

# Google

## Exam Questions Professional-Data-Engineer

Google Professional Data Engineer Exam



### NEW QUESTION 1

- (Exam Topic 1)

You want to use a database of information about tissue samples to classify future tissue samples as either normal or mutated. You are evaluating an unsupervised anomaly detection method for classifying the tissue samples. Which two characteristics support this method? (Choose two.)

- A. There are very few occurrences of mutations relative to normal samples.
- B. There are roughly equal occurrences of both normal and mutated samples in the database.
- C. You expect future mutations to have different features from the mutated samples in the database.
- D. You expect future mutations to have similar features to the mutated samples in the database.
- E. You already have labels for which samples are mutated and which are normal in the database.

**Answer:** AD

#### Explanation:

Unsupervised anomaly detection techniques detect anomalies in an unlabeled test data set under the assumption that the majority of the instances in the data set are normal by looking for instances that seem to fit least to the remainder of the data set. [https://en.wikipedia.org/wiki/Anomaly\\_detection](https://en.wikipedia.org/wiki/Anomaly_detection)

### NEW QUESTION 2

- (Exam Topic 1)

You are building a model to make clothing recommendations. You know a user's fashion preference is likely to change over time, so you build a data pipeline to stream new data back to the model as it becomes available. How should you use this data to train the model?

- A. Continuously retrain the model on just the new data.
- B. Continuously retrain the model on a combination of existing data and the new data.
- C. Train on the existing data while using the new data as your test set.
- D. Train on the new data while using the existing data as your test set.

**Answer:** C

#### Explanation:

<https://cloud.google.com/automl-tables/docs/prepare>

### NEW QUESTION 3

- (Exam Topic 1)

You are building a new real-time data warehouse for your company and will use Google BigQuery streaming inserts. There is no guarantee that data will only be sent in once but you do have a unique ID for each row of data and an event timestamp. You want to ensure that duplicates are not included while interactively querying data. Which query type should you use?

- A. Include ORDER BY DESK on timestamp column and LIMIT to 1.
- B. Use GROUP BY on the unique ID column and timestamp column and SUM on the values.
- C. Use the LAG window function with PARTITION by unique ID along with WHERE LAG IS NOT NULL.
- D. Use the ROW\_NUMBER window function with PARTITION by unique ID along with WHERE row equals 1.

**Answer:** D

#### Explanation:

<https://cloud.google.com/bigquery/docs/reference/standard-sql/analytic-function-concepts>

### NEW QUESTION 4

- (Exam Topic 1)

Your company's customer and order databases are often under heavy load. This makes performing analytics against them difficult without harming operations. The databases are in a MySQL cluster, with nightly backups taken using mysqldump. You want to perform analytics with minimal impact on operations. What should you do?

- A. Add a node to the MySQL cluster and build an OLAP cube there.
- B. Use an ETL tool to load the data from MySQL into Google BigQuery.
- C. Connect an on-premises Apache Hadoop cluster to MySQL and perform ETL.
- D. Mount the backups to Google Cloud SQL, and then process the data using Google Cloud Dataproc.

**Answer:** C

### NEW QUESTION 5

- (Exam Topic 1)

Your company is migrating their 30-node Apache Hadoop cluster to the cloud. They want to re-use Hadoop jobs they have already created and minimize the management of the cluster as much as possible. They also want to be able to persist data beyond the life of the cluster. What should you do?

- A. Create a Google Cloud Dataflow job to process the data.
- B. Create a Google Cloud Dataproc cluster that uses persistent disks for HDFS.
- C. Create a Hadoop cluster on Google Compute Engine that uses persistent disks.
- D. Create a Cloud Dataproc cluster that uses the Google Cloud Storage connector.
- E. Create a Hadoop cluster on Google Compute Engine that uses Local SSD disks.

**Answer:** D

### NEW QUESTION 6

- (Exam Topic 1)

You designed a database for patient records as a pilot project to cover a few hundred patients in three clinics. Your design used a single database table to represent all patients and their visits, and you used self-joins to generate reports. The server resource utilization was at 50%. Since then, the scope of the project has expanded. The database must now store 100 times more patient records. You can no longer run the reports, because they either take too long or they encounter errors with insufficient compute resources. How should you adjust the database design?

- A. Add capacity (memory and disk space) to the database server by the order of 200.
- B. Shard the tables into smaller ones based on date ranges, and only generate reports with prespecified date ranges.
- C. Normalize the master patient-record table into the patient table and the visits table, and create other necessary tables to avoid self-join.
- D. Partition the table into smaller tables, with one for each clinic
- E. Run queries against the smaller table pairs, and use unions for consolidated reports.

