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Course: Machine Learning in Cloud Computing - AIGC-5003

Assignment 6

Assignment

- Amazon SageMaker has built-in algorithms. They are listed in this URL: <https://docs.aws.amazon.com/sagemaker/latest/dg/algos.html>
- Select one of them that you are comfortable with to train a model
- Use an appropriate data set from <https://www.openml.org/>
- You need show a completed training job and the model artifact in S3 bucket
- You need to upload the **selected data set and the notebook file** that you use to training the model to BB. If you use console, just upload the data set.
- **Upload a one page or two pages** to report what you have done.
- **NOTE:** Please make sure you do not start a Hosting job. If you do so, make sure you terminate the hosting endpoint as it will consume your credit.

About the dataset:

- The transplant dataset is taken from [OpenML](#).
- It is about on patient deaths within 30 days of surgery in 131 U.S. hospitals. For which, please go through “Christiansen and Morris, Bayesian Biostatistics, D. Berry and D. Stangl, editors, 1996, Marcel Dekker, Inc.”
- The Data is on 131 heart transplant hospitals in the US. The 3646 transplants took place during a 27 month period from October 1987 through December 1989.
- The columns are: obs = hospital #, e = expected # of deaths within 30 days of the transplant surgeries, z = number of deaths within 30 days of surgery, n = # of patients receiving heart transplant within this time period. (Christiansen and Morris, Bayesian Biostatistics, D. Berry and D. Stangl, editors, 1996.)
- The patient level data which was used to create this data set was provided by the United Network for Organ Sharing, 1100 Boulders Parkway, Suite 500, P.O. Box 13770, Richmond, VA, 23225.

4 Features

	Feature Name	Type	Distinct/Missing Values
■	obs (target)	numeric	131 distinct values 0 missing attributes
■	e	numeric	127 distinct values 0 missing attributes
■	z	numeric	12 distinct values 0 missing attributes
■	n	numeric	55 distinct values 0 missing attributes

	A	B	C	D
1	1	0.057	0	1
2	2	0.064	0	1
3	3	0.064	0	1
4	4	0.066	1	1
5	5	0.462	0	1
6	6	0.086	0	2
7	7	0.114	0	2
8	8	0.117	0	2
9	9	0.118	0	2
10	10	0.119	0	2
11	11	0.126	0	2
12	12	0.231	1	2
13	13	0.261	1	2
14	14	0.211	1	3
15	15	0.216	1	3
16	16	0.218	0	3
17	17	0.648	1	3
18	18	0.143	0	4
19	19	0.144	2	4
20	20	0.21	1	4

Step 1: Create a S3 bucket and inside this S3 bucket create a folder named transplant_console.

Step 2: Now, add three folders in transplant_console and call it as “training_console”, “validation_console” and “output”. After which, add two .csv files called “Transplant_Training_Console.csv” and “Transplant_Validation_Console.csv” to the respective training and validation folders by ensuring 70:30 train test split ratio.

Screenshot of the AWS S3 Management Console showing the 'Buckets' page.

Account snapshot:

- Total storage: 981.5 KB
- Object count: 37
- Average object size: 26.5 KB
- You can enable advanced metrics in the "default-account-dashboard" configuration.

Buckets (8) Info:

Name	AWS Region	Access	Creation date
aiservicelab3	US East (N. Virginia) us-east-1	Bucket and objects not public	February 7, 2023, 13:01:52 (UTC-05:00)
assignment-4-customer-feedback	US East (N. Virginia) us-east-1	Bucket and objects not public	February 15, 2023, 16:34:11 (UTC-05:00)
awslabonebucket	US East (N. Virginia) us-east-1	Bucket and objects not public	January 17, 2023, 16:17:54 (UTC-05:00)
labtwo-s3bucket	US East (N. Virginia) us-east-1	Bucket and objects not public	January 31, 2023, 13:11:46 (UTC-05:00)
modulotwosession	US East (N. Virginia) us-east-1	Bucket and objects not public	January 31, 2023, 11:30:56 (UTC-05:00)
my-bucket-labnr	US East (N. Virginia) us-east-1	Objects can be public	January 17, 2023, 09:23:25 (UTC-05:00)
my-nrs3bucket	US East (N. Virginia) us-east-1	Objects can be public	January 14, 2023, 16:38:08 (UTC-05:00)
sm-nr-s3bucket	US East (N. Virginia) us-east-1	Bucket and objects not public	January 14, 2023, 16:32:39 (UTC-05:00)

Create bucket:

General configuration:

- Bucket name: transplant-assignment-6
- AWS Region: US East (N. Virginia) us-east-1
- Copy settings from existing bucket - optional: Choose bucket

Object Ownership:

- Control ownership of objects written to this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership determines who can specify access to objects.
- ACLs disabled (recommended): All objects in this bucket are owned by this account. Access to this bucket and its objects is specified using only policies.
- ACLs enabled: Objects in this bucket can be owned by other AWS accounts. Access to this bucket and its objects can be specified using ACLs.

Upcoming permission changes to disable ACLs:

Screenshot of the AWS S3 Bucket Creation Wizard:

Step 1: Set Bucket Name and Region

Bucket name: transplant-assignment-6
Region: US East (N. Virginia) us-east-1

Step 2: Set Bucket Location

Location: US East (N. Virginia) us-east-1

Step 3: Set Bucket Settings

Tags (0) - optional
No tags associated with this bucket.
Add tag

Default encryption (info)
Server-side encryption is automatically applied to new objects stored in this bucket.

