



**Google**

## **Exam Questions Professional-Machine-Learning-Engineer**

Google Professional Machine Learning Engineer

#### NEW QUESTION 1

Your organization wants to make its internal shuttle service route more efficient. The shuttles currently stop at all pick-up points across the city every 30 minutes between 7 am and 10 am. The development team has already built an application on Google Kubernetes Engine that requires users to confirm their presence and shuttle station one day in advance. What approach should you take?

- A. 1. Build a tree-based regression model that predicts how many passengers will be picked up at each shuttle station.\* 2. Dispatch an appropriately sized shuttle and provide the map with the required stops based on the prediction.
- B. 1. Build a tree-based classification model that predicts whether the shuttle should pick up passengers at each shuttle station.\* 2. Dispatch an available shuttle and provide the map with the required stops based on the prediction
- C. 1. Define the optimal route as the shortest route that passes by all shuttle stations with confirmed attendance at the given time under capacity constraints.\* 2 Dispatch an appropriately sized shuttle and indicate the required stops on the map
- D. 1. Build a reinforcement learning model with tree-based classification models that predict the presence of passengers at shuttle stops as agents and a reward function around a distance-based metric\* 2. Dispatch an appropriately sized shuttle and provide the map with the required stops based on the simulated outcome.

**Answer:** D

#### NEW QUESTION 2

You recently designed and built a custom neural network that uses critical dependencies specific to your organization's framework. You need to train the model using a managed training service on Google Cloud. However, the ML framework and related dependencies are not supported by AI Platform Training. Also, both your model and your data are too large to fit in memory on a single machine. Your ML framework of choice uses the scheduler, workers, and servers distribution structure. What should you do?

- A. Use a built-in model available on AI Platform Training
- B. Build your custom container to run jobs on AI Platform Training
- C. Build your custom containers to run distributed training jobs on AI Platform Training
- D. Reconfigure your code to a ML framework with dependencies that are supported by AI Platform Training

**Answer:** C

#### NEW QUESTION 3

You need to design a customized deep neural network in Keras that will predict customer purchases based on their purchase history. You want to explore model performance using multiple model architectures, store training data, and be able to compare the evaluation metrics in the same dashboard. What should you do?

- A. Create multiple models using AutoML Tables
- B. Automate multiple training runs using Cloud Composer
- C. Run multiple training jobs on AI Platform with similar job names
- D. Create an experiment in Kubeflow Pipelines to organize multiple runs

**Answer:** C

#### NEW QUESTION 4

During batch training of a neural network, you notice that there is an oscillation in the loss. How should you adjust your model to ensure that it converges?

- A. Increase the size of the training batch
- B. Decrease the size of the training batch
- C. Increase the learning rate hyperparameter
- D. Decrease the learning rate hyperparameter

**Answer:** C

#### NEW QUESTION 5

You have deployed multiple versions of an image classification model on AI Platform. You want to monitor the performance of the model versions overtime. How should you perform this comparison?

- A. Compare the loss performance for each model on a held-out dataset.
- B. Compare the loss performance for each model on the validation data
- C. Compare the receiver operating characteristic (ROC) curve for each model using the What-If Tool
- D. Compare the mean average precision across the models using the Continuous Evaluation feature

**Answer:** B

#### NEW QUESTION 6

You are building a real-time prediction engine that streams files which may contain Personally Identifiable Information (PII) to Google Cloud. You want to use the Cloud Data Loss Prevention (DLP) API to scan the files. How should you ensure that the PII is not accessible by unauthorized individuals?

- A. Stream all files to Google CloudT and then write the data to BigQuery Periodically conduct a bulk scan of the table using the DLP API.
- B. Stream all files to Google Cloud, and write batches of the data to BigQuery While the data is being written to BigQuery conduct a bulk scan of the data using the DLP API.
- C. Create two buckets of data Sensitive and Non-sensitive Write all data to the Non-sensitive bucket Periodically conduct a bulk scan of that bucket using the DLP API, and move the sensitive data to the Sensitive bucket
- D. Create three buckets of data: Quarantine, Sensitive, and Non-sensitive Write all data to the Quarantine bucket.
- E. Periodically conduct a bulk scan of that bucket using the DLP API, and move the data to either the Sensitive or Non-Sensitive bucket

**Answer:** A

#### NEW QUESTION 7

You are building a linear regression model on BigQuery ML to predict a customer's likelihood of purchasing your company's products. Your model uses a city name variable as a key predictive component. In order to train and serve the model, your data must be organized in columns. You want to prepare your data using the least amount of coding while maintaining the predictable variables. What should you do?

