

# Exam Questions AWS-Certified-Machine-Learning-Specialty

AWS Certified Machine Learning - Specialty

<https://www.2passeasy.com/dumps/AWS-Certified-Machine-Learning-Specialty/>



**NEW QUESTION 1**

A Data Scientist needs to create a serverless ingestion and analytics solution for high-velocity, real-time streaming data.

The ingestion process must buffer and convert incoming records from JSON to a query-optimized, columnar format without data loss. The output datastore must be highly available, and Analysts must be able to run SQL queries against the data and connect to existing business intelligence dashboards.

Which solution should the Data Scientist build to satisfy the requirements?

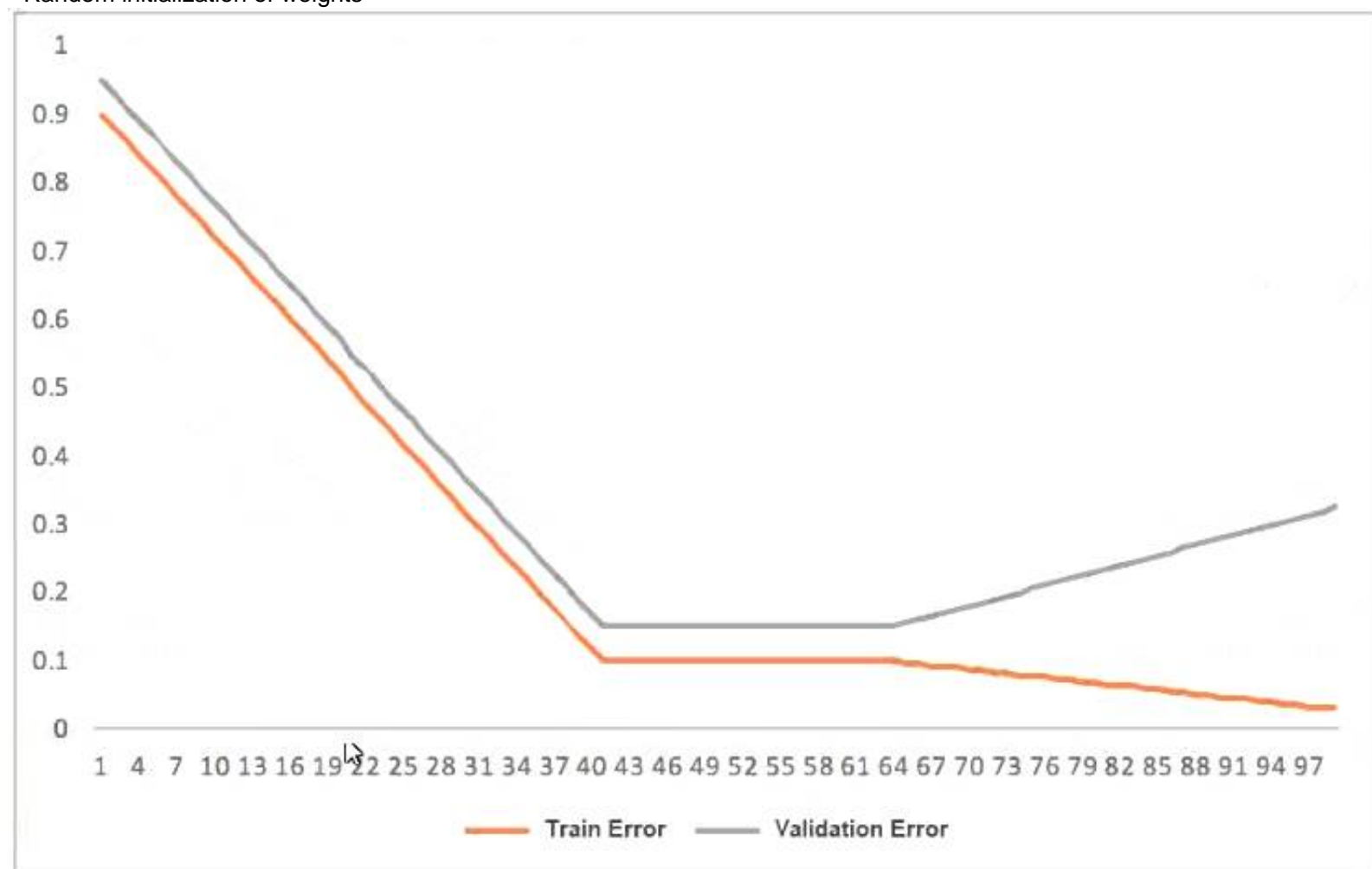
- A. Create a schema in the AWS Glue Data Catalog of the incoming data format
- B. Use an Amazon Kinesis Data Firehose delivery stream to stream the data and transform the data to Apache Parquet or ORC format using the AWS Glue Data Catalog before delivering to Amazon S3. Have the Analysts query the data directly from Amazon S3 using Amazon Athena, and connect to BI tools using the Athena Java Database Connectivity (JDBC) connector.
- C. Write each JSON record to a staging location in Amazon S3. Use the S3 Put event to trigger an AWS Lambda function that transforms the data into Apache Parquet or ORC format and writes the data to a processed data location in Amazon S3. Have the Analysts query the data directly from Amazon S3 using Amazon Athena, and connect to BI tools using the Athena Java Database Connectivity (JDBC) connector.
- D. Write each JSON record to a staging location in Amazon S3. Use the S3 Put event to trigger an AWS Lambda function that transforms the data into Apache Parquet or ORC format and inserts it into an Amazon RDS PostgreSQL database.
- E. Have the Analysts query and run dashboards from the RDS database.
- F. Use Amazon Kinesis Data Analytics to ingest the streaming data and perform real-time SQL queries to convert the records to Apache Parquet before delivering to Amazon S3. Have the Analysts query the data directly from Amazon S3 using Amazon Athena and connect to BI tools using the Athena Java Database Connectivity (JDBC) connector.

**Answer:** A

**NEW QUESTION 2**

This graph shows the training and validation loss against the epochs for a neural network. The network being trained is as follows:

- Two dense layers, one output neuron
- 100 neurons in each layer
- 100 epochs
- Random initialization of weights



Which technique can be used to improve model performance in terms of accuracy in the validation set?

- A. Early stopping
- B. Random initialization of weights with appropriate seed
- C. Increasing the number of epochs
- D. Adding another layer with the 100 neurons

**Answer:** D

**NEW QUESTION 3**

A Machine Learning Specialist observes several performance problems with the training portion of a machine learning solution on Amazon SageMaker. The solution uses a large training dataset 2 TB in size and is using the SageMaker k-means algorithm. The observed issues include the unacceptable length of time it takes before the training job launches and poor I/O throughput while training the model.

What should the Specialist do to address the performance issues with the current solution?

- A. Use the SageMaker batch transform feature
- B. Compress the training data into Apache Parquet format.
- C. Ensure that the input mode for the training job is set to Pipe.
- D. Copy the training dataset to an Amazon EFS volume mounted on the SageMaker instance.

**Answer:** B

#### NEW QUESTION 4

A Machine Learning Specialist works for a credit card processing company and needs to predict which transactions may be fraudulent in near-real time. Specifically, the Specialist must train a model that returns the probability that a given transaction may be fraudulent. How should the Specialist frame this business problem'?

- A. Streaming classification
- B. Binary classification
- C. Multi-category classification
- D. Regression classification

**Answer:** A

#### NEW QUESTION 5

A retail company wants to update its customer support system. The company wants to implement automatic routing of customer claims to different queues to prioritize the claims by category. Currently, an operator manually performs the category assignment and routing. After the operator classifies and routes the claim, the company stores the claim's record in a central database. The claim's record includes the claim's category. The company has no data science team or experience in the field of machine learning (ML). The company's small development team needs a solution that requires no ML expertise. Which solution meets these requirements?

- A. Export the database to a .csv file with two columns: claim\_label and claim\_text
- B. Use the Amazon SageMaker Object2Vec algorithm and the .csv file to train a model
- C. Use SageMaker to deploy the model to an inference endpoint
- D. Develop a service in the application to use the inference endpoint to process incoming claims, predict the labels, and route the claims to the appropriate queue.
- E. Export the database to a .csv file with one column: claim\_text
- F. Use the Amazon SageMaker Latent Dirichlet Allocation (LDA) algorithm and the .csv file to train a model
- G. Use the LDA algorithm to detect labels automatically
- H. Use SageMaker to deploy the model to an inference endpoint
- I. Develop a service in the application to use the inference endpoint to process incoming claims, predict the labels, and route the claims to the appropriate queue.
- J. Use Amazon Textract to process the database and automatically detect two columns: claim\_label and claim\_text
- K. Use Amazon Comprehend custom classification and the extracted information to train the custom classifier
- L. Develop a service in the application to use the Amazon Comprehend API to process incoming claims, predict the labels, and route the claims to the appropriate queue.
- M. Export the database to a .csv file with two columns: claim\_label and claim\_text
- N. Use Amazon Comprehend custom classification and the .csv file to train the custom classifier
- O. Develop a service in the application to use the Amazon Comprehend API to process incoming claims, predict the labels, and route the claims to the appropriate queue.

**Answer:** C

#### NEW QUESTION 6

A Marketing Manager at a pet insurance company plans to launch a targeted marketing campaign on social media to acquire new customers. Currently, the company has the following data in Amazon Aurora:

- Profiles for all past and existing customers
- Profiles for all past and existing insured pets
- Policy-level information
- Premiums received
- Claims paid

What steps should be taken to implement a machine learning model to identify potential new customers on social media?