Encryption key type: Amazon S3 managed keys (SSE-S3)
 Amazon S3 managed keys (SSE-S3)
 AWS Key Management Service key (SSE-KMS)

Bucket Key
When KMS encryption is used to encrypt new objects in this bucket, the bucket key reduces encryption costs by lowering calls to AWS KMS.
Learn more
 Disable
 Enable

Advanced settings

After creating the bucket you can upload files and folders to the bucket, and configure additional bucket settings.

Create bucket

Success! Successfully created bucket "transplant-assignment-6". To upload files and folders, or to configure additional bucket settings choose View details.

Buckets

Name	AWS Region	Access	Creation date
aiservicelab3	US East (N. Virginia) us-east-1	Bucket and objects not public	February 7, 2023, 13:01:32 (UTC-05:00)
assignment-4-customer-feedback	US East (N. Virginia) us-east-1	Bucket and objects not public	February 15, 2023, 16:34:11 (UTC-05:00)
awslabonebucket	US East (N. Virginia) us-east-1	Bucket and objects not public	January 17, 2023, 16:17:54 (UTC-05:00)
labtwo-s3bucket	US East (N. Virginia) us-east-1	Bucket and objects not public	January 31, 2023, 13:11:46 (UTC-05:00)
modulertwosession	US East (N. Virginia) us-east-1	Bucket and objects not public	January 31, 2023, 11:30:56 (UTC-05:00)
my-bucket-labnr	US East (N. Virginia) us-east-1	Objects can be public	January 17, 2023, 09:23:25 (UTC-05:00)
my-nrsbucket	US East (N. Virginia) us-east-1	Objects can be public	January 14, 2023, 16:58:05 (UTC-05:00)
sm-nr-s3bucket	US East (N. Virginia) us-east-1	Bucket and objects not public	January 14, 2023, 16:32:39 (UTC-05:00)
transplant-assignment-6	US East (N. Virginia) us-east-1	Bucket and objects not public	March 8, 2023, 20:14:18 (UTC-05:00)

Amazon S3 > Buckets > transplant-assignment-6

Objects (0)

No objects

You don't have any objects in this bucket.

Amazon S3 > Buckets > transplant-assignment-6 > Create folder

Your bucket policy might block folder creation

If your bucket policy prevents uploading objects without specific tags, metadata, or access control list (ACL) grantees, you will not be able to create a folder using this configuration. Instead, you can use the upload configuration to upload an empty folder and specify the appropriate settings.

Folder

Folder name: transplant_console /

Server-side encryption

The following settings apply only to the new folder object and not to the objects contained within it.

Encryption key type: [Info](#)

Amazon S3 managed keys (SSE-S3)

AWS Key Management Service key (SSE-KMS)

Create folder

Screenshot of the AWS S3 console showing the creation of a folder named "transplant_console".

The browser address bar shows: `https://s3.console.aws.amazon.com/s3/buckets/transplant-assignment-6?region=us-east-1&tab=objects`

The AWS S3 sidebar includes:

- Buckets
- Access Points
- Object Lambda Access Points
- Multi-Region Access Points
- Batch Operations
- IAM Access Analyzer for S3
- Block Public Access settings for this account
- Storage Lens
- Dashboards
- AWS Organizations settings
- Feature spotlight
- AWS Marketplace for S3

The main content area displays a success message: "Successfully created folder "transplant_console". Operation successfully completed."

The breadcrumb navigation shows: Amazon S3 > Buckets > transplant-assignment-6

The bucket name is transplant-assignment-6.

The Objects tab shows one item:

Name	Type	Last modified	Size	Storage class
transplant_console/	Folder	-	-	-

Actions available for the folder include: Copy S3 URI, Copy URL, Download, Open, Delete, Actions (dropdown), Create folder, and Upload.

Below the table, there is a search bar: "Find objects by prefix" and a pagination control: "1" (highlighted).

Feedback and Language settings are at the top left. The bottom right shows the date and time: 8:15 PM 2023-03-08.

Three identical screenshots are stacked vertically, showing the progression of the folder creation process.

Screenshot of the AWS S3 Management Console showing the creation of a new folder named "output" in the "transplant_console" bucket under the "transplant-assignment-6" prefix.

Create folder

Folder name: output

Your bucket policy might block folder creation
If your bucket policy prevents uploading objects without specific tags, metadata, or access control list (ACL) grantees, you will not be able to create a folder using this configuration. Instead, you can use the [upload configuration](#) to upload an empty folder and specify the appropriate settings.

Encryption key type: Amazon S3 managed keys (SSE-S3)

Create folder

Success!
Successfully created folder "output".
Operation successfully completed.

Objects (1)

Name	Type	Last modified	Size	Storage class
output/	Folder	-	-	-

Screenshot of the AWS S3 Management Console showing the creation of a folder named "training_console" in the "transplant_assignment-6" bucket.

Create folder

Folder name: training_console /

Your bucket policy might block folder creation
If your bucket policy prevents uploading objects without specific tags, metadata, or access control list (ACL) grantees, you will not be able to create a folder using this configuration. Instead, you can use the [upload configuration](#) to upload an empty folder and specify the appropriate settings.

