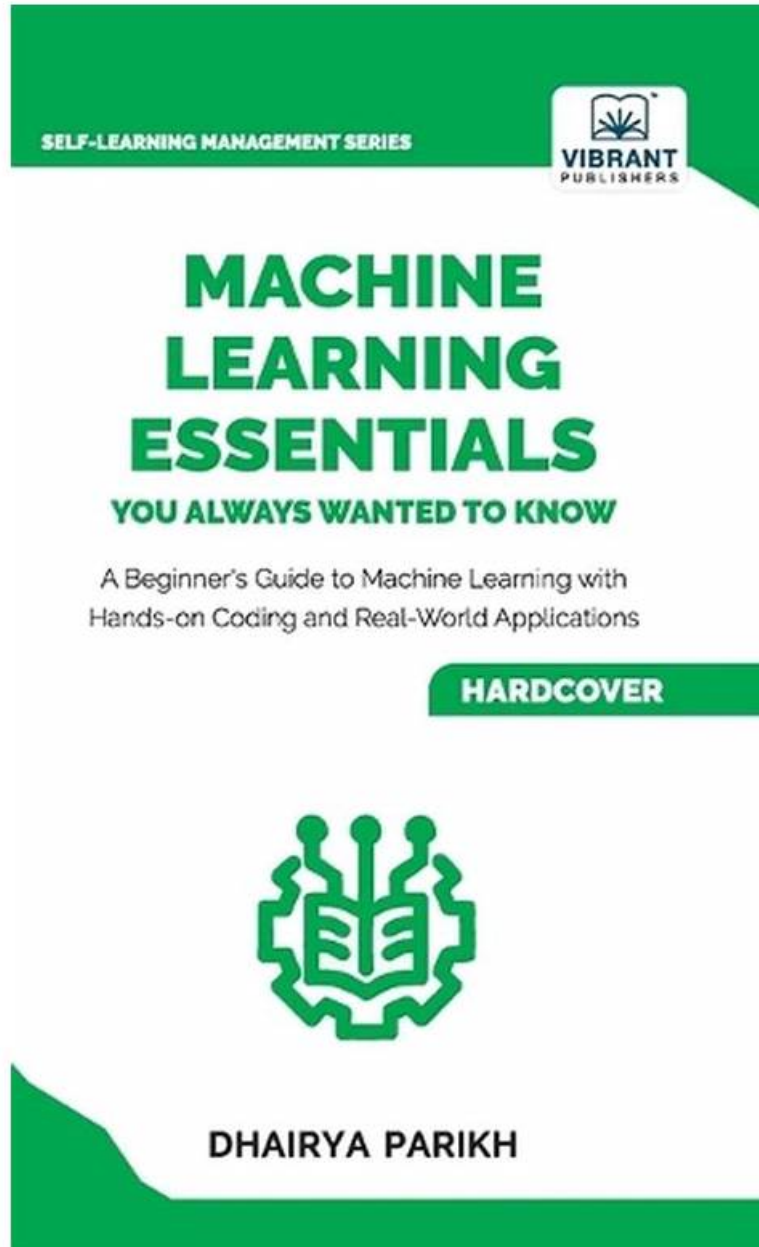


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The Google Professional Machine Learning Engineer certification is developed to validate the ability of the specialists to design, build, and productionize the Machine Learning models to solve business challenges with the help of Google Cloud technologies as well as their knowledge of the proven Machine Learning models & techniques. Specifically, this certificate equips the candidates with

an understanding of all the aspects related to data pipeline interaction, model architecture, as well as metrics interpretation. It also provides the target individuals with the comprehension of the basic concepts of application development, data engineering, infrastructure management, and data governance. To get certified, the individuals need to take one qualifying exam.

Google Professional Machine Learning Engineer exam is a certification test that is designed to validate the skills and knowledge of individuals in the field of machine learning. Professional-Machine-Learning-Engineer Exam is intended for individuals who have a strong understanding of machine learning concepts, including supervised learning, unsupervised learning, and deep learning. Additionally, this certification exam assesses an individual's ability to design and implement machine learning models on the Google Cloud Platform.

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A Professional Machine Learning Engineer designs, builds, and productionizes ML models to solve business challenges using Google Cloud technologies and knowledge of proven ML models and techniques. The ML Engineer collaborates closely with other job roles to ensure long-term success of models. The ML Engineer should be proficient in all aspects of model architecture, data pipeline interaction, and metrics interpretation. The ML Engineer needs familiarity with application development, infrastructure management, data engineering, and security. Through an understanding of training, retraining, deploying, scheduling, monitoring, and improving models, they design and create scalable solutions for optimal performance.

The **Google Professional-Machine-Learning-Engineer Exam** is for entry-level IT specialists and organization professionals with standard knowledge of the Google platform. The Google CCP certification validates the potential client's understanding of these topics and their skills; standard building principles, key services and also their use cases, security, and protection, as well as compliance with the Google model, paid versions, and prices. **Google Professional-Machine-Learning-Engineer exam** is the appropriate starting point for Google certification and is also an excellent resource for those interested in non-technical projects.

