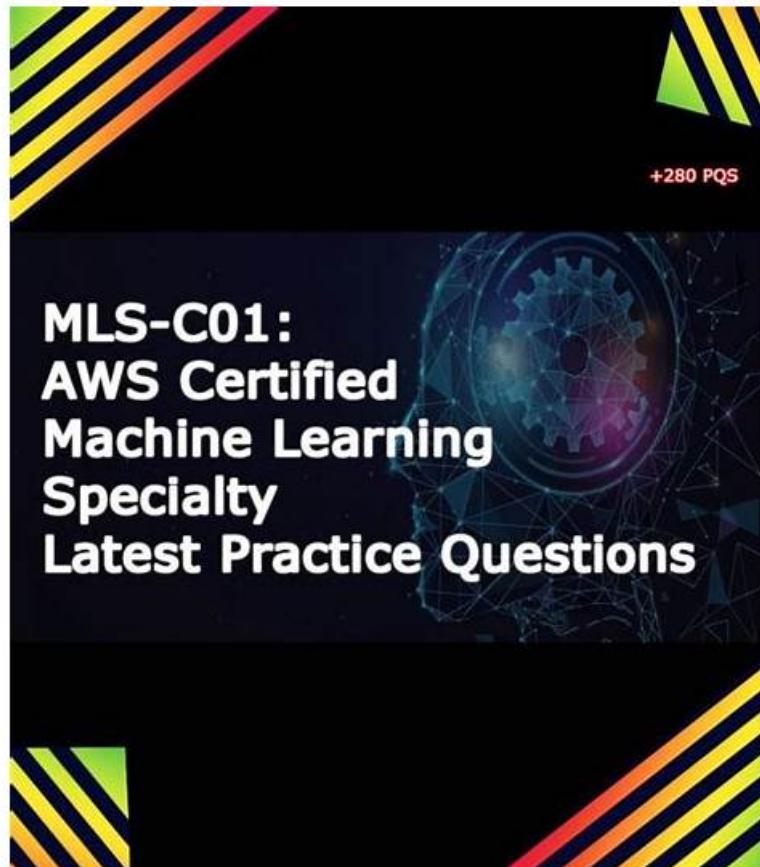


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## Amazon MLS-C01 Exam Questions - Failure Will Result In A Refund

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## Amazon AWS Certified Machine Learning - Specialty Sample Questions

## (Q101-Q106):

### NEW QUESTION # 101

A company is launching a new product and needs to build a mechanism to monitor comments about the company and its new product on social media. The company needs to be able to evaluate the sentiment expressed in social media posts, and visualize trends and configure alarms based on various thresholds.

The company needs to implement this solution quickly, and wants to minimize the infrastructure and data science resources needed to evaluate the messages. The company already has a solution in place to collect posts and store them within an Amazon S3 bucket. What services should the data science team use to deliver this solution?

- A. Trigger an AWS Lambda function when social media posts are added to the S3 bucket. Call Amazon Comprehend for each post to capture the sentiment in the message and record the sentiment in a custom Amazon CloudWatch metric and in S3. Use CloudWatch alarms to notify analysts of trends.
- B. Trigger an AWS Lambda function when social media posts are added to the S3 bucket. Call Amazon Comprehend for each post to capture the sentiment in the message and record the sentiment in an Amazon DynamoDB table. Schedule a second Lambda function to query recently added records and send an Amazon Simple Notification Service (Amazon SNS) notification to notify analysts of trends.
- C. Train a model in Amazon SageMaker by using the BlazingText algorithm to detect sentiment in the corpus of social media posts. Expose an endpoint that can be called by AWS Lambda. Trigger a Lambda function when posts are added to the S3 bucket to invoke the endpoint and record the sentiment in an Amazon DynamoDB table and in a custom Amazon CloudWatch metric. Use CloudWatch alarms to notify analysts of trends.
- D. Train a model in Amazon SageMaker by using the semantic segmentation algorithm to model the semantic content in the corpus of social media posts. Expose an endpoint that can be called by AWS Lambda. Trigger a Lambda function when objects are added to the S3 bucket to invoke the endpoint and record the sentiment in an Amazon DynamoDB table. Schedule a second Lambda function to query recently added records and send an Amazon Simple Notification Service (Amazon SNS) notification to notify analysts of trends.

### Answer: A

Explanation:

The solution that uses Amazon Comprehend and Amazon CloudWatch is the most suitable for the given scenario. Amazon Comprehend is a natural language processing (NLP) service that can analyze text and extract insights such as sentiment, entities, topics, and syntax. Amazon CloudWatch is a monitoring and observability service that can collect and track metrics, create dashboards, and set alarms based on various thresholds. By using these services, the data science team can quickly and easily implement a solution to monitor the sentiment of social media posts without requiring much infrastructure or data science resources. The solution also meets the requirements of storing the sentiment in both S3 and CloudWatch, and using CloudWatch alarms to notify analysts of trends.