Encryption key type: Amazon S3 managed keys (SSE-S3)

Create folder

Successfully created folder "training_console".
Operation successfully completed.

Objects (2)

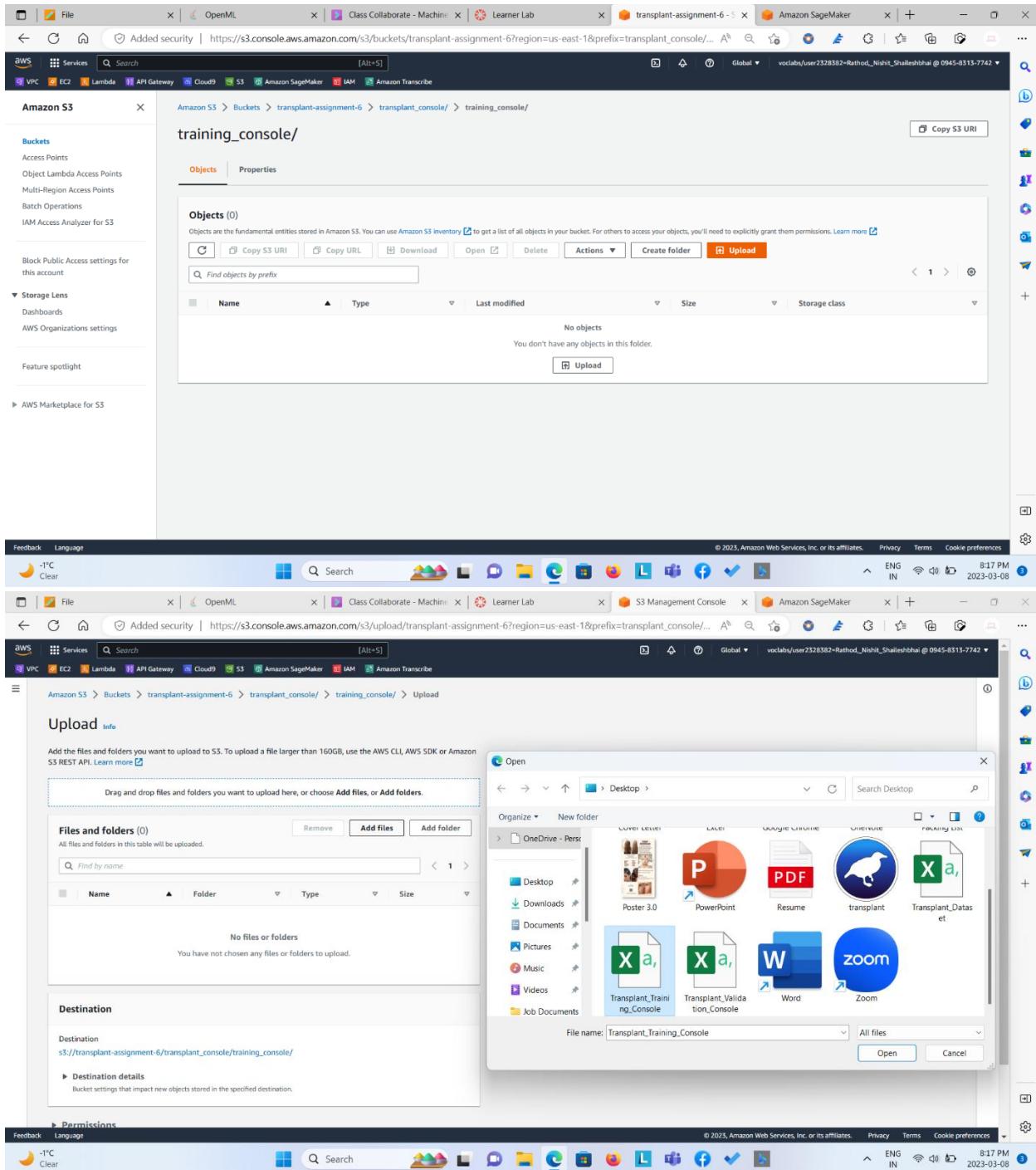
Name	Type	Last modified	Size	Storage class
output/	Folder	-	-	-
training_console/	Folder	-	-	-

Screenshot of the Amazon S3 Management Console showing the creation of a new folder named "validation_console".

The "Your bucket policy might block folder creation" warning is present.

The "validation_console" folder is successfully created, and its contents are displayed:

Name	Type	Last modified	Size	Storage class
output/	Folder	-	-	-
training_console/	Folder	-	-	-
validation_console/	Folder	-	-	-



The screenshot shows the AWS S3 Management Console with the following details:

- Upload Progress:** 100% complete.
- File Details:** `Transplant_Training_Console.csv` (1 Total, 1.3 KB)
- Destination:** `S3://transplant_assignment-6/transplant_console/training_console/`
- Permissions:** Grant public access and access to other AWS accounts.
- Properties:** Specify storage class, encryption settings, tags, and more.

