SQL query to run without comments, then provide answer to",
13     "Always use schema USER1.",
14     "",
15     "Use the following table:",
16     "{table_info}",
17     "",
18     "Example:",
19     "Human: How many Hotel are there ?",
20     "SQLQuery: SELECT COUNT(*) AS num_hotels FROM HOTEL ",
21     "SQLResult: [(3,)]",
22     "Assistant: There are 3 hotels.",
23     "",
24     "Human: {input}",
25     "",
26     "Assistant: ",
27 ]
28 _DEFAULT_TEMPLATE = "\n".join(_DEFAULT_TEMPLATE_ar)
```

Copied!



The screenshot shows a Jupyter Notebook interface with several tabs at the top: Launcher, Terminal 1, Lab1.ipynb, and Lab2.1.ipynb. The Lab2.1.ipynb tab is active. On the left, there's a file browser with a search bar and a list of files: Lab1.ipynb (4 minutes ago), Lab2.1.ipynb (10 seconds ago, selected), and myutils.zip (2 minutes ago). The main area contains Python code for generating SQL queries from prompts. The code uses SQLAlchemy to interact with a database and PromptTemplate to define the AI's response template.

```
from sqlalchemy import create_engine
from sqlalchemy.orm import sessionmaker
from sqlalchemy import create_engine, select, Table, MetaData, Column, String
import hdbcli
import json

#Next step is to prepare the template for prompt and input to be used by the Generative AI
table_info_ar = [
    "Table Hotel has fields Name, Address, City, State, Zip code.",
    "Table Room has fields Free or Available, Price.",
    "Table Customer has fields Customer Number, title, first name, name, address, zip code.",
    "Table Reservation has fields Reservation Number, Arrival Date, Departure Date.",
    "Table Maintenance has fields Description, Date performed, Performed by."
]
table_info = "\n".join(table_info_ar)

_DEFAULT_TEMPLATE_ar = [
    "Given an input question, create a syntactically correct {dialect} SQL query to run without comments, then provide answer to the question",
    "Always use schema USER1.",
    "...",
    "Use the following table:",
    "{table_info}",
    "...",
    "Example:",
    "Human: How many Hotel are there ?",
    "SQLQuery: SELECT COUNT(*) AS num_hotels FROM HOTEL ",
    "SQLResult: [(3,)]",
    "Assistant: There are 3 hotels.",
    "...",
    "Human: {input}",
    "...",
    "Assistant: ",
]
_DEFAULT_TEMPLATE = "\n".join(_DEFAULT_TEMPLATE_ar)

PROMPT = PromptTemplate(
    input_variables=["input", "table_info", "dialect"], template=_DEFAULT_TEMPLATE
)
```

## ▼ Lab Exercises

Lab 1. Query SAP HANA Cloud

**Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud**

Lab 3. Analyze SAP Report using Generative AI

Lab 4. Build GenAI API using Lambda and API Gateway

Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS ↗AWS for SAP homepage ↗SAP on AWS Technical Documentation ↗

## ► AWS account access

## ▼ Content preferences

Language

English

 ⓘ Event ends in 2 days 8 hours 57 minutes.✓ Copied!

```
1 #Next let's instantiate the bedrock and the handler treatment of input and output
2 class ContentHandler(LLMContentHandler):
3     content_type = "application/json"
4     accepts = "application/json"
5
6     def transform_input(self, prompt: str, model_kwargs: dict) -> bytes:
7         input_str = json.dumps({"text_inputs": prompt, **model_kwargs})
8         return input_str.encode('utf-8')
9
10    def transform_output(self, output: bytes) -> str:
11        response_json = json.loads(output.read().decode("utf-8"))
12        return response_json["generated_text"]
13
14 content_handler = ContentHandler()
15
16 model_parameter = {"temperature": 0, "max_tokens_to_sample": 600}
17
18 #Make sure your account has access to anthropic claude access. This can be enabled from Bedrock console. Access is auto approved.
19 llm = BedrockLLM(model_id="anthropic.claude-v2", model_kwargs=model_parameter, client=boto3_bedrock)
```

⚠ Please change the user, password and sql endpoint in the below code.

```
1 #Let's connect to the SAP HANA Database and then execute langchain SQL Database Chain to query from the Generative AI
2 db = SQLAlchemy.from_uri("hana://<user>:<password>@<changesqlendpoint>.hana.trial-us10.hanacloud.ondemand.com:443")
3 db_chain = SQLAlchemyChain.from_llm(llm=llm, db=db, prompt=PROMPT, verbose=True, use_query_checker=True, top_k=10 )
```

↗

Launcher Terminal 1 Lab1.ipynb Lab2.1.ipynb

Notebook Cluster Python 3 (ipykernel)

[ ]: #Next let's instantiate the bedrock and the handler treatment of input and output

```
class ContentHandler(LLMContentHandler):
    content_type = "application/json"
    accepts = "application/json"

    def transform_input(self, prompt: str, model_kwargs: dict) -> bytes:
        input_str = json.dumps({"text_inputs": prompt, **model_kwargs})
        return input_str.encode('utf-8')

    def transform_output(self, output: bytes) -> str:
        response_json = json.loads(output.read().decode("utf-8"))
        return response_json["generated_texts"][0]

content_handler = ContentHandler()

model_parameter = {"temperature": 0, "max_tokens_to_sample": 600}

#Make sure your account has access to anthropic claude access. This can be enabled from Bedrock console. Access is auto approved
llm = BedrockLLM(model_id="anthropic.claude-v2", model_kwargs=model_parameter, client=boto3_bedrock)
```

## aws workshop studio

michael\_tw\_lin

## ▼ Lab Exercises

Lab 1. Query SAP HANA Cloud

**Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud**

Lab 3. Analyze SAP Report using Generative AI

Lab 4. Build GenAI API using Lambda and API Gateway

Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS

AWS for SAP homepage

SAP on AWS Technical Documentation

## ► AWS account access

## ▼ Content preferences

Language

English

Event ends in 2 days 8 hours 56 minutes.

```
1 #Let's connect to the SAP HANA Database and then execute langchain SQL Database Chain to query from the Generative AI
2 db = SQLAlchemy.from_uri("hana://<user>:<password>@<changesqlendpoint>.hana.trial-us10.hanacloud.ondemand.com:443")
3 db_chain = SQLDatabaseChain.from_llm(llm=llm, db=db, prompt=PROMPT, verbose=True, use_query_checker=True, top_k=10 )
```



```
1 #Execute the first query, this is a simple English to text SQL
2 db_chain.invoke("How many HOTEL are there ?")
```



```
1 #Let's give a bit more challenges to the Generative AI
2 db_chain.invoke("How many HOTEL are there in Seattle ?")
```



```
1 #And what happened if the information is stored in another table
2 db_chain.invoke("How many free single and double rooms are there in Congress Hotel ?")
```



3. Observe the result when you are executing every cells.

Lab2.ipynb

[8]: *#Execute the first query, this is a simple English to text SQL*  
db\_chain.invoke("How many HOTEL are there ?")

Notebook Cluster Python 3 (ipykernel)

vfboabkwln6zti.studio.us-west-2.sagemaker.aws/jupyterlab/default/lab/tree/Lab2.1.ipynb

File Edit View Run Kernel Git Tabs Settings Help default-20240902T083726 / advantech-demo-20240902

+ Filter files by name

Name	Last Modified
Lab1.ipynb	5 minutes ago
Lab2.1.ipynb	1 minute ago
myutils.zip	3 minutes ago

[ ]: #Let's connect to the SAP HANA Database and then execute langchain SQL Database Chain to query from the Generative AI  
db = SQLAlchemy.from\_uri("hana://<user>:<password>@<changesqlendpoint>.hana.trial-us10.hanacloud.ondemand.com:443")  
db\_chain = SQLAlchemyChain.from\_llm(llm=llm, db=db, prompt=PROMPT, verbose=True, use\_query\_checker=True, top\_k=10 )

vfboabkwln6zti.studio.us-west-2.sagemaker.aws/jupyterlab/default/lab/tree/Lab2.1.ipynb

File Edit View Run Kernel Git Tabs Settings Help default-20240902T083726 / advantech-demo-20240902

+ Filter files by name

Name	Last Modified
Lab1.ipynb	6 minutes ago
Lab2.1.ipynb	10 seconds ago
myutils.zip	4 minutes ago

Launcher Terminal 1 Lab1.ipynb Lab2.1.ipynb

Notebook Cluster Python 3 (ipykernel)

#Let's connect to the SAP HANA Database and then execute langchain SQL Database Chain to query from the Generative AI

```
[6]: db = SQLAlchemy.from_uri("hana://::@hana.trial-us10.hanacloud.ondemand.com")  
db_chain = SQLAlchemyChain.from_llm(llm=llm, db=db, prompt=PROMPT, verbose=True, use_query_checker=True, top_k=10 )
```

[ ]: Click to add a cell.

## ▼ Lab Exercises

Lab 1. Query SAP HANA Cloud

**Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud**

Lab 3. Analyze SAP Report using Generative AI

Lab 4. Build GenAI API using Lambda and API Gateway

Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS AWS for SAP homepage SAP on AWS Technical Documentation 

## ► AWS account access

## ▼ Content preferences

Language

English

 Event ends in 2 days 8 hours 55 minutes.

```
1 #Execute the first query, this is a simple English to text SQL
2 db_chain.invoke("How many HOTEL are there ?")
```

 Copied!

```
1 #Let's give a bit more challenges to the Generative AI
2 db_chain.invoke("How many HOTEL are there in Seattle ?")
```



```
1 #And what happened if the information is stored in another table
2 db_chain.invoke("How many free single and double rooms are there in Congress Hotel ?")
```



## 3. Observe the result when you are executing every cells.



Lab2.ipynb

[8]: `#Execute the first query, this is a simple English to text SQL  
db_chain.invoke("How many HOTEL are there ?")`

> Entering new `SQLDatabaseChain` chain...  
How many HOTEL are there ?  
SQLQuery:`SELECT COUNT(*) AS num_hotels FROM HOTEL`  
SQLResult: `[(17,)]`  
Answer:The SQL query is:

Screenshot of a Jupyter Notebook interface titled "Lab2.1.ipynb" running on Amazon SageMaker Studio.

The notebook displays the following code and output:

```
[7]: #Execute the first query, this is a simple English to text SQL
db_chain.invoke("How many HOTEL are there ?")
```

> Entering new SQLDatabaseChain chain...

How many HOTEL are there ?

```
SQLQuery:SELECT COUNT(*) AS num_hotels FROM HOTEL
SQLResult: [(17,)]
Answer:There are 17 hotels.
```

> Finished chain.

```
[7]: {'query': 'How many HOTEL are there ?', 'result': 'There are 17 hotels.'}
```



## ▼ Lab Exercises

Lab 1. Query SAP HANA Cloud

**Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud**

Lab 3. Analyze SAP Report using Generative AI

Lab 4. Build GenAI API using Lambda and API Gateway

Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS AWS for SAP homepage SAP on AWS Technical Documentation 

## ► AWS account access

## ▼ Content preferences

Language

English Event ends in 2 days 8 hours 54 minutes.  

```
1 #Execute the first query, this is a simple English to text SQL
2 db_chain.invoke("How many HOTEL are there ?")
```



Copied!



