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## **AWS-Certified-Machine-Learning-Specialty Reliable Study Notes | 100% Free AWS Certified Machine Learning - Specialty Exam Pattern**

With the help of performance reports of AWS Certified Machine Learning - Specialty (AWS-Certified-Machine-Learning-Specialty) Desktop practice exam software, you can gauge and improve your growth. You can also alter the duration and AWS Certified Machine Learning - Specialty (AWS-Certified-Machine-Learning-Specialty) questions numbers in your practice tests. Questions of this AWS Certified Machine Learning - Specialty (AWS-Certified-Machine-Learning-Specialty) mock test closely resemble the format of the actual test. As a result, it gives you a feeling of taking the actual test.

To be eligible to take the AWS Certified Machine Learning - Specialty certification exam, the candidate must have a minimum of one year of experience using AWS services, and must have a strong understanding of machine learning concepts and techniques. AWS Certified Machine Learning - Specialty certification exam is a combination of multiple-choice and multiple-response questions, and requires the candidate to demonstrate their practical skills by completing a hands-on lab exercise. Upon passing the exam, the candidate will receive the AWS Certified Machine Learning - Specialty certification, which is valid for three years.

## Amazon AWS Certified Machine Learning - Specialty Sample Questions (Q12-Q17):

### NEW QUESTION # 12

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

**Answer: A**

Explanation:

Area Under the ROC Curve (AUC) is a metric that is best suited to score the model for the given scenario.

AUC is a measure of the performance of a binary classifier, such as a model that predicts whether a credit card transaction is valid or fraudulent. AUC is calculated based on the Receiver Operating Characteristic (ROC) curve, which is a plot that shows the trade-off between the true positive rate (TPR) and the false positive rate (FPR) of the classifier as the decision threshold is varied. The TPR, also known as recall or sensitivity, is the proportion of actual positive cases (fraudulent transactions) that are correctly predicted as positive by the classifier. The FPR, also known as the fall-out, is the proportion of actual negative cases (valid transactions) that are incorrectly predicted as positive by the classifier. The ROC curve illustrates how well the classifier can distinguish between the two classes, regardless of the class distribution or the error costs. A perfect classifier would have a TPR of 1 and an FPR of 0 for all thresholds, resulting in a ROC curve that goes from the bottom left to the top left and then to the top right of the plot. A random classifier would have a TPR and an FPR that are equal for all thresholds, resulting in a ROC curve that goes from the bottom left to the top right of the plot along the diagonal line. AUC is the area under the ROC curve, and it ranges from 0 to 1. A higher AUC indicates a better classifier, as it means that the classifier has a higher TPR and a lower FPR for all thresholds. AUC is a useful metric for imbalanced classification problems, such as the credit card transaction dataset, because it is insensitive to the class imbalance and the error costs. AUC can capture the overall performance of the classifier across all possible scenarios, and it can be used to compare different classifiers based on their ROC curves.

The other options are not as suitable as AUC for the given scenario for the following reasons:

\* Precision: Precision is the proportion of predicted positive cases (fraudulent transactions) that are actually positive. Precision is a useful metric when the cost of a false positive is high, such as in spam detection or medical diagnosis. However, precision is not a good metric for imbalanced classification problems, because it can be misleadingly high when the positive class is rare. For example, a classifier that predicts all transactions as valid would have a precision of 0, but a very high accuracy of 99%.

Precision is also dependent on the decision threshold and the error costs, which may vary for different scenarios.

\* Recall: Recall is the same as the TPR, and it is the proportion of actual positive cases (fraudulent transactions) that are correctly predicted as positive by the classifier. Recall is a useful metric when the cost of a false negative is high, such as in fraud detection or cancer diagnosis. However, recall is not a good metric for imbalanced classification problems, because it can be misleadingly low when the positive class is rare. For example, a classifier that predicts all transactions as fraudulent would have a recall of 1, but a very low accuracy of 1%. Recall is also dependent on the decision threshold and the error costs, which may vary for different scenarios.

\* Root Mean Square Error (RMSE): RMSE is a metric that measures the average difference between the predicted and the actual values. RMSE is a useful metric for regression problems, where the goal is to predict a continuous value, such as the price of a house or the temperature of a city. However, RMSE is not a good metric for classification problems, where the goal is to predict a discrete value, such as the class label of a transaction. RMSE is not meaningful for classification problems, because it does not capture the accuracy or the error costs of the predictions.