References:

- \* Amazon Comprehend
- \* Amazon CloudWatch

### NEW QUESTION # 102

A Data Scientist is working on an application that performs sentiment analysis. The validation accuracy is poor and the Data Scientist thinks that the cause may be a rich vocabulary and a low average frequency of words in the dataset. Which tool should be used to improve the validation accuracy?

- A. Natural Language Toolkit (NLTK) stemming and stop word removal
- B. Amazon SageMaker BlazingText allow mode
- C. Amazon Comprehend syntax analysts and entity detection
- D. Scikit-learn term frequency-inverse document frequency (TF-IDF) vectorizers

### Answer: D

Explanation:

Explanation

Term frequency-inverse document frequency (TF-IDF) is a technique that assigns a weight to each word in a document based on how important it is to the meaning of the document. The term frequency (TF) measures how often a word appears in a document, while the inverse document frequency (IDF) measures how rare a word is across a collection of documents. The TF-IDF weight is the product of the TF and IDF values, and it is high for words that are frequent in a specific document but rare in the overall corpus. TF-IDF can help improve the validation accuracy of a sentiment analysis model by reducing the impact of common words that have

little or no sentiment value, such as "the", "a", "and", etc. Scikit-learn is a popular Python library for machine learning that provides a TF-IDF vectorizer class that can transform a collection of text documents into a matrix of TF-IDF features. By using this tool, the Data Scientist can create a more informative and discriminative feature representation for the sentiment analysis task.

References:

TfidfVectorizer - scikit-learn

Text feature extraction - scikit-learn

TF-IDF for Beginners | by Jana Schmidt | Towards Data Science

Sentiment Analysis: Concept, Analysis and Applications | by Susan Li | Towards Data Science

### NEW QUESTION # 103

A bank's Machine Learning team is developing an approach for credit card fraud detection. The company has a large dataset of historical data labeled as fraudulent. The goal is to build a model to take the information from new transactions and predict whether each transaction is fraudulent or not. Which built-in Amazon SageMaker machine learning algorithm should be used for modeling this problem?

- A. Seq2seq
- B. Random Cut Forest (RCF)
- **C. XGBoost**
- D. K-means

**Answer: C**

Explanation:

XGBoost is a built-in Amazon SageMaker machine learning algorithm that should be used for modeling the credit card fraud detection problem. XGBoost is an algorithm that implements a scalable and distributed gradient boosting framework, which is a popular and effective technique for supervised learning problems.

Gradient boosting is a method of combining multiple weak learners, such as decision trees, into a strong learner, by iteratively fitting new models to the residual errors of the previous models and adding them to the ensemble. XGBoost can handle various types of data, such as numerical, categorical, or text, and can perform both regression and classification tasks. XGBoost also supports various features and optimizations, such as regularization, missing value handling, parallelization, and cross-validation, that can improve the performance and efficiency of the algorithm.

XGBoost is suitable for the credit card fraud detection problem for the following reasons:

- \* The problem is a binary classification problem, where the goal is to predict whether a transaction is fraudulent or not, based on the information from new transactions. XGBoost can perform binary classification by using a logistic regression objective function and outputting the probability of the positive class (fraudulent) for each transaction.
- \* The problem involves a large and imbalanced dataset of historical data labeled as fraudulent. XGBoost can handle large-scale and imbalanced data by using distributed and parallel computing, as well as techniques such as weighted sampling, class weighting, or stratified sampling, to balance the classes and reduce the bias towards the majority class (non-fraudulent).
- \* The problem requires a high accuracy and precision for detecting fraudulent transactions, as well as a low false positive rate for avoiding false alarms. XGBoost can achieve high accuracy and precision by using gradient boosting, which can learn complex and non-linear patterns from the data and reduce the variance and overfitting of the model. XGBoost can also achieve a low false positive rate by using regularization, which can reduce the complexity and noise of the model and prevent it from fitting spurious signals in the data.

The other options are not as suitable as XGBoost for the credit card fraud detection problem for the following reasons:

- \* Seq2seq: Seq2seq is an algorithm that implements a sequence-to-sequence model, which is a type of neural network model that can map an input sequence to an output sequence. Seq2seq is mainly used for natural language processing tasks, such as machine translation, text summarization, or dialogue generation. Seq2seq is not suitable for the credit card fraud detection problem, because the problem is not a sequence-to-sequence task, but a binary classification task. The input and output of the problem are not sequences of words or tokens, but vectors of features and labels.
- \* K-means: K-means is an algorithm that implements a clustering technique, which is a type of unsupervised learning method that can group similar data points into clusters. K-means is mainly used for exploratory data analysis, dimensionality reduction, or anomaly detection. K-means is not suitable for the credit card fraud detection problem, because the problem is not a clustering task, but a classification task. The problem requires using the labeled data to train a model that can predict the labels of new data, not finding the optimal number of clusters or the cluster memberships of the data.
- \* Random Cut Forest (RCF): RCF is an algorithm that implements an anomaly detection technique, which is a type of unsupervised learning method that can identify data points that deviate from the normal behavior or distribution of the data. RCF is mainly used for detecting outliers, frauds, or faults in the data. RCF is not suitable for the credit card fraud detection problem, because the problem is not an anomaly detection task, but a classification task. The problem requires using the labeled data to train a model that can predict the labels of new data, not finding the anomaly scores or the anomalous data points in the data.