```
1 #Let's give a bit more challenges to the Generative AI
2 db_chain.invoke("How many HOTEL are there in Seattle ?")
```



```
1 #And what happened if the information is stored in another table
2 db_chain.invoke("How many free single and double rooms are there in Congress Hotel ?")
```

## 3. Observe the result when you are executing every cells.



Lab2.ipynb  +       C  git  Notebook  Cluster  Python 3 (ipykernel) (

```
[8]: #Execute the first query, this is a simple English to text SQL
db_chain.invoke("How many HOTEL are there ?")
```

&gt; Entering new SQLDatabaseChain chain...

How many HOTEL are there ?

SQLQuery:SELECT COUNT(\*) AS num\_hotels FROM HOTEL

SQLResult: [(17,)]

Answer:The SQL query is:

File Edit View Run Kernel Git Tabs Settings Help default-20240902T083726 / advantech-demo-20240902

+ Filter files by name

Name	Last Modified
Lab1.ipynb	7 minutes ago
Lab2.1.ipynb	1 minute ago
myutils.zip	5 minutes ago

[8]: *#Let's give a bit more challenges to the Generative AI*  
db\_chain.invoke("How many HOTEL are there in Seattle ?")

> Entering new SQLDatabaseChain chain...  
How many HOTEL are there in Seattle ?  
SQLQuery:SELECT COUNT(\*) AS num\_hotels  
FROM HOTEL  
WHERE city = 'Seattle'  
SQLResult: [(2,)]  
Answer:There are 2 hotels in Seattle.  
> Finished chain.

[8]: {'query': 'How many HOTEL are there in Seattle ?',  
'result': 'There are 2 hotels in Seattle.'}



## ▼ Lab Exercises

Lab 1. Query SAP HANA Cloud

**Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud**

Lab 3. Analyze SAP Report using Generative AI

Lab 4. Build GenAI API using Lambda and API Gateway

Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS AWS for SAP homepage SAP on AWS Technical Documentation 

## ► AWS account access

## ▼ Content preferences

Language

English Event ends in 2 days 8 hours 54 minutes.  

```
1 #Execute the first query, this is a simple English to text SQL
2 db_chain.invoke("How many HOTEL are there ?")
```



```
1 #Let's give a bit more challenges to the Generative AI
2 db_chain.invoke("How many HOTEL are there in Seattle ?")
```



Copied!

```
1 #And what happened if the information is stored in another table
2 db_chain.invoke("How many free single and double rooms are there in Congress Hotel ?")
```



## 3. Observe the result when you are executing every cells.



Lab2.ipynb  +       C  git  [8]: *#Execute the first query, this is a simple English to text SQL*  
db\_chain.invoke("How many HOTEL are there ?")

Notebook  Cluster  Python 3 (ipykernel) 

> Entering new `SQLDatabaseChain` chain...  
How many HOTEL are there ?  
SQLQuery:`SELECT COUNT(*) AS num_hotels FROM HOTEL`  
SQLResult: `[(17,)]`  
Answer:The SQL query is:

File Edit View Run Kernel Git Tabs Settings Help

default-20240902T083726 / advantech-demo-20240902

+ Filter files by name

Name	Last Modified
Lab1.ipynb	7 minutes ago
Lab2.1.ipynb	1 minute ago
myutils.zip	6 minutes ago

[9]: #And what happened if the information is stored in another table  
db\_chain.invoke("How many free single and double rooms are there in Congress Hotel ?")

> Entering new SQLDatabaseChain chain...  
How many free single and double rooms are there in Congress Hotel ?  
SQLQuery:SELECT SUM(free) AS total\_free\_rooms  
FROM room  
WHERE hno = 10 AND (type = 'single' OR type = 'double')  
SQLResult: [(Decimal('65'),)]  
Answer:There are 65 free single and double rooms in Congress Hotel.  
> Finished chain.

[9]: {'query': 'How many free single and double rooms are there in Congress Hotel ?',  
'result': 'There are 65 free single and double rooms in Congress Hotel.'}



## ▼ Lab Exercises

Lab 1. Query SAP HANA Cloud

Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud

**Lab 3. Analyze SAP Report using Generative AI**

Lab 4. Build GenAI API using Lambda and API Gateway

Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS

AWS for SAP homepage

SAP on AWS Technical Documentation

## ► AWS account access

## ▼ Content preferences

Language

English

Exit event

# Lab 3. Analyze SAP Report using Generative AI

## Learning Objective

By the end of this lab, you will be able to:

- Explain the capabilities of the Generative AI API on analyzing SAP Reports
- Provide PDF as input to the Generative AI for summarization
- Leverage Claude, an LLM capable of generating Analysis as if it simulates a Financial Analyst

## Utilize Claude to analyze SAP Report

### 1. Choose File -> New -> Notebook

Download the [myutils.zip](#) to your computer. Drag and drop the **myutils.zip** to the root folder of your Notebook.

The screenshot shows a Jupyter Notebook interface. On the left, there is a file browser with a search bar labeled "Filter files by name". The main area shows a code cell with the following content:

