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- Part 4: Flow of Usage Fees
- Part 5: How to use representative services
 - Add an owner
 - Get started with OpenAI's services
 - Let's create a virtual machine
 - Use a notebook

Note

- This slide was created for the April 18, 2025 UTokyo Azure Usage Briefing.
- Azure specifications change frequently, so if the following does not work, please [refer to the Azure documentation](#).

Use a notebook

If you want to develop using **Jupyter Notebook** such as **Google Colaboratory**, you can use **Azure Machine Learning**.

Please refer to the [official notebook tutorial](#) as well.

Purpose

- In this session, we will use a service called “**Azure Machine Learning.**”
- Just like Google Colab, it allows you to implement and run code in an interactive environment (Jupyter Notebook).
- Roadmap:
 1. Create a Workspace
 2. Set up Compute Resources
 - Choose and deploy a machine to run your code.
 - If left idle for a while, it will automatically stop (billing for compute is also paused).
 - You can create multiple machines and switch between them.
 3. Creating a File (Notebook)
 - Create a notebook consisting of "code cells" and "markdown cells"
 - Similar to Google Colab, you can run a code cell and see the results instantly
 4. Get started with VS Code
 - A code editor loved by programmers around the world
 - Advanced extensions such as debugger and Github Copilot are also available.

1. Create a workspace

Azure services



Resources

Recent Favorite

Name

- Alfoundarytest
- openai_test1
- 1923306880-Yan

See all

Navigate

- Subscriptions
- Resource groups
- All resources
- Dashboard

Azure ma

All Services (99+) Marketplace (31) More (4)

Services [See more](#)

- Azure Machine Learning
- Azure Managed Grafana
- Azure Managed Instance
- Azure Managed Lustre

Marketplace [See more](#)

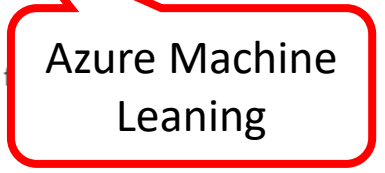
- Azure Machine Learning
- Azure AI Foundry
- Azure Maps
- Azure Managed Grafana

Documentation [See more](#)

- Deploy IBM Maximo Application Suite (MAS) on Azure - Azure Architectur

Continue searching in Microsoft Entra ID

Searching all subscriptions. [Give feedback](#)



- Kubernetes services
- Virtual machines
- App Services
- More services

Last Viewed
2 days ago
2 days ago
3 days ago

Home >

Azure Machine Learning

The University of Tokyo (univtokyo.onmicrosoft.com)

+ Create Recently deleted Manage view Refresh Export to CSV Open query Assign tags

- New workspace**
For ML projects and teams
- New registry
For sharing ML assets across workspaces

equals all Type equals all Resource group equals all Location equals all Add filter

No grouping List view

Resource group ↑↓ Type ↑↓ Location ↑↓ Subscription ↑↓



No workspaces to display

Workspaces are where you manage all the models, assets, and data related to your machine learning projects. Create one now to start using Azure Machine Learning.

[Learn more](#)

[Give feedback](#)

Home > Azure Machine Learning >

Azure Machine Learning

Create a machine learning workspace

Resource details

Every workspace must be assigned to an Azure subscription, which is where billing happens. You use resource groups like folders to organize and manage resources, including the workspace you're about to create.

[Learn more about Azure resource groups](#)

Subscription * ⓘ

1923306880-YamakataTraining

Resource group * ⓘ

Create new

Workspace details

Configure your basic workspace settings like

A resource group is a container that holds related resources for an Azure solution.

Name *

(new)ML-test ✓

OK

Cancel

[Create new](#)

Name * ⓘ

Region * ⓘ

Storage account * ⓘ

Key vault * ⓘ

Review + create

< Previous

Next : Inbound Access

Home > Azure Machine Learning >

Azure Machine Learning

Create a machine learning workspace

Workspace details

Configure your basic workspace settings like its storage connection, authentication, container, and more. [Learn more](#)

Name *	ML-workspace ✓
Region *	East US
Storage account *	(new) mlworkspace5877508646 Create new
Key vault *	(new) mlworkspace9437206468 Create new
Application insights *	(new) mlworkspace8039569950 Create new
Container registry	None Create new

[Review + create](#)

< Previous

Next : Inbound Access

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Azure Machine Learning

Create a machine learning workspace

- Basics
- Inbound Access
- Outbound Access**
- Encryption
- Identity
- Tags
- Review + create

Public network access allows access to this resource through the internet using a public IP address. An application or resource that is granted access with the following network rules still requires proper authorization to access this resource. [Learn more](#)

Public network access *

Disabled

All networks

i All networks, including the internet, can access this resource.

Workspace Inbound access

Name	Subscription	Resource group	Region	Subnet	Private DNS Zone
Click on add to create a private endpoint					
+ Add					

Home > Azure Machine Learning >

Azure Machine Learning

Create a machine learning workspace

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Network isolation

Choose the type of network isolation you need for your workspace, from not isolated at all to an entirely separate virtual network managed by Azure Machine Learning. [Learn more about managed network isolation](#)

<p>Public</p> <ul style="list-style-type: none">Compute can access public resourcesOutbound data movement is unrestricted	<p>Allow Internet Outbound</p> <ul style="list-style-type: none">Compute can access private resourcesOutbound data movement is unrestricted	<p>Allow Only Approved Outbound</p> <ul style="list-style-type: none">Compute can access allowlisted resources onlyOutbound data movement is restricted to approved targets
---------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Review + create

< Previous

Next : Encryption

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Azure Machine Learning

Create a machine learning workspace

Validation passed

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- Inbound Access
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Basics

Subscription	1923306880-YamakataTraining
Resource group	(New) (new)ML-test
Region	East US
Name	ML-workspace
Storage account	(new) mlworkspace5877508646
Key vault	(new) mlworkspace9437206468
Application insights	(new) mlworkspace8039569950
Container registry	None

Networking

Create

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[Download a template for automation](#)

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Create a machine learning workspace

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Basics

Subscription	1923306880-YamakataTraining
Resource group	(New) (new)ML-test
Region	East US
Name	ML-workspace
Storage account	(new) mlworkspace5877508646
Key vault	(new) mlworkspace9437206468
Application insights	(new) mlworkspace8039569950
Container registry	None

Networking

Connectivity method	Enable public access from all networks
Network isolation	Public

Submitting deployment...

