

Amazon

Exam Questions AWS-Certified-Machine-Learning-Specialty

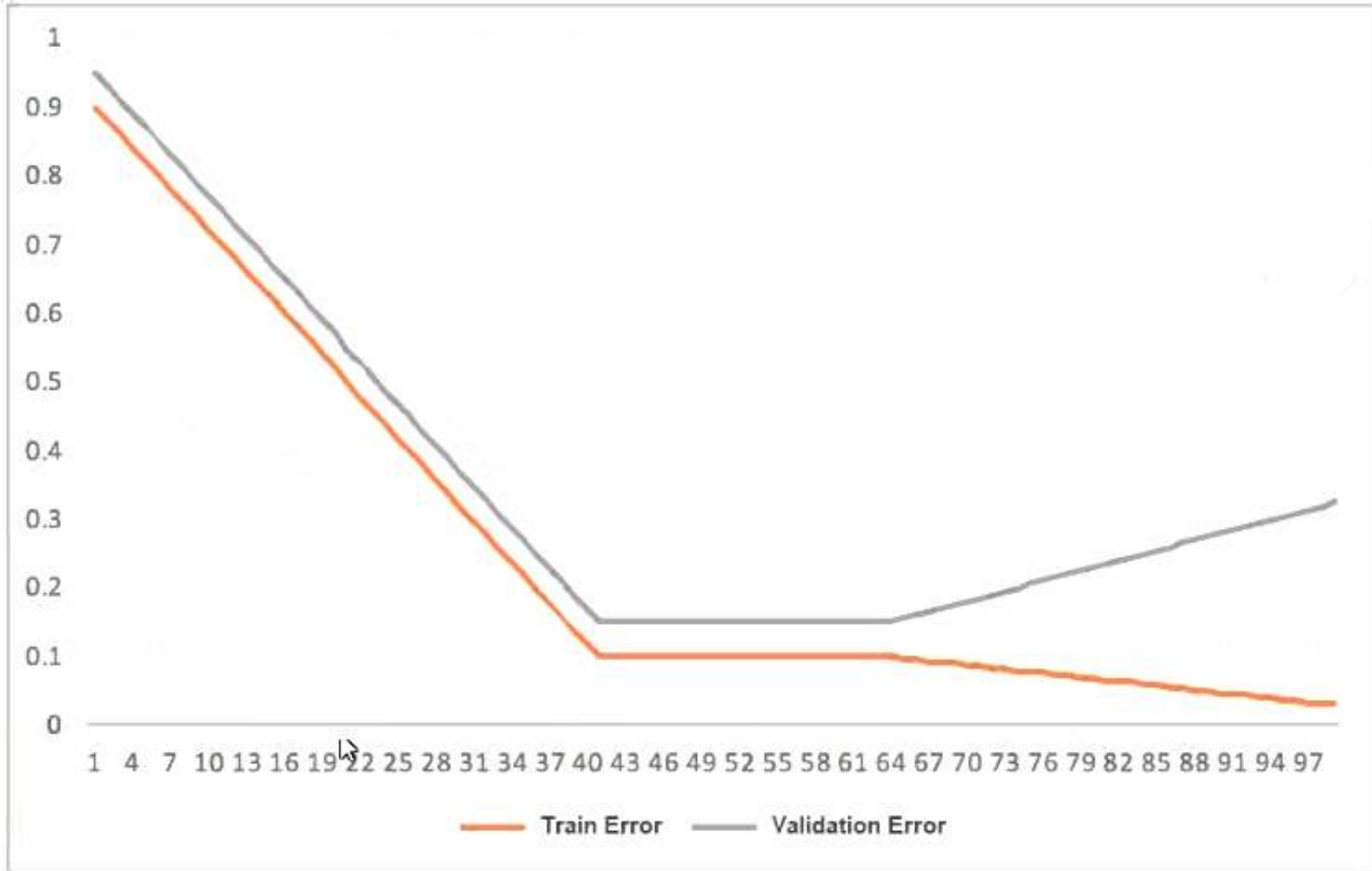
AWS Certified Machine Learning - Specialty



NEW QUESTION 1

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 2

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 3

An e-commerce company wants to launch a new cloud-based product recommendation feature for its web application. Due to data localization regulations, any sensitive data must not leave its on-premises data center, and the product recommendation model must be trained and tested using nonsensitive data only. Data transfer to the cloud must use IPsec. The web application is hosted on premises with a PostgreSQL database that contains all the data. The company wants the data to be uploaded securely to Amazon S3 each day for model retraining.

