

# Utilizing AWS SageMaker for Advanced Data Analysis and Machine Learning Deployment

We start with setting up a Notebook Instance in Amazon SageMaker where Jupyter notebook can be opened to build, train and test machine learning models.

Amazon SageMaker > Notebook instances

Notebook instances Info

Actions

Create notebook instance

	Name	Instance	Creation time	Status	Actions
<input type="radio"/>	sm-notebook-instance	ml.t2.medium	3/12/2024, 8:58:26 PM	InService	Open Jupyter Open JupyterLab

Amazon SageMaker > Notebook instances > sm-notebook-instance

sm-notebook-instance

Delete Stop Open Jupyter Open JupyterLab

Notebook instance settings

Edit

Name	Status	Notebook instance type	Platform identifier
sm-notebook-instance	InService	ml.t2.medium	Amazon Linux 2, Jupyter Lab 3 (notebook-al2-v2)
ARN	Creation time	Elastic Inference	Minimum IMDS Version
arn:aws:sagemaker:us-east-2:975050225617:notebook-instance/sm-notebook-instance	Mar 13, 2024 01:58 UTC	-	2
Lifecycle configuration	Last updated	Volume Size	
-	Mar 15, 2024 22:21 UTC	5GB EBS	

Git repositories

Name	Repository URL	Type
There are currently no resources.		

Permissions and encryption

IAM role ARN	Root access	Encryption key
arn:aws:iam::975050225617:role/service-role/AmazonSageMaker-ExecutionRole-20240312T202958	Enabled	

Here, data file and any pre-existing Jupyter notebook can be upload for further processing. It also has an option to create a new notebook if preferred.

The screenshot displays the JupyterLab interface. At the top, the browser address bar shows the URL: `sm-notebook-instance-bxlp.notebook.us-east-2.sagemaker.aws/tree`. Below the address bar, the JupyterLab logo is on the left, and buttons for "Open JupyterLab", "Quit", and "Logout" are on the right. A navigation bar contains tabs for "Files", "Running", "Clusters", "Conda", and "SageMaker Examples".

Under the "Files" tab, a message says "Select items to perform actions on them." To the right of this message are buttons for "Upload", "New", and a refresh icon. Below this is a file list table:

	Name	Last Modified	File size
<input type="checkbox"/>	/		
<input type="checkbox"/>	employee_salary_prediction_notebook.ipynb	3 days ago	311 kB
<input type="checkbox"/>	salary.csv	3 days ago	417 B

Below the file list, the browser address bar shows the URL: `sm-notebook-instance-bxlp.notebook.us-east-2.sagemaker.aws/notebooks/employee_salary_prediction_notebook.ipynb`. The JupyterLab interface shows the notebook "employee\_salary\_prediction\_notebook" with a "Last Checkpoint: 2 hours ago (autosaved)" status. The "File" menu is open, showing options like "File", "Edit", "View", "Insert", "Cell", "Kernel", "Widgets", and "Help". The "Run" button is highlighted.

The notebook content includes a section titled "The Problem Statement" with a bulleted list:

- The objective of this case study is to predict the employee salary based on the number of years of experience.
- In simple linear regression, we predict the value of one variable Y based on another variable X.
- X is called the independent variable and Y is called the dependant variable.
- It is called simple because it examines relationship between two variables only.
- It is linear in nature because when the independent variable increases (or decreases), the dependent variable increases (or decreases) in a linear fashion.

Below this is a section titled "Import libraries and dataset" with the following code:

```
In [1]: # install seaborn library
# !pip install seaborn
# !pip install tensorflow
# import tensorflow as tf
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt

Matplotlib is building the font cache; this may take a moment.

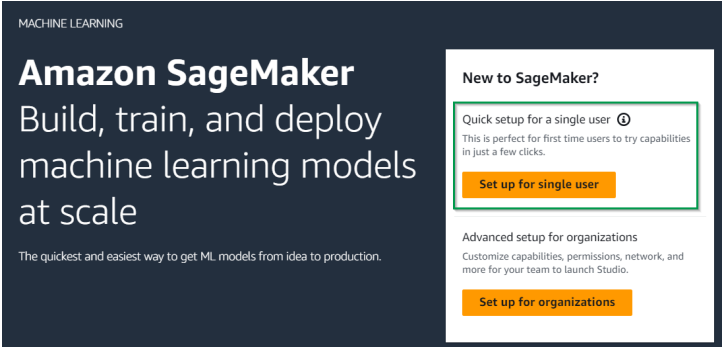
In [2]: # read the csv file
salary_df = pd.read_csv('salary.csv')

In [3]: salary_df
```