Submitting the deployment template for resource group '(new)ML-test'.

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Microsoft.MachineLearningServices | Overview


Deployment

Search

- Delete
- Cancel
- Redeploy
- Download
- Refresh

- Overview
- Inputs
- Outputs
- Template

Deployment is in progress


 Deployment name : Microsoft.MachineLearnin... Start time : 4/8/2025, 5:01:20 PM
 Subscription : 1923306880-YamakataTrai... Correlation ID : b1f26844-e165-42b8-be43...
 Resource group : (new)ML-test

Deployment details

Resource	Type	Status
There are no resources to display.		



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Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.
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- Home >
- Microsoft.MachineLearningServices | Overview
- Deployment
- Search
- Overview
- Inputs
- Outputs
- Template

Delete Cancel Redeploy Download Refresh

✔ Your deployment is complete

Deployment name : Microsoft.MachineLearnin... Start time : [Progress Bar]
Subscription : 1923306880-YamakataTrai... Correlation ID : b1f26844-e165-42b8-be43...
Resource group : (new)ML-test

> Deployment details

✓ Next steps

Go to resource



Cost management
Get notified to stay within your budget and prevent unexpected charges on your bill.
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Azure experts are service provider partners who can help manage your assets on Azure

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ML-workspace

Azure Machine Learning workspace

Search

Download config.json Delete

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Resource visualizer
- Events
- Settings
- Monitoring
- Automation
- Support + troubleshooting

Storage	Application Insights
mlworkspace5877508646	mlworkspace8039569950
Provisioning State	MLflow tracking URI
Succeeded	azureml://eastus.api.azureml.ms/mlflow/v1.0/subscriptions/a600356...



Work with your models in Azure Machine Learning Studio

The Azure Machine Learning Studio is a web app where you can build, train, test, and deploy ML models. Launch it now to start exploring, or [learn more about the Azure Machine Learning studio](#)


Launch studio

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ML-workspace

+ New Customize view


Generative AI with Prompt flow



Multi-Round Q&A on Your Data

Create a chatbot that uses LLM and data from your own indexed files to ground multi-round question and answering capabilities in enterprise chat scenarios.


Start Clone



Q&A on Your Data

Use LLM and data from your own indexed files to ground multi-round question and answering capabilities.


Start Clone



Web Classification

Use LLM to classify URLs into multiple categories.


Start Clone



Chat with Wikipedia

Create a chatbot that leverages Wikipedia data to ground the responses.

Start Clone



Use GPT

Learn how to extend the capabilities of external data.

Start

Generative AI models

View all

Llama-4-Scout-17B-16E-Instruct

Chat completion

Llama-4-Maverick-17B-128E-I...

Chat completion

Llama-4-Scout-17B-16E

Chat completion

Llama-3.2-11B-Vision-Instruct

Chat completion

supply

Chat completion

Notebook samples

View all

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The University of Tokyo > ML-workspace > Notebooks

Notebooks

Files Samples

🔊 📄 + ↻ ⏪

- Users
 - 2573969490



Notebooks is your space to add, browse, and edit files.

You can add files of any type, including Jupyter Notebooks (.ipynb). The files you see here are stored in the workspace file share, and are accessible and shared within the workspace.

In order to run notebooks and scripts, you must connect to an Azure Machine Learning compute resource. Once a notebook or terminal is connected, you can access all workspace assets including experiment details, data, models, and more. [Learn more](#)

[+ Files](#) [Create compute](#)

- [View Azure Machine Learning tutorials](#)
- [View Release Notes to learn more about the latest features](#)
- [Notebooks documentation](#)

2. Create a compute

You need to create a “**Compute instance**,” which is the environment where your code runs.

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Notebooks

Files Samples

Users

- 2573969490



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+ Files **Create compute**

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- [Notebooks documentation](#)

Create compute instance

- 1 Required settings
- 2 Scheduling optional
- 3 Security optional
- 4 Applications optional
- 5 Tags optional
- 6 Review

Configure required settings

Select the name and virtual machine size you would like to use for your compute instance

Note that a compute instance can not be shared. It can only be used by a single assigned user. By default, it will be assigned to the creator and you can change this to a different user in the Security step.

Compute name *

E4machine

Virtual machine type

CPU GPU

Virtual machine size

Select from recommended options Select from all options

Name ↑	Category	Workload types		
<input type="radio"/> Standard_DS11_v2 2 cores, 14GB RAM, 28GB storage	Memory optimized	Development on Notebook weight testing		
<input type="radio"/> Standard_DS3_v2 4 cores, 14GB RAM, 28GB storage	General purpose	Classical ML model training on datasets	300 cores	\$0.29/hr
<input checked="" type="radio"/> Standard_E4ds_v4	Memory optimized	Data manipulation and training on medium-sized	350 cores	\$0.29/hr

Compare the prices and specifications, and choose the one that best for your purpose.

Review + Create

Back

Next

Cancel

Price (example)

- Prices vary depending on the region (“Japan” is expensive)
- “Japan” may be safer for processing sensitive data?

Instance	vCPU(¢)	RAM	East US	Japan
E2 v3	2	16 GiB	¥19.852/hour	¥25.209/hour
E4 v3	4	32 GiB	¥39.704/hour	¥50.418/hour
E8 v3	8	64 GiB	¥79.408/hour	¥100.836/hour
E16 v3	16	128 GiB	¥158.816/hour	¥201.671/hour

You can also use a GPU, but...
(A100x8 for ¥4,285 per 1 hour!)