How should a machine learning specialist meet these requirements?

- A. Create an AWS Glue job to connect to the PostgreSQL DB instance
- B. Ingest tables without sensitive data through an AWS Site-to-Site VPN connection directly into Amazon S3.
- C. Create an AWS Glue job to connect to the PostgreSQL DB instance
- D. Ingest all data through an AWS Site-to-Site VPN connection into Amazon S3 while removing sensitive data using a PySpark job.
- E. Use AWS Database Migration Service (AWS DMS) with table mapping to select PostgreSQL tables with no sensitive data through an SSL connection
- F. Replicate data directly into Amazon S3.
- G. Use PostgreSQL logical replication to replicate all data to PostgreSQL in Amazon EC2 through AWS Direct Connect with a VPN connection
- H. Use AWS Glue to move data from Amazon EC2 to Amazon S3.

Answer: C

NEW QUESTION 4

A web-based company wants to improve its conversion rate on its landing page. Using a large historical dataset of customer visits, the company has repeatedly trained a multi-class deep learning network algorithm on Amazon SageMaker. However, there is an overfitting problem: training data shows 90% accuracy in

predictions, while test data shows 70% accuracy only

The company needs to boost the generalization of its model before deploying it into production to maximize conversions of visits to purchases

Which action is recommended to provide the HIGHEST accuracy model for the company's test and validation data?

- A. Increase the randomization of training data in the mini-batches used in training.
- B. Allocate a higher proportion of the overall data to the training dataset
- C. Apply L1 or L2 regularization and dropouts to the training.
- D. Reduce the number of layers and units (or neurons) from the deep learning network.

Answer: C

Explanation:

If this is a ComputerVision problem augmentation can help and we may consider A an option. However in analyzing customer historic data, there is no easy way to increase randomization in training. If you go deep into modelling and coding. When you build model with tensorflow/pytorch, most of the time the trainloader is already sampling in data in random manner (with shuffle enable). What we usually do to reduce overfitting is by adding dropout.

<https://docs.aws.amazon.com/machine-learning/latest/dg/model-fit-underfitting-vs-overfitting.html>

NEW QUESTION 5

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.jpgSelect 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 6

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 long Amazon SageMaker API calls to Amazon S3. Add code to push a custom metric to Amazon CloudWatc
- 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 CloudWatc
- 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 CloudTrai
- F. Add code to push a custom metric to Amazon CloudWatc
- 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 7

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 8

The Chief Editor for a product catalog wants the Research and Development team to build a machine learning system that can be used to detect whether or not individuals in a collection of images are wearing the company's retail brand. The team has a set of training data. Which machine learning algorithm should the researchers use that BEST meets their requirements?

- A. Latent Dirichlet Allocation (LDA)
- B. Recurrent neural network (RNN)
- C. K-means
- D. Convolutional neural network (CNN)