```
[1]: #This Notebook will show the integration between
!pip install -q langchain langchain_aws boto3 aw
!pip install -q sqlalchemy-hana langchain_experi
```

## ▼ Lab Exercises

Lab 1. Query SAP HANA Cloud

Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud

**Lab 3. Analyze SAP Report using Generative AI**

Lab 4. Build GenAI API using Lambda and API Gateway

Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS

AWS for SAP homepage

SAP on AWS Technical Documentation

## ► AWS account access

## ▼ Content preferences

Language

English

Exit event

Download **RFSSLD00.pdf**

The screenshot shows a Jupyter Notebook environment. At the top, there's a navigation bar with File, Edit, View, Run, Kernel, Git, Tabs, Settings, and Help. Below the navigation bar is a toolbar with various icons for file operations like creating new files, opening, saving, and running cells. A central code editor window has a tab titled "Lab3.ipynb". To the left of the code editor is a file browser sidebar. The sidebar has a search bar labeled "Filter files by name" and a path indicator "Folder /". It lists several files and folders:

Name	Last Modified
Lab1.ipynb	4 days ago
Lab2.2.ipynb	4 days ago
Lab2.3.ipynb	4 days ago
Lab2.ipynb	4 days ago
Lab3.ipynb	15 seconds ago
myutils.zip	4 days ago
RFSSLD00...	26 seconds ago

The "Downloads" folder is expanded in the sidebar, showing the "RFSSLD00.pdf" file. The main code editor area shows the "RFSSLD00.pdf" file selected, with its preview visible below the code editor.

- You can preview the content of the pdf file as below

Company Code 1010 Walldorf Ledger 01 Carryforward Periods 00-00 2023 Reporting Periods 01-16 2023				G/L Account Balances				Report output			
CoCo G/L Acct	Short Text	Crcy	BusA	Balance	Carryforward	Balance of Prior Periods	Debit	Balnce of Reporting Period	Credit	Balance Reporting Per.	Accumulated Balance

ws-assets-prod-iad-r-iad-ed304a55c2ca1aee.s3.us-east-1.amazonaws.com/db9a9d22-23d2-4070-86b6-d4b301d28c4b/RFSSLD00.pdf

1 / 3 | - 71% + | 🔍 🔍

Report output

09/11/2023, 13:28

Company Code 1010  
Walldorf Ledger 01  
Carryforward Periods 00-00 2023 Reporting Periods 01-16 2023

G/L Account Balances

CoCd G/Acct	Short Text	Crcy	BusA	Balance	Carryforward	Balance of Prior Periods	Debit	Blnce of Reporting Period	Credit	Balance Reporting Per.	Accumulated Balance
1010 12100000	Rcvbls Domestic	EUR		0.00		0.00		626.55	0.00		626.55
1010 13600000	Inventory TradingGd	EUR		0.00		0.00		5,971.28	5,841.46		129.82
1010 21120000	GR/IR	EUR		0.00		0.00		340.50	340.50		0.00
1010 21300000	Paybls Affiliate	EUR		0.00		0.00		0.00	4,212.00		4,212.00
1010 22000000	Output tax (MWS)	EUR		0.00		0.00		0.00	100.05		100.05
1010 29500100	Zero Balance Clrg	EUR		0.00		0.00		4,082.18	4,082.18		0.00
1010 41000000	Rev Domestic Prod	EUR		0.00		0.00		0.00	526.50		526.50
1010 51600000	Conspn Trde Gds	EUR		0.00		0.00		2,920.73	0.00		2,920.73
1010 52041000	Loss Prc Var PRD	EUR		0.00		0.00		1,161.45	0.00		1,161.45
*1010		EUR		0.00		0.00		15,102.69	15,102.69		0.00

Time 21:25:03 Date 11/08/2023  
RFSSLD00/FERRYMUL Page 1

Company Code 1710  
Palo Alto Ledger 01  
Carryforward Periods 00-00 2023 Reporting Periods 01-16 2023

G/L Account Balances

CoCd G/L Acct	Short Text	Crcy	BusA	Balance	Carryforward	Balance of Prior Periods	Debit	Blnce of Reporting Period	Credit	Balance Reporting Per.	Accumulated Balance
1710 10010000	Petty Cash	USD		93,321.69-		0.00		0.00	0.00		93,321.69-
1710 10020000	Petty Cash Journal	USD		730.00		0.00		0.00	0.00		730.00
1710 10090000	Res. Cash Collateral	USD		201,666.00		0.00		0.00	0.00		201,666.00
1710 11001000	Main Bank Acct (C/B)	USD		15,221,563.00		0.00		0.60	3,608.00		15,217,955.60
1710 11001010	Bankl Cash Payment	USD		790.00-		0.00		0.00	0.00		790.00-
1710 11001020	Bankl Bank Transfer	USD		152,401,195.61-		0.00		0.00	1,850.00		152,403,045.61-
1710 11001030	Bankl Other Transfer	USD		110.00-		0.00		0.00	0.00		110.00-
1710 11001050	Bankl Check Out	USD		4,520,128.45-		0.00		0.00	0.00		4,520,128.45-
1710 11001060	Bankl Check In	USD		11,926.97		0.00		0.00	0.00		11,926.97
1710 11001080	Bankl Cash Receipt	USD		303,077,649.26		0.00		0.00	0.00		303,077,649.26
1710 11001090	Bankl Techn. Account	USD		3,573.00		0.00		0.00	0.00		3,573.00
1710 11001100	Bankl Foreign Currcy	USD		29,066.67-		0.00		0.00	0.00		29,066.67-
1710 11001200	Bankl Lockbox	USD		333.40		0.00		0.00	0.00		333.40
1710 11002000	Bank2 Main Account	USD		5,470,666.48		0.00		0.00	0.00		5,470,666.48
1710 11002020	Bank2 Bank Transfer	USD		298,766,784.99-		0.00		0.00	0.00		298,766,784.99-
1710 11002050	Bank2 Check Out	USD		1,878,996.32-		0.00		0.00	0.00		1,878,996.32-
1710 11002080	Bank2 Cash Receipt	USD		201,121,976.31		0.00		100,869,899.95	0.00		301,991,876.26
1710 11008000	Di Pmnt Acq Bk (C/B)	USD		178,488.00		0.00		0.00	0.00		178,488.00
1710 12021000	Short T Invest Unaff	USD		2,000,000.00		0.00		0.00	0.00		2,000,000.00
1710 12021300	Bond Inv Short T Una	USD		99,850,906.15		0.00		0.00	0.00		99,850,906.15
1710 12042000	Deriv Assets Unaff	USD		1,679,261.13		0.00		0.00	0.00		1,679,261.13
1710 12043000	Eqt Secrt Inv	USD		1,993,333.33		0.00		36,666.67	136,666.67		1,893,333.33
1710 12100000	Rcvbls Domestic	USD		29,672,975.20		0.00		4,223,344.36	1,040.00		33,895,279.56
1710 12100100	Rcvbls Domestic OTA	USD		13,087.33		0.00		0.00	0.00		13,087.33
1710 12101000	Rcvbls Domestic > 1	USD		2,481,334.00		0.00		0.00	0.00		2,481,334.00
1710 12102000	Rcvbls Domestic Adj	USD		54,384.32		0.00		0.00	0.00		54,384.32
1710 12110000	Other Down Payments	USD		850.00		0.00		0.00	0.00		850.00
1710 12119000	Dpaymnt Request Vend	USD		180,447.57-		0.00		0.00	0.00		180,447.57-
1710 12120000	Rcvbls Foreign	USD		12,800.00		0.00		0.00	0.00		12,800.00
1710 12122000	Rcvbls Foreign Adj	USD		100.00		0.00		0.00	0.00		100.00
1710 12200300	LR-Motor (ROU)	USD		28,576.14		0.00		0.00	0.00		28,576.14
1710 12300000	Rcvbls Affiliate	USD		140.40		0.00		421.20	0.00		561.60
1710 12401100	Doubtfull Rcvbl(Val)	USD		1,000.00		0.00		723,619.31	723,619.31		1,000.00
1710 12531000	A/R - Unappl Checks	USD		333.40-		0.00		0.00	0.00		333.40-
1710 12550000	Unbilled Revenue	USD		11,493.98		0.00		0.00	0.00		11,493.98
1710 12561000	Prepaid Expenses	USD		3,050.00		0.00		0.00	0.00		3,050.00