Google Professional Machine Learning Engineer Sample Questions (Q150-Q155):

NEW QUESTION # 150

You are developing an ML pipeline using Vertex AI Pipelines. You want your pipeline to upload a new version of the XGBoost model to Vertex AI Model Registry and deploy it to Vertex AI End points for online inference. You want to use the simplest approach. What should you do?

- **A. Chain the Vertex AI ModelUploadOp and ModelDeployOp components together.**
- B. Use the Vertex AI SDK for Python within a custom component based on a python: 3.10 Image.
- C. Use the Vertex AI ModelEvaluationOp component to evaluate the model.
- D. Use the Vertex AI REST API within a custom component based on a vertex-ai/prediction/xgboost-cpu image.

Answer: A

Explanation:

According to the web search results, Vertex AI Pipelines is a serverless orchestrator for running ML pipelines, using either the KFP SDK or TFX1. Vertex AI Pipelines provides a set of prebuilt components that can be used to perform common ML tasks, such as training, evaluation, deployment, and more2. Vertex AI ModelUploadOp and ModelDeployOp are two such components that can be used to upload a new version of the XGBoost model to Vertex AI Model Registry and deploy it to Vertex AI Endpoints for online inference3.

Therefore, option D is the best way to use the simplest approach for the given use case, as it only requires chaining two prebuilt components together. The other options are not relevant or optimal for this scenario.

References:

- * Vertex AI Pipelines
- * Google Cloud Pipeline Components
- * Vertex AI ModelUploadOp and ModelDeployOp
- * Google Professional Machine Learning Certification Exam 2023
- * Latest Google Professional Machine Learning Engineer Actual Free Exam Questions

NEW QUESTION # 151

A machine learning specialist is running an Amazon SageMaker endpoint using the built-in object detection algorithm on a P3 instance for real-time predictions in a company's production application. When evaluating the model's resource utilization, the specialist notices that the model is using only a fraction of the GPU.

Which architecture changes would ensure that provisioned resources are being utilized effectively?

- A. Redeploy the model on a P3dn instance.
- B. Redeploy the model on an M5 instance. Attach Amazon Elastic Inference to the instance.
- C. Redeploy the model as a batch transform job on an M5 instance.
- **D. Deploy the model onto an Amazon Elastic Container Service (Amazon ECS) cluster using a P3 instance.**

Answer: D

NEW QUESTION # 152

You are developing a model to help your company create more targeted online advertising campaigns. You need to create a dataset that you will use to train the model. You want to avoid creating or reinforcing unfair bias in the model. What should you do?

Choose 2 answers

- **A. Conduct fairness tests across sensitive categories and demographics on the trained model.**
- **B. Collect a random sample of production traffic to build the training dataset.**
- C. include only the demographic groups that most frequently interact with advertisements.
- D. Collect a stratified sample of production traffic to build the training dataset.
- E. Include a comprehensive set of demographic features.

Answer: A,B

Explanation:

To avoid creating or reinforcing unfair bias in the model, you should collect a representative sample of production traffic to build the training dataset, and conduct fairness tests across sensitive categories and demographics on the trained model. A representative sample is one that reflects the true distribution of the population, and does not over- or under-represent any group. A random sample is a simple way to obtain a representative sample, as it ensures that every data point has an equal chance of being selected. A stratified sample is another way to obtain a representative sample, as it ensures that every subgroup has a proportional representation in the sample. However, a stratified sample requires prior knowledge of the subgroups and their sizes, which may not be available or easy to obtain. Therefore, a random sample is a more feasible option in this case. A fairness test is a way to measure and evaluate the potential bias and discrimination of the model, based on different categories and demographics, such as age, gender, race, etc. A fairness test can help you identify and mitigate any unfair outcomes or impacts of the model, and ensure that the model treats all groups fairly and equitably. A fairness test can be conducted using various methods and tools, such as confusion matrices, ROC curves, fairness indicators, etc. References: The answer can be verified from official Google Cloud documentation and resources related to data sampling and fairness testing.

* Sampling data | BigQuery

* Fairness Indicators | TensorFlow

* What-if Tool | TensorFlow

NEW QUESTION # 153

You work for an online publisher that delivers news articles to over 50 million readers. You have built an AI model that recommends content for the company's weekly newsletter. A recommendation is considered successful if the article is opened within two days of the newsletter's published date and the user remains on the page for at least one minute.

All the information needed to compute the success metric is available in BigQuery and is updated hourly. The model is trained on eight weeks of data, on average its performance degrades below the acceptable baseline after five weeks, and training time is 12 hours. You want to ensure that the model's performance is above the acceptable baseline while minimizing cost. How should you

monitor the model to determine when retraining is necessary?