Answer: C

NEW QUESTION 9

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 10

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%

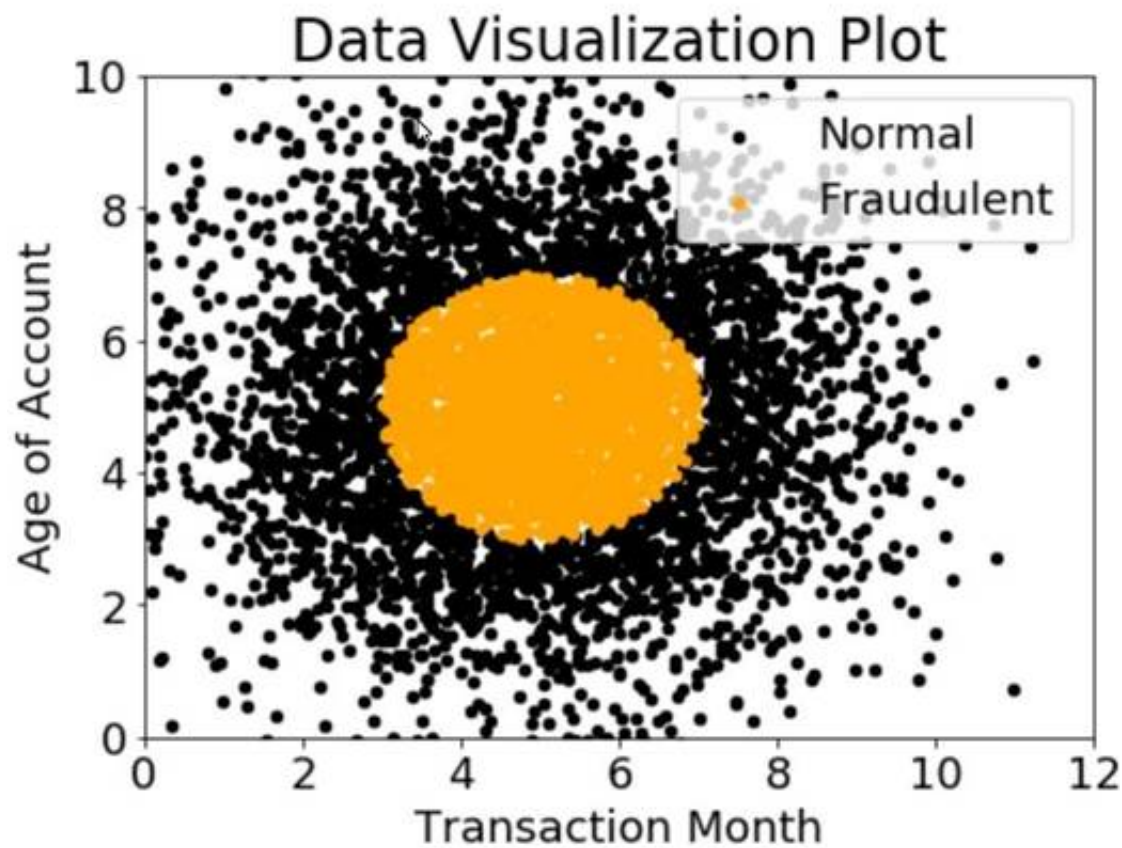
What can the Specialist learn from the experiments?

- 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 10

A company wants to classify user behavior as either fraudulent or normal. Based on internal research, a Machine Learning Specialist would like to build a binary classifier based on two features: age of account and transaction month. The class distribution for these features is illustrated in the figure provided.



Based on this information which model would have the HIGHEST accuracy?

- A. Long short-term memory (LSTM) model with scaled exponential linear unit (SELL)
- B. Logistic regression
- C. Support vector machine (SVM) with non-linear kernel
- D. Single perceptron with tanh activation function

Answer: C

NEW QUESTION 15

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 19

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 22

A Machine Learning Specialist is building a model that will perform time series forecasting using Amazon SageMaker. The Specialist has finished training the model and is now planning to perform load testing on the endpoint so they can configure Auto Scaling for the model variant. Which approach will allow the Specialist to review the latency, memory utilization, and CPU utilization during the load test?

- A. Review SageMaker logs that have been written to Amazon S3 by leveraging Amazon Athena and Amazon QuickSight to visualize logs as they are being produced
- B. Generate an Amazon CloudWatch dashboard to create a single view for the latency, memory utilization, and CPU utilization metrics that are outputted by Amazon SageMaker
- C. Build custom Amazon CloudWatch Logs and then leverage Amazon ES and Kibana to query and visualize the data as it is generated by Amazon SageMaker
- D. Send Amazon CloudWatch Logs that were generated by Amazon SageMaker to Amazon ES and use Kibana to query and visualize the log data.

Answer: B

NEW QUESTION 25

A retail company wants to combine its customer orders with the product description data from its product catalog. The structure and format of the records in each dataset is different. A data analyst tried to use a spreadsheet to combine the datasets, but the effort resulted in duplicate records and records that were not properly combined. The company needs a solution that it can use to combine similar records from the two datasets and remove any duplicates. Which solution will meet these requirements?