- A. Use regression on customer profile data to understand key characteristics of consumer segments. Find similar profiles on social media.
- B. Use clustering on customer profile data to understand key characteristics of consumer segments. Find similar profiles on social media.
- C. Use a recommendation engine on customer profile data to understand key characteristics of consumer segment.
- D. Find similar profiles on social media.
- E. Use a decision tree classifier engine on customer profile data to understand key characteristics of consumer segment.
- F. Find similar profiles on social media.

**Answer:** C

#### NEW QUESTION 7

A data scientist has a dataset of machine part images stored in Amazon Elastic File System (Amazon EFS). The data scientist needs to use Amazon SageMaker to create and train an image classification machine learning model based on this dataset. Because of budget and time constraints, management wants the data scientist to create and train a model with the least number of steps and integration work required. How should the data scientist meet these requirements?

- A. Mount the EFS file system to a SageMaker notebook and run a script that copies the data to an Amazon FSx for Lustre file system.
- B. Run the SageMaker training job with the FSx for Lustre file system as the data source.
- C. Launch a transient Amazon EMR cluster.
- D. Configure steps to mount the EFS file system and copy the data to an Amazon S3 bucket by using S3DistCp.
- E. Run the SageMaker training job with Amazon S3 as the data source.
- F. Mount the EFS file system to an Amazon EC2 instance and use the AWS CLI to copy the data to an Amazon S3 bucket.
- G. Run the SageMaker training job with Amazon S3 as the data source.
- H. Run a SageMaker training job with an EFS file system as the data source.

**Answer:** A

#### NEW QUESTION 8

A machine learning (ML) specialist is using Amazon SageMaker hyperparameter optimization (HPO) to improve a model's accuracy. The learning rate parameter

is specified in the following HPO configuration:

```
{
  "Name": "learning_rate",
  "MaxValue" : "0.0001",
  "MinValue": "0.1"
}
```

During the results analysis, the ML specialist determines that most of the training jobs had a learning rate between 0.01 and 0.1. The best result had a learning rate of less than 0.01. Training jobs need to run regularly over a changing dataset. The ML specialist needs to find a tuning mechanism that uses different learning rates more evenly from the provided range between MinValue and MaxValue.

Which solution provides the MOST accurate result?

A. Modify the HPO configuration as follows: C:\Users\Admin\Desktop\Data\Odt data\Untitled.jpg Select the most accurate hyperparameter configuration form this HPO job.

```
{
  "Name": "learning_rate",
  "MaxValue" : "0.0001",
  "MinValue": "0.1"
  "ScalingType": "ReverseLogarithmic"
}
```

B. Run three different HPO jobs that use different learning rates form the following intervals for MinValue and MaxValue while using the same number of training jobs for each HPO job:[0.01, 0.1][0.001, 0.01][0.0001, 0.001] Select the most accurate hyperparameter configuration form these three HPO jobs.

C. Modify the HPO configuration as follows: C:\Users\Admin\Desktop\Data\Odt data\Untitled.jpg

```
{
  "Name": "learning_rate",
  "MaxValue" : "0.0001",
  "MinValue": "0.1"
  "ScalingType": "Logarithmic"
}
```

Select the most accurate hyperparameter configuration form this training job.

D. Run three different HPO jobs that use different learning rates form the following intervals for MinValue and MaxValu

E. Divide the number of training jobs for each HPO job by three:[0.01, 0.1][0.001, 0.01][0.0001, 0.001] Select the most accurate hyperparameter configuration form these three HPO jobs.

**Answer: C**

### NEW QUESTION 9

A retail company intends to use machine learning to categorize new products A labeled dataset of current products was provided to the Data Science team The dataset includes 1 200 products The labeled dataset has 15 features for each product such as title dimensions, weight, and price Each product is labeled as belonging to one of six categories such as books, games, electronics, and movies.

Which model should be used for categorizing new products using the provided dataset for training?

- A. An XGBoost model where the objective parameter is set to multi: softmax
- B. A deep convolutional neural network (CNN) with a softmax activation function for the last layer
- C. A regression forest where the number of trees is set equal to the number of product categories
- D. A DeepAR forecasting model based on a recurrent neural network (RNN)

**Answer: A**

### NEW QUESTION 10

A Machine Learning Specialist was given a dataset consisting of unlabeled data The Specialist must create a model that can help the team classify the data into different buckets What model should be used to complete this work?

- A. K-means clustering
- B. Random Cut Forest (RCF)
- C. XGBoost
- D. BlazingText

**Answer: A**

### NEW QUESTION 10

A Machine Learning Specialist is creating a new natural language processing application that processes a dataset comprised of 1 million sentences The aim is to then run Word2Vec to generate embeddings of the sentences and enable different types of predictions

Here is an example from the dataset

"The quck BROWN FOX jumps over the lazy dog "

Which of the following are the operations the Specialist needs to perform to correctly sanitize and prepare the data in a repeatable manner? (Select THREE)

- A. Perform part-of-speech tagging and keep the action verb and the nouns only
- B. Normalize all words by making the sentence lowercase
- C. Remove stop words using an English stopword dictionary.
- D. Correct the typography on "quck" to "quick."
- E. One-hot encode all words in the sentence



F. Tokenize the sentence into words.

**Answer:** BCF

#### NEW QUESTION 12

A company will use Amazon SageMaker to train and host a machine learning (ML) model for a marketing campaign. The majority of data is sensitive customer data. The data must be encrypted at rest. The company wants AWS to maintain the root of trust for the master keys and wants encryption key usage to be logged. Which implementation will meet these requirements?

- A. Use encryption keys that are stored in AWS Cloud HSM to encrypt the ML data volumes, and to encrypt the model artifacts and data in Amazon S3.
- B. Use SageMaker built-in transient keys to encrypt the ML data volume
- C. Enable default encryption for new Amazon Elastic Block Store (Amazon EBS) volumes.
- D. Use customer managed keys in AWS Key Management Service (AWS KMS) to encrypt the ML data volumes, and to encrypt the model artifacts and data in Amazon S3.
- E. Use AWS Security Token Service (AWS STS) to create temporary tokens to encrypt the ML storage volumes, and to encrypt the model artifacts and data in Amazon S3.

**Answer:** C

#### NEW QUESTION 13

A large mobile network operating company is building a machine learning model to predict customers who are likely to unsubscribe from the service. The company plans to offer an incentive for these customers as the cost of churn is far greater than the cost of the incentive. The model produces the following confusion matrix after evaluating on a test dataset of 100 customers: Based on the model evaluation results, why is this a viable model for production?

n = 100	PREDICTED CHURN	
	Yes	No
ACTUAL Churn Yes	10	4
Actual No	10	76

- A. The model is 86% accurate and the cost incurred by the company as a result of false negatives is less than the false positives.
- B. The precision of the model is 86%, which is less than the accuracy of the model.
- C. The model is 86% accurate and the cost incurred by the company as a result of false positives is less than the false negatives.
- D. The precision of the model is 86%, which is greater than the accuracy of the model.

**Answer:** A

#### NEW QUESTION 18

A Machine Learning team uses Amazon SageMaker to train an Apache MXNet handwritten digit classifier model using a research dataset. The team wants to receive a notification when the model is overfitting. Auditors want to view the Amazon SageMaker log activity report to ensure there are no unauthorized API calls. What should the Machine Learning team do to address the requirements with the least amount of code and fewest steps?

- A. Implement an AWS Lambda function to log Amazon SageMaker API calls to Amazon S3. Add code to push a custom metric to Amazon CloudWatch.
- B. Create an alarm in CloudWatch with Amazon SNS to receive a notification when the model is overfitting.
- C. Use AWS CloudTrail to log Amazon SageMaker API calls to Amazon S3. Add code to push a custom metric to Amazon CloudWatch.
- D. Create an alarm in CloudWatch with Amazon SNS to receive a notification when the model is overfitting.
- E. Implement an AWS Lambda function to log Amazon SageMaker API calls to AWS CloudTrail.
- F. Add code to push a custom metric to Amazon CloudWatch.
- G. Create an alarm in CloudWatch with Amazon SNS to receive a notification when the model is overfitting.
- H. Use AWS CloudTrail to log Amazon SageMaker API calls to Amazon S3. Set up Amazon SNS to receive a notification when the model is overfitting.

**Answer:** C

#### NEW QUESTION 22

A Machine Learning Specialist is preparing data for training on Amazon SageMaker. The Specialist is transformed into a numpy .array, which appears to be negatively affecting the speed of the training. What should the Specialist do to optimize the data for training on SageMaker?

- A. Use the SageMaker batch transform feature to transform the training data into a DataFrame
- B. Use AWS Glue to compress the data into the Apache Parquet format
- C. Transform the dataset into the RecordIO protobuf format
- D. Use the SageMaker hyperparameter optimization feature to automatically optimize the data

**Answer:** C

#### NEW QUESTION 27

A Machine Learning Specialist deployed a model that provides product recommendations on a company's website. Initially, the model was performing very well and resulted in customers buying more products on average. However, within the past few months, the Specialist has noticed that the effect of product recommendations has diminished and customers are starting to return to their original habits of spending less. The Specialist is unsure of what happened, as the model has not changed from its initial deployment over a year ago. Which method should the Specialist try to improve model performance?

- A. The model needs to be completely re-engineered because it is unable to handle product inventory changes.
- B. The model's hyperparameters should be periodically updated to prevent drift.