ND A100 v4 series

Instance	Core(s)	RAM	GPU	East US
ND96asr A100 v4	96	900 GiB	8x A100 (NVlink)	¥4,285.024/hour

Create compute instance

- Required settings
- Scheduling optional
- Security optional
- Applications optional
- Tags optional
- 6 Review**

Review

Review or make changes to your job before submission. [Download a template for automation.](#)

Required settings

Review

Compute name
E4machine

Virtual machine
Standard_E4ds_v4
4 cores, 32GB RAM, 150GB storage

Virtual machine type
CPU

Scheduling

Review

i Auto shutdown enabled by default

Auto shutdown
After 60 minutes of inactivity

Start up and shutdown schedule
--

Security

Review

Enable SSH
no

Enable SSO
yes

Enable virtual network
no

Enable managed identity
no

Create

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Compute creation in progress... you can now see it in your list of computes.

Notebooks

Files Samples



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[+ Files](#) [Terminal](#)

[View Azure Machine Learning tutorials](#)

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Compute

The "Kubernetes clusters" tab is now where you can access the previous versions of "inference clusters" (also known as "AKS clusters") and "attached Kubernetes" compute types along with any previously created compute targets using those types. [Learn more](#) about Kubernetes clusters.

- Compute instances**
- Compute clusters
- Kubernetes clusters
- Attached computes
- Serverless instances

Choose from a selection of CPU or GPU instances preconfigured with popular tools such as VS Code, JupyterLab, Jupyter, and RStudio, ML packages, deep learning frameworks, and GPU drivers. [Learn more about compute instances](#)

+ New Refresh Start Stop Restart Schedule and idle shutdown Delete Reset view View quota

Name	☆	State	Idle shutdown ⓘ	Applications ⓘ	Size	Created
E4machine		○ Creating	--		STANDARD_E4DS_V4	Apr 8,

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+ New Refresh Start Stop Restart Schedule and idle shutdown Delete Reset view View quota

Search		Filter	Columns		
✓ Name	☆ State	Idle shutdown ⓘ	Applications ⓘ	Size	Created
✓ E4machine	▶ Running 📄	1 hour	JupyterLab Jupyter VS Code (Web) ⋮	Standard_E4ds_v4	Apr 8,

3. Create a notebook

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In order to run notebooks and scripts, you must connect to an Azure Machine Learning compute resource. Once a notebook or terminal is connected, you can access all workspace assets including experiment details, data, models, and more. [Learn more](#)

+ Files **Terminal**

- Create new file
- Create new folder

tutorials
[more about the latest features](#)

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Notebooks

Files Samples

Users


2573969490

File location
Users/2573969490 [Edit location](#)

File name *

File type

Overwrite if already exists
This will replace any existing file with the same name



to add, browse, and edit files.

including Jupyter Notebooks (.ipynb). The files you create are stored in the workspace file share, and are accessible and shared with other users.

For notebooks, you must connect to an Azure Machine Learning compute resource. Once a notebook or terminal is connected, you can access all workspace assets including experiment details, data, models, and more. [Learn more](#)

[View Azure Machine Learning tutorials](#)
[View Release Notes to learn more about the latest features](#)
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Notebooks

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 - Untitled.ipynb

Untitled.ipynb

Edit in VS Code Compute: E4m... Pyth...

You need to be authenticated to the compute to use any Azure SDK. Please use the authenticate button

E4machine · Kernel launching Last saved a few seconds ago

```
1
```

Manage your sessions here

Session management has moved! Now you can come here to manage the active sessions running on your compute, which will optimize the performance of your terminal and notebooks.

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Files Samples

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 - Untitled.ipynb

*Untitled.ipynb

⋮ ▶ ⏹ ↺ ⏪ ⏩ ⌨ ⋮ Edit in VS Code Compute: E4m... Python 3.10 - SDK V2

You need to be authenticated to the compute to use any Azure SDK. Please use the authenticate button to get authenticated. **Authenticate**

E4machine · Kernel idle CPU 0% RAM 1% Last saved a minute ago Python 3.10 - SDK V2