1710 12590000	Vendors w/ Debit Bal	USD		10,905.23		0.00		0.00	0.00		10,905.23
1710 12801000	Bond Int Rcv Una	USD		50,000.00		0.00		0.00	0.00		50,000.00

Time 21:25:03 Date 11/08/2023  
RFSSLD00/FERRYMUL Page 2

Report output

09/11/2023, 13:28

Company Code 1010  
Walldorf Ledger 01  
Carryforward Periods 00-00 2023 Reporting Periods 01-16 2023

G/L Account Balances

CoCd G/Acct	Short Text	Crcy	BusA	Balance	Carryforward	Balance of Prior Periods	Debit	Blnce of Reporting Period	Credit	Balance Reporting Per.	Accumulated Balance
1010 12100000	Rcvbls Domestic	EUR		0.00		0.00		626.55	0.00		626.55
1010 13600000	Inventory TradingGd	EUR		0.00		0.00		5,971.28	5,841.46		129.82
1010 21120000	GR/IR	EUR		0.00		0.00		340.50	340.50		0.00
1010 21300000	Paybls Affiliate	EUR		0.00		0.00		0.00	4,212.00		4,212.00
1010 22000000	Output tax (MWS)	EUR		0.00		0.00		0.00	100.05		100.05
1010 29500100	Zero Balance Clrg	EUR		0.00		0.00		4,082.18	4,082.18		0.00
1010 41000000	Rev Domestic Prod	EUR		0.00		0.00		0.00	526.50		526.50
1010 51600000	Conspn Trde Gds	EUR		0.00		0.00		2,920.73	0.00		2,920.73
1010 52041000	Loss Prc Var PRD	EUR		0.00		0.00		1,161.45	0.00		1,161.45
*1010		EUR		0.00		0.00		15,102.69	15,102.69		0.00

Time 21:25:03 Date 11/08/2023  
RFSSLD00/FERRYMUL Page 1

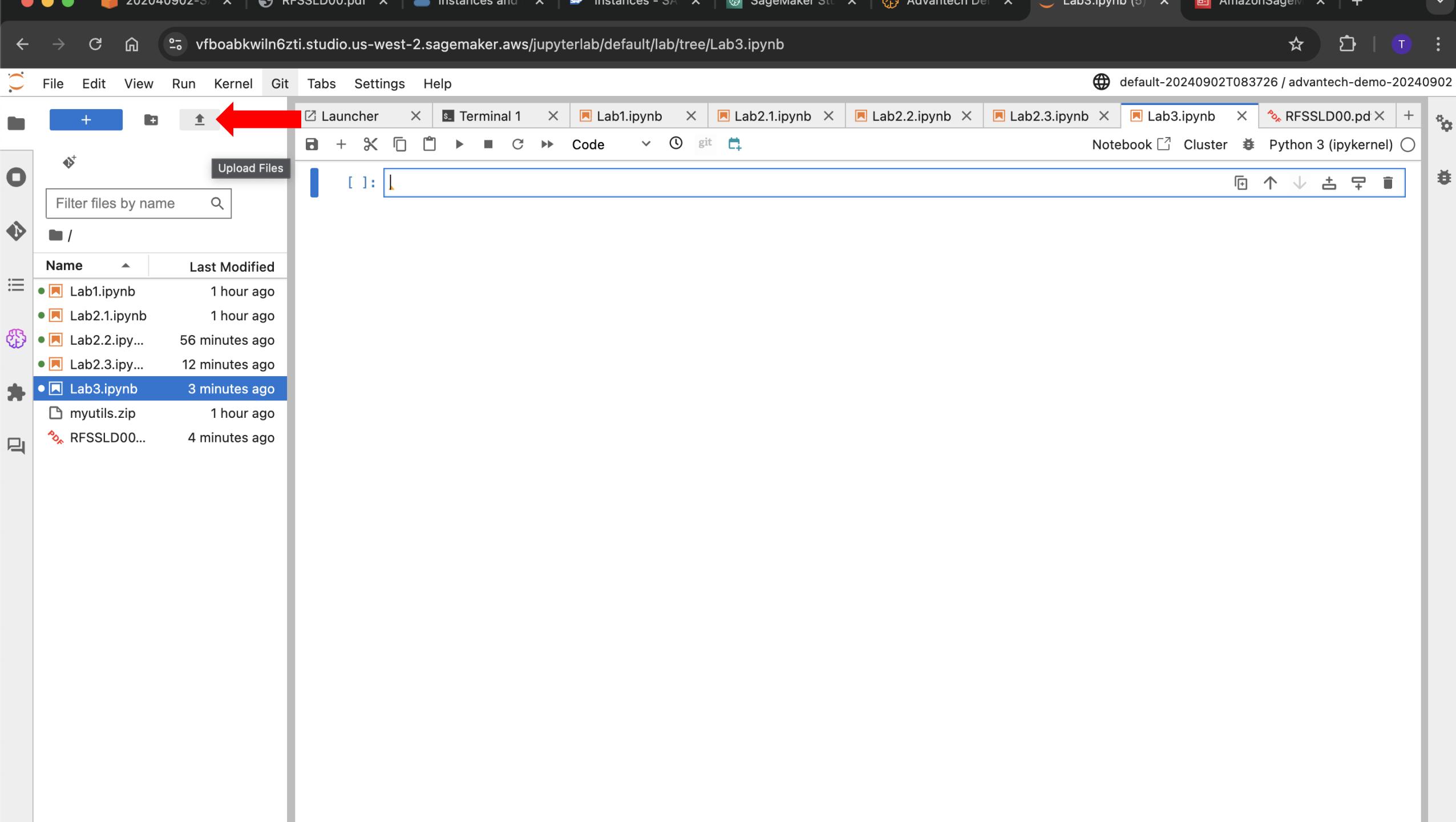
Report output

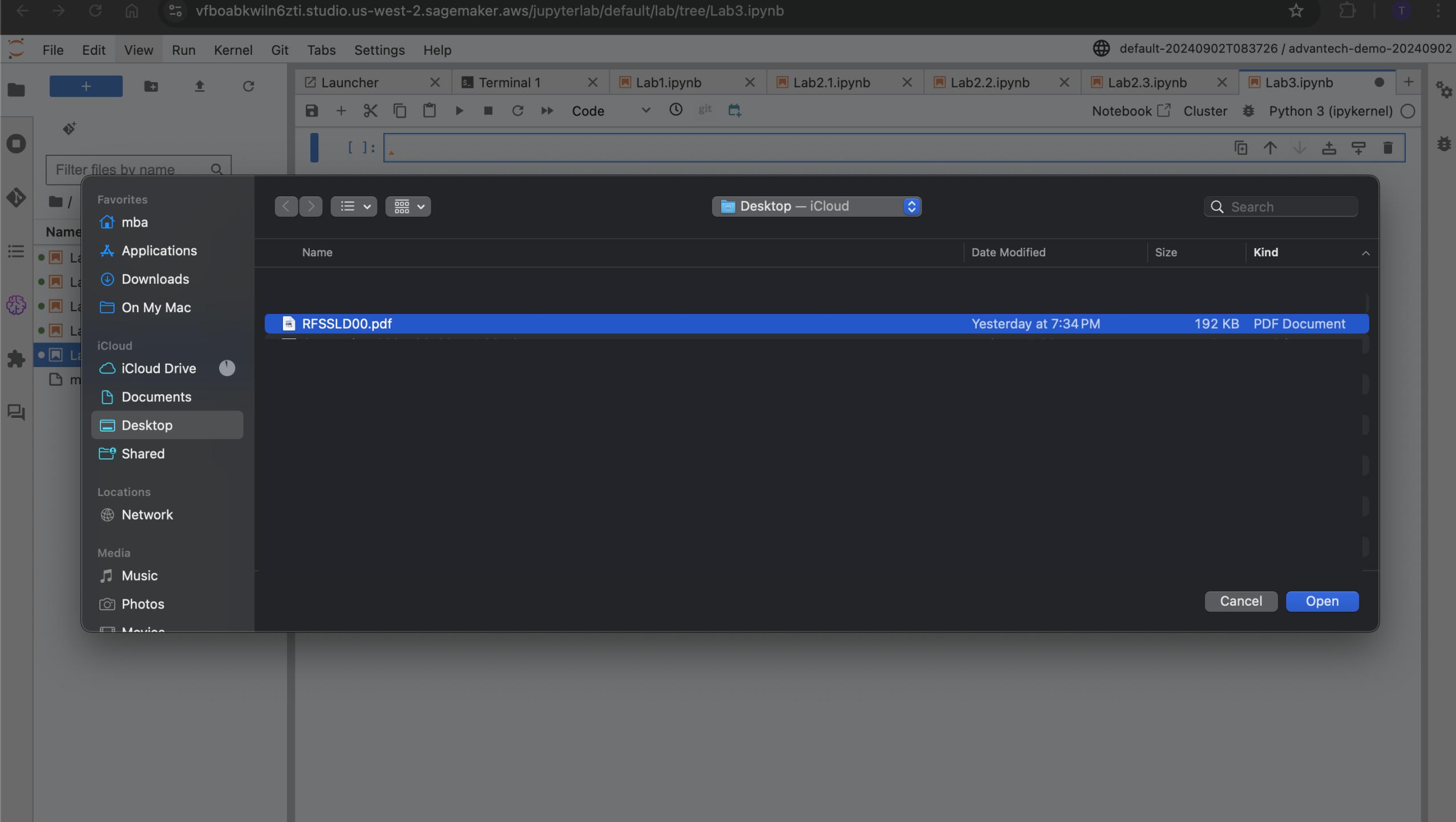
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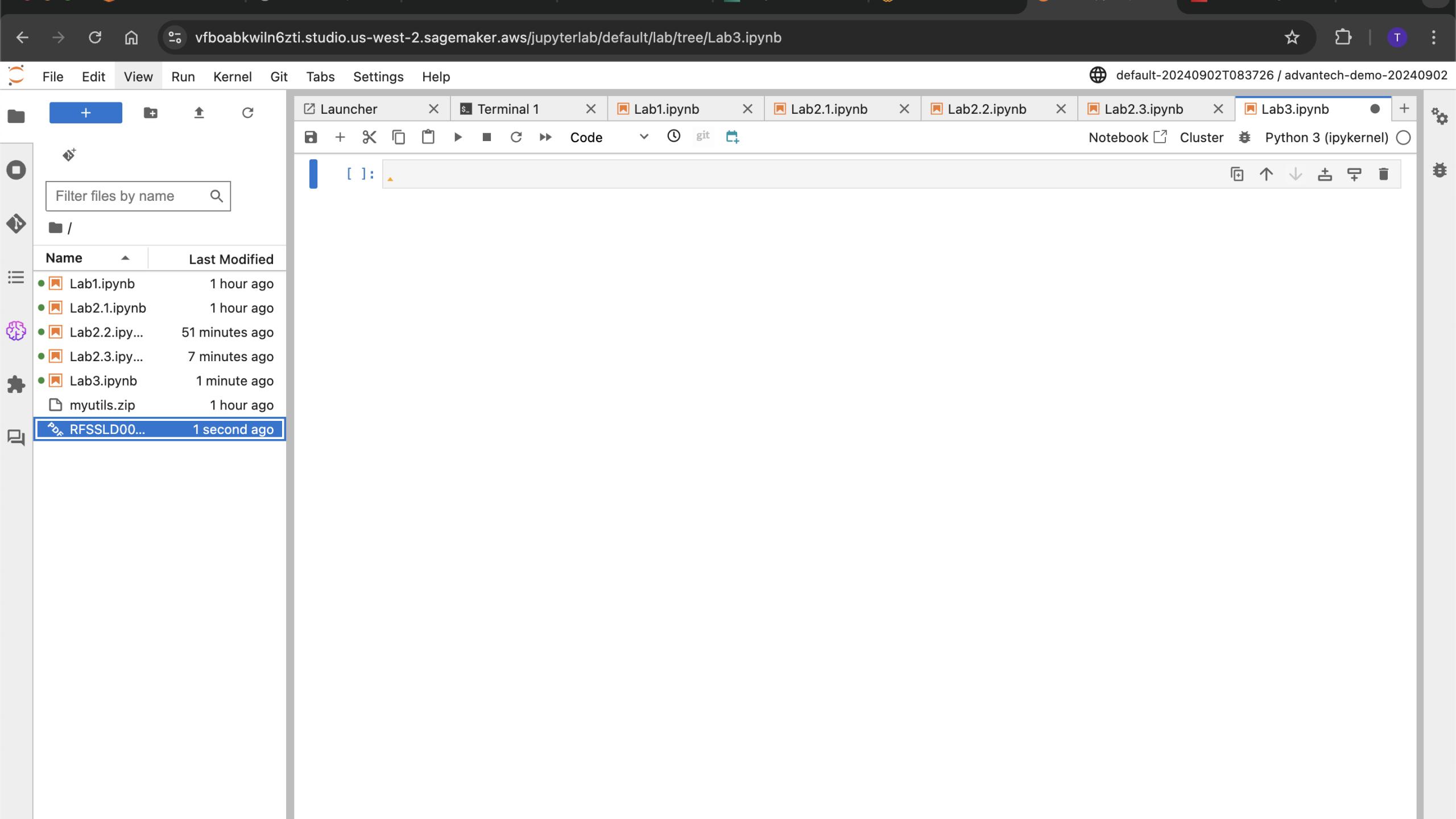
Company Code 1710  
Palo Alto Ledger 01  
Carryforward Periods 00-00 2023 Reporting Periods 01-16 2023

G/L Account Balances

CoCd G/L Acct	Short Text	Crcy	BusA	Balance	Carryforward	Balance of Prior Periods	Debit	Blnce of Reporting Period	Credit	Balance Reporting Per.	Accumulated Balance
1710 10010000	Petty Cash	USD		93,321.69-		0.00		0.00	0.00		93,321.69-
1710 10020000	Petty Cash Journal	USD		730.00		0.00		0.00	0.00		730.00
1710 10090000	Res. Cash Collateral	USD		201,666.00		0.00		0.00	0.00		201,666.00
1710 11001000	Main Bank Acct (C/B)	USD		15,221,563.00		0.00		0.60	3,608.00		15,217,955.60
1710 11001010	Bankl Cash Payment	USD		790.00-		0.00		0.00	0.00		790.00-
1710 11001020	Bankl Bank Transfer	USD		152,401,195.61-		0.00		0.00	1,850.00		152,403,045.61-
1710 11001030	Bankl Other Transfer	USD		110.00-		0.00		0.00	0.00		110.00-
1710 11001050	Bankl Check Out	USD		4,520,128.45-		0.00		0.00	0.00		4,520,128.45-
1710 11001060	Bankl Check In	USD		11,926.97		0.00		0.00	0.00		11,926.97
1710 11001080	Bankl Cash Receipt	USD		303,077,649.26		0.00		0.00	0.00		303,077,649.26
1710 11001090	Bankl Techn. Account	USD		3,573.00		0.00		0.00	0.00		3,573.00
1710 11001100	Bankl Foreign Currcy	USD		29,066.67-		0.00		0.00	0.00		29,066.67-
1710 11001200	Bankl Lockbox	USD		333.40		0.00		0.00	0.00		333.40
1710 11002000	Bank2 Main Account	USD		5,470,666.48		0.00		0.00	0.00		5,470,666.48
1710 11002020	Bank2 Bank Transfer	USD		298,766,784.99-		0.00		0.00	0.00		298,766,784.99-
1710 11002050	Bank2 Check Out	USD		1,878,996.32-		0.00		0.00	0.00		1,878,996.32-
1710 11002080	Bank2 Cash Receipt	USD		201,121,976.31		0.00		100,869,899.95	0.00		301,991,876.26
1710 11008000	Di Pmnt Acq Bk (C/B)	USD		178,488.00		0.00		0.00	0.00		178,488.00
1710 12021000	Short T Invest Unaff	USD		2,000,000.00		0.00		0.00	0.00		2,000,000.00
1710 12021300	Bond Inv Short T Una	USD		99,850,906.15		0.00		0.00	0.00		99,850,906.15
1710 12042000	Deriv Assets Unaff	USD		1,679,261.13		0.00		0.00	0.00		1,679,261.13
1710 12043000	Eqt Secrt Inv	USD		1,993,333.33		0.00		36,666.67	136,666.67		1,893,333.33
1710 12100000	Rcvbls Domestic	USD		29,672,975.20		0.00		4,223,344.36	1,040.00		33,895,279.56
1710 12100100	Rcvbls Domestic OTA	USD		13,087.33		0.00		0.00	0.00		13,087.33
1710 12101000	Rcvbls Domestic > 1	USD		2,481,334.00		0.00		0.00	0.00		2,481,334.00
1710 12102000	Rcvbls Domestic Adj	USD		54,384.32		0.00		0.00	0.00		54,384.32
1710 12110000	Other Down Payments	USD		850.00		0.00		0.00	0.00		850.00
1710 12119000	Dpaymnt Request Vend	USD		180,447.57-		0.00		0.00	0.00		180,447.57-
1710 12120000	Rcvbls Foreign	USD		12,800.00		0.00		0.00	0.00		12,800.00
1710 12122000	Rcvbls Foreign Adj	USD		100.00		0.00		0.00	0.00		100.00
1710 12200300	LR-Motor (ROU)	USD		28,576.14		0.00		0.00	0.00		28,576.14
1710 12300000	Rcvbls Affiliate	USD		140.40		0.00		421.20	0.00		561.60
1710 12401100	Doubtfull Rcvbl(Val)	USD		1,000.00		0.00</td					







File Edit View Run Kernel Git Tabs Settings Help

+ Terminal 1 Lab1.ipynb Lab2.1.ipynb Lab2.2.ipynb Lab2.3.ipynb Lab3.ipynb PDF RFSSLD00.pdf

Filter files by name

Name Last Modified

- Lab1.ipynb 1 hour ago
- Lab2.1.ipynb 1 hour ago
- Lab2.2.ipynb 51 minutes ago
- Lab2.3.ipynb 8 minutes ago
- Lab3.ipynb 1 minute ago
- myutils.zip 1 hour ago
- RFSSLD00.pdf 10 seconds ago

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Report output

09/11/2023, 13:28

Company Code	G/L Acct	Short Text	Crcy	BusA	Balance	Carryforward	Balance of Prior Periods	Debit	Binc of Reporting Period	Credit	Balance Reporting Per.	Accumulated Balance
1010	12100000	Rcvbls Domestic	EUR		0.00		0.00	626.55		0.00		626.55
1010	13600000	Inventory TradingGd	EUR		0.00		0.00	5,971.28		5,841.46		129.82
1010	21120000	GR/IR	EUR		0.00		0.00	340.50		340.50		0.00
1010	21300000	Paybls Affiliate	EUR		0.00		0.00	0.00		4,212.00		4,212.00
1010	22000000	Output tax (MWS)	EUR		0.00		0.00	0.00		100.05		100.05
1010	29500100	Zero Balance Clrg	EUR		0.00		0.00	4,082.18		4,082.18		0.00
1010	41000000	Rev Domestic Prod	EUR		0.00		0.00	0.00		526.50		526.50
1010	51600000	Conspn Trade Gds	EUR		0.00		0.00	2,920.73		0.00		2,920.73
1010	52041000	Loss Prc Var PRD	EUR		0.00		0.00	1,161.45		0.00		1,161.45
*1010					0.00		0.00	15,102.69		15,102.69		0.00
Company Code	1710											
1710	10010000	Petty Cash	USD		93,321.69-		0.00	0.00		0.00		93,321.69-
1710	10020000	Petty Cash Journal	USD		730.00		0.00	0.00		0.00		730.00
1710	10090000	Res. Cash Collateral	USD		201,666.00		0.00	0.00		0.00		201,666.00
1710	11010000	Bank1 Bank Acct (C/B)	USD		15,221,563.00		0.00	0.60		3,608.00		15,217,955.60
1710	11010100	Bank1 Cash Payment	USD		790.00-		0.00	0.00		0.00		790.00-
1710	11010200	Bank1 Bank Transfer	USD		152,401,195.61-		0.00	0.00		1,850.00		152,403,045.61-
1710	11010300	Bank1 Other Transfer	USD		110.00-		0.00	0.00		0.00		110.00-
