

Microsoft Azure

Search resources, services, and docs (G+)

Shellunext\_1693422651...  
UNEXT

Home > Azure Machine Learning >

# Azure Machine Learning

Create a machine learning workspace

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 \*

npunext-1680261963256

Resource group \*

(New) HandsOnAssessment

[Create new](#)

## Workspace details

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

Name \*

juhi-workspace

Region \*

East US

Storage account \*

(new) juhiworkspace4149728205

[Create new](#)

Key vault \*

(new) juhiworkspace3078732752

[Create new](#)

Application insights \*

(new) juhiworkspace7194909786

Review + create

< Previous

Next : Networking

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# Azure Machine Learning

Create a machine learning workspace

✓ Validation passed

Basics

Networking

Encryption

Identity

Tags

Review + create

## Basics

Subscription	npunext-1680261963256
Resource group	(New) HandsOnAssessment
Region	East US
Name	juhi-workspace
Storage account	(new) juhiworkspace4149728205
Key vault	(new) juhiworkspace3078732752
Application insights	(new) juhiworkspace7194909786
Container registry	None

## Networking

Connectivity method	Enable public access from all networks
Network isolation	Public

Create

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[Download a template for automation](#)

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Microsoft.MachineLearningServices | Overview

Deployment

Search

«

Delete

Cancel

Redeploy

Download

Refresh

Overview

Inputs

Outputs

Template

✓ Deployment succeeded

Deployment 'Microsoft.MachineLearningServices' to resource group 'HandsOnAssessment' was successful.

Go to resource

Go to resource group

✓ Your deployment is complete

Deployment name : Microsoft.MachineLearnin...

Subscription : npunext-1680261963256

Resource group : HandsOnAssessment

Start time : 10/4/2023, 1:39:46 PM

Correlation ID : 70c02461-0dda-4600-baa1...

> Deployment details

< Next steps

Go to resource

Cost management

Get notified to stay within your budget and prevent unexpected charges on your bill.

[Set up cost alerts >](#)

Microsoft Defender for Cloud

Secure your apps and infrastructure

[Go to Microsoft Defender for Cloud >](#)

Free Microsoft tutorials

[Start learning today >](#)

Work with an expert

Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.

[Find an Azure expert >](#)

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HandsOnAssessment

Resource group

Search

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Create

Manage view

Delete resource group

Refresh

Export to CSV

Open query

Assign tags

...

Overview

Activity log

Access control (IAM)

Tags

Resource visualizer

Events

Settings

Deployments

Security

Deployment stacks

Policies

Properties

Locks

Cost Management

Cost analysis

Essentials

JSON View

Resources

Recommendations

Filter for any field...

Type equals all

Location equals all

Add filter

Showing 1 to 5 of 5 records.

Show hidden types

No grouping

List view

<input type="checkbox"/>	Name ↑↓	Type ↑↓	Location ↑↓	
<input type="checkbox"/>	juhi-workspace	Azure Machine Learning workspace	East US	...
<input type="checkbox"/>	juhiworkspace3078732752	Key vault	East US	...
<input type="checkbox"/>	juhiworkspace4149728205	Storage account	East US	...
<input type="checkbox"/>	juhiworkspace7194909786	Application Insights	East US	...
<input type="checkbox"/>	juhiworkspace7828267082	Log Analytics workspace	East US	...

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[Give feedback](#)

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Home > Storage accounts > juhiworkspace4149728205

juhiworkspace4149728205 | Containers

Storage account

Search

<< + Container Change access level Restore containers Refresh Delete Give feedback

Search containers by prefix

Show deleted containers

	Name	Last modified	Anonymous access level	Lease state	
<input type="checkbox"/>	\$logs	10/4/2023, 1:40:29 PM	Private	Available	...
<input type="checkbox"/>	azureml	10/4/2023, 1:40:33 PM	Private	Available	...
<input type="checkbox"/>	azureml-blobstore-d1d15d5c-dff8-421f-8ce9-d479bac62...	10/4/2023, 1:40:33 PM	Private	Available	...