The output of the code is a table:

	YearsExperience	Salary
0	1.1	39343
1	1.3	46205
2	1.5	37731
3	2.0	43525
4	2.2	39891
5	2.4	54412

SageMaker Studio is set up with **Set up for single user** option which quickly onboards single users. It is also *recommended* by Amazon for first-time users.



Using the **Set up for single user** option, a **domain** and **user profile** are automatically created for us with default settings. Along with those, it also creates a Domain execution role, User profile execution role, Shared space execution role, SageMaker Canvas time series forecasting role, **Amazon S3 bucket** and selects a VPC.

**Domain:**

Amazon SageMaker > Domains

Domains [Info](#)

A domain includes an associated Amazon Elastic File System (EFS) volume; a list of authorized users; and a variety of security, application, policy, and Amazon Virtual Private Cloud (VPC) configurations. Each user in a domain receives a personal and private home directory within the EFS for notebooks, Git repositories, and data files.

Domains (1) [Info](#)

🔄

View

Edit

Create domain

🔍 Find domain name

< 1 > ⚙️

	Name	Id	Status	Created on	Modified on
○	<a href="#">QuickSetupDomain-20240315T154132</a>	d-jat8vk8trnj0w	🟢 InService	Mar 15, 2024 20:42 UTC	Mar 15, 2024 20:47 UTC

QuickSetupDomain-20240315T154132

Domain details

Configure and manage the domain.

User profiles | Space management | Environment | Domain settings

General settings [Info](#)

Edit

Name QuickSetupDomain-20240315T154132	Status ✔ Ready	Domain ID d-jat8vk8trj0w
Created Fri Mar 15 2024 15:42:02 GMT-0500 (Central Daylight Time)	Last modified Fri Mar 15 2024 15:47:41 GMT-0500 (Central Daylight Time)	VPC vpc-0a8d9ed8d33096940
Authentication method AWS Identity and Access Management (IAM)	Execution role arn:aws:iam::975050225617:role/service-role/AmazonSageMaker-ExecutionRole-20240315T154133	

Storage configurations


Edit

Encryption key No custom encryption	
Default space size 5	Maximum space size 100

Apps

Configure apps to manage your ML workflow using SageMaker.

Studio | Studio Lab | Canvas | RStudio

 Studio

Amazon SageMaker Studio provides a single, web-based visual interface where you can perform all ML development steps, including building notebooks, experiment management, automatic model creation, debugging, and model and data drift detection.

Configure app

Learn more

Projects

✔ Amazon SageMaker project templates enabled for this account

Launch constraint role: arn:aws:iam::975050225617:role/service-role/AmazonSageMakerServiceCatalogProductsLaunchRole  
Product use role: arn:aws:iam::975050225617:role/service-role/AmazonSageMakerServiceCatalogProductsUseRole  
API Gateway use role: arn:aws:iam::975050225617:role/service-role/AmazonSageMakerServiceCatalogProductsApiGatewayRole  
CloudFormation use role: arn:aws:iam::975050225617:role/service-role/AmazonSageMakerServiceCatalogProductsCloudformationRole  
CodeBuild use role: arn:aws:iam::975050225617:role/service-role/AmazonSageMakerServiceCatalogProductsCodeBuildRole  
CodePipeline use role: arn:aws:iam::975050225617:role/service-role/AmazonSageMakerServiceCatalogProductsCodePipelineRole  
Events use role: arn:aws:iam::975050225617:role/service-role/AmazonSageMakerServiceCatalogProductsEventsRole  
Firehose use role: arn:aws:iam::975050225617:role/service-role/AmazonSageMakerServiceCatalogProductsFirehoseRole  
Glue use role: arn:aws:iam::975050225617:role/service-role/AmazonSageMakerServiceCatalogProductsGlueRole  
Lambda use role: arn:aws:iam::975050225617:role/service-role/AmazonSageMakerServiceCatalogProductsLambdaRole  
SageMaker use role: arn:aws:iam::975050225617:role/service-role/AmazonSageMakerServiceCatalogProductsExecutionRole