The screenshot shows a Microsoft Edge browser window. At the top, there's a toolbar with icons for Feedback, Language, Search, and various Microsoft services like OneDrive, Mail, and Teams. The address bar shows a secure connection to the AWS S3 Management Console. Below the address bar, the AWS navigation bar is visible with links for Services, VPC, EC2, Lambda, API Gateway, Cloud9, S3, Amazon SageMaker, IAM, and Amazon Transcribe. The main content area displays a success message: "Upload succeeded" followed by "View details below." The status bar at the bottom right shows the date as 2023-03-08.

Upload: status

The information below will no longer be available after you navigate away from this page.

Summary

Destination	Succeeded	Failed
s3://transplant-assignment-6/transplant_console/training_console/	1 file, 1.3 KB (100.00%)	0 files, 0 B (0%)

Files and folders Configuration

Files and folders (1 Total, 1.3 KB)

Name	Folder	Type	Size	Status	Error
Transplant_Training_Console.csv	-	text/csv	1.3 kB	Succeeded	-

Feedback Language © 2023, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

-1°C Clear

Search

818 PM 2023-03-08

The screenshot shows the AWS S3 console interface. The URL in the address bar is https://s3.console.aws.amazon.com/s3/buckets/transplant-assignment-6?prefix=transplant_console/®ion=us-east-1. The page displays a single object named 'Transplant_Training_Console.csv' which is a CSV file.

Name	Type	Last modified	Size	Storage class
Transplant_Training_Console.csv	csv	March 8, 2023, 20:18:12 (UTC-05:00)	1.3 KB	Standard

The screenshot shows the AWS S3 console interface. The URL in the address bar is https://s3.console.aws.amazon.com/s3/buckets/transplant-assignment-6?prefix=transplant_console/®ion=us-east-1. The page displays three objects: 'output/' (Folder), 'training_console/' (Folder), and 'validation_console/' (Folder). The 'validation_console/' folder is currently selected.

Name	Type	Last modified	Size	Storage class
output/	Folder	-	-	-
training_console/	Folder	-	-	-
validation_console/	Folder	-	-	-

Screenshot of the AWS S3 Management Console showing the upload process for a CSV file.

Upload Step 1: The user is prompted to drag and drop files or choose Add files or Add folders. A Windows "Open" file dialog is overlaid, showing files from the Desktop including "Transplant_Training_Console" and "Transplant_Validation_Console".

Upload Step 2: The "Files and folders" section shows "Transplant_Validation_Console.csv" selected. The destination is set to "s3://transplant-assignment-6/transplant_console/validation_console/".

Upload Step 3: The "Permissions" section is expanded, showing "Grant public access and access to other AWS accounts." The "Properties" section is also visible.

Upload Step 4: The "Upload" button is highlighted at the bottom right of the upload interface.

Added security | https://s3.console.aws.amazon.com/s3/upload/transplant-assignment-6?region=us-east-1&prefix=transplant_console/ ...

Services Search [Alt+S]

VPC EC2 Lambda API Gateway Cloud9 S3 Amazon SageMaker IAM Amazon Transcribe

Upload succeeded
View details below.

Upload: status

The information below will no longer be available after you navigate away from this page.

Summary

Destination	Succeeded	Failed
s3://transplant-assignment-6/transplant_console/validation_console/	1 file, 639.0 B (100.00%)	0 files, 0 B (0%)

Files and folders Configuration

Files and folders (1 Total, 639.0 B)

Name	Folder	Type	Size	Status	Error
Transplant_Validation_Console.csv	-	text/csv	639.0 B	Succeeded	-



Added security | https://s3.console.aws.amazon.com/s3/buckets/transplant-assignment-6?region=us-east-1&prefix=transplant_console/ ...

Services Search [Alt+S]

VPC EC2 Lambda API Gateway Cloud9 S3 Amazon SageMaker IAM Amazon Transcribe

Amazon S3 > Buckets > transplant-assignment-6 > transplant_console/ > validation_console/

validation_console/

Copy S3 URI

Objects Properties

Objects (1)

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more

Name	Type	Last modified	Size	Storage class
Transplant_Validation_Console.csv	csv	March 8, 2023, 20:20:05 (UTC-05:00)	639.0 B	Standard



Step 3: Create a Training Job from Sage Maker's Training Tab.

- Select SageMaker built-in algorithm.
- Select XGboost Algorithm.
- Select the server that you want to train.
- Set the hyperparameter values.
- Define two channels for data: one for training data and another for validation data.
- Set the training channel with correct S3 bucket location.
- Set the validation channel with correct S3 bucket location.
- Set the output folder by pasteing S3 output folder path.
- Start the training job.
- Review the training job.
- See the result of training job in the output folder as model.tar.gz file.

Screenshot of the AWS Management Console showing the Amazon SageMaker service. The user is viewing the 'Training jobs' section, where a single training job named 'nr-training-job' is listed as completed.

Name	Creation time	Duration	Job status	Warm pool status	Time left
nr-training-job	Jan 31, 2023 17:08 UTC	4 minutes	Completed	-	-

The sidebar on the left provides navigation links for various SageMaker features like JumpStart, Governance, Ground Truth, Notebook, Processing, Training, Inference, Edge Manager, Augmented AI, and AWS Marketplace.