Data storage

Containers

File shares

Queues

Tables

Security + networking

Microsoft Azure

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Shellunext\_1693422651...  
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Home > HandsOnAssessment > juhiworkspace4149728205 | Containers >

azureml-blobstore-d1d15d5c-dff8-421f-8ce9-d479bac6

Container

Search

<< Upload Change access level Refresh

Search blobs by prefix (case-sensitive)

Add filter

Name

No results

Authentication method: Access key (Switch to Azure AD User)

Location: azureml-blobstore-d1d15d5c-dff8-421f-8ce9-d479bac6

Upload blob

1 file(s) selected: customer\_data.csv

Drag and drop files here or Browse for files

☐ Overwrite if files already exist

Advanced

Upload

Give feedback

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Shellunext\_1693422651...  
UNEXT

Home > HandsOnAssessment > juhiworkspace4149728205 | Containers >

azureml-blobstore-d1d15d5c-dff8-421f-8ce9-d479bac6295d

...

Container

Search

Upload
 Change access level
 Refresh
 Delete
 Change tier
 Acquire lease
 Break lease
 View snapshots
 ...

Overview

Diagnose and solve problems
 Access Control (IAM)

Settings

Shared access tokens
 Access policy
 Properties
 Metadata

Authentication method: Access key ([Switch to Azure AD User Account](#))

Location: azureml-blobstore-d1d15d5c-dff8-421f-8ce9-d479bac6295d

Search blobs by prefix (case-sensitive)

☐ Show deleted blobs

Add filter

Name	Modified	Access tier	Archive status	Blob type
<input type="checkbox"/> customer_data.csv	10/4/2023, 1:51:05 PM	Hot (Inferred)		Block blob

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juhi-workspace

Azure Machine Learning workspace

Azure Machine Learning workspace

Search

Download config.json
 Delete

Overview

Activity log
 Access control (IAM)
 Tags
 Diagnose and solve problems
 Events

Settings

Networking
 Properties
 Locks

Monitoring

Alerts
 Metrics
 Diagnostic settings
 Logs

Essentials

JSON View

Resource group	<a href="#">HandsOnAssessment</a>	Studio web URL
East US	Subscription	...
Subscription ID	8611f143-8cf4-47cb-b7d4-8b18969153e1	Application Insights
<a href="#">juhiworkspace4149728205</a>		azureml://eastus.api.azureml.ms/mlflow/v1.0/subscriptions/8611f143-8cf4-47cb-b7d4-8b18969153e1/juhiworkspace4149728205

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

Azure AI | Machine Learning Studio

juhi-workspace

# juhi-workspace

Generative AI with Prompt flow

Bring Your Own Data QnA

Bring Your Own Data Chat QnA

Ask Wikipedia

Generative AI models

openai-whisper-large

databricks-dolly-v2-12b

gpt-4-32k

gpt-4

## 1. Data Preparation:

Azure AI | Machine Learning Studio

juhi-workspace

Unext > juhi-workspace > Data

# Data

Data assets | Datasets | Dataset monitors

+ Create Refresh Archive View options

Show latest version only Include archived

Search

Name Source Version Created on Modified on Type

No data assets to display

25/Page

Azure AI | Machine Learning Studio

npunext-1680261963256  
juhi-workspace

Create data asset

1 Data type

2 Data source

Name \*

Customer\_data

Description

Data asset description

Type ⓘ

Tabular

Use cases for data types

When should I use File type?

The File type is recommended in most scenarios when you are working with a single data file of any type (including tabular data). This type allows you to specify a file location by URI in a storage location on your local computer, an attached Datastore, blob/ADLS storage, or a publicly available http(s) location. There are many types of supported URIs. In the Azure Machine Learning CLI v2 or Python SDK v2, this data type is called uri\_file. [Learn more about the uri\\_file type](#)

When should I use Folder type?

The Folder type has all the same capabilities and use cases as the File type, but is used

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Cancel

Azure AI | Machine Learning Studio

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juhi-workspace

Create data asset

1 Data type

2 Data source

3 Source storage type

4 Storage path

5 Settings

6 Schema

7 Review

Choose a source for your data asset

Choose the data source you want to create your asset from. A data source can be from a local storage location on your computer, from an attached datastore, from Azure storage, or from a publicly available web location.

From Azure storage

Create a data asset from registered data storage services including Azure Blob Storage, Azure file share, and Azure Data Lake.

From local files

Create a data asset by uploading files from your local drive.

From SQL databases

Create a dataset from Azure SQL database and Azure PostgreSQL database.

From web files

Create a data asset from a single file located at a public web URL.

From Azure Open Datasets

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Azure AI | Machine Learning Studio

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juhi-workspace

S

Create data asset

✓ Data type

✓ Data source

1 Source storage type

4 Storage path

5 Settings

6 Schema

7 Review

Asset

Select a datastore

Choose a storage type and a datastore that contains your data. You can also create a new datastore for your data first.