- A. Create a new view with BigQuery that does not include a column with city information
- B. Use Dataprep to transform the state column using a one-hot encoding method, and make each city a column with binary values.
- C. Use Cloud Data Fusion to assign each city to a region labeled as 1, 2, 3, 4, or 5r and then use that number to represent the city in the model.
- D. Use TensorFlow to create a categorical variable with a vocabulary list Create the vocabulary file, and upload it as part of your model to BigQuery ML.

**Answer:** C

#### NEW QUESTION 8

You are an ML engineer at a bank that has a mobile application. Management has asked you to build an ML-based biometric authentication for the app that verifies a customer's identity based on their fingerprint. Fingerprints are considered highly sensitive personal information and cannot be downloaded and stored into the bank databases. Which learning strategy should you recommend to train and deploy this ML model?

- A. Differential privacy
- B. Federated learning
- C. MD5 to encrypt data
- D. Data Loss Prevention API

**Answer:** B

#### NEW QUESTION 9

You recently joined a machine learning team that will soon release a new project. As a lead on the project, you are asked to determine the production readiness of the ML components. The team has already tested features and data, model development, and infrastructure. Which additional readiness check should you recommend to the team?

- A. Ensure that training is reproducible
- B. Ensure that all hyperparameters are tuned
- C. Ensure that model performance is monitored
- D. Ensure that feature expectations are captured in the schema

**Answer:** B

#### NEW QUESTION 10

You are an ML engineer at a global car manufacturer. You need to build an ML model to predict car sales in different cities around the world. Which features or feature crosses should you use to train city-specific relationships between car type and number of sales?

- A. Three individual features binned latitude, binned longitude, and one-hot encoded car type
- B. One feature obtained as an element-wise product between latitude, longitude, and car type
- C. One feature obtained as an element-wise product between binned latitude, binned longitude, and one-hot encoded car type
- D. Two feature crosses as a element-wise product the first between binned latitude and one-hot encoded car type, and the second between binned longitude and one-hot encoded car type

**Answer:** A

#### NEW QUESTION 10

You are developing ML models with AI Platform for image segmentation on CT scans. You frequently update your model architectures based on the newest available research papers, and have to rerun training on the same dataset to benchmark their performance. You want to minimize computation costs and manual intervention while having version control for your code. What should you do?

- A. Use Cloud Functions to identify changes to your code in Cloud Storage and trigger a retraining job
- B. Use the gcloud command-line tool to submit training jobs on AI Platform when you update your code
- C. Use Cloud Build linked with Cloud Source Repositories to trigger retraining when new code is pushed to the repository
- D. Create an automated workflow in Cloud Composer that runs daily and looks for changes in code in Cloud Storage using a sensor.

**Answer:** A

#### NEW QUESTION 12

You are responsible for building a unified analytics environment across a variety of on-premises data marts. Your company is experiencing data quality and security challenges when integrating data across the servers, caused by the use of a wide range of disconnected tools and temporary solutions. You need a fully managed, cloud-native data integration service that will lower the total cost of work and reduce repetitive work. Some members on your team prefer a codeless interface for building Extract, Transform, Load (ETL) process. Which service should you use?