ROC Curve and AUC

How and When to Use ROC Curves and Precision-Recall Curves for Classification in Python Precision-Recall Root Mean Squared Error

### NEW QUESTION # 13

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. 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
- B. 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
- **C. 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**
- 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: C**

Explanation:

The best services to use for building a data ingestion solution for the company's Amazon S3-based data lake are:

**AWS Glue as the data catalog:** AWS Glue is a fully managed extract, transform, and load (ETL) service that can discover, crawl, and catalog data from various sources and formats, and make it available for analysis. AWS Glue can also generate ETL code in Python or Scala to transform, enrich, and join data using AWS Glue Data Catalog as the metadata repository. AWS Glue Data Catalog is a central metadata store that integrates with Amazon Athena, Amazon EMR, and Amazon Redshift Spectrum, allowing users to create a unified view of their data across various sources and formats.

**Amazon Kinesis Data Streams and Amazon Kinesis Data Analytics for real-time data insights:** Amazon Kinesis Data Streams is a service that enables users to collect, process, and analyze real-time streaming data at any scale. Users can create data streams that can capture data from various sources, such as web and mobile applications, IoT devices, and social media platforms. Amazon Kinesis Data Analytics is a service that allows users to analyze streaming data using standard SQL queries or Apache Flink applications. Users can create real-time dashboards, metrics, and alerts based on the streaming data analysis results.

**Amazon Kinesis Data Firehose for delivery to Amazon ES for clickstream analytics:** Amazon Kinesis Data Firehose is a service that enables users to load streaming data into data lakes, data stores, and analytics services. Users can configure Kinesis Data Firehose to automatically deliver data to various destinations, such as Amazon S3, Amazon Redshift, Amazon OpenSearch Service, and third-party solutions. For clickstream analytics, users can use Kinesis Data Firehose to deliver data to Amazon OpenSearch Service, a fully managed service that offers search and analytics capabilities for log data. Users can use Amazon OpenSearch Service to perform interactive analysis and visualization of clickstream data using Kibana, an open-source tool that is integrated with Amazon OpenSearch Service.

**Amazon EMR to generate personalized product recommendations:** Amazon EMR is a service that enables users to run distributed data processing frameworks, such as Apache Spark, Apache Hadoop, and Apache Hive, on scalable clusters of EC2 instances. Users can use Amazon EMR to perform advanced analytics, such as machine learning, on large and complex datasets stored in Amazon S3 or other sources. For product recommendations, users can use Amazon EMR to run Spark MLlib, a library that provides scalable machine learning algorithms, such as collaborative filtering, to generate personalized recommendations based on user behavior and preferences.

References:

AWS Glue - Fully Managed ETL Service

Amazon Kinesis - Data Streaming Service

Amazon OpenSearch Service - Managed OpenSearch Service

Amazon EMR - Managed Hadoop Framework

### NEW QUESTION # 14

A retail chain has been ingesting purchasing records from its network of 20,000 stores to Amazon S3 using Amazon Kinesis Data Firehose. To support training an improved machine learning model, training records will require new but simple transformations, and some attributes will be combined. The model needs to be retrained daily.

Given the large number of stores and the legacy data ingestion, which change will require the LEAST amount of development effort?

- A. Spin up a fleet of Amazon EC2 instances with the transformation logic, have them transform the data records accumulating on Amazon S3, and output the transformed records to Amazon S3.
- **B. Insert an Amazon Kinesis Data Analytics stream downstream of the Kinesis Data Firehose stream that transforms raw record attributes into simple transformed values using SQL.**
- C. Require that the stores to switch to capturing their data locally on AWS Storage Gateway for loading into Amazon S3, then use AWS Glue to do the transformation.
- D. Deploy an Amazon EMR cluster running Apache Spark with the transformation logic, and have the cluster run each day on the accumulating records in Amazon S3, outputting new/transformed records to Amazon S3.

**Answer: B**

#### NEW QUESTION # 15

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? (Choose two.)

- **A. Use custom code in Amazon SageMaker with TensorFlow Estimator to load the model with an Inception network, 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. Customize the built-in image classification algorithm to use Inception 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: A,D**

#### NEW QUESTION # 16

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

**Answer: D**

### NEW QUESTION # 17

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