Create training job

When you create a training job, Amazon SageMaker sets up the distributed compute cluster, performs the training, and deletes the cluster when training has completed. The resulting model artifacts are stored in the location you specified when you created the training job. [Learn more](#)

Job settings

Job name: transplant-nfj (Maximum of 63 alphanumeric characters. Can include hyphens (-), but not spaces. Must be unique within your account in an AWS Region.)

IAM role: LabRole (Amazon SageMaker requires permissions to call other services on your behalf. Choose a role or let us create a role that has the [AmazonSageMakerFullAccess](#) IAM policy attached.)

Create role using the role creation wizard

Algorithm options: Use an Amazon SageMaker built-in algorithm, your own algorithm, or a third-party algorithm from AWS Marketplace.

Algorithm source: Amazon SageMaker built-in algorithm [Learn more](#)

- Your own algorithm resource
- Your own algorithm container in ECR [Learn more](#)
- An algorithm subscription from AWS Marketplace

Screenshot of the Amazon SageMaker console showing the creation of a new training job.

Choose an algorithm

- Selected: Tabular - XGBoost : v1.3
- Container: 68331368378.dkr.ecr.us-east-1.amazonaws.com/sagemaker-xgboost:1.3-1
- Input mode: File
- Metrics:

Metric name	Regex
train:mse	.\"[0-9]+\".#011train-rmse:([+-]?[0-9]*\\.?[0-9]+(?:[eE][+-]?[0-9]+)?)*."
train:mae	.\"[0-9]+\".#011train-mae:([+-]?[0-9]*\\.?[0-9]+(?:[eE][+-]?[0-9]+)?)*."
train:logloss	.\"[0-9]+\".#011train-logloss:([+-]?[0-9]*\\.?[0-9]+(?:[eE][+-]?[0-9]+)?)*."
train:error	.\"[0-9]+\".#011train-error:([+-]?[0-9]*\\.?[0-9]+(?:[eE][+-]?[0-9]+)?)*."
train:rror	.\"[0-9]+\".#011train-rror:([+-]?[0-9]*\\.?[0-9]+(?:[eE][+-]?[0-9]+)?)*."
train:mlgloss	.\"[0-9]+\".#011train-mlgloss:([+-]?[0-9]*\\.?[0-9]+(?:[eE][+-]?[0-9]+)?)*."
train:auc	.\"[0-9]+\".#011train-auc:([+-]?[0-9]*\\.?[0-9]+(?:[eE][+-]?[0-9]+)?)*."

Feedback Language: English (IN)

Resource configuration

 - Instance type: ml.m4.xlarge
 - Instance count: 1
 - Additional storage volume per instance (GB): 1
 - Keep alive period: 1 hour (60 minutes or 3600 seconds)
 - Encryption key - optional: No Custom Encryption
 - Stopping condition: Maximum runtime: 26 hours

Network

Feedback: 2°C Clear

Language: English (IN) 8:33 PM 2023-03-08

The screenshot shows two side-by-side configurations of hyperparameters for an XGBoost job in Amazon SageMaker. Both configurations are identical, with the exception of the 'num_round' parameter.

Top Configuration (Screenshot 1):

Key	Value
early_stopping_rounds	
csv_weights	0
num_round	2
booster	gbtree
verbosity	1
nthread	
eta	0.3
gamma	0.0
max_depth	6
min_child_weight	1.0
max_delta_step	0
subsample	1.0
sampling_method	uniform

Bottom Configuration (Screenshot 2):

Key	Value
subsample	1.0
sampling_method	uniform
colsample_bytree	1.0
colsample_bylevel	1
lambda	1.0
alpha	0.0
tree_method	auto
sketch_eps	0.05
scale_pos_weight	1.0
updater	
	grow_colmaker X
	prune X
dsplit	row
refresh_leaf	1
process_type	default
grow_policy	depthwise
max_leaves	0

The screenshot shows the AWS SageMaker console with the 'XGBoost Hyperparameters' tab selected. The configuration form contains the following parameters:

Parameter	Value
grow_policy	depthwise
max_leaves	0
max_bin	256
num_parallel_tree	1
sample_type	uniform
normalize_type	tree
rate_drop	0.0
one_drop	0
skip_drop	0.0
lambda_bias	0.0
tweedie_variance_power	1.5
objective	reg:squarederror
num_class	
base_score	0.5
eval_metric	

Feedback: Language: ENG IN 8:37 PM 2023-03-08

The screenshot shows the AWS S3 console with the 'transplant_assignment-6' bucket selected. The 'training_console' folder is shown, containing a single object named 'Transplant_Training_Console.csv'. The object details are as follows:

Name	Type	Last modified	Size	Storage class
Transplant_Training_Console.csv	csv	March 8, 2023, 20:18:12 (UTC-05:00)	1.3 KB	Standard

Feedback: Language: ENG IN 8:39 PM 2023-03-08

Input data configuration

Create up to 20 channels of input sources. If the algorithm you chose supports multiple input channels, you can specify those here. See [Algorithms Provided by Amazon SageMaker: Common Parameters](#)

Channels

train

Channel name: train, Input mode - optional: File

Content type - optional: CSV

Compression type: None, Record wrapper: None

Data source: S3

S3 data type: S3Prefix, S3 data distribution type: FullyReplicated

S3 location: s3://transplant-assignment-6/transplant_console/training_console/Transplant_Trainin

Amazon S3

Buckets

- Access Points
- Object Lambda Access Points
- Multi-Region Access Points
- Batch Operations
- IAM Access Analyzer for S3
- Block Public Access settings for this account
- Storage Lens
- Dashboards
- AWS Organizations settings
- Feature spotlight
- AWS Marketplace for S3

validation_console/

Objects

Object: Transplant_Validation_Console.csv

Actions: Copy S3 URI, Copy URL, Download, Open, Delete, Actions, Create folder, Upload

Name	Type	Last modified	Size	Storage class
Transplant_Validation_Console.csv	csv	March 8, 2023, 20:05 (UTC-05:00)	639.0 B	Standard

Screenshot of the AWS SageMaker console showing the creation of a new job.