- A. Dataflow
- B. Dataprep
- C. Apache Flink
- D. Cloud Data Fusion

**Answer:** D

#### NEW QUESTION 17

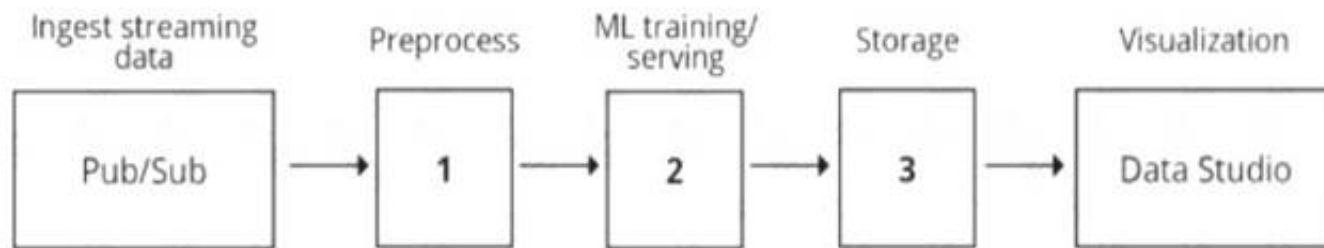
You work with a data engineering team that has developed a pipeline to clean your dataset and save it in a Cloud Storage bucket. You have created an ML model and want to use the data to refresh your model as soon as new data is available. As part of your CI/CD workflow, you want to automatically run a Kubeflow Pipelines training job on Google Kubernetes Engine (GKE). How should you architect this workflow?

- A. Configure your pipeline with Dataflow, which saves the files in Cloud Storage After the file is saved, start the training job on a GKE cluster
- B. Use App Engine to create a lightweight python client that continuously polls Cloud Storage for new files As soon as a file arrives, initiate the training job
- C. Configure a Cloud Storage trigger to send a message to a Pub/Sub topic when a new file is available in a storage bucket
- D. Use a Pub/Sub-triggered Cloud Function to start the training job on a GKE cluster
- E. Use Cloud Scheduler to schedule jobs at a regular interval
- F. For the first step of the job
- G. check the timestamp of objects in your Cloud Storage bucket If there are no new files since the last run, abort the job.

**Answer:** A

#### NEW QUESTION 18

You are building an ML model to detect anomalies in real-time sensor data. You will use Pub/Sub to handle incoming requests. You want to store the results for analytics and visualization. How should you configure the pipeline?



- A. 1 = Dataflow, 2 = AI Platform, 3 = BigQuery
- B. 1 = DataProc, 2 = AutoML, 3 = Cloud Bigtable
- C. 1 = BigQuery, 2 = AutoML, 3 = Cloud Functions
- D. 1 = BigQuery, 2 = AI Platform, 3 = Cloud Storage

**Answer:** C

#### NEW QUESTION 21

You have a functioning end-to-end ML pipeline that involves tuning the hyperparameters of your ML model using AI Platform, and then using the best-tuned parameters for training. Hypertuning is taking longer than expected and is delaying the downstream processes. You want to speed up the tuning job without significantly compromising its effectiveness. Which actions should you take?

Choose 2 answers

- A. Decrease the number of parallel trials
- B. Decrease the range of floating-point values
- C. Set the early stopping parameter to TRUE
- D. Change the search algorithm from Bayesian search to random search.
- E. Decrease the maximum number of trials during subsequent training phases.

**Answer:** DE

#### NEW QUESTION 26

You have trained a text classification model in TensorFlow using AI Platform. You want to use the trained model for batch predictions on text data stored in BigQuery while minimizing computational overhead. What should you do?

- A. Export the model to BigQuery ML.
- B. Deploy and version the model on AI Platform.
- C. Use Dataflow with the SavedModel to read the data from BigQuery
- D. Submit a batch prediction job on AI Platform that points to the model location in Cloud Storage.

**Answer:** A

#### NEW QUESTION 28

You are designing an ML recommendation model for shoppers on your company's ecommerce website. You will use Recommendations AI to build, test, and deploy your system. How should you develop recommendations that increase revenue while following best practices?

- A. Use the "Other Products You May Like" recommendation type to increase the click-through rate
- B. Use the "Frequently Bought Together" recommendation type to increase the shopping cart size for each order.
- C. Import your user events and then your product catalog to make sure you have the highest quality event stream
- D. Because it will take time to collect and record product data, use placeholder values for the product catalog to test the viability of the model.