Datastore type \*

Azure Blob Storage

Create new datastore

Search datastore

Filter

Columns

Name ↓	Storage name	Created on
workspaceblobstore	juhiworkspace4149728205	Oct 4, 2023 1:
workspaceartifactstore	juhiworkspace4149728205	Oct 4, 2023 1:

Page 1 of 1 25/Page

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Azure AI | Machine Learning Studio

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?

npunext-1680261963256

juhi-workspace

S

Create data asset

✓ Data type

✓ Data source

✓ Source storage type

4 Storage path

5 Settings

6 Schema

7 Review

Asset

Choose a storage path

Navigate to or enter the storage path you want to use for this data asset.

Browse to storage path

Enter storage path manually

Selected path: customer\_data.csv

Filter...

Name	Created on	Modified on
customer_data.csv	Oct 4, 2023 1:51 PM	Oct 4, 2023 1:51 PM

Advanced settings

Back

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Cancel

Azure AI | Machine Learning Studio

🕒

🔔

⚙️

🔍

?

😊

npunext-1680261963256

juhi-workspace

Create data asset

✓ Data type

✓ Data source

✓ Source storage type

✓ Storage path

5 Settings

6 Schema

7 Review

These settings determine how the data is parsed. The initial settings are automatically detected, but you can change them as needed to parse the data.

File format

Delimiter

Example

Encoding

Delimited

Comma

Field1,Field2,Field3

UTF-8

Column headers

Skip rows

All files have same headers

None

☐ Dataset contains multi-line data ⓘ

ⓘ Note: Processing tabular files with multi-line data is slower because multiple CPU cores cannot be used to ingest the data in parallel. Checking this option may result in slower processing times.

CustomerID	Age	AnnualIncome	SpendingScore
1	46	371,045	99
2	43	45,194	24
3	48	111,465	59
4	61	null	21
5	39	191,670	43

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Review

Cancel

Azure AI | Machine Learning Studio

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⚙️

🔍

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😊

npunext-1680261963256

juhi-workspace

Create data asset

✓ Data type

✓ Data source

✓ Source storage type

✓ Storage path

✓ Settings

6 Schema

7 Review

Schema

Column types are auto-detected based on the initial subset of the data and can be updated here. Values not aligning with the specified column type will fail conversion and would be either null-filled or replaced with error value. Any conversions preview errors are non-blocking and you can proceed.

🔍 Search column name

Incl...	Column name	Type	Example values	Date format ⓘ	Properties ⓘ
<input type="radio"/>	Path	String		Not applicable to s...	Not applicable t...
<input checked="" type="radio"/>	CustomerID	Integer	1, 2, 3	Not applicable to s...	Not applicable t...
<input checked="" type="radio"/>	Age	Decimal (dot '.')	46, 43, 48	Not applicable to s...	Not applicable t...
<input checked="" type="radio"/>	AnnualIncome	Decimal (dot '.')	371045, 45194, 111465	Not applicable to s...	Not applicable t...
<input checked="" type="radio"/>	SpendingScore	Decimal (dot '.')	99, 24, 59	Not applicable to s...	Not applicable t...

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Azure AI | Machine Learning Studio

npunext-1680261963256  
juhi-workspace

Create data asset

✓ Data type

✓ Data source

✓ Source storage type

✓ Storage path

✓ Settings

✓ Schema

Review

Review

Review the settings for your data asset and make any changes as needed.

Data type

Name  
Customer\_data

Description  
--

Type  
tabular

Data source

Type  
AzureStorage

Storage

Datastore type  
AzureBlob

Datastore name  
workspaceblobstore

Schema

CustomerID  
Integer

Age  
Decimal

AnnualIncome  
Decimal

SpendingScore  
Decimal

Back

Create

Cancel

Azure AI | Machine Learning Studio

npunext-1680261963256  
juhi-workspace

Unext > juhi-workspace > Data

Data

Data assets

Datastores

Dataset monitors

PREVIEW

Data assets are immutable references to your data that can be created from datastores, local files, public URLs, or Open Datasets. Data assets created with AzureML v2 APIs cannot be deleted, but you can up-version or archive them for easy referencing and reuse in machine learning tasks. Deleting data assets created with v1 APIs will permanently delete the data asset and all metadata. [Learn more about data assets](#)

+ Create

Refresh

Archive

View options

Show latest version only

Include archived

Search

Filter

Columns

Name	☆	Source	Version	Created on ↓	Modified on	Type
Customer_data		This workspace	1	Oct 4, 2023 1:56 PM	Oct 4, 2023 1:56 PM	Tab

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Azure AI | Machine Learning Studio

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Prompt flow PREVIEW

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Data

Jobs

Components

Pipelines

Environments

Models

Unext > juhi-workspace > Designer

Designer

New pipeline

Classic prebuilt

Custom

Show more samples

This low-code option uses existing prebuilt components and earlier dataset types (tabular, file), and is best suited for data processing and traditional machine learning tasks like regression and classification. This option continues to be supported but will not have any new components added.