- C. The model should be periodically retrained from scratch using the original data while adding a regularization term to handle product inventory changes
- D. The model should be periodically retrained using the original training data plus new data as product inventory changes

**Answer:** D

### NEW QUESTION 30

An Machine Learning Specialist discover the following statistics while experimenting on a model.

Experiment 1  
Baseline model  
Train error = 5%  
Test error = 16%

Experiment 2  
The Specialist added more layers and neurons to the model and received the following results:  
Train error = 5.2%  
Test error = 15.7%

Experiment 3  
The Specialist reverted back to the original number of neurons from Experiment 1 and implemented regularization in the neural network, which yielded the following results:  
Train error = 4.7%  
Test error = 9.5%

What can the Specialist from the experiments?

- A. The model In Experiment 1 had a high variance error that was reduced in Experiment 3 by regularization Experiment 2 shows that there is minimal bias error in Experiment 1
- B. The model in Experiment 1 had a high bias error that was reduced in Experiment 3 by regularization Experiment 2 shows that there is minimal variance error in Experiment 1
- C. The model in Experiment 1 had a high bias error and a high variance error that were reduced in Experiment 3 by regularization Experiment 2 shows that high bias cannot be reduced by increasing layers and neurons in the model
- D. The model in Experiment 1 had a high random noise error that was reduced in Experiment 3 by regularization Experiment 2 shows that random noise cannot be reduced by increasing layers and neurons in the model

**Answer:** C

### NEW QUESTION 31

A data science team is planning to build a natural language processing (NLP) application. The application's text preprocessing stage will include part-of-speech tagging and key phrase extraction. The preprocessed text will be input to a custom classification algorithm that the data science team has already written and trained using Apache MXNet.

Which solution can the team build MOST quickly to meet these requirements?

- A. Use Amazon Comprehend for the part-of-speech tagging, key phrase extraction, and classification tasks.
- B. Use an NLP library in Amazon SageMaker for the part-of-speech tagging
- C. Use Amazon Comprehend for the key phrase extraction
- D. Use AWS Deep Learning Containers with Amazon SageMaker to build the custom classifier.
- E. Use Amazon Comprehend for the part-of-speech tagging and key phrase extraction task
- F. Use Amazon SageMaker built-in Latent Dirichlet Allocation (LDA) algorithm to build the custom classifier.
- G. Use Amazon Comprehend for the part-of-speech tagging and key phrase extraction task
- H. Use AWS Deep Learning Containers with Amazon SageMaker to build the custom classifier.

**Answer:** B

### NEW QUESTION 36

A financial services company wants to adopt Amazon SageMaker as its default data science environment. The company's data scientists run machine learning (ML) models on confidential financial data. The company is worried about data egress and wants an ML engineer to secure the environment.

Which mechanisms can the ML engineer use to control data egress from SageMaker? (Choose three.)

- A. Connect to SageMaker by using a VPC interface endpoint powered by AWS PrivateLink.
- B. Use SCPs to restrict access to SageMaker.
- C. Disable root access on the SageMaker notebook instances.
- D. Enable network isolation for training jobs and models.
- E. Restrict notebook presigned URLs to specific IPs used by the company.
- F. Protect data with encryption at rest and in transi
- G. Use AWS Key Management Service (AWS KMS) to manage encryption keys.

**Answer:** BDE

### Explanation:

<https://aws.amazon.com/blogs/machine-learning/millennium-management-secure-machine-learning-using-amaz>

### NEW QUESTION 39

A Machine Learning Specialist is packaging a custom ResNet model into a Docker container so the company can leverage Amazon SageMaker for training The Specialist is using Amazon EC2 P3 instances to train the model and needs to properly configure the Docker container to leverage the NVIDIA GPUs

What does the Specialist need to do?

- A. Bundle the NVIDIA drivers with the Docker image
- B. Build the Docker container to be NVIDIA-Docker compatible
- C. Organize the Docker container's file structure to execute on GPU instances.

D. Set the GPU flag in the Amazon SageMaker Create TrainingJob request body

**Answer:** A

#### NEW QUESTION 42

A Data Scientist received a set of insurance records, each consisting of a record ID, the final outcome among 200 categories, and the date of the final outcome. Some partial information on claim contents is also provided, but only for a few of the 200 categories. For each outcome category, there are hundreds of records distributed over the past 3 years. The Data Scientist wants to predict how many claims to expect in each category from month to month, a few months in advance. What type of machine learning model should be used?

- A. Classification month-to-month using supervised learning of the 200 categories based on claim contents.
- B. Reinforcement learning using claim IDs and timestamps where the agent will identify how many claims in each category to expect from month to month.
- C. Forecasting using claim IDs and timestamps to identify how many claims in each category to expect from month to month.
- D. Classification with supervised learning of the categories for which partial information on claim contents is provided, and forecasting using claim IDs and timestamps for all other categories.

**Answer:** C

#### NEW QUESTION 45

A company is using Amazon Polly to translate plaintext documents to speech for automated company announcements. However, company acronyms are being mispronounced in the current documents. How should a Machine Learning Specialist address this issue for future documents?

- A. Convert current documents to SSML with pronunciation tags.
- B. Create an appropriate pronunciation lexicon.
- C. Output speech marks to guide in pronunciation.
- D. Use Amazon Lex to preprocess the text files for pronunciation.

**Answer:** A

#### NEW QUESTION 46

A trucking company is collecting live image data from its fleet of trucks across the globe. The data is growing rapidly and approximately 100 GB of new data is generated every day. The company wants to explore machine learning use cases while ensuring the data is only accessible to specific IAM users. Which storage option provides the most processing flexibility and will allow access control with IAM?

- A. Use a database, such as Amazon DynamoDB, to store the images, and set the IAM policies to restrict access to only the desired IAM users.
- B. Use an Amazon S3-backed data lake to store the raw images, and set up the permissions using bucket policies.
- C. Set up Amazon EMR with Hadoop Distributed File System (HDFS) to store the files, and restrict access to the EMR instances using IAM policies.
- D. Configure Amazon EFS with IAM policies to make the data available to Amazon EC2 instances owned by the IAM users.

**Answer:** C

#### NEW QUESTION 47

A Machine Learning Specialist is building a convolutional neural network (CNN) that will classify 10 types of animals. The Specialist has built a series of layers in a neural network that will take an input image of an animal, pass it through a series of convolutional and pooling layers, and then finally pass it through a dense and fully connected layer with 10 nodes. The Specialist would like to get an output from the neural network that is a probability distribution of how likely it is that the input image belongs to each of the 10 classes. Which function will produce the desired output?

- A. Dropout
- B. Smooth L1 loss
- C. Softmax
- D. Rectified linear units (ReLU)

**Answer:** C

#### NEW QUESTION 51

A machine learning (ML) specialist must develop a classification model for a financial services company. A domain expert provides the dataset, which is tabular with 10,000 rows and 1,020 features. During exploratory data analysis, the specialist finds no missing values and a small percentage of duplicate rows. There are correlation scores of  $> 0.9$  for 200 feature pairs. The mean value of each feature is similar to its 50th percentile. Which feature engineering strategy should the ML specialist use with Amazon SageMaker?

- A. Apply dimensionality reduction by using the principal component analysis (PCA) algorithm.
- B. Drop the features with low correlation scores by using a Jupyter notebook.
- C. Apply anomaly detection by using the Random Cut Forest (RCF) algorithm.
- D. Concatenate the features with high correlation scores by using a Jupyter notebook.

**Answer:** C

#### NEW QUESTION 56

A real estate company wants to create a machine learning model for predicting housing prices based on a historical dataset. The dataset contains 32 features. Which model will meet the business requirement?

- A. Logistic regression
- B. Linear regression
- C. K-means
- D. Principal component analysis (PCA)



**Answer:** B

#### NEW QUESTION 59

A company that promotes healthy sleep patterns by providing cloud-connected devices currently hosts a sleep tracking application on AWS. The application collects device usage information from device users. The company's Data Science team is building a machine learning model to predict if and when a user will stop utilizing the company's devices. Predictions from this model are used by a downstream application that determines the best approach for contacting users. The Data Science team is building multiple versions of the machine learning model to evaluate each version against the company's business goals. To measure long-term effectiveness, the team wants to run multiple versions of the model in parallel for long periods of time, with the ability to control the portion of inferences served by the models.

Which solution satisfies these requirements with MINIMAL effort?

- A. Build and host multiple models in Amazon SageMaker
- B. Create multiple Amazon SageMaker endpoints, one for each mode
- C. Programmatically control invoking different models for inference at the application layer.
- D. Build and host multiple models in Amazon SageMaker
- E. Create an Amazon SageMaker endpoint configuration with multiple production variant
- F. Programmatically control the portion of the inferences served by the multiple models by updating the endpoint configuration.
- G. Build and host multiple models in Amazon SageMaker Neo to take into account different types of medical device
- H. Programmatically control which model is invoked for inference based on the medical device type.
- I. Build and host multiple models in Amazon SageMaker
- J. Create a single endpoint that accesses multiple model
- K. Use Amazon SageMaker batch transform to control invoking the different models through the single endpoint.