- A. Use an AWS Lambda function to process the data
- B. Use two arrays to compare equal strings in the fields from the two datasets and remove any duplicates.

- C. Create AWS Glue crawlers for reading and populating the AWS Glue Data Catalog
- D. Call the AWS Glue SearchTables API operation to perform a fuzzy-matching search on the two datasets, and cleanse the data accordingly.
- E. Create AWS Glue crawlers for reading and populating the AWS Glue Data Catalog
- F. Use the FindMatches transform to cleanse the data.
- G. Create an AWS Lake Formation custom transform
- H. Run a transformation for matching products from the Lake Formation console to cleanse the data automatically.

Answer: D

NEW QUESTION 28

A media company with a very large archive of unlabeled images, text, audio, and video footage wishes to index its assets to allow rapid identification of relevant content by the Research team. The company wants to use machine learning to accelerate the efforts of its in-house researchers who have limited machine learning expertise.

Which is the FASTEST route to index the assets?

- A. Use Amazon Rekognition, Amazon Comprehend, and Amazon Transcribe to tag data into distinct categories/classes.
- B. Create a set of Amazon Mechanical Turk Human Intelligence Tasks to label all footage.
- C. Use Amazon Transcribe to convert speech to text
- D. Use the Amazon SageMaker Neural Topic Model (NTM) and Object Detection algorithms to tag data into distinct categories/classes.
- E. Use the AWS Deep Learning AMI and Amazon EC2 GPU instances to create custom models for audio transcription and topic modeling, and use object detection to tag data into distinct categories/classes.

Answer: A

NEW QUESTION 31

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 36

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 39

A Machine Learning Specialist is working for a credit card processing company and receives an unbalanced dataset containing credit card transactions. It contains 99,000 valid transactions and 1,000 fraudulent transactions. The Specialist is asked to score a model that was run against the dataset. The Specialist has been advised that identifying valid transactions is equally as important as identifying fraudulent transactions.

What metric is BEST suited to score the model?

- A. Precision
- B. Recall
- C. Area Under the ROC Curve (AUC)
- D. Root Mean Square Error (RMSE)

Answer: A

NEW QUESTION 44

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 needs to reduce the number of false negatives.

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

Which combination of steps should the Data Scientist take to reduce the number of false negative predictions by the model? (Choose two.)

- A. Change the XGBoost eval_metric parameter to optimize based on Root Mean Square Error (RMSE).
- 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 Area Under the ROC Curve (AUC).
- E. Decrease the XGBoost max_depth parameter because the model is currently overfitting the data.

Answer: BD

NEW QUESTION 45

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 47

A machine learning specialist is developing a regression model to predict rental rates from rental listings. A variable named Wall_Color represents the most prominent exterior wall color of the property. The following is the sample data, excluding all other variables:

Property_ID	Wall_Color
1000	Red
1001	White
1002	Green

The specialist chose a model that needs numerical input data.

Which feature engineering approaches should the specialist use to allow the regression model to learn from the Wall_Color data? (Choose two.)

- A. Apply integer transformation and set Red = 1, White = 5, and Green = 10.
- B. Add new columns that store one-hot representation of colors.
- C. Replace the color name string by its length.
- D. Create three columns to encode the color in RGB format.
- E. Replace each color name by its training set frequency.

Answer: AD

NEW QUESTION 48

A technology startup is using complex deep neural networks and GPU compute to recommend the company's products to its existing customers based upon each customer's habits and interactions. The solution currently pulls each dataset from an Amazon S3 bucket before loading the data into a TensorFlow model pulled from the company's Git repository that runs locally. This job then runs for several hours while continually outputting its progress to the same S3 bucket. The job can be paused, restarted, and continued at any time in the event of a failure, and is run from a central queue.

Senior managers are concerned about the complexity of the solution's resource management and the costs involved in repeating the process regularly. They ask for the workload to be automated so it runs once a week, starting Monday and completing by the close of business Friday.

Which architecture should be used to scale the solution at the lowest cost?