1710	11010500	Bank1 Check Out	USD		4,520,128.45-		0.00	0.00		0.00		4,520,128.45-
1710	11010600	Bank1 Check In	USD		11,216.97		0.00	0.00		0.00		11,216.97
1710	11010800	Bank1 Cash Receipt	USD		303,077,649.26		0.00	0.00		0.00		303,077,649.26
1710	11010900	Bank1 Techn. Account	USD		3,573.00		0.00	0.00		0.00		3,573.00
1710	11001100	Bank1 Foreign Currency	USD		29,666.67-		0.00	0.00		0.00		29,066.67-
1710	11001200	Bank1 Lockbox	USD		333.40		0.00	0.00		0.00		333.40
1710	11002000	Bank2 Main Account	USD		5,470,666.48		0.00	0.00		0.00		5,470,666.48
1710	11002020	Bank2 Bank Transfer	USD		298,766,784.99-		0.00	0.00		0.00		298,766,784.99-
1710	11002050	Bank2 Check Out	USD		1,878,996.32-		0.00	0.00		0.00		1,878,996.32-
1710	11002080	Bank2 Cash Receipt	USD		201,121,976.31		0.00	100,869,899.95		0.00		301,991,876.26
1710	11008000	DR Pmt Acq Bk (C/B)	USD		178,488.00		0.00	0.00		0.00		178,488.00
1710	12021000	Short T Invest Unaff	USD		2,000,000.00		0.00	0.00		0.00		2,000,000.00
1710	12021300	Bond Inv Short T Uma	USD		99,850,906.15		0.00	0.00		0.00		99,850,906.15
1710	12042000	Deriv Assets Unaff	USD		1,679,261.13		0.00	0.00		0.00		1,679,261.13
1710	12043000	Eqt Secret Inv	USD		1,993,333.33		0.00	36,666.67		1,040.00		1,893,333.33
1710	12100000	Rcvbls Domestic OTR	USD		29,672,975.20		0.00	4,223,344.36		1,040.00		33,895,279.56
1710	12101000	Rcvbls Domestic > 1	USD		13,087.33		0.00	0.00		0.00		13,087.33
1710	12101000	Rcvbls Domestic Adj	USD		2,481,334.00		0.00	0.00		0.00		2,481,334.00
1710	12102000	Rcvbls Domestic	USD		54,384.32		0.00	0.00		0.00		54,384.32
1710	12110000	Other Down Payments	USD		850.00		0.00	0.00		0.00		850.00
1710	12119000	Dpmnt Request Vend	USD		180,447.57-		0.00	0.00		0.00		180,447.57-
1710	12120000	Rcvbls Foreign	USD		12,800.00		0.00	0.00		0.00		12,800.00
1710	12200300	LR-Motor (ROU)	USD		28,576.14		0.00	0.00		0.00		28,576.14
1710	12300000	Rcvbls Affiliate	USD		140.40		0.00	421.20		0.00		561.60
1710	12401100	Doubtfull Rcvbl (Val)	USD		1,000.00		0.00	723,619.31		723,619.31		1,000.00
1710	12531000	A/R - Unappl Checks	USD		333.40-		0.00	0.00		0.00		333.40-
1710	12550000	Unbilled Revenue	USD		11,493.98		0.00	0.00		0.00		11,493.98
1710	12561000	Prepaid Expenses	USD		3,050.00		0.00	0.00		0.00		3,050.00
1710	12590000	Vendors w/ Debit Bal	USD		10,905.23		0.00	0.00		0.00		10,905.23
1710	12801000	Bond Int Rcv Uba	USD		50,000.00		0.00	0.00		0.00		50,000.00
1710	13100000	Inventory Rec Mat.	USD		33,415,809.08		0.00	11,157,600.33		1,613,788.90		42,959,620.51
1710	13200000	Inventory WIP	USD		456,789.22		0.00	0.00		0.00		456,789.22
1710	13300000	Inventory Sem Fin	USD		9,936,834.01		0.00	0.00		150.00		9,936,684.01
1710	13400000	Inventory FinishedDd	USD		1,489,931.76		0.00	2,336,251.69		2,336,158.44		1,480,085.01
1710	13600000	Inventory TradingGd	USD		6,905,771,175.53		0.00	1,154,341.63		693,062.08		6,906,232,455.08
1710	13600900	Invent. Rev. TradingGd	USD		5,620,50-		0.00	0.00		0.00		5,620,50-
1710	13701400	WIP Def Rev	USD		4,402,442.55-		0.00	0.00		0.00		4,402,242.55-
1710	13711100	WIP Acc Rev	USD		0.00		0.00	2,270.20		0.00		2,270.20
1710	13711400	WIP Acc Rev	USD		4,401,708.70		0.00	0.00		0.00		4,401,708.70

file:///Users/ferrymln/Downloads/WIP/GenAI/RFSSLD00.htm 1/3

09/11/2023, 13:28 Report output

1710	13811100	Def Rev	USD	0.00	0.00	0.00	2,220.20	2,220.20
1710	15200000	Prepayments Sal/Wag	USD	1,446.93-	0.00	0.00	0.00	1,446.93-

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New

New Launcher

Open from Path...

Open from URL...

New View for Notebook

New Console for Notebook

Close Tab

Close and Shut Down Notebook

Close All Tabs

Save Notebook

Save Notebook As...

Save All

Reload Notebook from Disk

Revert Notebook to Checkpoint...

Rename Notebook...

Duplicate Notebook

Download

Save and Export Notebook As...

Save Current Workspace As...

Save Current Workspace

Print... ⌘ P

Log Out

Console

Notebook

Terminal

Text File

Markdown File

Python File

final 1

Lab1.ipynb

Lab2.1.ipynb

Lab2.2.ipynb

Lab2.3.ipynb

Notebook Cluster Python 3 (ipykernel)

challenging and complex query ?

("List of the hotels and total number of free rooms sorted")

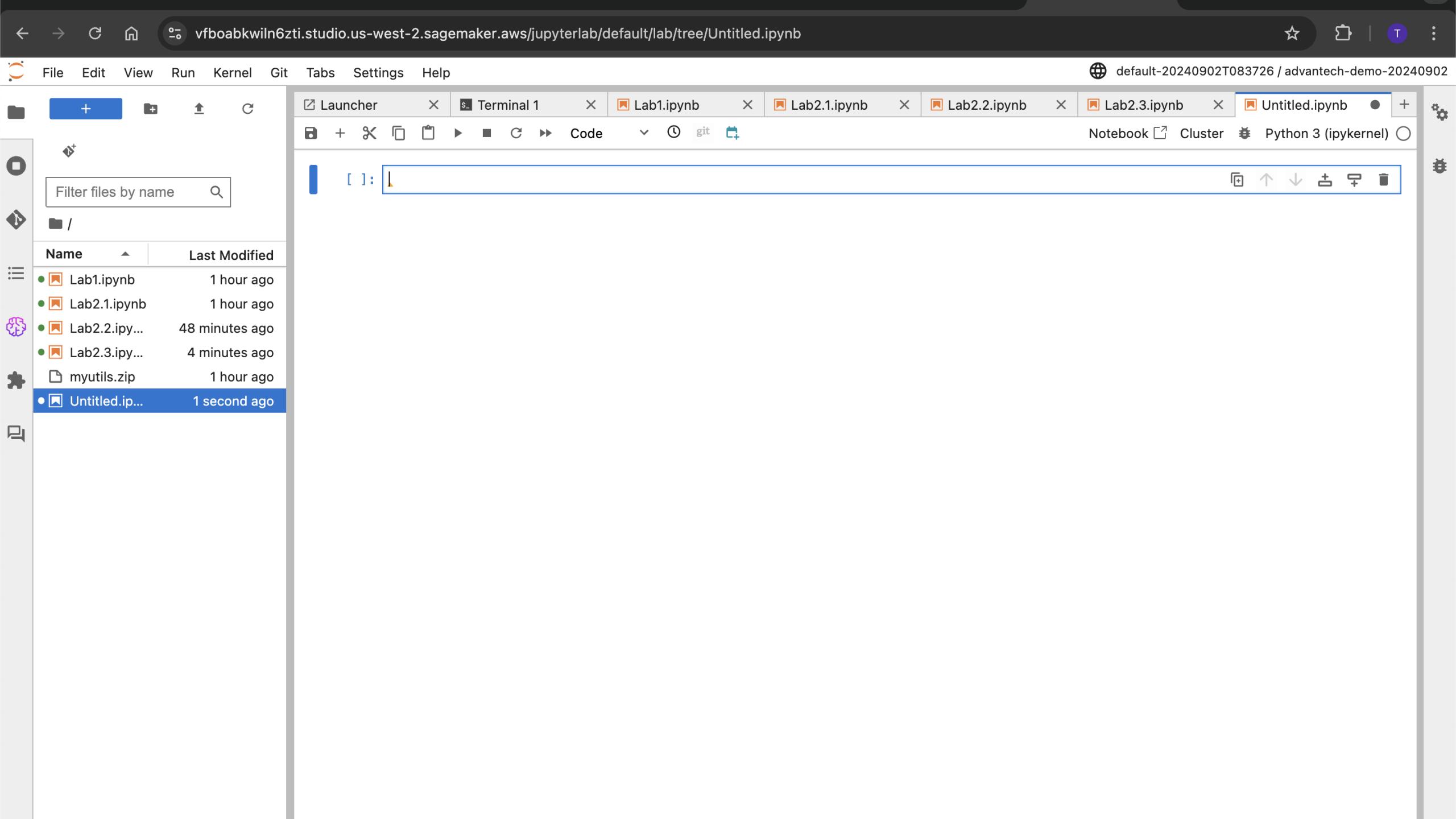
TOTAL\_FREE\_ROOMS

Rank	Hotel Name	Total Free Rooms
1	Eighth Avenue	489.0
2	Beach	292.0
3	Indian Horse	250.0
4	Ocean Star	167.0
5	River Boat	165.0
6	Lake Michigan	97.0
7	Congress	69.0
8	Midtown	65.0
9	Sunshine	55.0
10	Atlantic	39.0
11	Empire State	35.0
12	Long Island	27.0
13	Airport	23.0
14	Long Beach	15.0
		12.0

/tmp/ipykernel\_646/2029746390.py:18: UserWarning: pandas only supports SQLAlchemy connectable (engine/connection) or database string URI or sqlite3 DBAPI2 connection. Other DBAPI2 objects are not tested. Please consider using SQLAlchemy.

sql\_result=pd.read\_sql(sql\_query,conn)

Red arrow pointing to the "Notebook" option in the "File" menu.



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Filter files by name

Name Last Modified

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- Lab2.1.ipynb 1 hour ago
- Lab2.2.ipynb 48 minutes ago
- Lab2.3.ipynb 4 minutes ago
- myutils.zip 1 hour ago
- Untitled.ip... 10 seconds ago

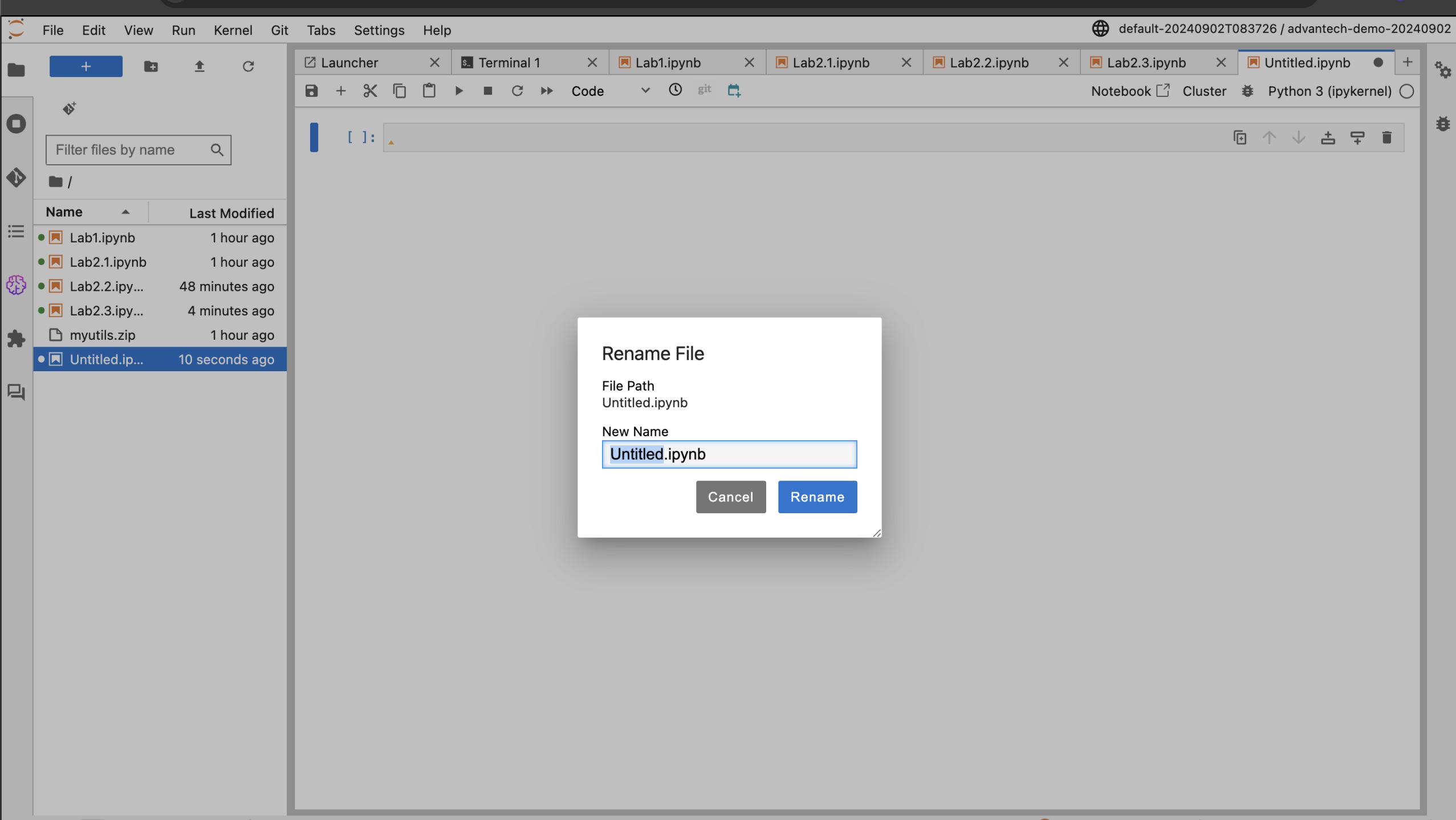
Launcher Terminal 1 Lab1.ipynb Lab2.1.ipynb Lab2.2.ipynb Lab2.3.ipynb Untitled.ipynb

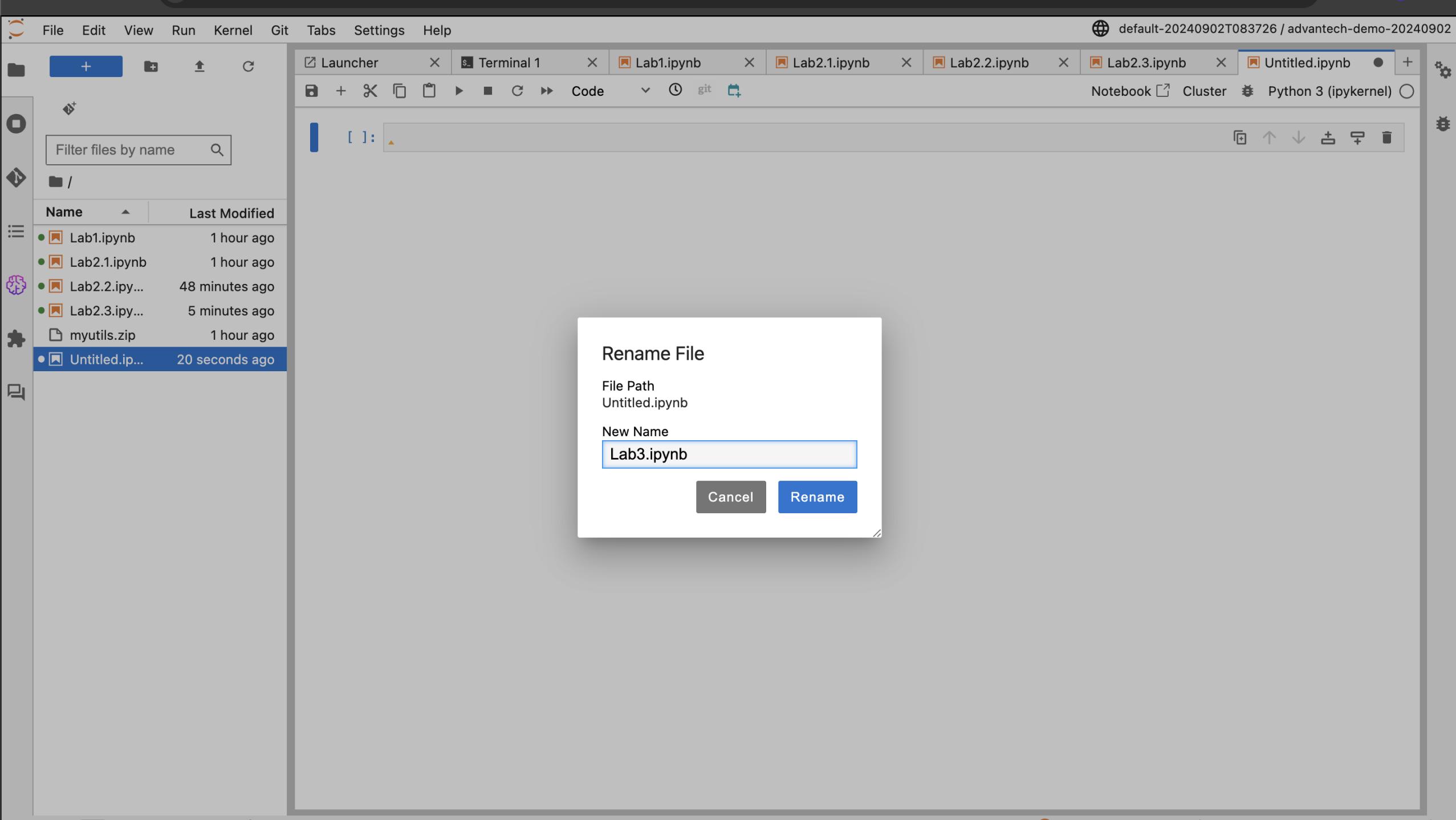
Code git

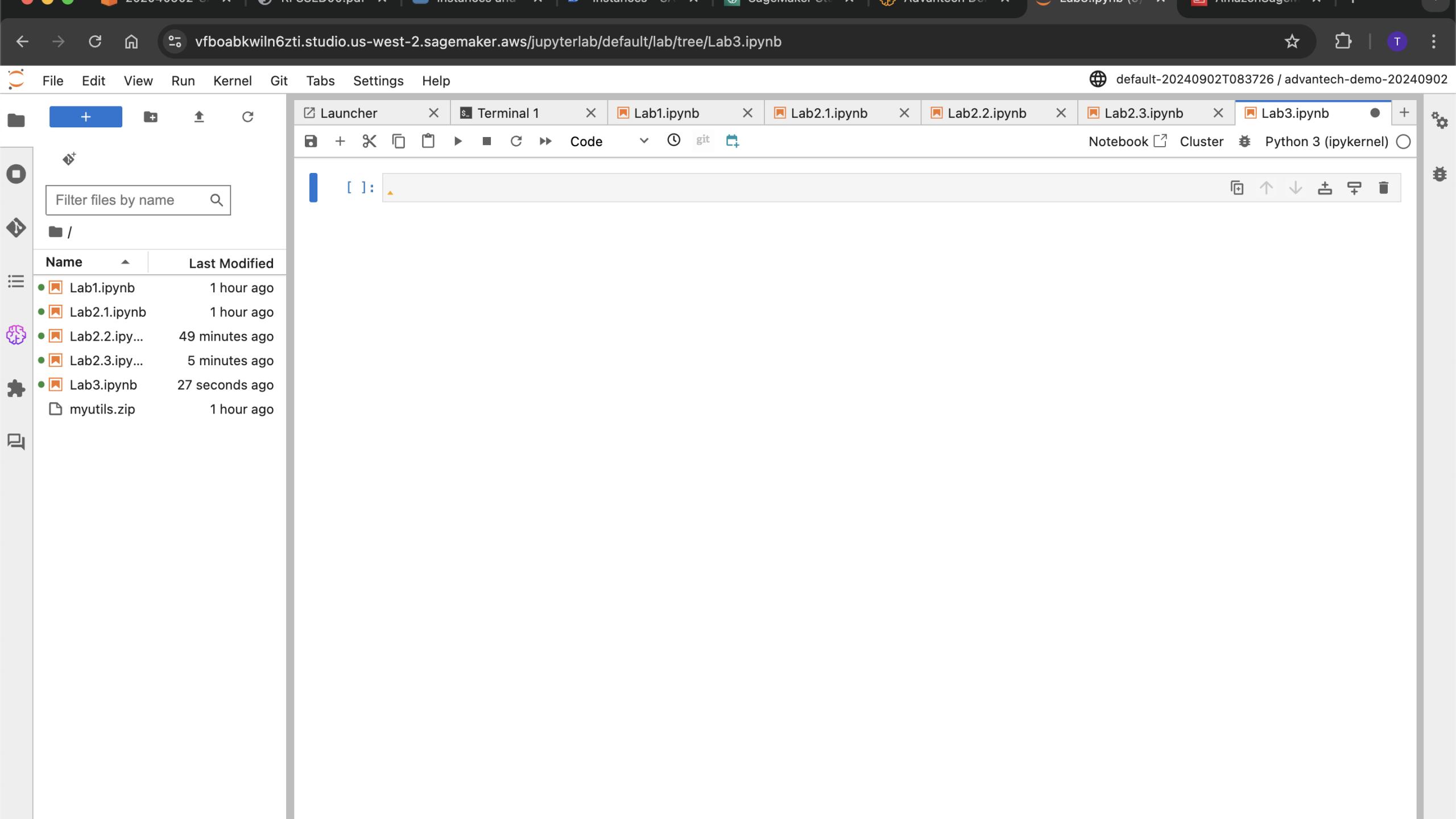
Notebook

[ ]:

Close Tab  
Close All Other Tabs  
Close All Tabs  
Close Tabs to Right  
New Console for Notebook  
Rename Notebook...  
Duplicate Notebook  
Delete Notebook  
New View for Notebook  
Show in File Browser  
Shift+Right Click for Browser Menu







catalog.us-east-1.prod.workshops.aws/event/dashboard/en-US/workshop/lab-exercises/lab-3-analyze-sap-report

aws workshop studio

Lab Exercises

- Lab 1. Query SAP HANA Cloud
- Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud
- Lab 3. Analyze SAP Report using Generative AI**
- Lab 4. Build GenAI API using Lambda and API Gateway
- Lab 5. Using SAP Build Apps to interact with GenAI API

Additional Lab Exercises

- Clean Up
- Summary

Get Started with SAP on AWS

AWS for SAP homepage

SAP on AWS Technical Documentation

AWS account access

Content preferences

Language: English

Exit event