**Answer:** B

#### Explanation:

A/B testing with Amazon SageMaker is required in the Exam. In A/B testing, you test different variants of your models and compare how each variant performs. Amazon SageMaker enables you to test multiple models or model versions behind the `same endpoint` using `production variants`. Each production variant identifies a machine learning (ML) model and the resources deployed for hosting the model. To test multiple models by `distributing traffic` between them, specify the `percentage of the traffic` that gets routed to each model by specifying the `weight` for each `production variant` in the endpoint configuration.  
<https://docs.aws.amazon.com/sagemaker/latest/dg/model-ab-testing.html#model-testing-target-variant>

#### NEW QUESTION 60

A Machine Learning Specialist is deciding between building a naive Bayesian model or a full Bayesian network for a classification problem. The Specialist computes the Pearson correlation coefficients between each feature and finds that their absolute values range between 0.1 to 0.95. Which model describes the underlying data in this situation?

- A. A naive Bayesian model, since the features are all conditionally independent.
- B. A full Bayesian network, since the features are all conditionally independent.
- C. A naive Bayesian model, since some of the features are statistically dependent.
- D. A full Bayesian network, since some of the features are statistically dependent.

**Answer:** C

#### NEW QUESTION 63

A company is running a machine learning prediction service that generates 100 TB of predictions every day. A Machine Learning Specialist must generate a visualization of the daily precision-recall curve from the predictions, and forward a read-only version to the Business team. Which solution requires the LEAST coding effort?

- A. Run a daily Amazon EMR workflow to generate precision-recall data, and save the results in Amazon S3. Give the Business team read-only access to S3.
- B. Generate daily precision-recall data in Amazon QuickSight, and publish the results in a dashboard shared with the Business team.
- C. Run a daily Amazon EMR workflow to generate precision-recall data, and save the results in Amazon S3. Visualize the arrays in Amazon QuickSight, and publish them in a dashboard shared with the Business team.
- D. Generate daily precision-recall data in Amazon ES, and publish the results in a dashboard shared with the Business team.

**Answer:** C

#### NEW QUESTION 65

A machine learning (ML) specialist needs to extract embedding vectors from a text series. The goal is to provide a ready-to-ingest feature space for a data scientist to develop downstream ML predictive models. The text consists of curated sentences in English. Many sentences use similar words but in different contexts. There are questions and answers among the sentences, and the embedding space must differentiate between them.

Which options can produce the required embedding vectors that capture word context and sequential QA information? (Choose two.)

- A. Amazon SageMaker seq2seq algorithm
- B. Amazon SageMaker BlazingText algorithm in Skip-gram mode
- C. Amazon SageMaker Object2Vec algorithm
- D. Amazon SageMaker BlazingText algorithm in continuous bag-of-words (CBOW) mode
- E. Combination of the Amazon SageMaker BlazingText algorithm in Batch Skip-gram mode with a custom recurrent neural network (RNN)

**Answer:** AC

#### NEW QUESTION 70

A manufacturing company has structured and unstructured data stored in an Amazon S3 bucket. A Machine Learning Specialist wants to use SQL to run queries on this data. Which solution requires the LEAST effort to be able to query this data?

- A. Use AWS Data Pipeline to transform the data and Amazon RDS to run queries.
- B. Use AWS Glue to catalogue the data and Amazon Athena to run queries.
- C. Use AWS Batch to run ETL on the data and Amazon Aurora to run the queries.



D. Use AWS Lambda to transform the data and Amazon Kinesis Data Analytics to run queries

**Answer:** D

#### NEW QUESTION 73

An Amazon SageMaker notebook instance is launched into Amazon VPC. The SageMaker notebook references data contained in an Amazon S3 bucket in another account. The bucket is encrypted using SSE-KMS. The instance returns an access denied error when trying to access data in Amazon S3. Which of the following are required to access the bucket and avoid the access denied error? (Select THREE )

- A. An AWS KMS key policy that allows access to the customer master key (CMK)
- B. A SageMaker notebook security group that allows access to Amazon S3
- C. An IAM role that allows access to the specific S3 bucket
- D. A permissive S3 bucket policy
- E. An S3 bucket owner that matches the notebook owner
- F. A SageMaker notebook subnet ACL that allows traffic to Amazon S3.

**Answer:** ACF

#### NEW QUESTION 78

A company supplies wholesale clothing to thousands of retail stores. A data scientist must create a model that predicts the daily sales volume for each item for each store. The data scientist discovers that more than half of the stores have been in business for less than 6 months. Sales data is highly consistent from week to week. Daily data from the database has been aggregated weekly, and weeks with no sales are omitted from the current dataset. Five years (100 MB) of sales data is available in Amazon S3.

Which factors will adversely impact the performance of the forecast model to be developed, and which actions should the data scientist take to mitigate them? (Choose two.)

- A. Detecting seasonality for the majority of stores will be an issue
- B. Request categorical data to relate new stores with similar stores that have more historical data.
- C. The sales data does not have enough variance
- D. Request external sales data from other industries to improve the model's ability to generalize.
- E. Sales data is aggregated by week
- F. Request daily sales data from the source database to enable building a daily model.
- G. The sales data is missing zero entries for item sale
- H. Request that item sales data from the source database include zero entries to enable building the model.
- I. Only 100 MB of sales data is available in Amazon S3. Request 10 years of sales data, which would provide 200 MB of training data for the model.

**Answer:** AB

#### NEW QUESTION 83

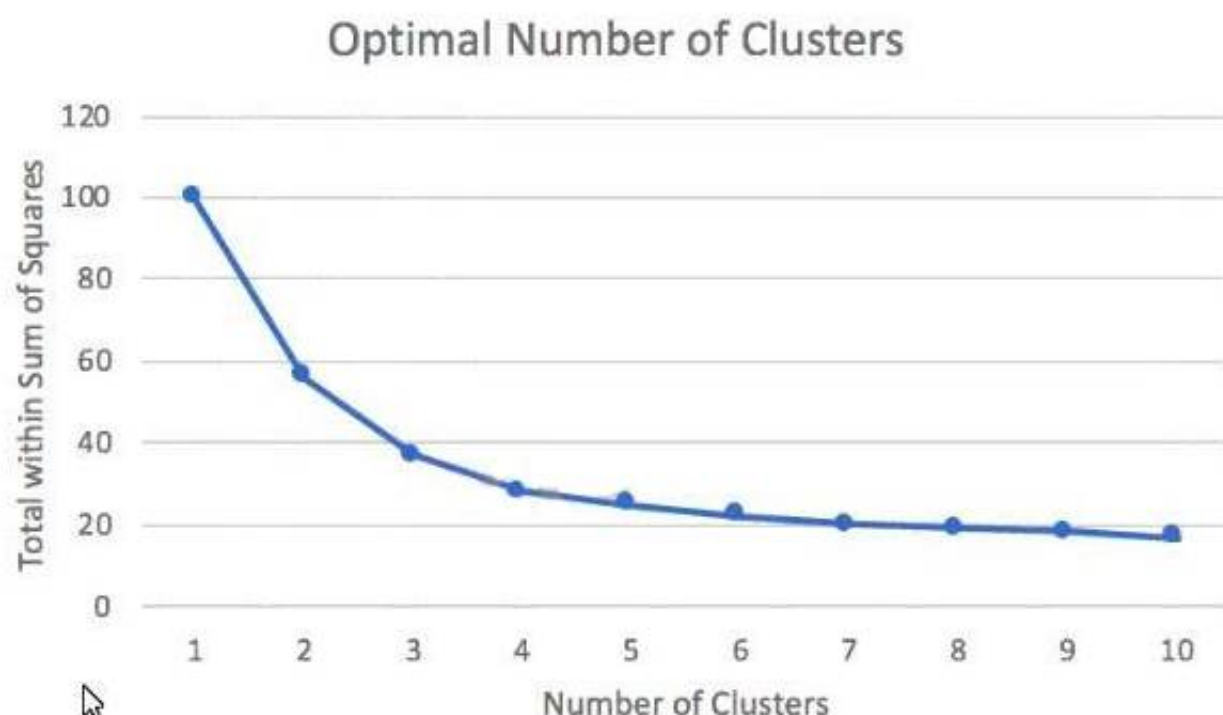
A Data Scientist wants to gain real-time insights into a data stream of GZIP files. Which solution would allow the use of SQL to query the stream with the LEAST latency?

- A. Amazon Kinesis Data Analytics with an AWS Lambda function to transform the data.
- B. AWS Glue with a custom ETL script to transform the data.
- C. An Amazon Kinesis Client Library to transform the data and save it to an Amazon ES cluster.
- D. Amazon Kinesis Data Firehose to transform the data and put it into an Amazon S3 bucket.

**Answer:** A

#### NEW QUESTION 86

A Machine Learning Specialist prepared the following graph displaying the results of k-means for  $k = [1:10]$



Considering the graph, what is a reasonable selection for the optimal choice of  $k$ ?

- A. 1
- B. 4
- C. 7
- D. 10

**Answer: C**

#### NEW QUESTION 90

A Data Scientist is developing a binary classifier to predict whether a patient has a particular disease on a series of test results. The Data Scientist has data on 400 patients randomly selected from the population. The disease is seen in 3% of the population. Which cross-validation strategy should the Data Scientist adopt?

- A. A k-fold cross-validation strategy with k=5
- B. A stratified k-fold cross-validation strategy with k=5
- C. A k-fold cross-validation strategy with k=5 and 3 repeats
- D. An 80/20 stratified split between training and validation

**Answer: B**

#### NEW QUESTION 94

A data scientist is training a text classification model by using the Amazon SageMaker built-in BlazingText algorithm. There are 5 classes in the dataset, with 300 samples for category A, 292 samples for category B, 240 samples for category C, 258 samples for category D, and 310 samples for category E. The data scientist shuffles the data and splits off 10% for testing. After training the model, the data scientist generates confusion matrices for the training and test sets.