**Answer:** C

#### NEW QUESTION 33

You are developing models to classify customer support emails. You created models with TensorFlow Estimators using small datasets on your on-premises system, but you now need to train the models using large datasets to ensure high performance. You will port your models to Google Cloud and want to minimize code refactoring and infrastructure overhead for easier migration from on-prem to cloud. What should you do?

- A. Use AI Platform for distributed training
- B. Create a cluster on Dataproc for training
- C. Create a Managed Instance Group with autoscaling
- D. Use Kubeflow Pipelines to train on a Google Kubernetes Engine cluster.

**Answer:** D

**NEW QUESTION 36**

You work for a social media company. You need to detect whether posted images contain cars. Each training example is a member of exactly one class. You have trained an object detection neural network and deployed the model version to AI Platform Prediction for evaluation. Before deployment, you created an evaluation job and attached it to the AI Platform Prediction model version. You notice that the precision is lower than your business requirements allow. How should you adjust the model's final layer softmax threshold to increase precision?

- A. Increase the recall
- B. Decrease the recall.
- C. Increase the number of false positives
- D. Decrease the number of false negatives

**Answer:** D

**NEW QUESTION 41**

You have trained a deep neural network model on Google Cloud. The model has low loss on the training data, but is performing worse on the validation data. You want the model to be resilient to overfitting. Which strategy should you use when retraining the model?

- A. Apply a dropout parameter of 0.2, and decrease the learning rate by a factor of 10
- B. Apply a L2 regularization parameter of 0.4, and decrease the learning rate by a factor of 10.
- C. Run a hyperparameter tuning job on AI Platform to optimize for the L2 regularization and dropout parameters
- D. Run a hyperparameter tuning job on AI Platform to optimize for the learning rate, and increase the number of neurons by a factor of 2.

**Answer:** A

**NEW QUESTION 43**

You are an ML engineer at a regulated insurance company. You are asked to develop an insurance approval model that accepts or rejects insurance applications from potential customers. What factors should you consider before building the model?

- A. Redaction, reproducibility, and explainability
- B. Traceability, reproducibility, and explainability
- C. Federated learning, reproducibility, and explainability
- D. Differential privacy federated learning, and explainability

**Answer:** B

**NEW QUESTION 46**

You are training an LSTM-based model on AI Platform to summarize text using the following job submission script:

```
gcloud ai-platform jobs submit training $JOB_NAME \
  --package-path $TRAINER_PACKAGE_PATH \
  --module-name $MAIN_TRAINER_MODULE \
  --job-dir $JOB_DIR \
  --region $REGION \
  --scale-tier basic \
  -- \
  --epochs 20 \
  --batch_size=32 \
  --learning_rate=0.001 \
```

You want to ensure that training time is minimized without significantly compromising the accuracy of your model. What should you do?

- A. Modify the 'epochs' parameter
- B. Modify the 'scale-tier' parameter
- C. Modify the batch size' parameter
- D. Modify the 'learning rate' parameter

**Answer:** A

**NEW QUESTION 50**

Your team trained and tested a DNN regression model with good results. Six months after deployment, the model is performing poorly due to a change in the distribution of the input data. How should you address the input differences in production?

- A. Create alerts to monitor for skew, and retrain the model.
- B. Perform feature selection on the model, and retrain the model with fewer features
- C. Retrain the model, and select an L2 regularization parameter with a hyperparameter tuning service
- D. Perform feature selection on the model, and retrain the model on a monthly basis with fewer features

**Answer:** C

**NEW QUESTION 55**

You work for a large technology company that wants to modernize their contact center. You have been asked to develop a solution to classify incoming calls by



product so that requests can be more quickly routed to the correct support team. You have already transcribed the calls using the Speech-to-Text API. You want to minimize data preprocessing and development time. How should you build the model?