Job Configuration:

- Channel name:** validation
- Input mode - optional:** File
- Content type - optional:** csv
- Compression type:** None
- Record wrapper:** None
- Data source:** S3
- S3 data type:** S3Prefix
- S3 data distribution type:** FullyReplicated
- S3 location:** signment-6/transplant_console/validation_console/Transplant_Validation_Console.csv
- Add channel:** [button]

Checkpoint configuration - optional:

The algorithm is responsible for periodically generating checkpoints. The checkpoints are saved to this location and used to resume managed spot training jobs. [Learn more.](#)

Feedback: Language: English (IN) Date: 2023-03-08

Amazon S3 Bucket Structure:

- Buckets
 - Object Lambda Access Points
 - Multi-Region Access Points
 - Batch Operations
 - IAM Access Analyzer for S3
 - Block Public Access settings for this account
- Storage Lens
- Dashboards
- AWS Organizations settings
- Feature spotlight
- AWS Marketplace for S3

Objects:

Name	Type	Last modified	Size	Storage class
output/	Folder	-	-	-
training_console/	Folder	-	-	-
validation_console/	Folder	-	-	-

Feedback: Language: English (IN) Date: 2023-03-08

Checkpoint configuration - optional

The algorithm is responsible for periodically generating checkpoints. The checkpoints are saved to this location and used to resume managed spot training jobs. [Learn more.](#)

S3 location
s3://bucket/path-to-your-data/
To find a path, go to [Amazon S3](#)

Local path - optional
If the algorithm provides checkpoints, this is the local location the checkpoints are written to. If you do not specify a location, the checkpoints are written to /opt/ml/checkpoints.

Output data configuration

S3 output path
s3://transplant-assignment-6/transplant_console/output/

Encryption key - optional
If you want Amazon SageMaker to encrypt the output of your training job using your own AWS KMS encryption key instead of the default S3 service key, provide its ID or ARN.

Managed spot training

Enable managed spot training - optional
Save compute costs for jobs that have flexibility in start and end times. Amazon SageMaker will use spare capacity only to run this job. [Learn more](#)

Maximum wait time before job terminates optional stopping condition
At the end of this duration you will receive the complete or partial results of your managed spot training job.
48 hours

Tags - optional

Key	Value
<input type="text"/>	<input type="text"/>

Add tag

[Cancel](#) [Create training job](#)

Screenshot of the Amazon SageMaker console showing the Training jobs page.

The top banner displays a success message: "Success! You created a training job. To track the status of the job, view details." with a "View details" button.

The main table lists two training jobs:

Name	Creation time	Duration	Job status	Warm pool status	Time left
transplant-nr	Mar 09, 2023 01:50 UTC	-	InProgress	-	-
nr-training-job	Jan 31, 2023 17:08 UTC	4 minutes	Completed	-	-

The bottom banner shows the AWS navigation bar and the status bar indicating the date and time (2023-03-08 8:50 PM).

The screenshot is repeated three times vertically.

Screenshot of the AWS SageMaker console showing the "transplant-nr" training job settings.

Job settings

Job name	Status	SageMaker metrics time series	IAM role ARN
transplant-nr	Completed View history	Disabled	arn:aws:siam::094583137742:role/LabRole
ARN	Creation time	Training time (seconds)	
arnaws:sagemaker:us-east-1:094583137742:training-job/transplant-nr	Mar 09, 2023 01:50 UTC	103	
	Last modified time	Billable time (seconds)	
	Mar 09, 2023 01:53 UTC	103	
		Managed spot training savings	
		0%	
		Tuning job source/parent	-

Algorithm

Algorithm ARN	Additional volume size (GB)	Maximum wait time for managed spot training(s)	Volume encryption key
-	1	-	-

Training image

Training image	Maximum runtime (s)	Managed spot training
683315688378.dkr.ecr.us-east-1.amazonaws.com/sagemaker-xgboost:1.3-1	93600	Disabled

Input mode

File

Instance group

Instance group	Instance type	Instance count	Keep alive period
-	mLm4.xlarge	1	-

Input data configuration: train

Channel name	Input mode	Data source	S3 data type
train	File	S3	S3Prefix
	Content type	Instance group	S3 data distribution type
	csv	-	FullyReplicated
	Compression type		URI

The screenshot shows two side-by-side browser windows displaying the Amazon SageMaker console.