Training data confusion matrix

		Predicted class					Total
		A	B	C	D	E	
True class	A	270	0	0	0	0	270
	B	1	260	0	0	2	263
	C	0	0	111	100	5	216
	D	4	3	132	92	1	232
	E	0	0	2	3	274	279
	Total	275	263	245	195	282	1260

Test data confusion matrix

		Predicted class					Total
		A	B	C	D	E	
True class	A	9	1	0	0	0	10
	B	2	25	0	2	0	29
	C	10	2	11	10	1	34
	D	1	0	12	14	0	27
	E	9	1	4	1	25	40
	Total	31	29	27	27	26	140

What could the data scientist conclude from these results?

- A. Classes C and D are too similar.
- B. The dataset is too small for holdout cross-validation.
- C. The data distribution is skewed.
- D. The model is overfitting for classes B and E.

**Answer: B**

#### NEW QUESTION 97

A Data Science team within a large company uses Amazon SageMaker notebooks to access data stored in Amazon S3 buckets. The IT Security team is concerned that internet-enabled notebook instances create a security vulnerability where malicious code running on the instances could compromise data privacy. The company mandates that all instances stay within a secured VPC with no internet access, and data communication traffic must stay within the AWS network. How should the Data Science team configure the notebook instance placement to meet these requirements?

- A. Associate the Amazon SageMaker notebook with a private subnet in a VP
- B. Place the Amazon SageMaker endpoint and S3 buckets within the same VPC.
- C. Associate the Amazon SageMaker notebook with a private subnet in a VP

- D. Use IAM policies to grant access to Amazon S3 and Amazon SageMaker.
- E. Associate the Amazon SageMaker notebook with a private subnet in a VPC
- F. Ensure the VPC has S3 VPC endpoints and Amazon SageMaker VPC endpoints attached to it.
- G. Associate the Amazon SageMaker notebook with a private subnet in a VPC
- H. Ensure the VPC has a NAT gateway and an associated security group allowing only outbound connections to Amazon S3 and Amazon SageMaker

**Answer:** D

#### NEW QUESTION 100

A company has an ecommerce website with a product recommendation engine built in TensorFlow. The recommendation engine endpoint is hosted by Amazon SageMaker. Three compute-optimized instances support the expected peak load of the website. Response times on the product recommendation page are increasing at the beginning of each month. Some users are encountering errors. The website receives the majority of its traffic between 8 AM and 6 PM on weekdays in a single time zone. Which of the following options are the MOST effective in solving the issue while keeping costs to a minimum? (Choose two.)

- A. Configure the endpoint to use Amazon Elastic Inference (EI) accelerators.
- B. Create a new endpoint configuration with two production variants.
- C. Configure the endpoint to automatically scale with the `InvocationsPerInstance` metric.
- D. Deploy a second instance pool to support a blue/green deployment of models.
- E. Reconfigure the endpoint to use burstable instances.

**Answer:** BD

#### NEW QUESTION 102

A Machine Learning Specialist previously trained a logistic regression model using scikit-learn on a local machine, and the Specialist now wants to deploy it to production for inference only. What steps should be taken to ensure Amazon SageMaker can host a model that was trained locally?

- A. Build the Docker image with the inference code
- B. Tag the Docker image with the registry hostname and upload it to Amazon ECR.
- C. Serialize the trained model so the format is compressed for deployment
- D. Tag the Docker image with the registry hostname and upload it to Amazon S3.
- E. Serialize the trained model so the format is compressed for deployment
- F. Build the image and upload it to Docker Hub.
- G. Build the Docker image with the inference code
- H. Configure Docker Hub and upload the image to Amazon ECR.

**Answer:** D

#### NEW QUESTION 106

An ecommerce company sends a weekly email newsletter to all of its customers. Management has hired a team of writers to create additional targeted content. A data scientist needs to identify five customer segments based on age, income, and location. The customers' current segmentation is unknown. The data scientist previously built an XGBoost model to predict the likelihood of a customer responding to an email based on age, income, and location. Why does the XGBoost model NOT meet the current requirements, and how can this be fixed?

- A. The XGBoost model provides a true/false binary output
- B. Apply principal component analysis (PCA) with five feature dimensions to predict a segment.
- C. The XGBoost model provides a true/false binary output
- D. Increase the number of classes the XGBoost model predicts to five classes to predict a segment.
- E. The XGBoost model is a supervised machine learning algorithm
- F. Train a k-Nearest-Neighbors (kNN) model with  $K = 5$  on the same dataset to predict a segment.
- G. The XGBoost model is a supervised machine learning algorithm
- H. Train a k-means model with  $K = 5$  on the same dataset to predict a segment.

**Answer:** C

#### NEW QUESTION 108

A company that runs an online library is implementing a chatbot using Amazon Lex to provide book recommendations based on category. This intent is fulfilled by an AWS Lambda function that queries an Amazon DynamoDB table for a list of book titles, given a particular category. For testing, there are only three categories implemented as the custom slot types: "comedy," "adventure," and "documentary."

A machine learning (ML) specialist notices that sometimes the request cannot be fulfilled because Amazon Lex cannot understand the category spoken by users with utterances such as "funny," "fun," and "humor." The ML specialist needs to fix the problem without changing the Lambda code or data in DynamoDB. How should the ML specialist fix the problem?

- A. Add the unrecognized words in the enumeration values list as new values in the slot type.
- B. Create a new custom slot type, add the unrecognized words to this slot type as enumeration values, and use this slot type for the slot.
- C. Use the `AMAZON.SearchQuery` built-in slot types for custom searches in the database.
- D. Add the unrecognized words as synonyms in the custom slot type.

**Answer:** C

#### NEW QUESTION 113

A company provisions Amazon SageMaker notebook instances for its data science team and creates Amazon VPC interface endpoints to ensure communication between the VPC and the notebook instances. All connections to the Amazon SageMaker API are contained entirely and securely using the AWS network. However, the data science team realizes that individuals outside the VPC can still connect to the notebook instances across the internet. Which set of actions should the data science team take to fix the issue?

- A. Modify the notebook instances' security group to allow traffic only from the CIDR ranges of the VPC

- B. Apply this security group to all of the notebook instances' VPC interfaces.
- C. Create an IAM policy that allows the sagemaker:CreatePresignedNotebookInstanceUrl and sagemaker:DescribeNotebookInstance actions from only the VPC endpoint
- D. Apply this policy to all IAM users, groups, and roles used to access the notebook instances.
- E. Add a NAT gateway to the VP
- F. Convert all of the subnets where the Amazon SageMaker notebook instances are hosted to private subnet
- G. Stop and start all of the notebook instances to reassign only private IP addresses.
- H. Change the network ACL of the subnet the notebook is hosted in to restrict access to anyone outside the VPC.

**Answer:** B

#### NEW QUESTION 115

A Machine Learning Specialist is building a logistic regression model that will predict whether or not a person will order a pizza. The Specialist is trying to build the optimal model with an ideal classification threshold.

What model evaluation technique should the Specialist use to understand how different classification thresholds will impact the model's performance?

- A. Receiver operating characteristic (ROC) curve
- B. Misclassification rate
- C. Root Mean Square Error (RM&)
- D. L1 norm

**Answer:** A

#### NEW QUESTION 117

A data scientist must build a custom recommendation model in Amazon SageMaker for an online retail company. Due to the nature of the company's products, customers buy only 4-5 products every 5-10 years. So, the company relies on a steady stream of new customers. When a new customer signs up, the company collects data on the customer's preferences. Below is a sample of the data available to the data scientist.

timestamp	user_id	product_id	preference_1	...	preference_10
2020-03-04	90	25	0	...	0.374
2020-03-04	90	61	0	...	0.374
2020-02-21	203	56	1	...	0.098

How should the data scientist split the dataset into a training and test set for this use case?

- A. Shuffle all interaction dat
- B. Split off the last 10% of the interaction data for the test set.
- C. Identify the most recent 10% of interactions for each use
- D. Split off these interactions for the test set.
- E. Identify the 10% of users with the least interaction dat
- F. Split off all interaction data from these users for the test set.
- G. Randomly select 10% of the user
- H. Split off all interaction data from these users for the test set.

**Answer:** B

#### Explanation:

<https://aws.amazon.com/blogs/machine-learning/building-a-customized-recommender-system-in-amazon-sagem>

#### NEW QUESTION 119

IT leadership wants Jo transition a company's existing machine learning data storage environment to AWS as a temporary ad hoc solution The company currently uses a custom software process that heavily leverages SOL as a query language and exclusively stores generated csv documents for machine learning The ideal state for the company would be a solution that allows it to continue to use the current workforce of SQL experts The solution must also support the storage of csv and JSON files, and be able to query over semi-structured data The following are high priorities for the company:

- Solution simplicity
- Fast development time
- Low cost
- High flexibility

What technologies meet the company's requirements?

- A. Amazon S3 and Amazon Athena
- B. Amazon Redshift and AWS Glue
- C. Amazon DynamoDB and DynamoDB Accelerator (DAX)
- D. Amazon RDS and Amazon ES

**Answer:** B

#### NEW QUESTION 121

A monitoring service generates 1 TB of scale metrics record data every minute A Research team performs queries on this data using Amazon Athena The queries run slowly due to the large volume of data, and the team requires better performance

How should the records be stored in Amazon S3 to improve query performance?