```
1 #This Notebook will show the integration between Generative AI with SAP HANA Cloud
2 !pip install -q --upgrade pyPDF2 pycryptodome

1 #Setup boto3 client to access bedrock in a shared AWS Account
2 import json
3 import os
4 import sys
5 import boto3
6 import botocore
7
8 module_path = "/home/sagemaker-user/myutils.zip"
9 sys.path.append(os.path.abspath(module_path))
10 from myutils import bedrock, print_ww
11
12 # ---- ▲ Un-comment and edit the below lines as needed for your AWS setup ▲ ----
13 os.environ["AWS_DEFAULT_REGION"] = "us-west-2"
14 # os.environ["AWS_PROFILE"] = "<YOUR_PROFILE>"
15 # os.environ["BEDROCK_ASSUME_ROLE"] = "arn:aws:iam:<SharedAWSAccount>:role/Crossaccountbedrock" # E.g. "arn:aws:..."
16
17
18 boto3_bedrock = bedrock.get_bedrock_client(
19     assumed_role=os.environ.get("BEDROCK_ASSUME_ROLE", None),
20     region=os.environ.get("AWS_DEFAULT_REGION", None),
21     runtime=True
22 )

1 import os
2 from PyPDF2 import PdfReader
3
4 def summarize_pdf(path: str) -> str:
```

Copied!

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+ Terminal 1 Lab1.ipynb Lab2.1.ipynb Lab2.2.ipynb Lab2.3.ipynb Lab3.ipynb

Launcher Notebooks Cluster Python 3 (ipykernel)

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- Lab2.1.ipynb 1 hour ago
- Lab2.2.ipynb 49 minutes ago
- Lab2.3.ipynb 5 minutes ago
- Lab3.ipynb 49 seconds ago

myutils.zip 1 hour ago

[1]: *#This Notebook will show the integration between Generative AI with SAP HANA Cloud*  
!pip install -q --upgrade pyPDF2 pycryptodome

[ ]:



## ▼ Lab Exercises

Lab 1. Query SAP HANA Cloud

Lab 2. Integrate Generative AI  
(Claude) with SAP HANA Cloud**Lab 3. Analyze SAP Report  
using Generative AI**Lab 4. Build GenAI API using  
Lambda and API GatewayLab 5. Using SAP Build Apps to  
interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS

AWS for SAP homepage

SAP on AWS Technical  
Documentation 

## ► AWS account access

## ▼ Content preferences

Language

English



Exit event

```
1 #Setup boto3 client to access bedrock in a shared AWS Account
2 import json
3 import os
4 import sys
5 import boto3
6 import botocore
7
8 module_path = "/home/sagemaker-user/myutils.zip"
9 sys.path.append(os.path.abspath(module_path))
10 from myutils import bedrock, print_ww
11
12 # ---- ▲ Un-comment and edit the below lines as needed for your AWS setup ▲ ----
13 os.environ["AWS_DEFAULT_REGION"] = "us-west-2"
14 # os.environ["AWS_PROFILE"] = "<YOUR_PROFILE>"
15 # os.environ["BEDROCK_ASSUME_ROLE"] = "arn:aws:iam:<SharedAWSAccount>:role/Crossaccountbedrock" # E.g. "arn:aws:..."
16
17
18 boto3_bedrock = bedrock.get_bedrock_client(
19     assumed_role=os.environ.get("BEDROCK_ASSUME_ROLE", None),
20     region=os.environ.get("AWS_DEFAULT_REGION", None),
21     runtime=True
22 )
```