- A. Implement the solution using AWS Deep Learning Containers and run the container as a job using AWS Batch on a GPU-compatible Spot Instance
- B. Implement the solution using a low-cost GPU-compatible Amazon EC2 instance and use the AWS Instance Scheduler to schedule the task
- C. Implement the solution using AWS Deep Learning Containers, run the workload using AWS Fargate running on Spot Instances, and then schedule the task using the built-in task scheduler
- D. Implement the solution using Amazon ECS running on Spot Instances and schedule the task using the ECS service scheduler

Answer: C

NEW QUESTION 51

A library is developing an automatic book-borrowing system that uses Amazon Rekognition. Images of library members' faces are stored in an Amazon S3 bucket. When members borrow books, the Amazon Rekognition CompareFaces API operation compares real faces against the stored faces in Amazon S3.

The library needs to improve security by making sure that images are encrypted at rest. Also, when the images are used with Amazon Rekognition, they need to be encrypted in transit. The library also must ensure that the images are not used to improve Amazon Rekognition as a service.

How should a machine learning specialist architect the solution to satisfy these requirements?

- A. Enable server-side encryption on the S3 bucket
- B. Submit an AWS Support ticket to opt out of allowing images to be used for improving the service, and follow the process provided by AWS Support.
- C. Switch to using an Amazon Rekognition collection to store the image
- D. Use the IndexFaces and SearchFacesByImage API operations instead of the CompareFaces API operation.
- E. Switch to using the AWS GovCloud (US) Region for Amazon S3 to store images and for Amazon Rekognition to compare face
- F. Set up a VPN connection and only call the Amazon Rekognition API operations through the VPN.
- G. Enable client-side encryption on the S3 bucket
- H. Set up a VPN connection and only call the Amazon Rekognition API operations through the VPN.

Answer: B

NEW QUESTION 55

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 56

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					
		A	B	C	D	E	Total
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					
		A	B	C	D	E	Total
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 57

A Data Scientist needs to analyze employment data. The dataset contains approximately 10 million observations on people across 10 different features. During the preliminary analysis, the Data Scientist notices that income and age distributions are not normal. While income levels shows a right skew as expected, with fewer individuals having a higher income, the age distribution also show a right skew, with fewer older individuals participating in the workforce. Which feature transformations can the Data Scientist apply to fix the incorrectly skewed data? (Choose two.)

- A. Cross-validation
- B. Numerical value binning
- C. High-degree polynomial transformation
- D. Logarithmic transformation
- E. One hot encoding

Answer: AB

NEW QUESTION 59

While working on a neural network project, a Machine Learning Specialist discovers that some features in the data have very high magnitude resulting in this data being weighted more in the cost function. What should the Specialist do to ensure better convergence during backpropagation?

- A. Dimensionality reduction
- B. Data normalization
- C. Model regularization
- D. Data augmentation for the minority class

Answer: D

NEW QUESTION 64

A credit card company wants to build a credit scoring model to help predict whether a new credit card applicant will default on a credit card payment. The company has collected data from a large number of sources with thousands of raw attributes. Early experiments to train a classification model revealed that many attributes are highly correlated, the large number of features slows down the training speed significantly, and that there are some overfitting issues. The Data Scientist on this project would like to speed up the model training time without losing a lot of information from the original dataset. Which feature engineering technique should the Data Scientist use to meet the objectives?

- A. Run self-correlation on all features and remove highly correlated features
- B. Normalize all numerical values to be between 0 and 1
- C. Use an autoencoder or principal component analysis (PCA) to replace original features with new features
- D. Cluster raw data using k-means and use sample data from each cluster to build a new dataset

Answer: B

NEW QUESTION 68

A manufacturing company uses machine learning (ML) models to detect quality issues. The models use images that are taken of the company's product at the end of each production step. The company has thousands of machines at the production site that generate one image per second on average. The company ran a successful pilot with a single manufacturing machine. For the pilot, ML specialists used an industrial PC that ran AWS IoT Greengrass with a long-running AWS Lambda function that uploaded the images to Amazon S3. The uploaded images invoked a Lambda function that was written in Python to perform inference by using an Amazon SageMaker endpoint that ran a custom model. The inference results were forwarded back to a web service that was hosted at the production site to prevent faulty products from being shipped. The company scaled the solution out to all manufacturing machines by installing similarly configured industrial PCs on each production machine. However, latency for predictions increased beyond acceptable limits. Analysis shows that the internet connection is at its capacity limit. How can the company resolve this issue MOST cost-effectively?