- A. CSV files
- B. Parquet files
- C. Compressed JSON
- D. RecordIO

**Answer:** D



#### NEW QUESTION 124

A manufacturing company has a large set of labeled historical sales data. The manufacturer would like to predict how many units of a particular part should be produced each quarter. Which machine learning approach should be used to solve this problem?

- A. Logistic regression
- B. Random Cut Forest (RCF)
- C. Principal component analysis (PCA)
- D. Linear regression

**Answer:** D

#### NEW QUESTION 128

A Machine Learning Specialist is building a prediction model for a large number of features using linear models, such as linear regression and logistic regression. During exploratory data analysis, the Specialist observes that many features are highly correlated with each other. This may make the model unstable. What should be done to reduce the impact of having such a large number of features?

- A. Perform one-hot encoding on highly correlated features.
- B. Use matrix multiplication on highly correlated features.
- C. Create a new feature space using principal component analysis (PCA).
- D. Apply the Pearson correlation coefficient.

**Answer:** B

#### NEW QUESTION 131

A machine learning (ML) specialist is administering a production Amazon SageMaker endpoint with model monitoring configured. Amazon SageMaker Model Monitor detects violations on the SageMaker endpoint, so the ML specialist retrains the model with the latest dataset. This dataset is statistically representative of the current production traffic. The ML specialist notices that even after deploying the new SageMaker model and running the first monitoring job, the SageMaker endpoint still has violations.

What should the ML specialist do to resolve the violations?

- A. Manually trigger the monitoring job to re-evaluate the SageMaker endpoint traffic sample.
- B. Run the Model Monitor baseline job again on the new training set.
- C. Configure Model Monitor to use the new baseline.
- D. Delete the endpoint and recreate it with the original configuration.
- E. Retrain the model again by using a combination of the original training set and the new training set.

**Answer:** B

#### NEW QUESTION 135

A company uses camera images of the tops of items displayed on store shelves to determine which items were removed and which ones still remain. After several hours of data labeling, the company has a total of 1,000 hand-labeled images covering 10 distinct items. The training results were poor.

Which machine learning approach fulfills the company's long-term needs?

- A. Convert the images to grayscale and retrain the model.
- B. Reduce the number of distinct items from 10 to 2, build the model, and iterate.
- C. Attach different colored labels to each item, take the images again, and build the model.
- D. Augment training data for each item using image variants like inversions and translations, build the model, and iterate.

**Answer:** A

#### NEW QUESTION 139

A health care company is planning to use neural networks to classify their X-ray images into normal and abnormal classes. The labeled data is divided into a training set of 1,000 images and a test set of 200 images. The initial training of a neural network model with 50 hidden layers yielded 99% accuracy on the training set, but only 55% accuracy on the test set.

What changes should the Specialist consider to solve this issue? (Choose three.)

- A. Choose a higher number of layers
- B. Choose a lower number of layers
- C. Choose a smaller learning rate
- D. Enable dropout
- E. Include all the images from the test set in the training set
- F. Enable early stopping

**Answer:** ADE

#### NEW QUESTION 140

A Machine Learning Specialist working for an online fashion company wants to build a data ingestion solution for the company's Amazon S3-based data lake. The Specialist wants to create a set of ingestion mechanisms that will enable future capabilities comprised of:

- Real-time analytics
  - Interactive analytics of historical data
  - Clickstream analytics
  - Product recommendations
- Which services should the Specialist use?

- A. AWS Glue as the data catalog; Amazon Kinesis Data Streams and Amazon Kinesis Data Analytics for real-time data insights; Amazon Kinesis Data Firehose for delivery to Amazon ES for clickstream analytics; Amazon EMR to generate personalized product recommendations
- B. Amazon Athena as the data catalog; Amazon Kinesis Data Streams and Amazon Kinesis Data Analytics for near-realtime data insights; Amazon Kinesis Data

Firehose for clickstream analytics; AWS Glue to generate personalized product recommendations  
C. AWS Glue as the data catalog; Amazon Kinesis Data Streams and Amazon Kinesis Data Analytics for historical data insights; Amazon Kinesis Data Firehose for delivery to Amazon ES for clickstream analytics; Amazon EMR to generate personalized product recommendations  
D. Amazon Athena as the data catalog; Amazon Kinesis Data Streams and Amazon Kinesis Data Analytics for historical data insights; Amazon DynamoDB streams for clickstream analytics; AWS Glue to generate personalized product recommendations

**Answer:** A

#### NEW QUESTION 145

A Machine Learning Specialist trained a regression model, but the first iteration needs optimizing. The Specialist needs to understand whether the model is more frequently overestimating or underestimating the target.

What option can the Specialist use to determine whether it is overestimating or underestimating the target value?

- A. Root Mean Square Error (RMSE)
- B. Residual plots
- C. Area under the curve
- D. Confusion matrix

**Answer:** B

#### NEW QUESTION 149

A Machine Learning Specialist has completed a proof of concept for a company using a small data sample and now the Specialist is ready to implement an end-to-end solution in AWS using Amazon SageMaker. The historical training data is stored in Amazon RDS.

Which approach should the Specialist use for training a model using that data?

- A. Write a direct connection to the SQL database within the notebook and pull data in.
- B. Push the data from Microsoft SQL Server to Amazon S3 using an AWS Data Pipeline and provide the S3 location within the notebook.
- C. Move the data to Amazon DynamoDB and set up a connection to DynamoDB within the notebook to pull data in.
- D. Move the data to Amazon ElastiCache using AWS DMS and set up a connection within the notebook to pull data in for fast access.

**Answer:** B

#### NEW QUESTION 154

When submitting Amazon SageMaker training jobs using one of the built-in algorithms, which common parameters **MUST** be specified? (Select THREE.)

- A. The training channel identifying the location of training data on an Amazon S3 bucket.
- B. The validation channel identifying the location of validation data on an Amazon S3 bucket.
- C. The IAM role that Amazon SageMaker can assume to perform tasks on behalf of the users.
- D. Hyperparameters in a JSON array as documented for the algorithm used.
- E. The Amazon EC2 instance class specifying whether training will be run using CPU or GPU.
- F. The output path specifying where on an Amazon S3 bucket the trained model will persist.

**Answer:** CEF

#### NEW QUESTION 157

A large consumer goods manufacturer has the following products on sale:

- 34 different toothpaste variants
- 48 different toothbrush variants
- 43 different mouthwash variants

The entire sales history of all these products is available in Amazon S3. Currently, the company is using custom-built autoregressive integrated moving average (ARIMA) models to forecast demand for these products. The company wants to predict the demand for a new product that will soon be launched.

Which solution should a Machine Learning Specialist apply?

- A. Train a custom ARIMA model to forecast demand for the new product.
- B. Train an Amazon SageMaker DeepAR algorithm to forecast demand for the new product.
- C. Train an Amazon SageMaker k-means clustering algorithm to forecast demand for the new product.
- D. Train a custom XGBoost model to forecast demand for the new product.

**Answer:** B

#### Explanation:

The Amazon SageMaker DeepAR forecasting algorithm is a supervised learning algorithm for forecasting scalar (one-dimensional) time series using recurrent neural networks (RNN). Classical forecasting methods, such as autoregressive integrated moving average (ARIMA) or exponential smoothing (ETS), fit a single model to each individual time series. They then use that model to extrapolate the time series into the future.

#### NEW QUESTION 160

A Machine Learning Specialist receives customer data for an online shopping website. The data includes demographics, past visits, and locality information. The Specialist must develop a machine learning approach to identify the customer shopping patterns, preferences and trends to enhance the website for better service and smart recommendations.

Which solution should the Specialist recommend?

- A. Latent Dirichlet Allocation (LDA) for the given collection of discrete data to identify patterns in the customer database.
- B. A neural network with a minimum of three layers and random initial weights to identify patterns in the customer database.
- C. Collaborative filtering based on user interactions and correlations to identify patterns in the customer database.
- D. Random Cut Forest (RCF) over random subsamples to identify patterns in the customer database.

**Answer:** C

**NEW QUESTION 161**

A telecommunications company is developing a mobile app for its customers. The company is using an Amazon SageMaker hosted endpoint for machine learning model inferences.

Developers want to introduce a new version of the model for a limited number of users who subscribed to a preview feature of the app. After the new version of the model is tested as a preview, developers will evaluate its accuracy. If a new version of the model has better accuracy, developers need to be able to gradually release the new version for all users over a fixed period of time.

How can the company implement the testing model with the LEAST amount of operational overhead?

- A. Update the ProductionVariant data type with the new version of the model by using the CreateEndpointConfig operation with the InitialVariantWeight parameter set to 0. Specify the TargetVariant parameter for InvokeEndpoint calls for users who subscribed to the preview feature
- B. When the new version of the model is ready for release, gradually increase InitialVariantWeight until all users have the updated version.
- C. Configure two SageMaker hosted endpoints that serve the different versions of the model
- D. Create an Application Load Balancer (ALB) to route traffic to both endpoints based on the TargetVariant query string parameter
- E. Reconfigure the app to send the TargetVariant query string parameter for users who subscribed to the preview feature
- F. When the new version of the model is ready for release, change the ALB's routing algorithm to weighted until all users have the updated version.
- G. Update the DesiredWeightsAndCapacity data type with the new version of the model by using the UpdateEndpointWeightsAndCapacities operation with the DesiredWeight parameter set to 0. Specify the TargetVariant parameter for InvokeEndpoint calls for users who subscribed to the preview feature
- H. When the new version of the model is ready for release, gradually increase DesiredWeight until all users have the updated version.
- I. Configure two SageMaker hosted endpoints that serve the different versions of the model
- J. Create an Amazon Route 53 record that is configured with a simple routing policy and that points to the current version of the model
- K. Configure the mobile app to use the endpoint URL for users who subscribed to the preview feature and to use the Route 53 record for other users
- L. When the new version of the model is ready for release, add a new model version endpoint to Route 53, and switch the policy to weighted until all users have the updated version.