```
1 import os
2 from PyPDF2 import PdfReader
3
4 def summarize_pdf(path: str) -> str:
5     reader = PdfReader(path)
6     text = "\n".join([page.extract_text() for page in reader.pages])
7
8 System = "You are a great Finance Analyst, which can analyze the health of a company based on a Financial Report."
9 User = "Analyze the result of the Report below and provide an Executive Summary with Insights.\n\n"+text
10
```

vfboabkwln6zti.studio.us-west-2.sagemaker.aws/jupyterlab/default/lab/tree/Lab3.ipynb

File Edit View Run Kernel Git Tabs Settings Help default-20240902T083726 / advantech-demo-20240902

+ Filter files by name

Name Last Modified

- Lab1.ipynb 1 hour ago
- Lab2.1.ipynb 1 hour ago
- Lab2.2.ipynb 49 minutes ago
- Lab2.3.ipynb 5 minutes ago
- Lab3.ipynb 1 minute ago

myutils.zip 1 hour ago

[1]: *#This Notebook will show the integration between Generative AI with SAP HANA Cloud*  
!pip install -q --upgrade pyPDF2 pycryptodome

[2]: *#Setup boto3 client to access bedrock in a shared AWS Account*  
import json  
import os  
import sys  
import boto3  
import botocore  
  
module\_path = "/home/sagemaker-user/myutils.zip"  
sys.path.append(os.path.abspath(module\_path))  
from myutils import bedrock, print\_ww  
  
# ---- ⚠️ Un-comment and edit the below lines as needed for your AWS setup ⚠️ ----  
os.environ["AWS\_DEFAULT\_REGION"] = "us-west-2"  
# os.environ["AWS\_PROFILE"] = "<YOUR\_PROFILE>"  
# os.environ["BEDROCK\_ASSUME\_ROLE"] = "arn:aws:iam::<SharedAWSAccount>:role/Crossaccountbedrock" # E.g. "arn:aws:..."  
  
boto3\_bedrock = bedrock.get\_bedrock\_client(  
 assumed\_role=os.environ.get("BEDROCK\_ASSUME\_ROLE", None),  
 region=os.environ.get("AWS\_DEFAULT\_REGION", None),  
 runtime=True  
)  
  
Create new client  
Using region: us-west-2  
boto3 Bedrock client successfully created!  
bedrock-runtime(<https://bedrock-runtime.us-west-2.amazonaws.com>)

[ ]:

catalog.us-east-1.prod.workshops.aws/event/dashboard/en-US/workshop/lab-exercises/lab-3-analyze-sap-report

aws workshop studio

Lab Exercises

- Lab 1. Query SAP HANA Cloud
- Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud
- Lab 3. Analyze SAP Report using Generative AI**
- Lab 4. Build GenAI API using Lambda and API Gateway
- Lab 5. Using SAP Build Apps to interact with GenAI API

Additional Lab Exercises

- Clean Up
- Summary

---

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AWS for SAP homepage

SAP on AWS Technical Documentation

---

AWS account access

---

Content preferences

Language

English

Copied!

```
1 import os
2 from PyPDF2 import PdfReader
3
4 def summarize_pdf(path: str) -> str:
5     reader = PdfReader(path)
6     text = "\n".join([page.extract_text() for page in reader.pages])
7
8     System = "You are a great Finance Analyst, which can analyze the health of a company based on a Financial Report."
9     User = "Analyze the result of the Report below and provide an Executive Summary with Insights.\n\n"+text
10
11 body = json.dumps({
12     "max_tokens": 2000,
13     "temperature": 0,
14     "system": System,
15     "messages": [
16         {
17             "role": "user",
18             "content": [
19                 {
20                     "type": "text",
21                     "text": User
22                 }
23             ]
24         }
25     ],
26     "anthropic_version": "bedrock-2023-05-31"
27 })
28 response = boto3_bedrock.invoke_model(body=body, modelId="anthropic.claude-3-sonnet-20240229-v1:0")
29 response_body = json.loads(response.get("body").read())
30 result = response_body.get("content")
31 return result
```

File Edit View Run Kernel Git Tabs Settings Help default-20240902T083726 / advantech-demo-20240902

+ Terminal 1 Lab1.ipynb Lab2.1.ipynb Lab2.2.ipynb Lab2.3.ipynb Lab3.ipynb

Filter files by name

Name	Last Modified
Lab1.ipynb	1 hour ago
Lab2.1.ipynb	1 hour ago
Lab2.2.ipynb	50 minutes ago
Lab2.3.ipynb	6 minutes ago
Lab3.ipynb	1 minute ago
myutils.zip	1 hour ago

```
[3]: import os
from PyPDF2 import PdfReader

def summarize_pdf(path: str) -> str:
    reader = PdfReader(path)
    text = "\n".join([page.extract_text() for page in reader.pages])

    System = "You are a great Finance Analyst, which can analyze the health of a company based on a Financial Report."
    User = "Analyze the result of the Report below and provide an Executive Summary with Insights.\n\n"+text

    body = json.dumps({
        "max_tokens": 2000,
        "temperature": 0,
        "system": System,
        "messages": [
            {
                "role": "user",
                "content": [
                    {
                        "type": "text",
                        "text": User
                    }
                ]
            }
        ],
        "anthropic_version": "bedrock-2023-05-31"
    })
    response = boto3_bedrock.invoke_model(body=body, modelId="anthropic.claude-3-sonnet-20240229-v1:0")
    response_body = json.loads(response.get("body").read())
    result = response_body.get("content")
    return result
```

[ ]:



## ▼ Lab Exercises

Lab 1. Query SAP HANA Cloud

Lab 2. Integrate Generative AI (Claude) with SAP HANA Cloud

**Lab 3. Analyze SAP Report using Generative AI**

Lab 4. Build GenAI API using Lambda and API Gateway

Lab 5. Using SAP Build Apps to interact with GenAI API

## ► Additional Lab Exercises

Clean Up

Summary

Get Started with SAP on AWS

AWS for SAP homepage

SAP on AWS Technical Documentation

## ► AWS account access

## ▼ Content preferences

Language

English

Exit event

```
1 analysis=summarize_pdf("RFSSLD00.pdf")
2 print(analysis[0]['text'])
```

3. Observe the result when you are executing every cells, and you will see the result as below.

**Executive Summary:**

Based on the G/L Account Balances report, here are the key insights:

**1. Revenue:**

- The company generated domestic product revenue of \$4,223,226 and affiliate product revenue of \$526.50 during the reporting period.
- There were revenue adjustments of \$2,270.20 recorded.

**2. Cost of Goods Sold (COGS):**

- COGS components like direct materials (\$1,694,481.95), material overhead (\$247,723.20), personnel time (\$195,498.30), machine time
- Consumption of raw materials (\$1,615,071.90) and trading goods (\$694,369.42) was recorded.

**3. Inventory:**

- Significant inventory balances were reported for raw materials (\$42,959,620.51), work-in-progress (\$456,789.22), semi-finished goods
- Inventory adjustments were made for trading goods (\$3,620.50) and work-in-progress deferred revenue (\$4,402,242.55).

**4. Receivables and Payables:**

- Domestic receivables stood at \$33,895,279.56, with adjustments of \$54,384.32.
- Domestic payables amounted to \$64,980,323.14, with adjustments of \$7,197.70.
- Goods received/invoice received (GR/IR) balance was \$6,415,679.76.

**5. Investments and Financing:**

- Short-term investments in unaffiliated entities were \$2,000,000, and long-term investments were \$10,000,000.
- Bond investments (short-term: \$99,850,906.15, long-term: \$199,700,000) were significant.
- Short-term bond payable was \$600,000,000, and long-term bond payable was \$100,000,000.

**6. Other Expenses:**

vfboabkwln6zti.studio.us-west-2.sagemaker.aws/jupyterlab/default/lab/tree/Lab3.ipynb

File Edit View Run Kernel Git Tabs Settings Help default-20240902T083726 / advantech-demo-20240902

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Name Last Modified

- Lab1.ipynb 1 hour ago
- Lab2.1.ipynb 1 hour ago
- Lab2.2.ipynb 52 minutes ago
- Lab2.3.ipynb 8 minutes ago
- Lab3.ipynb 1 minute ago
- myutils.zip 1 hour ago
- RFSSLD00... 21 seconds ago

[ ]: analysis=summarize\_pdf("RFSSLD00.pdf")  
print(analysis[0]['text'])

Notebook Cluster Python 3 (ipykernel)

Launcher Terminal 1 Lab1.ipynb Lab2.1.ipynb Lab2.2.ipynb Lab2.3.ipynb Lab3.ipynb RFSSLD00.pdf

File Edit View Run Kernel Git Tabs Settings Help default-20240902T083726 / advantech-demo-20240902

+ Terminal 1 Lab1.ipynb Lab2.1.ipynb Lab2.2.ipynb Lab2.3.ipynb Lab3.ipynb RFSSLD00.pdf

Filter files by name

Name Last Modified

- Lab1.ipynb 1 hour ago
- Lab2.1.ipynb 1 hour ago
- Lab2.2.ipynb 52 minutes ago
- Lab2.3.ipynb 8 minutes ago
- Lab3.ipynb now
- myutils.zip 1 hour ago
- RFSSLD00... 54 seconds ago

[5]: `analysis=summarize_pdf("RFSSLD00.pdf")  
print(analysis[0]['text'])`

Executive Summary:

Based on the G/L Account Balances report, here are the key insights:

1. Revenue:
  - The company generated domestic product revenue of \$4,223,226 and affiliate product revenue of \$526.50 during the reporting period.
  - There were revenue adjustments of \$2,270.20 recorded.
2. Cost of Goods Sold (COGS):
  - Significant COGS components include direct materials (\$1,694,481.95), material overhead (\$247,723.20), personnel time (\$19,5,498.30), machine time (\$140,120.76), and setup time (\$58,334.23).
  - Consumption of raw materials (\$1,615,071.90) and trading goods (\$694,369.42) were also recorded.
3. Inventory:
  - The company has substantial inventory balances, including raw materials (\$42,959,620.51), work-in-progress (\$456,789.22), semi-finished goods (\$9,936,684.01), finished goods (\$1,490,085.01), and trading goods (\$6,906,232,455.08).
  - Inventory adjustments were made for trading goods (\$3,620.50) and work-in-progress deferred revenue (\$4,402,242.55).
4. Receivables and Payables:
  - Domestic receivables stood at \$33,895,279.56, with adjustments of \$54,384.32.
  - Domestic payables amounted to \$64,980,323.14, with adjustments of \$7,197.70.
  - Significant payables were recorded for goods received/invoices received (\$6,415,679.76) and affiliate payables (\$4,212.00).
5. Cash and Investments:
  - The company had substantial cash balances in various bank accounts, totaling over \$300 million.
  - Short-term investments in unaffiliated entities amounted to \$2,000,000, and long-term investments in unaffiliated entities were \$10,000,000.
  - Bond investments, both short-term (\$99,850,906.15) and long-term (\$199,700,000), were significant.
6. Debt and Financing:
  - The company had short-term bond payables of \$600,000,000 and long-term bond payables of \$100,000,000.
  - Discounts and premiums on bond issuances were recorded.
7. Expenses:
  - Notable expenses included bad debt expense (\$724,659.31), travel expenses (\$99.00), electricity and utilities (\$10.00), pu



## ▼ Lab Exercises

[Lab 1. Query SAP HANA Cloud](#)[Lab 2. Integrate Generative AI \(Claude\) with SAP HANA Cloud](#)[Lab 3. Analyze SAP Report using Generative AI](#)[Lab 4. Build GenAI API using Lambda and API Gateway](#)[Lab 5. Using SAP Build Apps to interact with GenAI API](#)

## ► Additional Lab Exercises

[Clean Up](#)[Summary](#)[Get Started with SAP on AWS](#) [AWS for SAP homepage](#) [SAP on AWS Technical Documentation](#) 

## ► AWS account access

## ▼ Content preferences

Language

English



Exit event

# Lab 4. Build GenAI API using Lambda and API Gateway

## Learning Objective

By the end of this lab, you will be able to:

- Explain how AWS Lambda functions can expose machine learning models through APIs
- Package the model code and dependencies into a Lambda deployment package (layers and functions)
- Write a Lambda function handler to accept text prompts and return SQL queries
- Deploy the Lambda function within AWS serverless infrastructure
- Create an API Gateway to expose the Lambda function through a public HTTP endpoint
- Configure API Gateway methods, integration, and security for the Lambda function (apikey)
- Test the API Gateway endpoint and validate the generated SQL queries
- Call the API endpoint from postman simulating a web or mobile app to generate SQL from text
- Troubleshoot issues with the Lambda function, API Gateway, and text-to-SQL model

1. Choose **File -> New -> Terminal**. Execute the following scripts.



For kernel, you can choose **Data Science 3.0 with Python 3** and **ml.t3.medium**.



Please change **AWSAccountNumber** to your own aws account number, and create **lambda\_layer** folder in the bucket **s3://sagemaker-us-west-2-AWSAccountNumber/**.



GET / POST text2sql ● + No environment

HTTP SAP-GenAI-Workshop / text2sql Save Share

POST https://pyrgb /default/TextToSQL Send

Params Authorization Headers (10) Body Scripts Settings Cookies

none form-data x-www-form-urlencoded raw binary GraphQL JSON Beautify