- A. Set up a 10 Gbps AWS Direct Connect connection between the production site and the nearest AWS Region
- B. Use the Direct Connect connection to upload the image
- C. Increase the size of the instances and the number of instances that are used by the SageMaker endpoint.
- D. Extend the long-running Lambda function that runs on AWS IoT Greengrass to compress the images and upload the compressed files to Amazon S3. Decompress the files by using a separate Lambda function that invokes the existing Lambda function to run the inference pipeline.
- E. Use auto scaling for SageMaker
- F. Set up an AWS Direct Connect connection between the production site and the nearest AWS Region
- G. Use the Direct Connect connection to upload the images.
- H. Deploy the Lambda function and the ML models onto the AWS IoT Greengrass core that is running on the industrial PCs that are installed on each machine
- I. Extend the long-running Lambda function that runs on AWS IoT Greengrass to invoke the Lambda function with the captured images and run the inference on the edge component that forwards the results directly to the web service.

Answer: D

NEW QUESTION 71

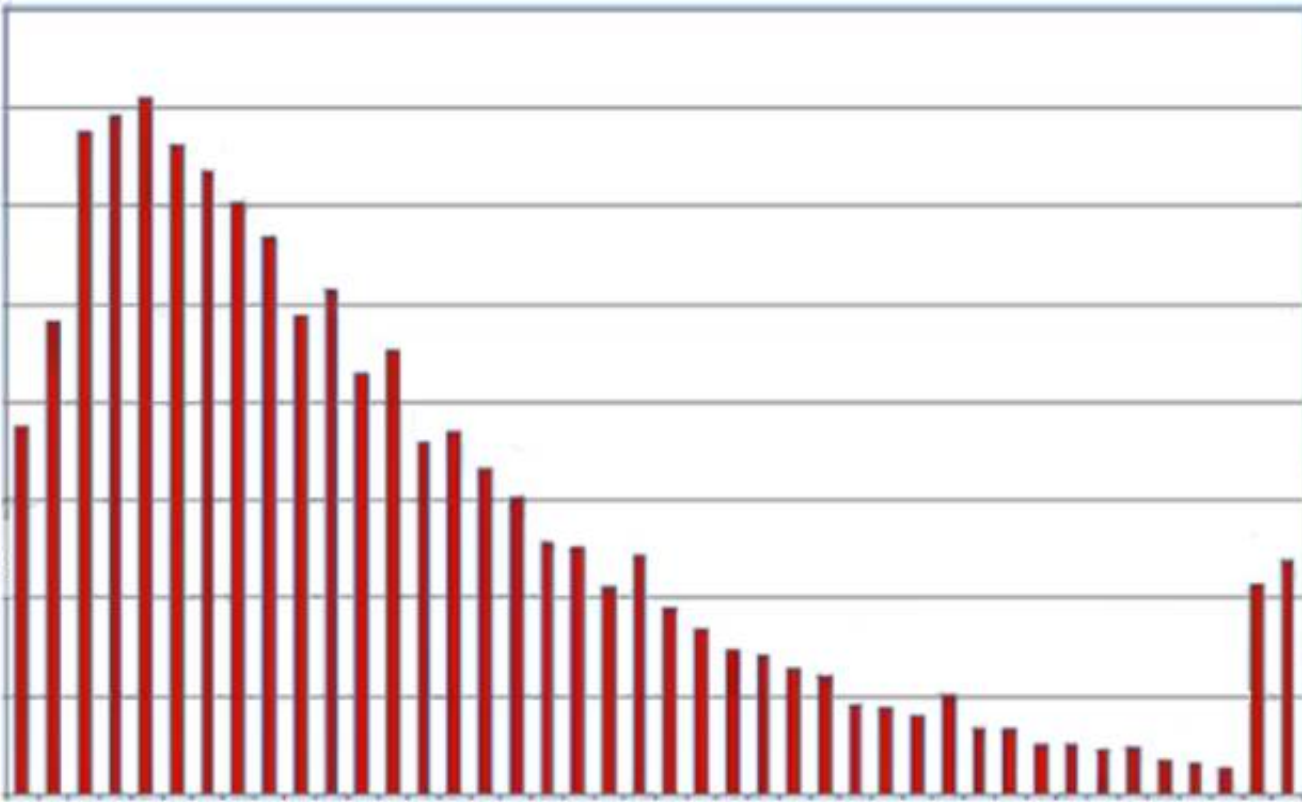
A company provisions Amazon SageMaker notebook instances for its data science team and creates Amazon VPC interface endpoints to ensure communication between the VPC and the notebook instances. All connections to the Amazon SageMaker API are contained entirely and securely using the AWS network. However, 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 VPC
- F. Convert all of the subnets where the Amazon SageMaker notebook instances are hosted to private subnets
- 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 75