M 🔍 🗨️ 🔒 ❄️ ⋮ 🗑️

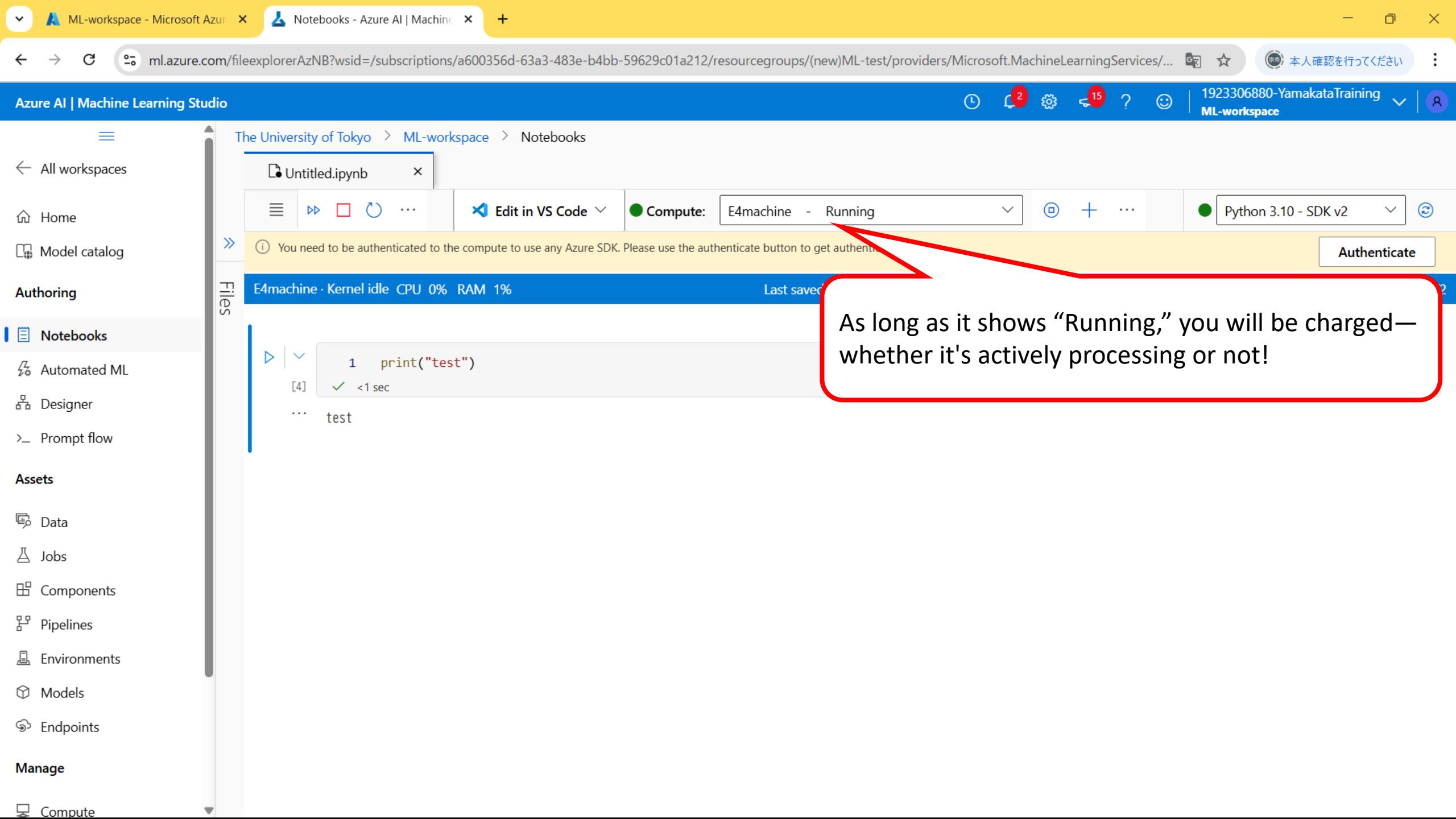
```
1 print("test")
```

[4] ✓ <1 sec

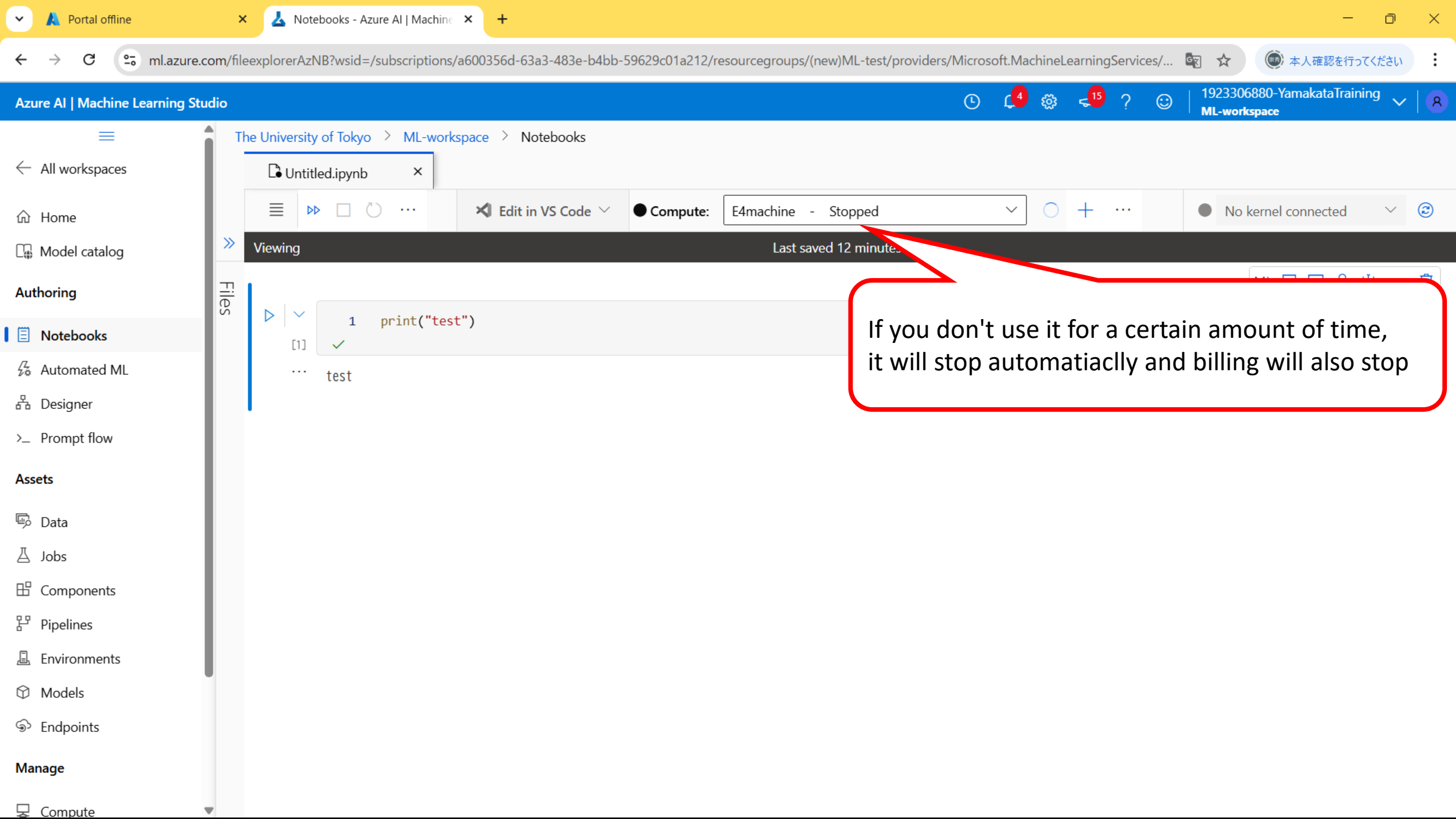
... test

Write and run the code

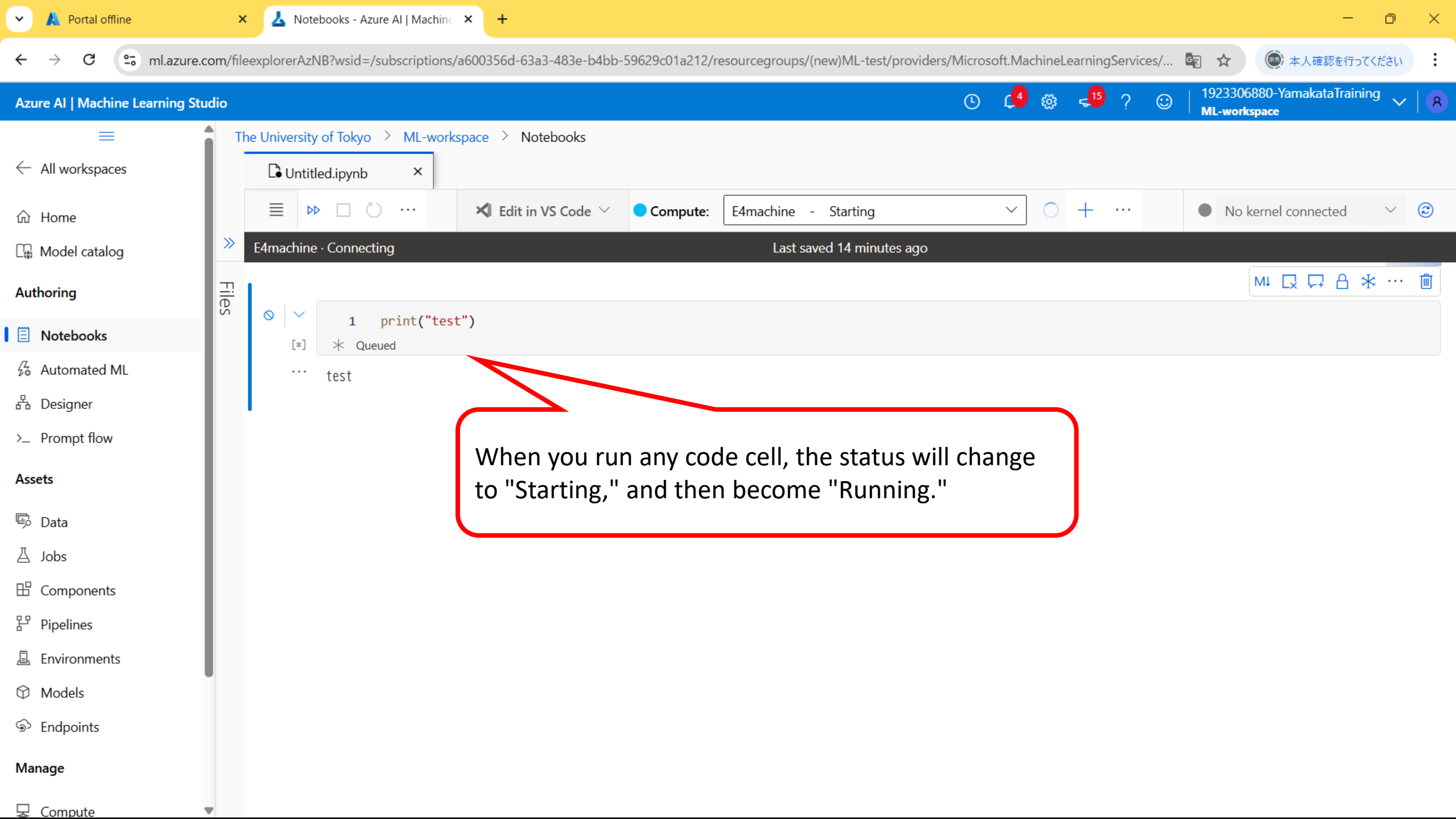
How can I stop the billing?



As long as it shows "Running," you will be charged—whether it's actively processing or not!



If you don't use it for a certain amount of time, it will stop automatically and billing will also stop



When you run any code cell, the status will change to "Starting," and then become "Running."

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Compute

The "Kubernetes clusters" tab is now where you can access previous versions of "inference clusters" (also known as "AKS clusters") and "attached Kubernetes" compute types along with any previously created compute targets using those types. [Learn more](#) about Kubernetes clusters.

Compute instances Compute clusters Kubernetes clusters Serverless instances

It can also be stopped manually.

Choose from a selection of CPU or GPU instances pre-emptible, JupyterLab, Jupyter, and RStudio, ML packages, deep learning frameworks, and GPU drivers. [Learn more about compute instances](#)

+ New Refresh Start Stop Restart Schedule and idle shutdown Delete Reset view View quota

Name	☆	State	Idle shutdown ⓘ	Applications ⓘ	Size	Created
E4machine		Stopped 📄	1 hour	JupyterLab Jupyter VS Code (Web) ...	Standard_E4ds_v4	Apr 8, 2024

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Name	☆	State	Idle shutdown ⓘ	Applications ⓘ	Size	Created
E4machine		Stopped 📄	1 hour	JupyterLab Jupyter VS Code (Web) ...	Standard_E4ds_v4	Apr 8, 2024

It can also be stopped manually.

If you want to change the time until shutdown

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The University of Tokyo > ML-workspace > Compute > E4machine

E4machine ☆

Details Jobs Monitoring (preview)

Refresh Connect Start Stop Restart Delete Diagnose

Resource properties

Status
Stopped

Last operation
Stopped at Apr 8, 2025 5:55 PM: Succeeded

Virtual machine size
Standard_E4ds_v4 (4 cores, 32 GB RAM, 150 GB disk)

Processing unit
CPU - Memory optimized

Estimated cost
\$0.29/hr (when running)

Additional data storage
--

Applications
JupyterLab Jupyter VS Code (Web) VS Code (Desktop) Terminal Notebook