```
1 {
2   "prompt": "How many Hotels are there in Seattle?"
3 }
```

Body Cookies Headers (10) Test Results

200 OK • 9.13 s • 502 B • Save Response

Pretty Raw Preview Visualize JSON

```
1 "There are 2 hotels in Seattle according to the provided information."
```



GET / POST text2sql • +

No environment

HTTP SAP-GenAI-Workshop / text2sql

POST https://pyrgb/default/TextToSQL

Send

Params Authorization Headers (10) Body Scripts Settings Cookies

none form-data x-www-form-urlencoded raw binary GraphQL JSON

Beautify

```
1 {
2   "prompt": "How many Hotels are there in Seattle?"
3 }
```

Body Cookies Headers (10) Test Results

200 OK • 9.13 s • 502 B • Save Response

Pretty Raw Preview Visualize JSON

1 "There are 2 hotels in Seattle according to the provided information."

AWS Services Search [Alt+S] N. Virginia Admin/linmicht-Isengard @ 0947-8459-0684

API Gateway X API Gateway > APIs > TextToSQL-API (pyrgbcbfwbk) > Stages

## Stages

Stage actions ▾ Create stage

default
<b>Stage details</b> Info Edit
Stage name default Rate Info Web ACL -
Cache cluster Info Burst Info Client certificate -
Default method-level caching Inactive -
Invoke URL https://pyrgb/default
Active deployment 83187y on August 28, 2024, 19:00 (UTC+08:00)
<b>Logs and tracing</b> Info Edit
CloudWatch logs Inactive Detailed metrics Inactive Data tracing Inactive

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Type here to search

10:20 AM 9/2/2024



## API Gateway

APIs

Custom domain names

VPC links

▼ API: TextToSQL-API

Resources 

Stages

Authorizers

Gateway responses

Models

Resource policy

Documentation

Dashboard

API settings

Usage plans

API keys

Client certificates

Settings

API Gateway > APIs > Resources - TextToSQL-API (pyrgbcfwbk)

## Resources

API actions

Deploy API

Create resource



/TextToSQL

ANY

/TextToSQL - ANY - Method execution

Update documentation

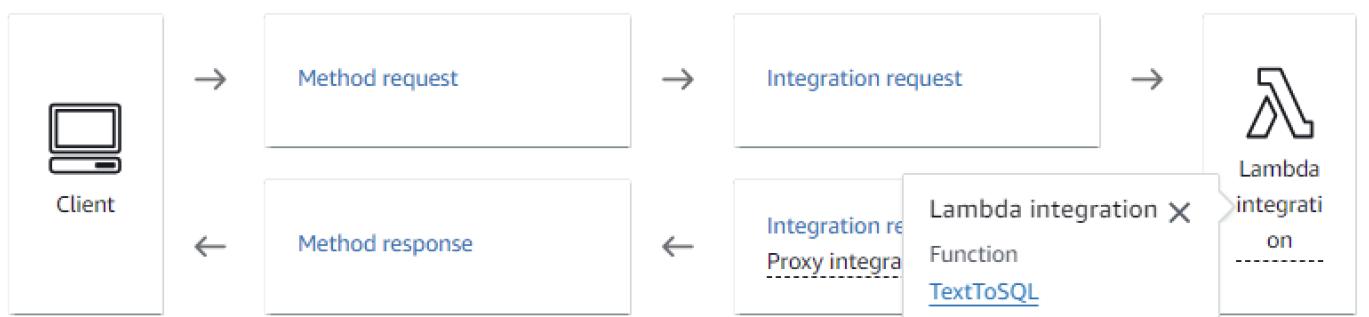
Delete

ARN

arn:aws:execute-api:us-east-1:094784590684:pyrgbcfwbk/\*/\*/TextToSQL

Resource ID

hnvg8m



Method request

Integration request

Integration response

Method response

Test

### Method request settings

Edit

Authorization

NONE

API key required

True





## API Gateway X

API Gateway > APIs > Resources - TextToSQL-API (pyrgbcfwbk)



APIs

Custom domain names

VPC links

### ▼ API: TextToSQL-API

Resources

Stages

Authorizers

Gateway responses

Models

Resource policy

Documentation

Dashboard

API settings

Usage plans

API keys

Client certificates

Settings

## Resources

Create resource

/  
  /TextToSQL  
  ANY

### /TextToSQL - ANY - Method execution

API actions ▾

Deploy API

Update documentation

Delete

ARN  
arn:aws:execute-api:us-east-1:094784590684:pyrgbcfwbk/\*/\*/TextToSQL

Resource ID  
hnvg8m



Method request | Integration request | Integration response | Method response | Test

#### Method request settings

Edit

Authorization  
NONE

API key required  
True



Type here to search





## TextToSQL

Throttle

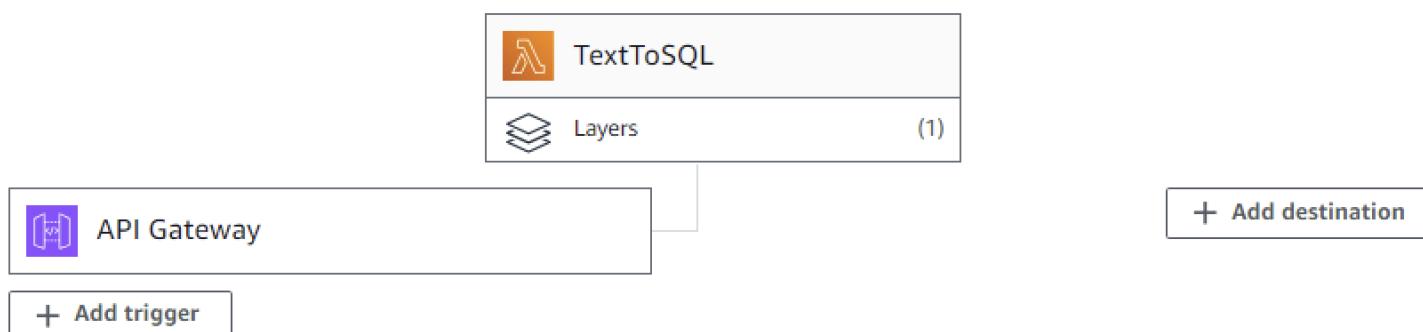
Copy ARN

Actions ▾

Function overview Info

Export to Application Composer

Download ▾

Diagram Template

Description

Last modified  
5 days ago

Function ARN

arn:aws:lambda:us-east-1:094784590684:function:TextToSQL

Function URL InfoCode Test Monitor Configuration Aliases VersionsCode source Info

Upload from ▾

AWS Cloud9 File Edit Find View Go Tools Window

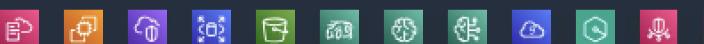
Test ▾

Deploy



Go to Anything (Ctrl-P)





Code  Monitor Configuration Aliases Versions

Code source Info Upload from ▾

File Edit Find View Go Tools Window Test Deploy 

Go to Anything (Ctrl-P)  lambda\_function Environment Var Execution results 

Environment  TextToSQL - / myutils lambda\_function.py

```
1 import json
2 import os
3 import sys
4 import boto3
5 import botocore
6 from hdbcli import dbapi
7 import pandas as pd
8
9 System = """Transform the following requests into valid SQL queries in SAP HANA dialect. Assume a database with the following tables and columns exists in schema USER1:
10
11 HOTEL:
12     hno INTEGER PRIMARY KEY,
13     name NVARCHAR(50) NOT NULL,
14     address NVARCHAR(40) NOT NULL,
15     city NVARCHAR(30) NOT NULL,
16     state NVARCHAR(2) NOT NULL,
17     zip NVARCHAR(6)
18
19 ROOM:
20     hno INTEGER,
21     type NVARCHAR(6),
22     free NUMERIC(3),
23     price NUMERIC(6, 2),
24     PRIMARY KEY (hno, type),
25     FOREIGN KEY (hno) REFERENCES HOTEL
26
27 CUSTOMER:
28     cno INTEGER PRIMARY KEY,
29     title NVARCHAR(7),
30     firstname NVARCHAR(20),
31     name NVARCHAR(40) NOT NULL,
32     address NVARCHAR(40) NOT NULL,
33     zip NVARCHAR(6)
34
35 RESERVATION
36     hno INTEGER NOT NULL, GENERATED BY DEFAULT AS IDENTITY
```



Code | **Test** | Configuration | Aliases | Versions



**Test event** Info

Delete

Save

Test

To invoke your function without saving an event, modify the event, then choose Test. Lambda uses the modified event to invoke your function, but does not overwrite the original event until you choose Save changes.

Test event action

Create new event

Edit saved event

Event name

MyTestEvent



**Event JSON**

Format JSON

```
1. []
2. "body": "{\"prompt\": \"How many Hotels are there in Seattle ?\"}"
3. []
```



Type here to search



AWS Lambda Test event interface. The 'Test' tab is selected. A red arrow points to the 'Test' button in the top right corner.

To invoke your function without saving an event, modify the event, then choose Test. Lambda uses the modified event to invoke your function, but does not overwrite the original event until you choose Save changes.

Test event action:  Create new event  Edit saved event

Event name: MyTestEvent

Event JSON:

```
1. []
2. "body": "{\"prompt\": \"How many Hotels are there in Seattle ?\"}"
3. []
```

Format JSON





Code Test Monitor Configuration Aliases Versions

Executing function: succeeded ([logs](#))

▼ Details

The area below shows the last 4 KB of the execution log.

```
{  
  "statusCode": 200,  
  "headers": {  
    "Content-Type": "application/json",  
    "Access-Control-Allow-Headers": "*",  
    "Access-Control-Allow-Origin": "*",  
    "Access-Control-Allow-Methods": "*"  
  },  
  "body": "\"There are 2 hotels in Seattle according to the result provided.\""  
}
```

Summary

Code SHA-256

Uh8uMqSzOaEUxQgL6mQ0+qlTyEvkN71dZDoK/Oiwpco=

Request ID

d23e99dd-7423-47d8-be4d-06a58e45573f

Duration

3778.47 ms

Resources configured

128 MB

Log output

Execution time

14 seconds ago (September 2, 2024 at 10:22 AM GMT+8)

Function version

\$LATEST

Billed duration

3779 ms

Max memory used

122 MB



Type here to search





# Thank you!

Michael Lin

[linmicht@amazon.com](mailto:linmicht@amazon.com)