A Data Scientist is building a linear regression model and will use resulting p-values to evaluate the statistical significance of each coefficient. Upon inspection of the dataset, the Data Scientist discovers that most of the features are normally distributed. The plot of one feature in the dataset is shown in the graphic.



What transformation should the Data Scientist apply to satisfy the statistical assumptions of the linear regression model?

- A. Exponential transformation
- B. Logarithmic transformation
- C. Polynomial transformation
- D. Sinusoidal transformation

Answer: A

NEW QUESTION 80

A company is running an Amazon SageMaker training job that will access data stored in its Amazon S3 bucket. A compliance policy requires that the data never be transmitted across the internet. How should the company set up the job?

- A. Launch the notebook instances in a public subnet and access the data through the public S3 endpoint.
- B. Launch the notebook instances in a private subnet and access the data through a NAT gateway.
- C. Launch the notebook instances in a public subnet and access the data through a NAT gateway.
- D. Launch the notebook instances in a private subnet and access the data through an S3 VPC endpoint.

Answer: D

NEW QUESTION 85

A Data Engineer needs to build a model using a dataset containing customer credit card information. How can the Data Engineer ensure the data remains encrypted and the credit card information is secure?

- A. Use a custom encryption algorithm to encrypt the data and store the data on an Amazon SageMaker instance in a VP.
- B. Use the SageMaker DeepAR algorithm to randomize the credit card numbers.
- C. Use an IAM policy to encrypt the data on the Amazon S3 bucket and Amazon Kinesis to automatically discard credit card numbers and insert fake credit card numbers.
- D. Use an Amazon SageMaker launch configuration to encrypt the data once it is copied to the SageMaker instance in a VP.
- E. Use the SageMaker principal component analysis (PCA) algorithm to reduce the length of the credit card numbers.
- F. Use AWS KMS to encrypt the data on Amazon S3 and Amazon SageMaker, and redact the credit card numbers from the customer data with AWS Glue.

Answer: D

NEW QUESTION 86

A company is observing low accuracy while training on the default built-in image classification algorithm in Amazon SageMaker. The Data Science team wants to use an Inception neural network architecture instead of a ResNet architecture. Which of the following will accomplish this? (Select TWO.)

- A. Customize the built-in image classification algorithm to use Inception and use this for model training.
- B. Create a support case with the SageMaker team to change the default image classification algorithm to Inception.
- C. Bundle a Docker container with TensorFlow Estimator loaded with an Inception network and use this for model training.
- D. Use custom code in Amazon SageMaker with TensorFlow Estimator to load the model with an Inception network and use this for model training.
- E. Download and apt-get install the inception network code into an Amazon EC2 instance and use this instance as a Jupyter notebook in Amazon SageMaker.

Answer: AD

NEW QUESTION 91

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 retraining 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 se
- 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 93

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 96

A Data Scientist is building a model to predict customer churn using a dataset of 100 continuous numerical features. The Marketing team has not provided any insight about which features are relevant for churn prediction. The Marketing team wants to interpret the model and see the direct impact of relevant features on the model outcome. While training a logistic regression model, the Data Scientist observes that there is a wide gap between the training and validation set accuracy.