✔ Amazon SageMaker project templates enabled for Studio users

Execution role: arn:aws:iam::975050225617:role/service-role/AmazonSageMaker-ExecutionRole-20240315T154133

User Profile:

Amazon SageMaker > Domains > Domain: QuickSetupDomain-20240315T154132 > User Details: default-20240315t154132

User Details

General details about this user profile.

Launch

**Apps**

App name	Status	App type	Created
sagemaker-data-scienc-ml-t3-medium-26b76b1d598bfaa012ec45c79dc5	Ready	KernelGateway	Fri Mar 15 2024 17:05:58 GMT-0500 (Central Daylight Time)
default	Ready	JupyterServer	Fri Mar 15 2024 16:19:24 GMT-0500 (Central Daylight Time)

**Details**

Name default-20240315t154132	Execution role arn:aws:iam:975050225617:role/service-role/AmazonSageMaker-ExecutionRole-20240315T154133
Created On Fri Mar 15 2024 15:47:45 GMT-0500 (Central Daylight Time)	Status InService
ID d-jat8vk8trjDw	Modified On Fri Mar 15 2024 15:47:47 GMT-0500 (Central Daylight Time)
Space Type -	Owner User Profile Name -

From user profile, Amazon SageMaker Studio can be launched.

Amazon SageMaker > Domains > Domain: QuickSetupDomain-20240315T154132

QuickSetupDomain-20240315T154132

Domain details

Configure and manage the domain.

User profiles | Space management | Environment | Domain settings

**User profiles** Info

A user profile represents a single user within a domain. It is the main way to reference a user for the purposes of sharing, reporting, and other user-oriented features.

Search users

Name	Modified on	Created on
default-20240315t154132	Mar 15, 2024 20:47 UTC	Mar 15, 2024 20:47 UTC

Launch

Personal apps

Studio

Canvas

TensorBoard

Profiler

Collaborative

Spaces

S3 Bucket:

Amazon S3

**Account snapshot**

Storage lens provides visibility into storage usage and activity trends. [Learn more](#)

View Storage Lens dashboard

General purpose buckets | Directory buckets

**General purpose buckets (3)** Info

Buckets are containers for data stored in S3.

Find buckets by name

	Name	AWS Region	Access	Creation date
	sagemaker-studio-975050225617-d3olyjco6c9	US East (Ohio) us-east-2	Bucket and objects not public	March 15, 2024, 15:42:01 (UTC-05:00)
	sagemaker-studio-975050225617-v6kerqjv3hk	US East (Ohio) us-east-2	Bucket and objects not public	March 15, 2024, 19:28:42 (UTC-05:00)
	sagemaker-us-east-2-975050225617	US East (Ohio) us-east-2	Bucket and objects not public	March 15, 2024, 15:42:03 (UTC-05:00)

In Amazon SageMaker Studio, we have the option of various application suits based on need. For our purposes, we launch a JupyterLab application.

The image shows two screenshots of the Amazon SageMaker Studio interface. The top screenshot is the 'Home' page, and the bottom screenshot is the 'Running Instances' page.

**Home Page:**

- Applications (5):** JupyterLab, RStudio, Canvas, Code Editor, Studio CL...
- Home:** Launch workflows, manage your applications and spaces, and view getting started materials.
- Overview:** Start a new ML workflow or jump back into 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, pre-built solutions, and example notebooks. Build models and prepare data from visual interface.
  - JumpStart:** Quickly deploy, fine-tune, and evaluate pre-trained models.
  - AutoML:** Automatically build, train, and tune models.