XGBoost Algorithm

Use XGBoost for Binary Classification with Amazon SageMaker

Seq2seq Algorithm

K-means Algorithm

[Random Cut Forest Algorithm]

#### NEW QUESTION # 104

A company sells thousands of products on a public website and wants to automatically identify products with potential durability problems. The company has 1,000 reviews with date, star rating, review text, review summary, and customer email fields, but many reviews are incomplete and have empty fields. Each review has already been labeled with the correct durability result.

A machine learning specialist must train a model to identify reviews expressing concerns over product durability. The first model needs to be trained and ready to review in 2 days.

What is the MOST direct approach to solve this problem within 2 days?

- A. Train a custom classifier by using Amazon Comprehend.
- B. Build a recurrent neural network (RNN) in Amazon SageMaker by using Gluon and Apache MXNet.
- C. Use a built-in seq2seq model in Amazon SageMaker.
- D. Train a built-in BlazingText model using Word2Vec mode in Amazon SageMaker.

**Answer: A**

Explanation:

The most direct approach to solve this problem within 2 days is to train a custom classifier by using Amazon Comprehend. Amazon Comprehend is a natural language processing (NLP) service that can analyze text and extract insights such as sentiment, entities, topics, and syntax. Amazon Comprehend also provides a custom classification feature that allows users to create and train a custom text classifier using their own labeled data.

The custom classifier can then be used to categorize any text document into one or more custom classes. For this use case, the custom classifier can be trained to identify reviews that express concerns over product durability as a class, and use the star rating, review text, and review summary fields as input features. The custom classifier can be created and trained using the Amazon Comprehend console or API, and does not require any coding or machine learning expertise. The training process is fully managed and scalable, and can handle large and complex datasets. The custom classifier can be trained and ready to review in 2 days or less, depending on the size and quality of the dataset.

The other options are not the most direct approaches because:

\* Option B: Building a recurrent neural network (RNN) in Amazon SageMaker by using Gluon and Apache MXNet is a more complex and time-consuming approach that requires coding and machine learning skills. RNNs are a type of deep learning models that can process sequential data, such as text, and learn long-term dependencies between tokens. Gluon is a high-level API for MXNet that simplifies the development of deep learning models. Amazon SageMaker is a fully managed service that provides tools and frameworks for building, training, and deploying machine learning models. However, to use this approach, the machine learning specialist would have to write custom code to preprocess the data, define the RNN architecture, train the model, and evaluate the results. This would likely take more than

2 days and involve more administrative overhead.

\* Option C: Training a built-in BlazingText model using Word2Vec mode in Amazon SageMaker is not a suitable approach for text classification. BlazingText is a built-in algorithm in Amazon SageMaker that provides highly optimized implementations of the Word2Vec and text classification algorithms. The Word2Vec algorithm is useful for generating word embeddings, which are dense vector representations of words that capture their semantic and syntactic similarities. However, word embeddings alone are not sufficient for text classification, as they do not account for the context and structure of the text documents. To use this approach, the machine learning specialist would have to combine the word embeddings with another classifier model, such as a logistic regression or a neural network, which would add more complexity and time to the solution.

\* Option D: Using a built-in seq2seq model in Amazon SageMaker is not a relevant approach for text classification. Seq2seq is a built-in algorithm in Amazon SageMaker that provides a sequence-to- sequence framework for neural machine translation based on MXNet. Seq2seq is a supervised learning algorithm that can generate an output sequence of tokens given an input sequence of tokens, such as translating a sentence from one language to another. However, seq2seq is not designed for text classification, which requires assigning a label or a category to a text document, not generating another text sequence. To use this approach, the machine learning specialist would have to modify the seq2seq algorithm to fit the text classification task, which would be challenging and inefficient.

Custom Classification - Amazon Comprehend

Build a Text Classification Model with Amazon Comprehend - AWS Machine Learning Blog Recurrent Neural Networks - Gluon API BlazingText Algorithm - Amazon SageMaker Sequence-to-Sequence Algorithm - Amazon SageMaker

## NEW QUESTION # 105

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 an Amazon SageMaker lifecycle configuration with package installation commands and assign the lifecycle configuration to the 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 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.

**Answer: B**

### Explanation:

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

## NEW QUESTION # 106

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