- A. Use the AI Platform Training built-in algorithms to create a custom model
- B. Use AutoML Natural Language to extract custom entities for classification
- C. Use the Cloud Natural Language API to extract custom entities for classification
- D. Build a custom model to identify the product keywords from the transcribed calls, and then run the keywords through a classification algorithm

**Answer:** A

#### NEW QUESTION 56

You have a demand forecasting pipeline in production that uses Dataflow to preprocess raw data prior to model training and prediction. During preprocessing, you employ Z-score normalization on data stored in BigQuery and write it back to BigQuery. New training data is added every week. You want to make the process more efficient by minimizing computation time and manual intervention. What should you do?

- A. Normalize the data using Google Kubernetes Engine
- B. Translate the normalization algorithm into SQL for use with BigQuery
- C. Use the `normalizer_fn` argument in TensorFlow's Feature Column API
- D. Normalize the data with Apache Spark using the Dataproc connector for BigQuery

**Answer:** B

#### NEW QUESTION 61

You need to build classification workflows over several structured datasets currently stored in BigQuery.

Because you will be performing the classification several times, you want to complete the following steps without writing code: exploratory data analysis, feature selection, model building, training, and hyperparameter tuning and serving. What should you do?

- A. Configure AutoML Tables to perform the classification task
- B. Run a BigQuery ML task to perform logistic regression for the classification
- C. Use AI Platform Notebooks to run the classification model with pandas library
- D. Use AI Platform to run the classification model job configured for hyperparameter tuning

**Answer:** C

#### NEW QUESTION 65

You work for an online retail company that is creating a visual search engine. You have set up an end-to-end ML pipeline on Google Cloud to classify whether an image contains your company's product. Expecting the release of new products in the near future, you configured a retraining functionality in the pipeline so that new data can be fed into your ML models. You also want to use AI Platform's continuous evaluation service to ensure that the models have high accuracy on your test data set. What should you do?

- A. Keep the original test dataset unchanged even if newer products are incorporated into retraining
- B. Extend your test dataset with images of the newer products when they are introduced to retraining
- C. Replace your test dataset with images of the newer products when they are introduced to retraining.
- D. Update your test dataset with images of the newer products when your evaluation metrics drop below a pre-decided threshold.

**Answer:** C

#### NEW QUESTION 66

You work for a public transportation company and need to build a model to estimate delay times for multiple transportation routes. Predictions are served directly to users in an app in real time. Because different seasons and population increases impact the data relevance, you will retrain the model every month. You want to follow Google-recommended best practices. How should you configure the end-to-end architecture of the predictive model?

- A. Configure Kubeflow Pipelines to schedule your multi-step workflow from training to deploying your model.
- B. Use a model trained and deployed on BigQuery ML and trigger retraining with the scheduled query feature in BigQuery
- C. Write a Cloud Functions script that launches a training and deploying job on AI Platform that is triggered by Cloud Scheduler
- D. Use Cloud Composer to programmatically schedule a Dataflow job that executes the workflow from training to deploying your model

**Answer:** B

#### NEW QUESTION 69

You built and manage a production system that is responsible for predicting sales numbers. Model accuracy is crucial, because the production model is required to keep up with market changes. Since being deployed to production, the model hasn't changed; however the accuracy of the model has steadily deteriorated. What issue is most likely causing the steady decline in model accuracy?

- A. Poor data quality
- B. Lack of model retraining
- C. Too few layers in the model for capturing information
- D. Incorrect data split ratio during model training, evaluation, validation, and test

**Answer:** D

#### NEW QUESTION 73

You have written unit tests for a Kubeflow Pipeline that require custom libraries. You want to automate the execution of unit tests with each new push to your development branch in Cloud Source Repositories. What should you do?

- A. Write a script that sequentially performs the push to your development branch and executes the unit tests on Cloud Run
- B. Using Cloud Build, set an automated trigger to execute the unit tests when changes are pushed to your development branch.

- C. Set up a Cloud Logging sink to a Pub/Sub topic that captures interactions with Cloud Source Repositories Configure a Pub/Sub trigger for Cloud Run, and execute the unit tests on Cloud Run.
- D. Set up a Cloud Logging sink to a Pub/Sub topic that captures interactions with Cloud Source Repositories
- E. Execute the unit tests using a Cloud Function that is triggered when messages are sent to the Pub/Sub topic

**Answer:** B

#### NEW QUESTION 77

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