**Running Instances Page:**

- Running instances:** View and stop running instances across all your available applications and spaces.
- How running instances work:**
  - Stop:** Click stop to shut down any running application or space to which you have access.
  - Shared spaces:** Remember that before stopping a shared space you should let your team know to prevent data loss.
  - Restart application:** Restart an application or space by clicking the application icon in the left nav, then click run.
- Search:** Search...
- Table:**

Name	Application	Status	Sharing	Instance	Storage	CreateBy	CreatedTime	Action
default-20240315t154132.sagemaker-data-scienc-ml-t3-medium-26b76b1d598bfaa...	Studio Classic Kernel Gateway	Running	Private	ml.t3.medium	-	default-20240315t154132	2 hours ago	<a href="#">Stop</a>
default-20240315t154132	Studio Classic Jupyter Server	Running	Private	system	-	default-20240315t154132	3 hours ago	<a href="#">Stop</a>

2 results   Results are cached   [Refresh](#)   Go to page 1   Page 1 of 1

We have the option to either upload a notebook or create a new notebook to get started with machine learning tasks.

The screenshot displays the Amazon SageMaker Studio Classic interface. The top navigation bar shows the file path: `d-jat8vk8tnj0w.studio.us-east-2.sagemaker.aws/jupyter/default/lab/tree/employee_salary_prediction_notebook.ipynb`. The notebook is titled "employee\_salary\_prediction\_notebook.ipynb" and is in a "Paused" state. The left sidebar shows a file explorer with a search bar and a list of files, including "employee\_salary\_prediction\_not...". The main area of the notebook is divided into two sections: "The Problem Statement" and "Import libraries and dataset".

**The Problem Statement**

- The objective of this case study is to predict the employee salary based on the number of years of experience.
- In simple linear regression, we predict the value of one variable Y based on another variable X.
- X is called the independent variable and Y is called the dependant variable.
- It is called simple because it examines relationship between two variables only.
- It is linear in nature because when the independent variable increases (or decreases), the dependent variable increases (or decreases) in a linear fashion.

**Import libraries and dataset**

```
[1]: # install seaborn library
# !pip install seaborn
# !pip install tensorflow
# import tensorflow as tf
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt

Matplotlib is building the font cache; this may take a moment.

[2]: # read the csv file
salary_df = pd.read_csv('salary.csv')
```

[3]: salary\_df

	YearsExperience	Salary
0	1.1	39343
1	1.3	46205
2	1.5	37731
3	2.0	43525
4	2.2	39891
5	2.9	56642
6	3.0	60150
7	3.2	54445
8	3.2	64445

The bottom status bar shows the environment: "Python 3 (Data Science 3.0) | ...", "Kernel: Idle", "Instance MEM", "Cookie Preferences", "Mode: Comm...", "Ln 7, Col...", and "employee\_salary\_prediction\_notebook.ip...".

## Created Execution Role Through IAM for Sagemaker Project:

[IAM](#) > [Roles](#) > [AmazonSageMaker-ExecutionRole-20240314T212445](#)

### AmazonSageMaker-ExecutionRole-20240314T212445 [Info](#)

SageMaker execution role created from the SageMaker AWS Management Console.

**Summary**

Creation date

March 14, 2024, 21:24 (UTC-05:00)

Last activity

19 minutes ago

ARN

arn:aws:iam::654654508688:role/service-role/AmazonSageMaker-ExecutionRole-20240314T212445

Maximum session duration

1 hour

Permissions

Trust relationships

Tags

Access Advisor

Revoke sessions

**Permissions policies (4)** [Info](#)

You can attach up to 10 managed policies.

