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Amazon MLS-C01 exam covers a range of topics such as data engineering, exploratory data analysis, feature engineering, model selection and training, tuning and optimization, machine learning algorithms, and deploying and maintaining machine learning models. Candidates are expected to have a deep understanding of these topics and be able to apply their knowledge to real-world scenarios. AWS-Certified-Machine-Learning-Specialty Exam is designed to test the candidate's ability to create efficient and effective machine learning solutions on AWS. Successful candidates will be able to demonstrate their expertise in the field and show that they are capable of designing and deploying machine learning models that meet business requirements.

The AWS Certified Machine Learning - Specialty certification exam is a valuable credential for professionals seeking to advance their careers in the field of machine learning. AWS Certified Machine Learning - Specialty certification exam is recognized globally and is highly respected in the industry. Earning this certification demonstrates the candidate's commitment to staying up-to-date with the latest technologies and tools in the field of machine learning and their ability to apply this knowledge to real-world scenarios.

How to Prepare for the AWS Certified Machine Learning Specialty Exam

Preparation Guide for For AWS Certified Machine Learning Specialty Exam

Introduction

Amazon Web Services is the current market leader in the field of cloud computing. Many organizations are boarding the AWS train for very promising benefits. Profitability, flexibility, ease of use and comprehensive support are the pillars of AWS's popularity. As AWS gained popularity, many companies began looking for AWS certified professionals.

AWS certified machine learning specialty certification is one of many AWS certifications popular today. AWS provides certification to validate an individual's skills and experience in AWS specific tools, resources and technologies. The following discussion will focus on the details of the AWS certified machine learning specialty certification. The purpose of the following discussion is to support the preparation of candidates for the certification exam.

Amazon AWS Certified Machine Learning - Specialty Sample Questions (Q73-Q78):

NEW QUESTION # 73
An ecommerce company has developed a XGBoost model in Amazon SageMaker to predict whether a customer will return a purchased item. The dataset is imbalanced. Only 5% of customers return items A data scientist must find the hyperparameters to capture as many instances of returned items as possible. The company has a small budget for compute.
How should the data scientist meet these requirements MOST cost-effectively?

- A. Tune the csv_weight hyperparameter and the scale_pos_weight hyperparameter by using automatic model tuning (AMT). Optimize on {"HyperParameterTuningJobObjective": {"MetricName": "validation:f1", "Type": "Minimize"}).
- B. Tune all possible hyperparameters by using automatic model tuning (AMT). Optimize on {"HyperParameterTuningJobObjective": {"MetricName": "validation:f1", "Type": "Maximize"}}.
- C. Tune all possible hyperparameters by using automatic model tuning (AMT). Optimize on {"HyperParameterTuningJobObjective": {"MetricName": "validation:accuracy", "Type": "Maximize"}}
- D. Tune the csv_weight hyperparameter and the scale_pos_weight hyperparameter by using automatic model tuning (AMT). Optimize on {"HyperParameterTuningJobObjective": {"MetricName": "validation:f1", "Type": "Maximize"}}.

Answer: D

Explanation:
The best solution to meet the requirements is to tune the csv_weight hyperparameter and the scale_pos_weight hyperparameter by using automatic model tuning (AMT). Optimize on {"HyperParameterTuningJobObjective": {"MetricName": "validation:f1", "Type": "Maximize"}}.
The csv_weight hyperparameter is used to specify the instance weights for the training data in CSV format. This can help handle imbalanced data by assigning higher weights to the minority class examples and lower weights to the majority class examples. The scale_pos_weight hyperparameter is used to control the balance of positive and negative weights. It is the ratio of the number of negative class examples to the number of positive class examples. Setting a higher value for this hyperparameter can increase the importance of the positive class and improve the recall. Both of these hyperparameters can help the XGBoost model capture as many instances of returned items as possible.
Automatic model tuning (AMT) is a feature of Amazon SageMaker that automates the process of finding the best hyperparameter

values for a machine learning model. AMT uses Bayesian optimization to search the hyperparameter space and evaluate the model performance based on a predefined objective metric. The objective metric is the metric that AMT tries to optimize by adjusting the hyperparameter values. For imbalanced classification problems, accuracy is not a good objective metric, as it can be misleading and biased towards the majority class. A better objective metric is the F1 score, which is the harmonic mean of precision and recall. The F1 score can reflect the balance between precision and recall and is more suitable for imbalanced data. The F1 score ranges from 0 to 1, where 1 is the best possible value. Therefore, the type of the objective should be "Maximize" to achieve the highest F1 score. By tuning the csv_weight and scale_pos_weight hyperparameters and optimizing on the F1 score, the data scientist can meet the requirements most cost-effectively. This solution requires tuning only two hyperparameters, which can reduce the computation time and cost compared to tuning all possible hyperparameters. This solution also uses the appropriate objective metric for imbalanced classification, which can improve the model performance and capture more instances of returned items.
References:
* XGBoost Hyperparameters
* Automatic Model Tuning
* How to Configure XGBoost for Imbalanced Classification
* Imbalanced Data

NEW QUESTION # 74
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:
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:
  Select the most accurate hyperparameter configuration form this training job.
- 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:
  Select the most accurate hyperparameter configuration form this HPO job.
- D. Run three different HPO jobs that use different learning rates form the following intervals for MinValue and MaxValue. 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: A