**Answer: C**

#### NEW QUESTION 7

- (Exam Topic 1)

Your company uses a proprietary system to send inventory data every 6 hours to a data ingestion service in the cloud. Transmitted data includes a payload of several fields and the timestamp of the transmission. If there are any concerns about a transmission, the system re-transmits the data. How should you deduplicate the data most efficiently?

- A. Assign global unique identifiers (GUID) to each data entry.
- B. Compute the hash value of each data entry, and compare it with all historical data.
- C. Store each data entry as the primary key in a separate database and apply an index.
- D. Maintain a database table to store the hash value and other metadata for each data entry.

**Answer: D**

#### NEW QUESTION 8

- (Exam Topic 2)

Flowlogistic's CEO wants to gain rapid insight into their customer base so his sales team can be better informed in the field. This team is not very technical, so they've purchased a visualization tool to simplify the creation of BigQuery reports. However, they've been overwhelmed by all the data in the table, and are spending a lot of money on queries trying to find the data they need. You want to solve their problem in the most cost-effective way. What should you do?

- A. Export the data into a Google Sheet for virtualization.
- B. Create an additional table with only the necessary columns.
- C. Create a view on the table to present to the virtualization tool.
- D. Create identity and access management (IAM) roles on the appropriate columns, so only they appear in a query.

**Answer: C**

#### NEW QUESTION 9

- (Exam Topic 3)

You need to compose visualization for operations teams with the following requirements:

- Telemetry must include data from all 50,000 installations for the most recent 6 weeks (sampling once every minute)
- The report must not be more than 3 hours delayed from live data.
- The actionable report should only show suboptimal links.
- Most suboptimal links should be sorted to the top.
- Suboptimal links can be grouped and filtered by regional geography.
- User response time to load the report must be <5 seconds.

You create a data source to store the last 6 weeks of data, and create visualizations that allow viewers to see multiple date ranges, distinct geographic regions, and unique installation types. You always show the latest data without any changes to your visualizations. You want to avoid creating and updating new visualizations each month. What should you do?

- A. Look through the current data and compose a series of charts and tables, one for each possible combination of criteria.
- B. Look through the current data and compose a small set of generalized charts and tables bound to criteria filters that allow value selection.
- C. Export the data to a spreadsheet, compose a series of charts and tables, one for each possible combination of criteria, and spread them across multiple tabs.
- D. Load the data into relational database tables, write a Google App Engine application that queries all rows, summarizes the data across each criteria, and then renders results using the Google Charts and visualization API.

**Answer: B**

#### NEW QUESTION 10

- (Exam Topic 4)

You work for a large fast food restaurant chain with over 400,000 employees. You store employee information in Google BigQuery in a Users table consisting of a FirstName field and a LastName field. A member of IT is building an application and asks you to modify the schema and data in BigQuery so the application can query a FullName field consisting of the value of the FirstName field concatenated with a space, followed by the value of the LastName field for each employee. How can you make that data available while minimizing cost?

- A. Create a view in BigQuery that concatenates the FirstName and LastName field values to produce the FullName.
- B. Add a new column called FullName to the Users table
- C. Run an UPDATE statement that updates the FullName column for each user with the concatenation of the FirstName and LastName values.
- D. Create a Google Cloud Dataflow job that queries BigQuery for the entire Users table, concatenates the FirstName value and LastName value for each user, and loads the proper values for FirstName, LastName, and FullName into a new table in BigQuery.
- E. Use BigQuery to export the data for the table to a CSV file
- F. Create a Google Cloud Dataproc job to process the CSV file and output a new CSV file containing the proper values for FirstName, LastName and FullName
- G. Run a BigQuery load job to load the new CSV file into BigQuery.

Answer: C

#### NEW QUESTION 10

- (Exam Topic 4)

You work for an economic consulting firm that helps companies identify economic trends as they happen. As part of your analysis, you use Google BigQuery to correlate customer data with the average prices of the 100 most common goods sold, including bread, gasoline, milk, and others. The average prices of these goods are updated every 30 minutes. You want to make sure this data stays up to date so you can combine it with other data in BigQuery as cheaply as possible. What should you do?

- A. Load the data every 30 minutes into a new partitioned table in BigQuery.
- B. Store and update the data in a regional Google Cloud Storage bucket and create a federated data source in BigQuery
- C. Store the data in Google Cloud Datastor
- D. Use Google Cloud Dataflow to query BigQuery and combine the data programmatically with the data stored in Cloud Datastore
- E. Store the data in a file in a regional Google Cloud Storage bucke
- F. Use Cloud Dataflow to query BigQuery and combine the data programmatically with the data stored in Google Cloud Storage.