Filter by Type

All types

<input type="checkbox"/>	Policy name <a href="#">Info</a>	Type	Attached entities
<input type="checkbox"/>	<a href="#">AmazonS3FullAccess</a>	AWS managed	19
<input type="checkbox"/>	<a href="#">AmazonSageMaker-ExecutionPolicy-20240314T212445</a>	Customer managed	1
<input type="checkbox"/>	<a href="#">AmazonSageMakerFullAccess</a>	AWS managed	34
<input type="checkbox"/>	<a href="#">AWSGlueConsoleFullAccess</a>	AWS managed	19

## Security group for Sagemaker:

[EC2](#) > [Security groups](#) > [sg-0de59b648fec6bb07 - mp4](#)

### sg-0de59b648fec6bb07 - mp4 [Actions](#)

**Details**

Security group name

mp4

Owner

654654508688

Security group ID

sg-0de59b648fec6bb07

Inbound rules count

5 Permission entries

Description

mp4 show all

VPC ID

vpc-0a3c7b7c7b7c7b7c

Inbound rules

Outbound rules

Tags

**Inbound rules (5)**

Message type

Get inbound rules

<input type="checkbox"/>	Name	Security group rule...	IP address	Type	Protocol	Port range	Source	Description
<input type="checkbox"/>	mp4 HTTP	sg-0de59b648fec6bb07	IPV4	HTTP	TCP	443	0.0.0.0/0	-
<input type="checkbox"/>	mp4 SSH	sg-0de59b648fec6bb07	IPV4	SSH	TCP	22	0.0.0.0/0	-
<input type="checkbox"/>	mp4 HTTP	sg-0de59b648fec6bb07	IPV4	HTTP	TCP	80	0.0.0.0/0	-

## Created S3 Bucket to hold project icon and data (endpoints and model push/saves along with csv pulls):

[Amazon S3](#) > [Buckets](#)

**Account snapshot**

Storage lens provides visibility into storage usage and activity trends. [Learn more](#)

[View Storage Lens dashboard](#)

General purpose buckets

Directory buckets

**General purpose buckets (4)** [Info](#)

Buckets are containers for data stored in S3.

< 1 >

<input type="radio"/>	Name	AWS Region	Access	Creation date
<input type="radio"/>	sagemaker-project-bucket	US East (Ohio) us-east-2	<a href="#">Bucket and objects not public</a>	March 14, 2024, 22:47:35 (UTC-05:00)
<input type="radio"/>	sagemaker-studio-654654508688-1c1hbpz2s2c	US East (Ohio) us-east-2	<a href="#">Bucket and objects not public</a>	March 16, 2024, 20:13:08 (UTC-05:00)
<input type="radio"/>	sagemaker-studio-654654508688-uyg2z9p9c3e	US East (Ohio) us-east-2	<a href="#">Bucket and objects not public</a>	March 14, 2024, 21:39:06 (UTC-05:00)
<input type="radio"/>	sagemaker-us-east-2-654654508688	US East (Ohio) us-east-2	<a href="#">Bucket and objects not public</a>	March 14, 2024, 21:39:08 (UTC-05:00)



AWS Glue database created for data connection when using Sagemaker Studio Lab:

You can now create Apache Iceberg tables in the AWS Glue Data Catalog. To learn more, visit the [documentation](#).

AWS Glue > Databases > sagemakerdb

## sagemakerdb

Last updated (UTC)  
March 17, 2024 at 04:21:38 Create Edit Delete

### Database properties

Name sagemakerdb	Description -	Location -	Created on (UTC) March 15, 2024 at 04:03:59
---------------------	------------------	---------------	--

### Tables (0)

View and manage all available tables.

Last updated (UTC)  
March 17, 2024 at 01:27:54 Create Delete Add tables using crawler Add table

Name	Database	Location	Classification	Deprecated	View data	Data quality
No available tables						

Kendra data source created and connected to sagemaker database for data connection.


We're creating the following index: 'sagemaker-project-index'. It can take up to 30 minutes.

[Amazon Kendra](#) > [Indexes](#) > sagemaker-project-index

## sagemaker-project-index [Info](#)

---


### Getting started



**Step 1. Create an index**

An index is the place where you add your data sources to make them searchable in Amazon Kendra.


[Creating](#)



**Step 2. Add data sources**

Add and sync your data from S3, SharePoint, and other databases to your index.