Created on
2025/4/8 17:09:16

SSH access
Disabled

Tags

No tags

Managed identity

No managed identities

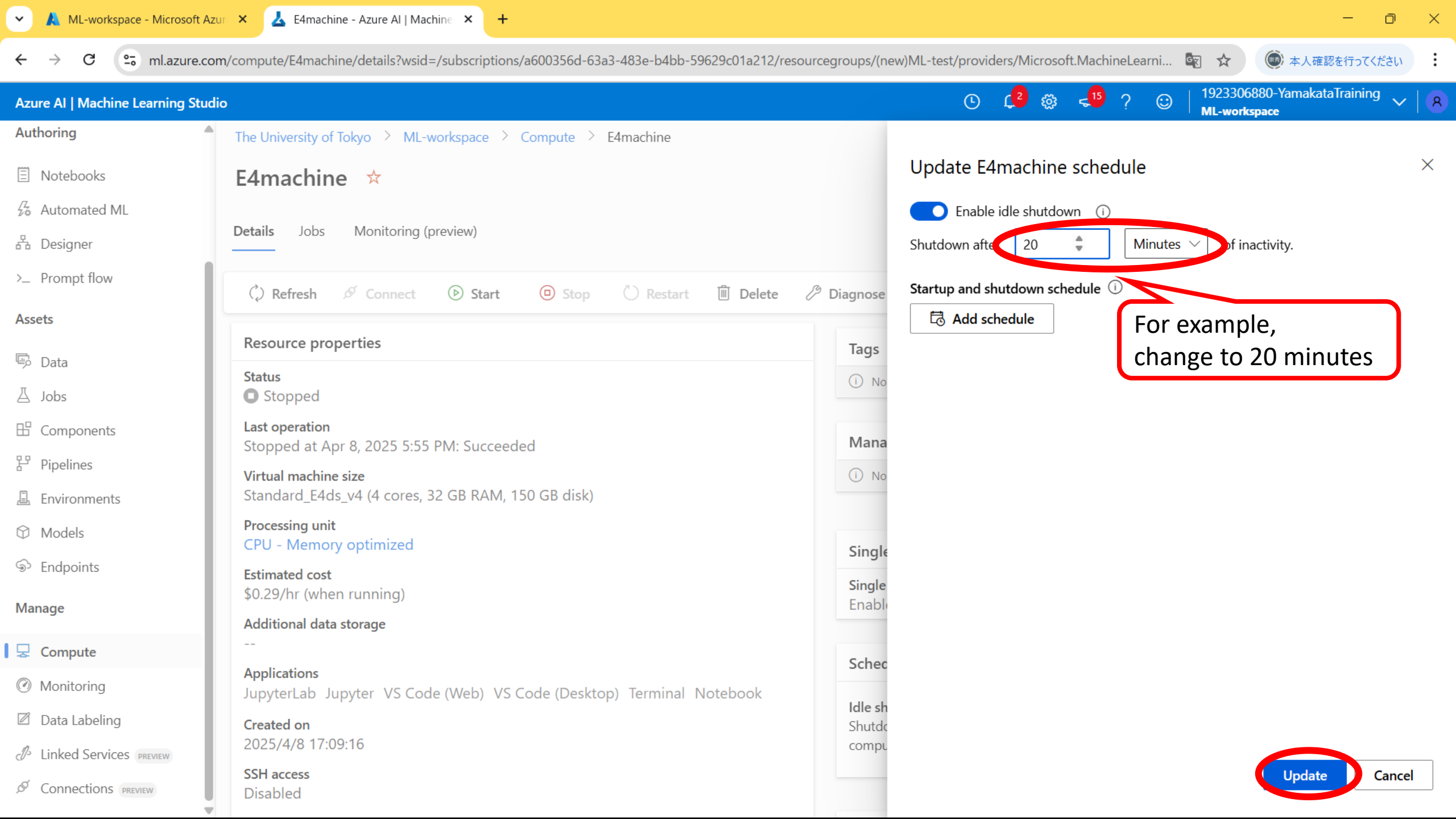
Single sign-on details

Single sign-on
Enabled

Schedules

Idle shutdown schedule
Shutdown after 1 hours of inactivity. Note: if you have prompt flow runtimes configured on this compute instance, idle shutdown will not occur.





The University of Tokyo > ML-workspace > Compute > E4machine

E4machine ☆

Details Jobs Monitoring (preview)

Refresh Connect Start Stop Restart Delete Diagnose

Resource properties

Status

Stopped

Last operation

Stopped at Apr 8, 2025 5:55 PM: Succeeded

Virtual machine size

Standard_E4ds_v4 (4 cores, 32 GB RAM, 150 GB disk)

Processing unit

CPU - Memory optimized

Estimated cost

\$0.29/hr (when running)

Additional data storage

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Applications

JupyterLab Jupyter VS Code (Web) VS Code (Desktop) Terminal Notebook

Created on

2025/4/8 17:09:16

SSH access

Disabled

Update E4machine schedule

Enable idle shutdown ⓘ

Shutdown after Minutes of inactivity.

Startup and shutdown schedule ⓘ

For example, change to 20 minutes

4. Use “VS Code”

A code editor made by Microsoft and loved by developers around the world. The official Azure documentation is available [here](#)

- All workspaces
- Home
- Model catalog
- Authoring
 - Notebooks**
 - Automated ML
 - Designer
 - Prompt flow
- Assets
 - Data
 - Jobs
 - Components
 - Pipelines
 - Environments
 - Models
 - Endpoints
- Manage
 - Compute

The University of Tokyo > ML-workspace > Notebooks

Untitled.ipynb

Run, Stop, Refresh, and other notebook controls.