Answer: A

#### NEW QUESTION 14

- (Exam Topic 5)

The Dataflow SDKs have been recently transitioned into which Apache service?

- A. Apache Spark
- B. Apache Hadoop
- C. Apache Kafka
- D. Apache Beam

Answer: D

#### Explanation:

Dataflow SDKs are being transitioned to Apache Beam, as per the latest Google directive Reference: <https://cloud.google.com/dataflow/docs/>

#### NEW QUESTION 19

- (Exam Topic 5)

How can you get a neural network to learn about relationships between categories in a categorical feature?

- A. Create a multi-hot column
- B. Create a one-hot column
- C. Create a hash bucket
- D. Create an embedding column

Answer: D

#### Explanation:

There are two problems with one-hot encoding. First, it has high dimensionality, meaning that instead of having just one value, like a continuous feature, it has many values, or dimensions. This makes computation more time-consuming, especially if a feature has a very large number of categories. The second problem is that it doesn't encode any relationships between the categories. They are completely independent from each other, so the network has no way of knowing which ones are similar to each other.

Both of these problems can be solved by representing a categorical feature with an embedding

column. The idea is that each category has a smaller vector with, let's say, 5 values in it. But unlike a one-hot vector, the values are not usually 0. The values are weights, similar to the weights that are used for basic features in a neural network. The difference is that each category has a set of weights (5 of them in this case).

You can think of each value in the embedding vector as a feature of the category. So, if two categories are very similar to each other, then their embedding vectors should be very similar too.

Reference:

<https://cloudacademy.com/google/introduction-to-google-cloud-machine-learning-engine-course/a-wide-and-dee>

#### NEW QUESTION 24

- (Exam Topic 5)

If a dataset contains rows with individual people and columns for year of birth, country, and income, how many of the columns are continuous and how many are categorical?

- A. 1 continuous and 2 categorical
- B. 3 categorical
- C. 3 continuous
- D. 2 continuous and 1 categorical

Answer: D

#### Explanation:

The columns can be grouped into two types—categorical and continuous columns:

A column is called categorical if its value can only be one of the categories in a finite set. For example, the native country of a person (U.S., India, Japan, etc.) or the education level (high school, college, etc.) are categorical columns.

A column is called continuous if its value can be any numerical value in a continuous range. For example, the capital gain of a person (e.g. \$14,084) is a continuous column.

Year of birth and income are continuous columns. Country is a categorical column.

You could use bucketization to turn year of birth and/or income into categorical features, but the raw columns are continuous.

Reference: [https://www.tensorflow.org/tutorials/wide#reading\\_the\\_census\\_data](https://www.tensorflow.org/tutorials/wide#reading_the_census_data)



**Answer:** A

**Explanation:**

The dataflow.worker role provides the permissions necessary for a Compute Engine service account to execute work units for a Dataflow pipeline  
Reference: <https://cloud.google.com/dataflow/access-control>

**NEW QUESTION 38**

- (Exam Topic 5)

When creating a new Cloud Dataproc cluster with the projects.regions.clusters.create operation, these four values are required: project, region, name, and .

- A. zone
- B. node
- C. label
- D. type

**Answer:** A

**Explanation:**

At a minimum, you must specify four values when creating a new cluster with the projects.regions.clusters.create operation:

The project in which the cluster will be created  
The region to use

The name of the cluster

The zone in which the cluster will be created

You can specify many more details beyond these minimum requirements. For example, you can also specify the number of workers, whether preemptible compute should be used, and the network settings. Reference: [https://cloud.google.com/dataproc/docs/tutorials/python-library-example#create\\_a\\_new\\_cloud\\_dataproc\\_cluste](https://cloud.google.com/dataproc/docs/tutorials/python-library-example#create_a_new_cloud_dataproc_cluste)

**NEW QUESTION 40**

- (Exam Topic 5)

Which is the preferred method to use to avoid hotspotting in time series data in Bigtable?

- A. Field promotion
- B. Randomization
- C. Salting
- D. Hashing

**Answer:** A

**Explanation:**

By default, prefer field promotion. Field promotion avoids hotspotting in almost all cases, and it tends to make it easier to design a row key that facilitates queries.

Reference:

[https://cloud.google.com/bigtable/docs/schema-design-time-series#ensure\\_that\\_your\\_row\\_key\\_avoids\\_hotspotti](https://cloud.google.com/bigtable/docs/schema-design-time-series#ensure_that_your_row_key_avoids_hotspotti)

**NEW QUESTION 44**

- (Exam Topic 5)

Which of these sources can you not load data into BigQuery from?