[Add data sources](#)



**Step 3. Design, tune and share your search experience**

Quickly create and customize your search application using UX search experience with others using a generated endpoint URL

[Create experience](#)

---

### Index settings

Name sagemaker-project-index	Status <a href="#">Creating</a>	Role ARN arn:aws:iam::654654508688:role/service-role/AmazonKendra-us-east-2-sagemaker-project-role	Storage used -
Description -	Data sources 0	FAQ count -	Creation time Mar 14, 2024, 10:55 PM CDT
Index ID 662f373a-c036-44f1-ad0a-a7c93ca8a07c	Encryption key Amazon Kendra owned key	Document count -	Last modified time Mar 14, 2024, 10:55 PM CDT

Sagemaker Role created and connected to project with IAM Sagemaker execution role privileges.

You successfully created the following index: 'sagemaker-project-index'. Add data sources to make your content searchable. [Add data source](#)

**Sync started successfully at Mar 14, 2024, 11:09 PM CDT.**  
Amazon Kendra is syncing the following data source: 'sagemaker-project-datasource'. It can take from a few minutes to a few hours. Syncing is a two-step process. First documents are crawled to determine the ones to index. Then the selected documents are indexed. Sync speeds are limited by factors such as remote repository throughput and throttling, network bandwidth, and the size of documents.

Amazon Kendra > Indexes > sagemaker-project-index > Data sources > sagemaker-project-datasource

### sagemaker-project-datasource [info](#)

[Sync now](#) [Stop sync](#) [Actions](#)

**Data source details**

Name: sagemaker-project-datasource	Status: <span>Active</span>	Last sync status: -	Current sync state: • Syncing - crawling Syncing - indexing
Description: -	Type: S3	Last sync time: -	Next scheduled sync: -
Data source ID: 3a00f0d2-f2ff-4351-b479-97685f9338fa	IAM role ARN: arn:aws:iam::654654508688:role/service-role/AmazonKendra-sample-s3-role-S4712431-9949-46e5-9d84-c66998b8caff		
Default language: <a href="#">info</a> English (en)			

[Sync history](#) [Settings](#) [Tags](#)

► **Sync history reports - optional** [info](#)  
Sync history reports track each file's status during sync run. Reports are auto-generated and saved in your Amazon S3 bucket.

**Sync run history (1)**

Status	Start time	End time	Total items scanned	Added	Deleted	Modified	Failed <a href="#">🔗</a>	Details <a href="#">🔗</a>	Reports <a href="#">🔗</a>
Syncing - crawling	Mar 14, 2024, 11:09 PM CDT	-	↻	↻	↻	↻	↻	<a href="#">View in CloudWatch</a>	

Inference.py created and saved into bucket to use with notebook and define endpoint(s):

jupyter inference Last Checkpoint: 44 minutes ago (autosaved) [Logout](#)

File Edit View Insert Cell Kernel Widgets Help Trusted | conda\_pytorch\_p310

[📁](#) [+](#) [🔍](#) [📄](#) [📁](#) [⬆️](#) [⬆️](#) [▶️ Run](#) [🛑](#) [🔄](#) [🔍](#) Code [📄](#) [🔄 nbdiff](#)

```
In [1]: import joblib
import numpy as np

# Function to load the model
def model_fn(model_dir):
    """
    Load the model from the model_dir directory.
    """
    model = joblib.load(f"{model_dir}/model.joblib")
    return model

# Function to make predictions
def predict_fn(input_data, model):
    """
    Apply the model to the input data.
    """
    predictions = model.predict(input_data)
    return np.array(predictions)
```

In [ ]:

Code testing with AWS CLI through Visual Studio Code using AWS key for remote use:

PROBLEMS OUTPUT DEBUG CONSOLE **TERMINAL** PORTS COMMENTS

```
$ aws configure
AWS Access Key ID [None]: 
AWS Secret Access Key [None]: 
Default region name [None]: us-east-2
Default output format [None]: 
(sm)
Jessica M@DESKTOP-F9IAE9K MINGW64 ~
$ aws ecr describe-repositories
{
  "repositories": []
}

(sm)
Jessica M@DESKTOP-F9IAE9K MINGW64 ~
$ ^C
(sm)
Jessica M@DESKTOP-F9IAE9K MINGW64 ~
$ aws ecr create-repository --repository-name sagemaker_project_repo
{
  "repository": {
    "repositoryArn": "arn:aws:ecr:us-east-2:654654508688:repository/sagemaker_project_repo",
    "registryId": "654654508688",
    "repositoryName": "sagemaker_project_repo",
    "repositoryUri": "654654508688.dkr.ecr.us-east-2.amazonaws.com/sagemaker_project_repo",
    "createdAt": "2024-03-14T22:43:27.545000-05:00",
    "imageTagMutability": "MUTABLE",
    "imageScanningConfiguration": {
      "scanOnPush": false
    },
    "encryptionConfiguration": {
      "encryptionType": "AES256"
    }
  }
}
```