**Answer: D**

**NEW QUESTION 164**

An employee found a video clip with audio on a company's social media feed. The language used in the video is Spanish. English is the employee's first language, and they do not understand Spanish. The employee wants to do a sentiment analysis.

What combination of services is the MOST efficient to accomplish the task?

- A. Amazon Transcribe, Amazon Translate, and Amazon Comprehend
- B. Amazon Transcribe, Amazon Comprehend, and Amazon SageMaker seq2seq
- C. Amazon Transcribe, Amazon Translate, and Amazon SageMaker Neural Topic Model (NTM)
- D. Amazon Transcribe, Amazon Translate, and Amazon SageMaker BlazingText

**Answer: A**

**NEW QUESTION 166**

A Machine Learning Specialist is working with a large cybersecurity company that manages security events in real time for companies around the world. The cybersecurity company wants to design a solution that will allow it to use machine learning to score malicious events as anomalies on the data as it is being ingested. The company also wants to be able to save the results in its data lake for later processing and analysis.

What is the MOST efficient way to accomplish these tasks?

- A. Ingest the data using Amazon Kinesis Data Firehose, and use Amazon Kinesis Data Analytics Random Cut Forest (RCF) for anomaly detection. Then use Kinesis Data Firehose to stream the results to Amazon S3.
- B. Ingest the data into Apache Spark Streaming using Amazon EMR.
- C. and use Spark MLlib with k-means to perform anomaly detection. Then store the results in an Apache Hadoop Distributed File System (HDFS) using Amazon EMR with a replication factor of three as the data lake.
- D. Ingest the data and store it in Amazon S3. Use AWS Batch along with the AWS Deep Learning AMIs to train a k-means model using TensorFlow on the data in Amazon S3.
- E. Ingest the data and store it in Amazon S3. Have an AWS Glue job that is triggered on demand transform the new data. Then use the built-in Random Cut Forest (RCF) model within Amazon SageMaker to detect anomalies in the data.

**Answer: A**

**NEW QUESTION 169**

A machine learning specialist works for a fruit processing company and needs to build a system that categorizes apples into three types. The specialist has collected a dataset that contains 150 images for each type of apple and applied transfer learning on a neural network that was pretrained on ImageNet with this dataset.

The company requires at least 85% accuracy to make use of the model.

After an exhaustive grid search, the optimal hyperparameters produced the following: 68% accuracy on the training set, 67% accuracy on the validation set.

What can the machine learning specialist do to improve the system's accuracy?

- A. Upload the model to an Amazon SageMaker notebook instance and use the Amazon SageMaker HPO feature to optimize the model's hyperparameters.
- B. Add more data to the training set and retrain the model using transfer learning to reduce the bias.
- C. Use a neural network model with more layers that are pretrained on ImageNet and apply transfer learning to increase the variance.
- D. Train a new model using the current neural network architecture.

**Answer: B**

**NEW QUESTION 174**

A retail company uses a machine learning (ML) model for daily sales forecasting. The company's brand manager reports that the model has provided inaccurate results for the past 3 weeks.

At the end of each day, an AWS Glue job consolidates the input data that is used for the forecasting with the actual daily sales data and the predictions of the model. The AWS Glue job stores the data in Amazon S3. The company's ML team is using an Amazon SageMaker Studio notebook to gain an understanding about the source of the model's inaccuracies.

What should the ML team do on the SageMaker Studio notebook to visualize the model's degradation MOST accurately?



- A. Create a histogram of the daily sales over the last 3 week
- B. In addition, create a histogram of the daily sales from before that period.
- C. Create a histogram of the model errors over the last 3 week
- D. In addition, create a histogram of the model errors from before that period.
- E. Create a line chart with the weekly mean absolute error (MAE) of the model.
- F. Create a scatter plot of daily sales versus model error for the last 3 week
- G. In addition, create a scatter plot of daily sales versus model error from before that period.

**Answer:** C

#### NEW QUESTION 178

A Machine Learning Specialist is assigned a TensorFlow project using Amazon SageMaker for training, and needs to continue working for an extended period with no Wi-Fi access.

Which approach should the Specialist use to continue working?

- A. Install Python 3 and boto3 on their laptop and continue the code development using that environment.
- B. Download the TensorFlow Docker container used in Amazon SageMaker from GitHub to their local environment, and use the Amazon SageMaker Python SDK to test the code.
- C. Download TensorFlow from tensorflow.org to emulate the TensorFlow kernel in the SageMaker environment.
- D. Download the SageMaker notebook to their local environment then install Jupyter Notebooks on their laptop and continue the development in a local notebook.

**Answer:** D

#### NEW QUESTION 179

A machine learning specialist stores IoT soil sensor data in Amazon DynamoDB table and stores weather event data as JSON files in Amazon S3. The dataset in DynamoDB is 10 GB in size and the dataset in Amazon S3 is 5 GB in size. The specialist wants to train a model on this data to help predict soil moisture levels as a function of weather events using Amazon SageMaker.

Which solution will accomplish the necessary transformation to train the Amazon SageMaker model with the LEAST amount of administrative overhead?

- A. Launch an Amazon EMR cluste
- B. Create an Apache Hive external table for the DynamoDB table and S3 dat
- C. Join the Hive tables and write the results out to Amazon S3.
- D. Crawl the data using AWS Glue crawler
- E. Write an AWS Glue ETL job that merges the two tables and writes the output to an Amazon Redshift cluster.
- F. Enable Amazon DynamoDB Streams on the sensor tabl
- G. Write an AWS Lambda function that consumes the stream and appends the results to the existing weather files in Amazon S3.
- H. Crawl the data using AWS Glue crawler
- I. Write an AWS Glue ETL job that merges the two tables and writes the output in CSV format to Amazon S3.

**Answer:** C

#### NEW QUESTION 184

A company has video feeds and images of a subway train station. The company wants to create a deep learning model that will alert the station manager if any passenger crosses the yellow safety line when there is no train in the station. The alert will be based on the video feeds. The company wants the model to detect the yellow line, the passengers who cross the yellow line, and the trains in the video feeds. This task requires labeling. The video data must remain confidential.

A data scientist creates a bounding box to label the sample data and uses an object detection model. However, the object detection model cannot clearly demarcate the yellow line, the passengers who cross the yellow line, and the trains.

Which labeling approach will help the company improve this model?

- A. Use Amazon Rekognition Custom Labels to label the dataset and create a custom Amazon Rekognition object detection mode
- B. Create a private workforc
- C. Use Amazon Augmented AI (Amazon A2I) to review the low-confidence predictions and retrain the custom Amazon Rekognition model.
- D. Use an Amazon SageMaker Ground Truth object detection labeling tas
- E. Use Amazon Mechanical Turk as the labeling workforce.
- F. Use Amazon Rekognition Custom Labels to label the dataset and create a custom Amazon Rekognition object detection mode
- G. Create a workforce with a third-party AWS Marketplace vendo
- H. Use Amazon Augmented AI (Amazon A2I) to review the low-confidence predictions and retrain the custom Amazon Rekognition model.
- I. Use an Amazon SageMaker Ground Truth semantic segmentation labeling tas
- J. Use a private workforce as the labeling workforce.

**Answer:** B

#### NEW QUESTION 189

A Machine Learning Specialist is designing a system for improving sales for a company. The objective is to use the large amount of information the company has on users' behavior and product preferences to predict which products users would like based on the users' similarity to other users.

What should the Specialist do to meet this objective?

- A. Build a content-based filtering recommendation engine with Apache Spark ML on Amazon EMR.
- B. Build a collaborative filtering recommendation engine with Apache Spark ML on Amazon EMR.
- C. Build a model-based filtering recommendation engine with Apache Spark ML on Amazon EMR.
- D. Build a combinative filtering recommendation engine with Apache Spark ML on Amazon EMR.

**Answer:** B

#### Explanation:

Many developers want to implement the famous Amazon model that was used to power the “People who bought this also bought these items” feature on Amazon.com. This model is based on a method called Collaborative Filtering. It takes items such as movies, books, and products that were rated highly by a set of users and recommending them to other users who also gave them high ratings. This method works well in domains where explicit ratings or implicit user actions can be gathered and analyzed.



#### NEW QUESTION 191

A machine learning specialist is developing a proof of concept for government users whose primary concern is security. The specialist is using Amazon SageMaker to train a convolutional neural network (CNN) model for a photo classifier application. The specialist wants to protect the data so that it cannot be accessed and transferred to a remote host by malicious code accidentally installed on the training container. Which action will provide the MOST secure protection?

- A. Remove Amazon S3 access permissions from the SageMaker execution role.
- B. Encrypt the weights of the CNN model.
- C. Encrypt the training and validation dataset.
- D. Enable network isolation for training jobs.

**Answer: D**

#### NEW QUESTION 192

A Machine Learning Specialist is working for an online retailer that wants to run analytics on every customer visit, processed through a machine learning pipeline. The data needs to be ingested by Amazon Kinesis Data Streams at up to 100 transactions per second, and the JSON data blob is 100 KB in size. What is the MINIMUM number of shards in Kinesis Data Streams the Specialist should use to successfully ingest this data?