Which methods can the Data Scientist use to improve the model performance and satisfy the Marketing team's needs? (Choose two.)

- A. Add L1 regularization to the classifier
- B. Add features to the dataset
- C. Perform recursive feature elimination
- D. Perform t-distributed stochastic neighbor embedding (t-SNE)
- E. Perform linear discriminant analysis

Answer: BE

NEW QUESTION 99

A company has set up and deployed its machine learning (ML) model into production with an endpoint using Amazon SageMaker hosting services. The ML team has configured automatic scaling for its SageMaker instances to support workload changes. During testing, the team notices that additional instances are being launched before the new instances are ready. This behavior needs to change as soon as possible.

How can the ML team solve this issue?

- A. Decrease the cooldown period for the scale-in activit
- B. Increase the configured maximum capacity of instances.
- C. Replace the current endpoint with a multi-model endpoint using SageMaker.
- D. Set up Amazon API Gateway and AWS Lambda to trigger the SageMaker inference endpoint.
- E. Increase the cooldown period for the scale-out activity.

Answer: A

NEW QUESTION 101

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 102

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 107

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 110

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 113

A Machine Learning Specialist is building a supervised model that will evaluate customers' satisfaction with their mobile phone service based on recent usage The model's output should infer whether or not a customer is likely to switch to a competitor in the next 30 days

Which of the following modeling techniques should the Specialist use?

- A. Time-series prediction
- B. Anomaly detection
- C. Binary classification
- D. Regression

Answer: D

NEW QUESTION 115

A logistics company needs a forecast model to predict next month's inventory requirements for a single item in 10 warehouses. A machine learning specialist uses Amazon Forecast to develop a forecast model from 3 years of monthly data. There is no missing data. The specialist selects the DeepAR+ algorithm to train a predictor. The predictor means absolute percentage error (MAPE) is much larger than the MAPE produced by the current human forecasters.

Which changes to the CreatePredictor API call could improve the MAPE? (Choose two.)

- A. Set PerformAutoML to true.
- B. Set ForecastHorizon to 4.
- C. Set ForecastFrequency to W for weekly.
- D. Set PerformHPO to true.
- E. Set FeaturizationMethodName to filling.

Answer: CD

NEW QUESTION 117

A Machine Learning Specialist is applying a linear least squares regression model to a dataset with 1 000 records and 50 features Prior to training, the ML Specialist notices that two features are perfectly linearly dependent

Why could this be an issue for the linear least squares regression model?

- A. It could cause the backpropagation algorithm to fail during training
- B. It could create a singular matrix during optimization which fails to define a unique solution
- C. It could modify the loss function during optimization causing it to fail during training
- D. It could introduce non-linear dependencies within the data which could invalidate the linear assumptions of the model

Answer: C

NEW QUESTION 121

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 124

A data scientist needs to identify fraudulent user accounts for a company's ecommerce platform. The company wants the ability to determine if a newly created account is associated with a previously known fraudulent user. The data scientist is using AWS Glue to cleanse the company's application logs during ingestion. Which strategy will allow the data scientist to identify fraudulent accounts?

- A. Execute the built-in FindDuplicates Amazon Athena query.
- B. Create a FindMatches machine learning transform in AWS Glue.
- C. Create an AWS Glue crawler to infer duplicate accounts in the source data.
- D. Search for duplicate accounts in the AWS Glue Data Catalog.

Answer: B

NEW QUESTION 129

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 132

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 135

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 140

A Machine Learning Specialist is developing a 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 145

A Machine Learning Specialist is working with multiple data sources containing billions of records that need to be joined. What feature engineering and model development approach should the Specialist take with a dataset this large?

- A. Use an Amazon SageMaker notebook for both feature engineering and model development
- B. Use an Amazon SageMaker notebook for feature engineering and Amazon ML for model development
- C. Use Amazon EMR for feature engineering and Amazon SageMaker SDK for model development
- D. Use Amazon ML for both feature engineering and model development.

Answer: B

NEW QUESTION 150

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