- A. Schedule a cron job in Cloud Tasks to retrain the model every week before the newsletter is created.
- B. Use Vertex AI Model Monitoring to detect skew of the input features with a sample rate of 100% and a monitoring frequency of two days.
- C. Schedule a daily Dataflow job in Cloud Composer to compute the success metric.
- **D. Schedule a weekly query in BigQuery to compute the success metric.**

Answer: D

Explanation:

The best option for monitoring the model to determine when retraining is necessary is to schedule a weekly query in BigQuery to compute the success metric. This option has the following advantages:

- * It allows the model performance to be evaluated regularly, based on the actual outcome of the recommendations. By computing the success metric, which is the percentage of articles that are opened within two days and read for at least one minute, you can measure how well the model is achieving its objective and compare it with the acceptable baseline.
- * It leverages the scalability and efficiency of BigQuery, which is a serverless, fully managed, and highly scalable data warehouse that can run complex queries over petabytes of data in seconds. By using BigQuery, you can access and analyze all the information needed to compute the success metric, such as the newsletter publication date, the article opening date, and the user reading time, without worrying about the infrastructure or the cost.
- * It simplifies the model monitoring and retraining workflow, as the weekly query can be scheduled and executed automatically using BigQuery's built-in scheduling feature. You can also set up alerts or notifications to inform you when the success metric falls below the acceptable baseline, and trigger the model retraining process accordingly.

The other options are less optimal for the following reasons:

- * Option A: Using Vertex AI Model Monitoring to detect skew of the input features with a sample rate of 100% and a monitoring frequency of two days introduces additional complexity and overhead. This option requires setting up and managing a Vertex AI Model Monitoring service, which is a managed service that provides various tools and features for machine learning, such as training, tuning, serving, and monitoring. However, using Vertex AI Model Monitoring to detect skew of the input features may not reflect the actual performance of the model, as skew is the discrepancy between the distributions of the features in the training dataset and the serving data, which may not affect the outcome of the recommendations. Moreover, using a sample rate of 100% and a monitoring frequency of two days may incur unnecessary cost and latency, as it requires analyzing all the input features every two days, which may not be needed for the model monitoring.
- * Option B: Scheduling a cron job in Cloud Tasks to retrain the model every week before the newsletter is created introduces additional cost and risk. This option requires creating and running a cron job in Cloud Tasks, which is a fully managed service that allows you to schedule and execute tasks that are invoked by HTTP requests. However, using Cloud Tasks to retrain the model every week may not be optimal, as it may retrain the model more often than necessary, wasting compute resources and cost. Moreover, using Cloud Tasks to retrain the model before the newsletter is created may introduce risk, as it may deploy a new model version that has not been tested or validated, potentially affecting the quality of the recommendations.
- * Option D: Scheduling a daily Dataflow job in Cloud Composer to compute the success metric introduces additional complexity and cost. This option requires creating and running a Dataflow job in Cloud Composer, which is a fully managed service that runs Apache Airflow pipelines for workflow orchestration. Dataflow is a fully managed service that runs Apache Beam pipelines for data processing and transformation. However, using Dataflow and Cloud Composer to compute the success metric may not be necessary, as it may add more steps and overhead to the model monitoring process. Moreover, using Dataflow and Cloud Composer to compute the success metric daily may not be optimal, as it may compute the success metric more often than needed, consuming more compute resources and cost.

References:

- * [BigQuery documentation]
- * [Vertex AI Model Monitoring documentation]
- * [Cloud Tasks documentation]
- * [Cloud Composer documentation]
- * [Dataflow documentation]

NEW QUESTION # 154

You have built a custom model that performs several memory-intensive preprocessing tasks before it makes a prediction. You deployed the model to a Vertex AI endpoint, and validated that results were received in a reasonable amount of time. After routing user traffic to the endpoint, you discover that the endpoint does not autoscale as expected when receiving multiple requests. What should you do?

- A. Use a machine type with more memory
- **B. Decrease the CPU utilization target in the autoscaling configurations**

- C. Decrease the number of workers per machine
- D. Increase the CPU utilization target in the autoscaling configurations

Answer: B

Explanation:

According to the web search results, Vertex AI is a unified platform for machine learning development and deployment. Vertex AI offers various services and tools for building, managing, and serving machine learning models¹. Vertex AI allows you to deploy your models to endpoints for online prediction, and configure the compute resources and autoscaling options for your deployed models². Autoscaling with Vertex AI endpoints is (by default) based on the CPU utilization across all cores of the machine type you have specified. The default threshold of 60% represents 60% on all cores. For example, for a 4 core machine, that means you need 240% utilization to trigger autoscaling³. Therefore, if you discover that the endpoint does not autoscale as expected when receiving multiple requests, you might need to decrease the CPU utilization target in the autoscaling configurations. This way, you can lower the threshold for triggering autoscaling and allocate more resources to handle the prediction requests. Therefore, option D is the best way to solve the problem for the given use case. The other options are not relevant or optimal for this scenario. References:

- * Vertex AI
- * Deploy a model to an endpoint
- * Vertex AI endpoint doesn't scale up / down
- * Google Professional Machine Learning Certification Exam 2023
- * Latest Google Professional Machine Learning Engineer Actual Free Exam Questions

NEW QUESTION # 155

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