Edit in VS Code

Compute: E4machine - Running

Python 3.10 - SDK v2

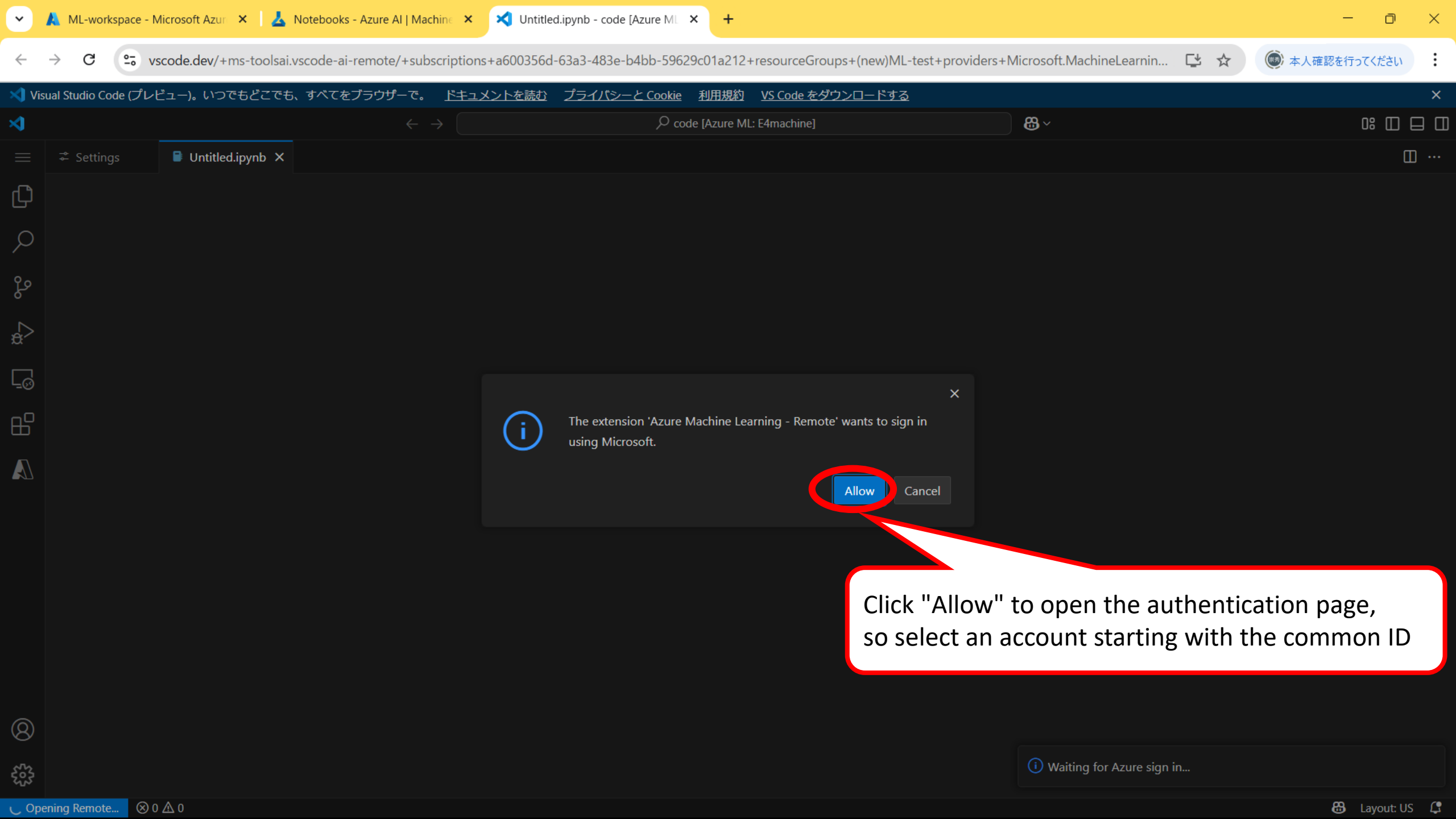
You need to be authenticated to t... Edit in VS Code (Web) ... please use the authenticate button to get authenticated. Authenticate

E4machine · Kernel busy Edit in VS Code (Desktop) Last saved a few seconds ago Python 3.10 - SDK V2

```
1 print("test")
```

[1] ✓

... test



The extension 'Azure Machine Learning - Remote' wants to sign in using Microsoft.