Create a new pipeline using classic prebuilt components

Image Classification using DenseNet

Binary Classification using Vowpal Wabbit Model - A...

Wide & Deep based Recommendation - Restau...

Pipelines

Pipeline drafts

Pipeline jobs

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Delete

View options

Search

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Columns

Select a pipeline from list to preview

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Models

Unext > juhi-workspace > Designer > Authoring

Search by name, tags and description

Tags: All

Add filter

Data

Component

1

You can find the prebuilt sample data under Component tab. [Click here](#)

Customer\_data

Version 1

Shellunext unextIDA57

10/4/2023

Pipeline-Created-on-10-04-2023

Save

Pipeline interface

Customer\_data

Customer\_data

1

Data output

Navigator

75%

1:1

Azure AI | Machine Learning Studio

Unext > juhi-workspace > Designer > Authoring

Search by name, tags and description

Tags: All Add filter

Data Component

95 +

Runs a SQLite query on input datasets to transform the data. [Learn More](https://aka.ms/aml/apply-s-...)

azureml.Designer:true 1/10/2023

**Clean Missing Data**  
Microsoft  
Specifies how to handle the values missing from a dataset. [Learn More](https://aka.ms/aml/clean-mi-...)

azureml.Designer:true 1/10/2023

**Clip Values**  
Microsoft  
Detects outliers and clips or replaces their values. [Learn More](https://aka.ms/aml/clip-values)

azureml.Designer:true 1/10/2023

Pipeline-Created-on-10-04-2023

Save Pipeline interface

Customer\_data  
Customer\_data  
V | 1

Data output

Dataset

Clean Missing Data  
clean\_missing\_data

Cleaned data... Cleaning tran...

Parameters

Columns to be cleaned	
Minimum missing value ratio	0.0
Maximum missing value ratio	1.0
Cleaning mode	Custom substitution value
Replacement value	0
Generate missing value indicator column	False

Navigator 75%

Azure AI | Machine Learning Studio

Unext > juhi-workspace > Designer > Authoring

Undo Redo Validate Show lineage Clone AutoSave

Configure & Submit

Save Pipeline interface

**Columns to be cleaned**

Select columns ☒ With rules ☐ By name

Allow duplicates and preserve column order in selection ☐

Include Column names Age X AnnualIncome X SpendingScore X

Save Cancel

Generate missing value indicator column

Generate missing value indicator column

False

Output settings

Azure AI | Machine Learning Studio

Unext > juhi-workspace > Designer > Authoring

Undo Redo Validate Show lineage Clone AutoSave Configure & Submit

Pipeline-Created-on-10-04-2023 Save Pipeline interface

Customer\_data  
Customer\_data  
Data output  
Dataset  
Clean Missing Data  
clean\_missing\_data  
Cleaned datas... Cleaning tran...

Parameters

Columns to be cleaned  
Minimum missing value ratio  
Maximum missing value ratio  
Cleaning mode  
Replacement value  
Generate missing value indicator column

Clean Missing Data

Columns to be cleaned \*  
Column names: Age,AnnualIncome,SpendingScore  
Edit column

Minimum missing value ratio \*  
0.0

Maximum missing value ratio \*  
1.0

Cleaning mode \*  
Custom substitution value

Replacement value  
0

Generate missing value indicator column \*  
False

Output settings

Navigator 100%

## 2. Model Development:

Azure AI | Machine Learning Studio

Unext > juhi-workspace > Designer > Authoring

Undo Redo Validate Show lineage Clone ... Configure & Submit

Pipeline-Created-on-10-04-2023 Save Pipeline interface

Search by name, tags and description

Tags: All Add filter

Data Component

95 +

Cross Validate a classification or regression model with standard metrics. [Learn More](https://aka.ms/...)

azureml.Designertree 1/10/2023

Evaluate Model  
Microsoft  
Evaluates the results of a classification or regression model with standard metrics. [Learn More](https://aka.ms/...)

azureml.Designertree 1/10/2023

Score Image Model  
Microsoft  
Scores predictions for a trained image model. [Learn More](https://aka.ms/aml/score-image-mo...)