Notebook instance and files created/ saved into S3 bucket:

Success Your notebook instance is being created.  
Open the notebook instance when status is InService and open a template notebook to get started.

Amazon SageMaker > Notebook instances

Notebook instances info

Search notebook instances

	Name	Instance	Creation time
<input type="radio"/>	sagemaker-project-notebook	ml.t3.medium	3/16/2024, 6:37:23 PM

Bucket Files (viewed from notebook instance):

jupyter Open JupyterLab Quit Logout

Files Running Clusters Conda SageMaker Examples

Select items to perform actions on them. Upload New Refresh

	Name	Last Modified	File size
<input type="checkbox"/>	sagemaker-project-notebook-Copy1.ipynb	Running 24 minutes ago	26.9 kB
<input type="checkbox"/>	sagemaker-project-notebook.ipynb	Running a minute ago	180 kB
<input type="checkbox"/>	Untitled.ipynb	5 hours ago	72 B
<input type="checkbox"/>	Untitled1.ipynb	43 minutes ago	72 B
<input type="checkbox"/>	inference.py	42 minutes ago	1.33 kB
<input type="checkbox"/>	model.joblib	15 minutes ago	884 B
<input type="checkbox"/>	salary.csv	16 minutes ago	417 B

Model saved as model.joblib to use with Kendra and Sagemaker DB, and S3 bucket:

Amazon S3 > Buckets > sagemaker-project-bucket > model/ > model.joblib

model.joblib [info](#) [Copy S3 URI](#) [Download](#) [Open](#)

Properties Permissions Versions

### Object overview

<b>Owner</b> a61ce3881187c1cf40c3fe4f257b27556a2300a7e0dd955097d78d2226c30b8	<b>S3 URI</b> <a href="s3://sagemaker-project-bucket/model/model.joblib">s3://sagemaker-project-bucket/model/model.joblib</a>
<b>AWS Region</b> US East (Ohio) us-east-2	<b>Amazon Resource Name (ARN)</b> <a href="arn:aws:s3::sagemaker-project-bucket/model/model.joblib">arn:aws:s3::sagemaker-project-bucket/model/model.joblib</a>
<b>Last modified</b> March 16, 2024, 22:30:25 (UTC-05:00)	<b>Entity tag (ETag)</b> 1d361be6dd7badf4a10c420c08b21012
<b>Size</b> 864.0 B	<b>Object URL</b> <a href="https://sagemaker-project-bucket.s3.us-east-2.amazonaws.com/model/model.joblib">https://sagemaker-project-bucket.s3.us-east-2.amazonaws.com/model/model.joblib</a>
<b>Type</b> joblib	
<b>Key</b> <a href="#">model/model.joblib</a>	

Sagemaker Studio Lab provision completed. Lab is now ready for use with model and resources created above:

amazon **SageMaker Studio Lab** Texaschikkita

## My project

**CPU and GPU runtime limits have changed.**

**i** You can use CPU for up to 4 hours at a time with a limit of 8 hours in a 24-hour period.  
You can use GPU for up to 4 hours at a time with a limit of 4 hours in a 24-hour period. **x**

<b>Runtime status</b>	<b>Runtime remaining</b> <a href="#">?</a>	<b>Compute type</b> <a href="#">?</a>	<a href="#">▶ Start runtime</a>	<a href="#">Open project</a>
<b>Idle</b>	Session: —	<input checked="" type="radio"/> CPU <input type="radio"/> GPU		
	Today: <b>8 h 0 m</b>			

Snapshot of instance created in sagemaker portal through aws- EDA, and saving model to bucket.