Allow

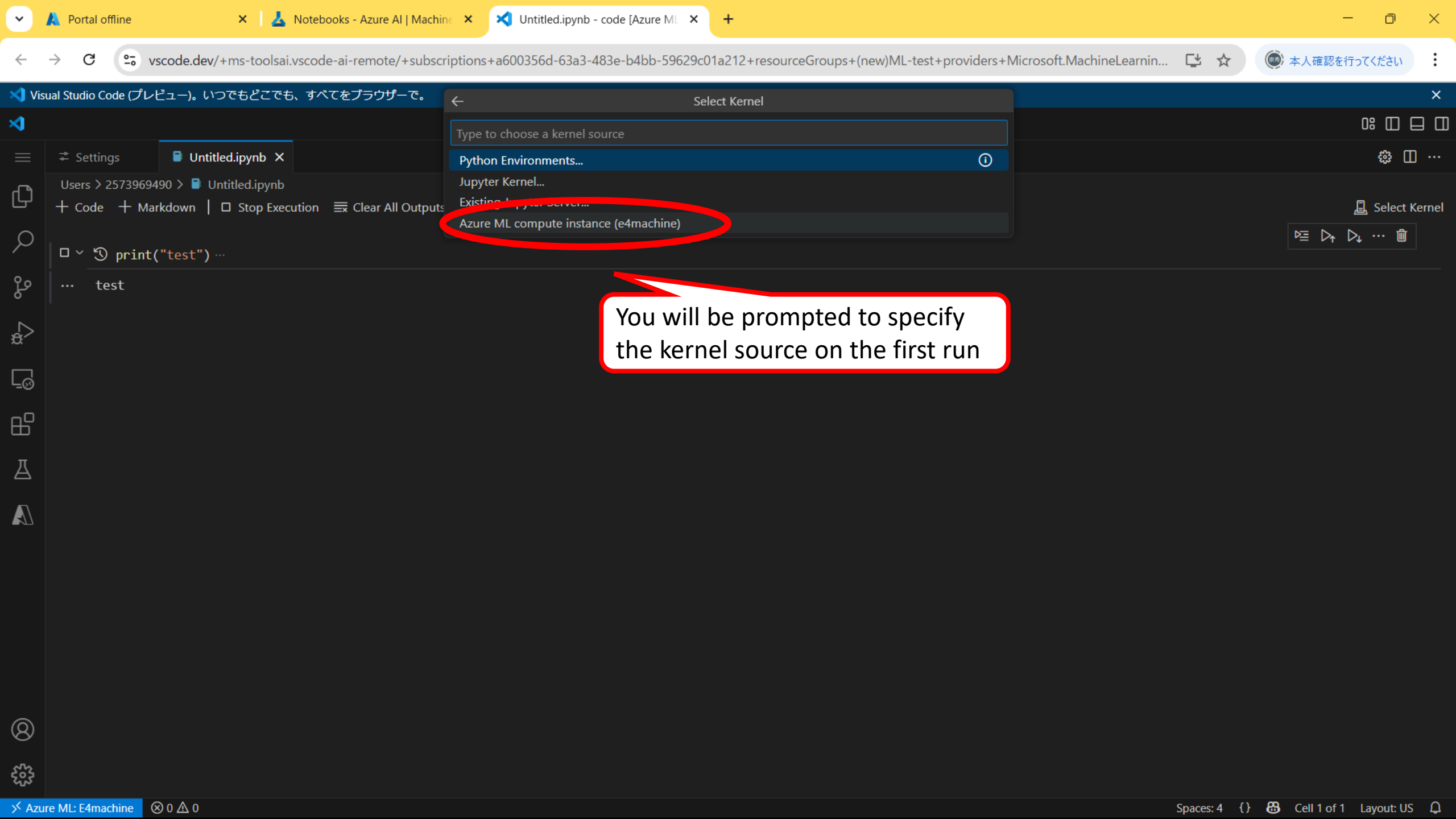
Cancel

Click "Allow" to open the authentication page, so select an account starting with the common ID

Waiting for Azure sign in...

Opening Remote...

Layout: US

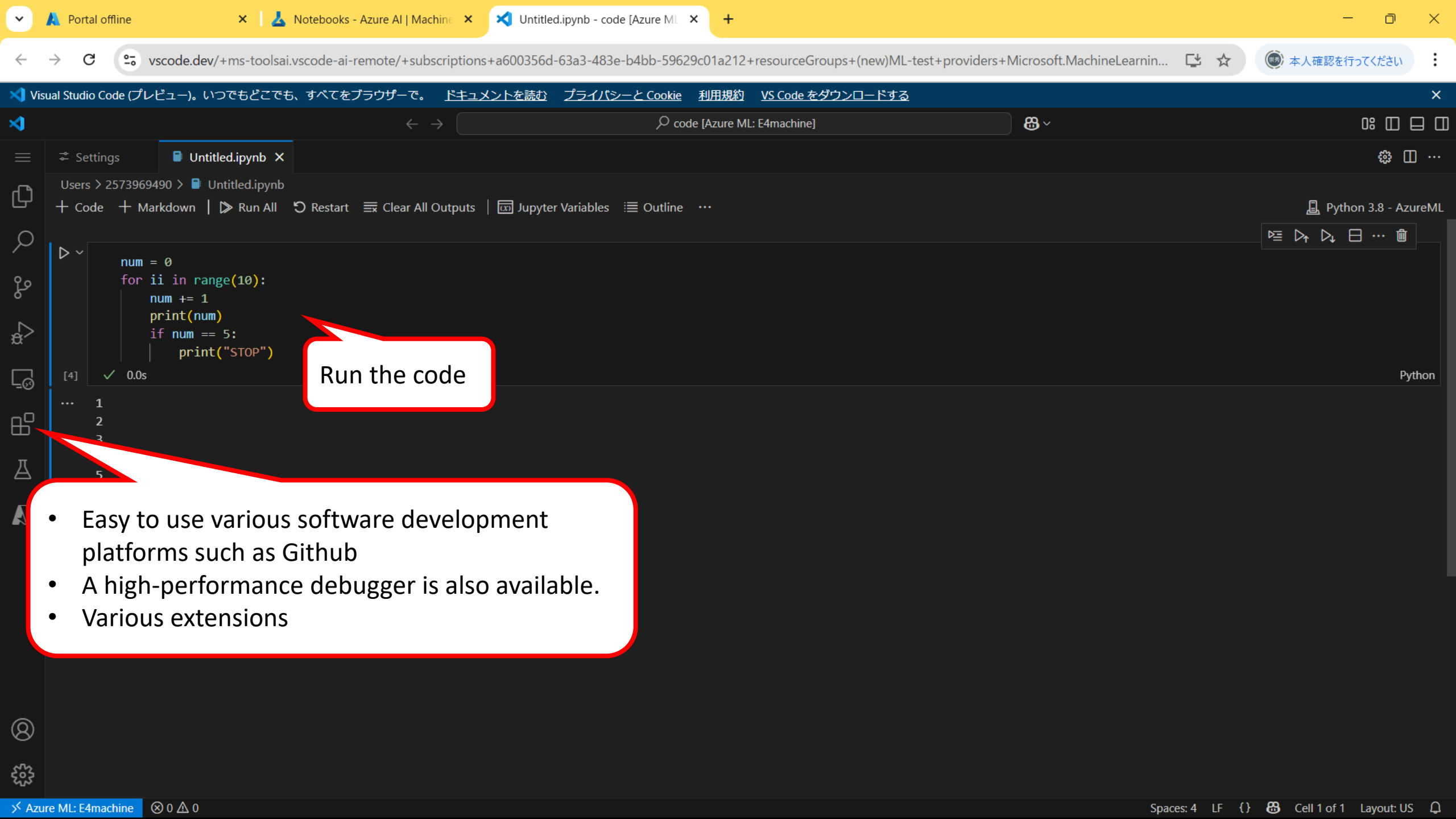


You will be prompted to specify the kernel source on the first run

The image shows a VS Code interface with a kernel selection dialog box open. The dialog box is titled "Select a Kernel from e4machine" and contains a list of kernels. A red callout box with the text "Choose to Azure ML" points to the "Python 3.8 - AzureML" option. The background shows the VS Code editor with a code cell containing `print("test")` and the output "test".

Kernel Name	Path	Label
★ Python 3.10 - SDK v2	/anaconda/envs/azureml_py310_sdkv2/bin/python	Recommended
Python 3 (ipykernel)	/anaconda/envs/jupyter_env/bin/python	Jupyter Kernel
Python 3.8 - AzureML	/anaconda/envs/azureml_py38/bin/python	
Python 3.8 - Pytorch and Tensorflow	/anaconda/envs/azureml_py38_PT_TF/bin/python	
R	/usr/lib/R/bin/R	
Python 3.10 - SDK v2		2 mins ago, ... Jupyter Session

Choose to Azure ML



Run the code

- Easy to use various software development platforms such as Github
- A high-performance debugger is also available.
- Various extensions