- A. 1 shards
- B. 10 shards
- C. 100 shards
- D. 1,000 shards

**Answer: B**

#### NEW QUESTION 197

A Data Scientist is developing a machine learning model to classify whether a financial transaction is fraudulent. The labeled data available for training consists of 100,000 non-fraudulent observations and 1,000 fraudulent observations.

The Data Scientist applies the XGBoost algorithm to the data, resulting in the following confusion matrix when the trained model is applied to a previously unseen validation dataset. The accuracy of the model is 99.1%, but the Data Scientist has been asked to reduce the number of false negatives.

Predicted	0	1
Actual	0 99,966	34
	1 877	123

Which combination of steps should the Data Scientist take to reduce the number of false positive predictions by the model? (Select TWO.)

- A. Change the XGBoost eval\_metric parameter to optimize based on rmse instead of error.
- B. Increase the XGBoost scale\_pos\_weight parameter to adjust the balance of positive and negative weights.
- C. Increase the XGBoost max\_depth parameter because the model is currently underfitting the data.
- D. Change the XGBoost eval\_metric parameter to optimize based on AUC instead of error.
- E. Decrease the XGBoost max\_depth parameter because the model is currently overfitting the data.

**Answer: DE**

#### NEW QUESTION 202

A Machine Learning Specialist wants to determine the appropriate SageMakerVariant Invocations Per Instance setting for an endpoint automatic scaling configuration. The Specialist has performed a load test on a single instance and determined that peak requests per second (RPS) without service degradation is about 20 RPS. As this is the first deployment, the Specialist intends to set the invocation safety factor to 0.5.

Based on the stated parameters and given that the invocations per instance setting is measured on a per-minute basis, what should the Specialist set as the sageMakervariantinvocationsPerinstance setting?

- A. 10
- B. 30
- C. 600
- D. 2,400

**Answer: C**

#### NEW QUESTION 207

A data scientist uses an Amazon SageMaker notebook instance to conduct data exploration and analysis. This requires certain Python packages that are not natively available on Amazon SageMaker to be installed on the notebook instance.

How can a machine learning specialist ensure that required packages are automatically available on the notebook instance for the data scientist to use?

- A. Install AWS Systems Manager Agent on the underlying Amazon EC2 instance and use Systems Manager Automation to execute the package installation commands.
- B. Create a Jupyter notebook file (.ipynb) with cells containing the package installation commands to execute and place the file under the /etc/init directory of each Amazon SageMaker notebook instance.
- C. Use the conda package manager from within the Jupyter notebook console to apply the necessary conda packages to the default kernel of the notebook.
- D. Create an Amazon SageMaker lifecycle configuration with package installation commands and assign the lifecycle configuration to the notebook instance.

**Answer: D**

#### Explanation:

<https://docs.aws.amazon.com/sagemaker/latest/dg/nbi-add-external.html>

#### NEW QUESTION 211

A Machine Learning Specialist has built a model using Amazon SageMaker built-in algorithms and is not getting expected accurate results. The Specialist wants to use hyperparameter optimization to increase the model's accuracy. Which method is the MOST repeatable and requires the LEAST amount of effort to achieve this?

- A. Launch multiple training jobs in parallel with different hyperparameters
- B. Create an AWS Step Functions workflow that monitors the accuracy in Amazon CloudWatch Logs and relaunches the training job with a defined list of hyperparameters
- C. Create a hyperparameter tuning job and set the accuracy as an objective metric.
- D. Create a random walk in the parameter space to iterate through a range of values that should be used for each individual hyperparameter

**Answer:** B

#### NEW QUESTION 212

A Machine Learning Specialist must build out a process to query a dataset on Amazon S3 using Amazon Athena. The dataset contains more than 800,000 records stored as plaintext CSV files. Each record contains 200 columns and is approximately 1.5 MB in size. Most queries will span 5 to 10 columns only. How should the Machine Learning Specialist transform the dataset to minimize query runtime?

- A. Convert the records to Apache Parquet format
- B. Convert the records to JSON format
- C. Convert the records to GZIP CSV format
- D. Convert the records to XML format

**Answer:** A

#### Explanation:

Using compressions will reduce the amount of data scanned by Amazon Athena, and also reduce your S3 bucket storage. It's a Win-Win for your AWS bill. Supported formats: GZIP, LZO, SNAPPY (Parquet) and ZLIB.

#### NEW QUESTION 216

A Machine Learning Specialist is designing a scalable data storage solution for Amazon SageMaker. There is an existing TensorFlow-based model implemented as a train.py script that relies on static training data that is currently stored as TFRecords. Which method of providing training data to Amazon SageMaker would meet the business requirements with the LEAST development overhead?

- A. Use Amazon SageMaker script mode and use train.py unchanged
- B. Point the Amazon SageMaker training invocation to the local path of the data without reformatting the training data.
- C. Use Amazon SageMaker script mode and use train.py unchanged
- D. Put the TFRecord data into an Amazon S3 bucket
- E. Point the Amazon SageMaker training invocation to the S3 bucket without reformatting the training data.
- F. Rewrite the train.py script to add a section that converts TFRecords to protobuf and ingests the protobuf data instead of TFRecords.
- G. Prepare the data in the format accepted by Amazon SageMaker
- H. Use AWS Glue or AWS Lambda to reformat and store the data in an Amazon S3 bucket.

**Answer:** B

#### Explanation:

<https://github.com/aws-samples/amazon-sagemaker-script-mode/blob/master/tf-horovod-inference-pipeline/train>

#### NEW QUESTION 221

A company is using Amazon Textract to extract textual data from thousands of scanned text-heavy legal documents daily. The company uses this information to process loan applications automatically. Some of the documents fail business validation and are returned to human reviewers, who investigate the errors. This activity increases the time to process the loan applications. What should the company do to reduce the processing time of loan applications?

- A. Configure Amazon Textract to route low-confidence predictions to Amazon SageMaker Ground Truth. Perform a manual review on those words before performing a business validation.
- B. Use an Amazon Textract synchronous operation instead of an asynchronous operation.
- C. Configure Amazon Textract to route low-confidence predictions to Amazon Augmented AI (AmazonA2I). Perform a manual review on those words before performing a business validation.
- D. Use Amazon Rekognition's feature to detect text in an image to extract the data from scanned images. Use this information to process the loan applications.

**Answer:** C

#### NEW QUESTION 222

A Machine Learning Specialist is packaging a custom ResNet model into a Docker container so the company can leverage Amazon SageMaker for training. The Specialist is using Amazon EC2 P3 instances to train the model and needs to properly configure the Docker container to leverage the NVIDIA GPUs. What does the Specialist need to do?

- A. Bundle the NVIDIA drivers with the Docker image.
- B. Build the Docker container to be NVIDIA-Docker compatible.
- C. Organize the Docker container's file structure to execute on GPU instances.
- D. Set the GPU flag in the Amazon SageMaker CreateTrainingJob request body

**Answer:** B

#### NEW QUESTION 225

A manufacturing company has structured and unstructured data stored in an Amazon S3 bucket. A Machine Learning Specialist wants to use SQL to run queries on this data.

Which solution requires the LEAST effort to be able to query this data?

- A. Use AWS Data Pipeline to transform the data and Amazon RDS to run queries.
- B. Use AWS Glue to catalogue the data and Amazon Athena to run queries.
- C. Use AWS Batch to run ETL on the data and Amazon Aurora to run the queries.
- D. Use AWS Lambda to transform the data and Amazon Kinesis Data Analytics to run queries.

**Answer:** B

#### NEW QUESTION 226

A Machine Learning Specialist is required to build a supervised image-recognition model to identify a cat. The ML Specialist performs some tests and records the following results for a neural network-based image classifier:

Total number of images available = 1,000 Test set images = 100 (constant test set)

The ML Specialist notices that, in over 75% of the misclassified images, the cats were held upside down by their owners.

Which techniques can be used by the ML Specialist to improve this specific test error?

- A. Increase the training data by adding variation in rotation for training images.
- B. Increase the number of epochs for model training.
- C. Increase the number of layers for the neural network.
- D. Increase the dropout rate for the second-to-last layer.

**Answer:** A

#### NEW QUESTION 228

A data scientist is using an Amazon SageMaker notebook instance and needs to securely access data stored in a specific Amazon S3 bucket.

How should the data scientist accomplish this?

- A. Add an S3 bucket policy allowing GetObject, PutObject, and ListBucket permissions to the AmazonSageMaker notebook ARN as principal.
- B. Encrypt the objects in the S3 bucket with a custom AWS Key Management Service (AWS KMS) key that only the notebook owner has access to.
- C. Attach the policy to the IAM role associated with the notebook that allows GetObject, PutObject, and ListBucket operations to the specific S3 bucket.
- D. Use a script in a lifecycle configuration to configure the AWS CLI on the instance with an access key ID and secret.

**Answer:** C

#### NEW QUESTION 229

A Machine Learning Specialist is developing recommendation engine for a photography blog Given a picture, the recommendation engine should show a picture that captures similar objects The Specialist would like to create a numerical representation feature to perform nearest-neighbor searches

What actions would allow the Specialist to get relevant numerical representations?

- A. Reduce image resolution and use reduced resolution pixel values as features
- B. Use Amazon Mechanical Turk to label image content and create a one-hot representation indicating the presence of specific labels
- C. Run images through a neural network pre-trained on ImageNet, and collect the feature vectors from the penultimate layer
- D. Average colors by channel to obtain three-dimensional representations of images.

**Answer:** A

#### NEW QUESTION 234

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