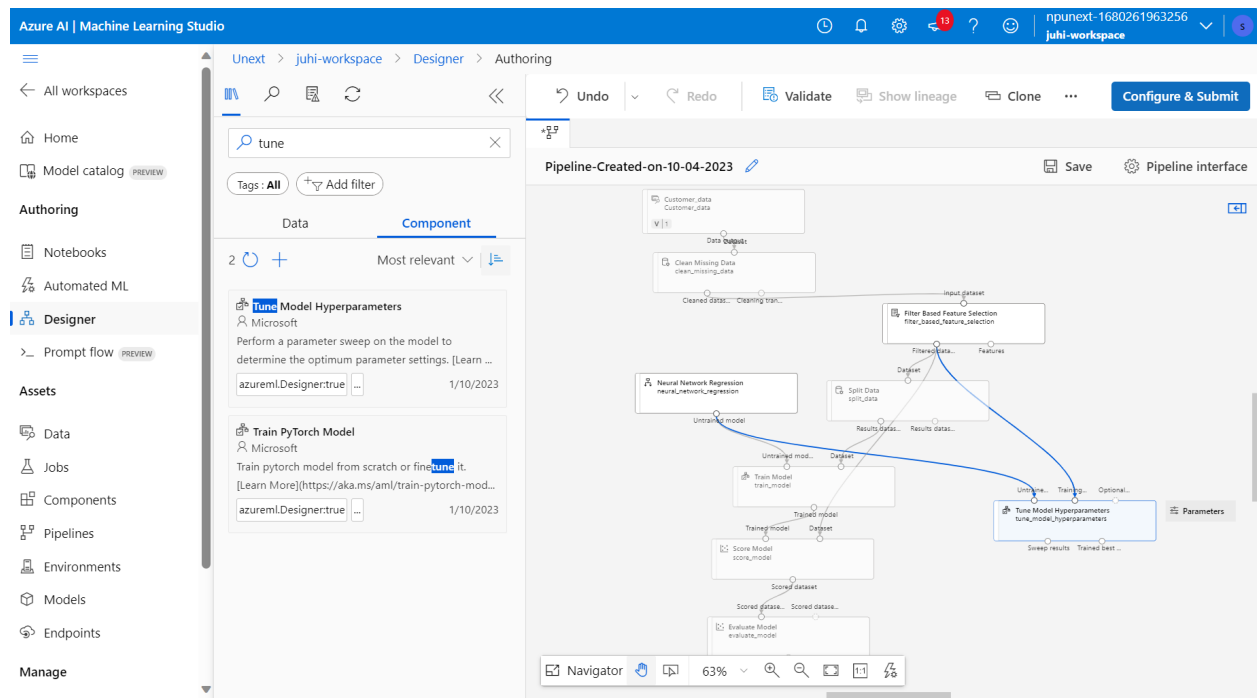
azureml.Designertree 1/10/2023

Score Model  
Microsoft  
Scores predictions for a trained classification or regression model. [Learn More](https://aka.ms/a...

Customer\_data  
Customer\_data  
Data output  
Clean Missing Data  
clean\_missing\_data  
Cleaned datas... Cleaning tran...  
Filter Based Feature Selection  
Filter\_based\_feature\_selection  
Features  
Split Data  
split\_data  
Results datas... Results datas...  
Neural Network Regression  
neural\_network\_regression  
Untrained model  
Train Model  
train\_model  
Trained model  
score\_model  
Scored dataset  
Evaluate Model  
evaluate\_model

Navigator 63%

### 3. Hyperparameter Tuning:



#### 4. Assessment Questions:

1. What are the key steps involved in preparing the dataset for training a machine learning model using Azure Machine Learning? Briefly explain each step?

The key steps involved in preparing the dataset for training a machine learning model using Azure Machine Learning are: Loading the data into the storage, Cleaning the data, Processing the data and performing necessary transformations.

Why is it important to split the dataset into training and testing sets when developing a machine learning model? How does this help in model evaluation?

3. Describe a machine learning algorithm suitable for predicting customer purchasing behavior in the given scenario. Explain why you chose this algorithm. Neural Regression

What is hyperparameter tuning, and why is it important in machine learning? Explain a technique used for hyperparameter tuning and its benefits