Left Window:

Input data configuration: train

Channel name	Input mode	Data source	S3 data type
train	File	S3	S3Prefix
	Content type	Instance group	S3 data distribution type
	csv	-	FullyReplicated
	Compression type		URI
	None		s3://transplant-assignment-6/transplant_console/training_console/Tra
	Record wrapper type		nspoint_Training_Console.csv
	None		

Input data configuration: validation

Channel name	Input mode	Data source	S3 data type
validation	File	S3	S3Prefix
	Content type	Instance group	S3 data distribution type
	csv	-	FullyReplicated
	Compression type		URI
	None		s3://transplant-assignment-6/transplant_console/validation_console/
	Record wrapper type		Transplant_Validation_Console.csv
	None		

Right Window:

Checkpoint configuration

S3 output path	Local path
-	-

Metrics

Name	Regex
trainmae	.*\[\[(0 9)+\].*\#011train-mae:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
traingamma-nloglik	.*\[\[(0 9)+\].*\#011train-gamma-nloglik:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
validation:mae	.*\[\[(0 9)+\].*\#011validation-mae:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
validation:gloss	.*\[\[(0 9)+\].*\#011validation-logloss:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
traincox-nloglik	.*\[\[(0 9)+\].*\#011train-cox-nloglik:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
validation:f1	.*\[\[(0 9)+\].*\#011validation-f1:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
validation:cox-nloglik	.*\[\[(0 9)+\].*\#011validation-cox-nloglik:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
trainaccuracy	.*\[\[(0 9)+\].*\#011train-accuracy:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
trainmse	.*\[\[(0 9)+\].*\#011train-mse:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
validation:poisson-nloglik	.*\[\[(0 9)+\].*\#011validation-poisson-nloglik:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
trainerror	.*\[\[(0 9)+\].*\#011train-error:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
trainndcg	.*\[\[(0 9)+\].*\#011train-ndcg:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
validation:map	.*\[\[(0 9)+\].*\#011validation-map:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
validation:gamma-deviance	.*\[\[(0 9)+\].*\#011validation-gamma-deviance:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
validation:error	.*\[\[(0 9)+\].*\#011validation-error:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
trainpoisson-nloglik	.*\[\[(0 9)+\].*\#011train-poisson-nloglik:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
trainrmse	.*\[\[(0 9)+\].*\#011train-rmse:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
train:gloss	.*\[\[(0 9)+\].*\#011train-logloss:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
validation:accuracy	.*\[\[(0 9)+\].*\#011validation-accuracy:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*
validation:rmse	.*\[\[(0 9)+\].*\#011validation-rmse:([-+]?[0-9]*\?([0-9]+)?([eE][+-]?[0-9]+)?).*

The screenshot shows two side-by-side browser windows displaying the Amazon SageMaker console. Both windows are for the same job named 'transplant-assignment'.

Top Window (Left): Output Data Configuration

The left window shows the 'Output data configuration' section. It includes an 'S3 output path' field containing 's3://transplant-assignment-6/transplant_console/output/' and an 'Output encryption key' field set to '-'. The sidebar on the left lists various training metrics and configurations.

```

train:cox-nloglik
validation:f1
validation:cox-nloglik
train:accuracy
train:rmse
validation:poisson-nloglik
train:error
train:ndcg
validation:map
validation:gamma-deviance
validation:error
train:poisson-nloglik
train:rmse
train:logloss
validation:accuracy
validation:rmse
train:gamma-deviance
validation:mse
validation:ndcg
train:f1
validation:r2
train:map
validation:gamma-nloglik
  
```

Bottom Window (Right): Hyperparameters

The right window shows the 'Hyperparameters' section. It displays a table of hyperparameter settings:

Key	Value
alpha	0.0
base_score	0.5
booster	gbtree
colsample_bylevel	1
colsample_bytree	1.0
csv_weights	0
dsplit	row
eta	0.3
gamma	0.0
grow_policy	depthwise
lambda	1.0
lambda_bias	0.0
max_bin	256
max_delta_step	0
max_depth	6
max_leaves	0
min_child_weight	1.0
normalize_type	tree
num_parallel_tree	1
num_round	2

The sidebar on the left of the bottom window also lists training metrics and configurations.

The screenshot shows two stacked views of the Amazon SageMaker console interface.

Top View: This view displays the results of an XGBoost Hyperparameter tuning job. The left sidebar shows the navigation menu, and the main area lists various hyperparameters and their values. A portion of the list is as follows:

Hyperparameter	Value
grow_policy	depthwise
lambda	1.0
lambda_bias	0.0
max_bin	256
max_delta_step	0
max_depth	6
max_leaves	0
min_child_weight	1.0
normalize_type	tree
num_parallel_tree	1
num_round	2
objective	reg:squarederror
one_drop	0
process_type	default
rate_drop	0.0
refresh_leaf	1
sample_type	uniform
sampling_method	uniform
scale_pos_weight	1.0
sketch_eps	0.03
skip_drop	0.0
subsample	1.0
tree_method	auto
tweedie_variance_power	1.5
updater	grow_colmaker,prune
verbosity	1

Bottom View: This view shows the Network configuration for the job. It includes sections for VPC settings (No custom VPC settings applied), network isolation (Enable network isolation: False), inter-container traffic encryption (Enable inter-container traffic encryption: False), and warm pool status (Status: -, Time left: -, Billable time: -, Reused by job: -). Below this is a Monitor section with links for algorithm metrics, instance metrics, logs, and search logs, along with a time range selector (1h, 3h, 12h, 1d, 3d, 1w) and an 'Add to dashboard' button.