Explanation:
The solution C modifies the HPO configuration to use a logarithmic scale for the learning rate parameter. This means that the values of the learning rate are sampled from a log-uniform distribution, which gives more weight to smaller values. This can help to explore the lower end of the range more evenly and find the optimal learning rate more efficiently. The other solutions either use a linear scale, which may not sample enough values from the lower end, or divide the range into sub-intervals, which may miss some combinations of hyperparameters. References:
* How Hyperparameter Tuning Works - Amazon SageMaker
* Tuning Hyperparameters - Amazon SageMaker

NEW QUESTION # 75
During mini-batch training of a neural network for a classification problem, a Data Scientist notices that training accuracy oscillates
What is the MOST likely cause of this issue?

- A. The batch size is too big
- B. Dataset shuffling is disabled

- C. The class distribution in the dataset is imbalanced
- D. The learning rate is very high

Answer: D

Explanation:
Mini-batch gradient descent is a variant of gradient descent that updates the model parameters using a subset of the training data (called a mini-batch) at each iteration. The learning rate is a hyperparameter that controls how much the model parameters change in response to the gradient. If the learning rate is very high, the model parameters may overshoot the optimal values and oscillate around the minimum of the cost function. This can cause the training accuracy to fluctuate and prevent the model from converging to a stable solution. To avoid this issue, the learning rate should be chosen carefully, such as by using a learning rate decay schedule or an adaptive learning rate algorithm1. Alternatively, the batch size can be increased to reduce the variance of the gradient estimates2. However, the batch size should not be too big, as this can slow down the training process and reduce the generalization ability of the model3. Dataset shuffling and class distribution are not likely to cause oscillations in training accuracy, as they do not affect the gradient updates directly. Dataset shuffling can help avoid getting stuck in local minima and improve the convergence speed of mini-batch gradient descent4. Class distribution can affect the performance and fairness of the model, especially if the dataset is imbalanced, but it does not necessarily cause fluctuations in training accuracy.

NEW QUESTION # 76
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. Create an Amazon SageMaker lifecycle configuration with package installation commands and assign the lifecycle configuration to the notebook instance.
- B. Install AWS Systems Manager Agent on the underlying Amazon EC2 instance and use Systems Manager Automation to execute the package installation commands.
- 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: A

Explanation:
Explanation
The best way to ensure that required packages are automatically available on the notebook instance for the data scientist to use is to create an Amazon SageMaker lifecycle configuration with package installation commands and assign the lifecycle configuration to the notebook instance. A lifecycle configuration is a shell script that runs when you create or start a notebook instance. You can use a lifecycle configuration to customize the notebook instance by installing libraries, changing environment variables, or downloading datasets. You can also use a lifecycle configuration to automate the installation of custom Python packages that are not natively available on Amazon SageMaker.
Option A is incorrect because installing AWS Systems Manager Agent on the underlying Amazon EC2 instance and using Systems Manager Automation to execute the package installation commands is not a recommended way to customize the notebook instance. Systems Manager Automation is a feature that lets you safely automate common and repetitive IT operations and tasks across AWS resources. However, using Systems Manager Automation would require additional permissions and configurations, and it would not guarantee that the packages are installed before the notebook instance is ready to use.
Option B is incorrect because creating a Jupyter notebook file (.ipynb) with cells containing the package installation commands to execute and placing the file under the /etc/init directory of each Amazon SageMaker notebook instance is not a valid way to customize the notebook instance. The /etc/init directory is used to store scripts that are executed during the boot process of the operating system, not the Jupyter notebook application.
Moreover, a Jupyter notebook file is not a shell script that can be executed by the operating system.
Option C is incorrect because using the conda package manager from within the Jupyter notebook console to apply the necessary conda packages to the default kernel of the notebook is not an automatic way to customize the notebook instance. This option would require the data scientist to manually run the conda commands every time they create or start a new notebook instance. This would not be efficient or convenient for the data scientist.
References:
Customize a notebook instance using a lifecycle configuration script - Amazon SageMaker AWS Systems Manager Automation - AWS Systems Manager Conda environments - Amazon SageMaker

NEW QUESTION # 77
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 private subnet and access the data through an S3 VPC endpoint.
- D. Launch the notebook instances in a public subnet and access the data through a NAT gateway

Answer: C

Explanation:
A private subnet is a subnet that does not have a route to the internet gateway, which means that the resources in the private subnet cannot access the internet or be accessed from the internet. An S3 VPC endpoint is a gateway endpoint that allows the resources in the VPC to access the S3 service without going through the internet. By launching the notebook instances in a private subnet and accessing the data through an S3 VPC endpoint, the company can set up the job in a secure and compliant way, as the data never leaves the AWS network and is not exposed to the internet. This can also improve the performance and reliability of the data transfer, as the traffic does not depend on the internet bandwidth or availability.
References:
Amazon VPC Endpoints - Amazon Virtual Private Cloud
Endpoints for Amazon S3 - Amazon Virtual Private Cloud
Connect to SageMaker Within your VPC - Amazon SageMaker
Working with VPCs and Subnets - Amazon Virtual Private Cloud

NEW QUESTION # 78
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