The screenshot displays two browser windows side-by-side, both showing the AWS SageMaker interface.

Top Window (SageMaker Console):

- Left Sidebar:** Includes links like "Getting started", "Studio", "Studio Lab", "Canvas", "RStudio", "Domains", "SageMaker dashboard", "Images", "Lifecycle configurations", "Search", "JumpStart", "Governance", "Ground Truth", "Notebook", "Processing", and "Training".
- Main Content Area:** Shows two line charts for "Output" and "Loss". The "Output" chart has values ranging from 0 to 0.2 across time points 01:45, 01:46, 01:47, 01:48, 01:49, and 01:50. The "Loss" chart also has values ranging from 0 to 0.2 across the same time points.
- Output Section:** Displays the "S3 model artifact" path: `s3://transplant-assignment-6/transplant_console/output/transplant-nr/output/model.tar.gz`.
- Tags Section:** An empty table with columns "Key" and "Value".

Bottom Window (Amazon S3 Bucket View):

- Left Sidebar:** Shows "Buckets" and other S3-related options.
- Main Content Area:** Shows the contents of the "output/" folder in the "transplant-assignment-6" bucket. It lists a single item: "transplant-nr/" which is a folder.
- Toolbar:** Includes buttons for "Copy S3 URI", "Upload", and a search bar.

Both windows have a standard Windows taskbar at the bottom with icons for File Explorer, Task View, and various applications.

Screenshot of the AWS S3 console showing the contents of the 'output' folder in the 'transplant-assignment-6' bucket.

The 'Objects' table shows one item:

Name	Type	Last modified	Size	Storage class
model.tar.gz	gz	March 8, 2023, 20:53:22 (UTC-05:00)	774.0 B	Standard

Details for the 'model.tar.gz' object:

Object overview

- Owner: awslabsc0w4952617t1670108254
- AWS Region: US East (N. Virginia) us-east-1
- Last modified: March 8, 2023, 20:53:22 (UTC-05:00)
- Size: 774.0 B
- Type: gz
- Key: transplant_console/output/transplant-nr/output/model.tar.gz

Object management overview

The following bucket properties and object management configurations impact the behavior of this object.

Bucket properties

Management configurations

Object management overview

The following bucket properties and object management configurations impact the behavior of this object.

Bucket properties

Bucket Versioning
When enabled, multiple variants of an object can be stored in the bucket to easily recover from unintended user actions and application failures.

Disabled

Bucket "transplant-assignment-6" doesn't have Bucket Versioning enabled
We recommend that you enable Bucket Versioning to help protect against unintentionally overwriting or deleting objects. [Learn more](#)

Enable Bucket Versioning

Object Lock
When enabled, this object will be prevented from being deleted or overwritten until the hold is explicitly removed.

Disabled

Object Lock retention mode
In governance mode, users can't overwrite or delete this object or alter its lock settings unless they have special permissions. In compliance mode the object can't be overwritten or deleted by any user, including the root user in your AWS account.

Disabled

Default retention period
Objects will be prevented from being overwritten or deleted for the duration of the retention period.

Management configurations

Replication status
When a replication rule is applied to an object the replication status indicates the progress of the operation.

View replication rules

Expiration rule
You can use a lifecycle configuration to define expiration rules to schedule the removal of this object after a pre-defined time period.

Expiration date
The object will be permanently deleted on this date.

Storage class

Amazon S3 offers a range of storage classes designed for different use cases. [Learn more](#) or see [Amazon S3 pricing](#).

Storage class
Standard

Server-side encryption settings [Info](#)

Server-side encryption protects data at rest.

Encryption key type: [Info](#)
AWS Key Management Service key (SSE-KMS)

Encryption key ARN:
[arnaws:kms:us-east-1:094583137742:key/5d8504d9-eb1b-4d3f-a0ca-c68309db8e26](#)

Bucket Key:
When KMS encryption is used to encrypt new objects in this bucket, the bucket key reduces encryption costs by lowering calls to AWS KMS. [Learn more](#)

Enabled

Additional checksums

Checksum functions are used for additional data integrity verification of new objects. [Learn more](#)

Additional checksums
Off

Tags (0)

Track storage cost of other criteria by tagging your objects. [Learn more](#)

Key	Value

The screenshot shows the AWS S3 console interface. On the left, there's a sidebar with navigation links such as Buckets, Storage Lens, Dashboards, AWS Organizations settings, Feature spotlight, and AWS Marketplace for S3. The main content area is titled "Amazon S3" and contains several configuration sections:

- Additional checksums**: A section for checksum functions with a note about integrity verification.
- Tags (0)**: A section for tagging objects with a note about storage cost.
- Metadata (1)**: A table showing one entry: Type: System defined, Key: Content-Type, Value: application/x-gzip.
- Object Lock**: A section explaining the WORM model with a note that Object Lock is currently disabled.

A message at the bottom states: "Amazon S3 currently does not support enabling Object Lock after a bucket has been created. To enable Object Lock for this bucket, contact Customer Support."

The bottom of the screen shows the Windows taskbar with various pinned icons and the system tray indicating the date and time (8:58 PM, 2023-03-08).