- A. File upload
- B. Google Drive
- C. Google Cloud Storage
- D. Google Cloud SQL

**Answer:** D

**Explanation:**

You can load data into BigQuery from a file upload, Google Cloud Storage, Google Drive, or Google Cloud Bigtable. It is not possible to load data into BigQuery directly from Google Cloud SQL. One way to get data from Cloud SQL to BigQuery would be to export data from Cloud SQL to Cloud Storage and then load it from there.

Reference: <https://cloud.google.com/bigquery/loading-data>

**NEW QUESTION 47**

- (Exam Topic 5)

Which of these statements about BigQuery caching is true?

- A. By default, a query's results are not cached.
- B. BigQuery caches query results for 48 hours.
- C. Query results are cached even if you specify a destination table.
- D. There is no charge for a query that retrieves its results from cache.

**Answer:** D

**Explanation:**

When query results are retrieved from a cached results table, you are not charged for the query. BigQuery caches query results for 24 hours, not 48 hours.

Query results are not cached if you specify a destination table.

A query's results are always cached except under certain conditions, such as if you specify a destination table. Reference:

<https://cloud.google.com/bigquery/querying-data#query-caching>

**NEW QUESTION 52**

- (Exam Topic 5)

Suppose you have a dataset of images that are each labeled as to whether or not they contain a human face. To create a neural network that recognizes human faces in images using this labeled dataset, what approach would likely be the most effective?

- A. Use K-means Clustering to detect faces in the pixels.
- B. Use feature engineering to add features for eyes, noses, and mouths to the input data.
- C. Use deep learning by creating a neural network with multiple hidden layers to automatically detect features of faces.
- D. Build a neural network with an input layer of pixels, a hidden layer, and an output layer with two categories.

**Answer: C**

**Explanation:**

Traditional machine learning relies on shallow nets, composed of one input and one output layer, and at most one hidden layer in between. More than three layers (including input and output) qualifies as "deep" learning. So deep is a strictly defined, technical term that means more than one hidden layer.

In deep-learning networks, each layer of nodes trains on a distinct set of features based on the previous layer's output. The further you advance into the neural net, the more complex the features your nodes can recognize, since they aggregate and recombine features from the previous layer.

A neural network with only one hidden layer would be unable to automatically recognize high-level features of faces, such as eyes, because it wouldn't be able to "build" these features using previous hidden layers that detect low-level features, such as lines.

Feature engineering is difficult to perform on raw image data.

K- means Clustering is an unsupervised learning method used to categorize unlabeled data. Reference: <https://deeplearning4j.org/neuralnet-overview>

**NEW QUESTION 54**

- (Exam Topic 5)

What are two of the benefits of using denormalized data structures in BigQuery?

- A. Reduces the amount of data processed, reduces the amount of storage required
- B. Increases query speed, makes queries simpler
- C. Reduces the amount of storage required, increases query speed
- D. Reduces the amount of data processed, increases query speed

**Answer: B**

**Explanation:**

Denormalization increases query speed for tables with billions of rows because BigQuery's performance degrades when doing JOINS on large tables, but with a denormalized data

structure, you don't have to use JOINS, since all of the data has been combined into one table. Denormalization also makes queries simpler because you do not have to use JOIN clauses.

Denormalization increases the amount of data processed and the amount of storage required because it creates redundant data.

Reference:

[https://cloud.google.com/solutions/bigquery-data-warehouse#denormalizing\\_data](https://cloud.google.com/solutions/bigquery-data-warehouse#denormalizing_data)

**NEW QUESTION 59**

- (Exam Topic 5)

All Google Cloud Bigtable client requests go through a front-end server they are sent to a Cloud Bigtable node.

- A. before
- B. after
- C. only if
- D. once

**Answer: A**

**Explanation:**

In a Cloud Bigtable architecture all client requests go through a front-end server before they are sent to a Cloud Bigtable node.

The nodes are organized into a Cloud Bigtable cluster, which belongs to a Cloud Bigtable instance, which is a container for the cluster. Each node in the cluster handles a subset of the requests to the cluster.

When additional nodes are added to a cluster, you can increase the number of simultaneous requests that the cluster can handle, as well as the maximum throughput for the entire cluster.

Reference: <https://cloud.google.com/bigtable/docs/overview>

**NEW QUESTION 61**

- (Exam Topic 5)

For the best possible performance, what is the recommended zone for your Compute Engine instance and Cloud Bigtable instance?

- A. Have the Compute Engine instance in the furthest zone from the Cloud Bigtable instance.
- B. Have both the Compute Engine instance and the Cloud Bigtable instance to be in different zones.
- C. Have both the Compute Engine instance and the Cloud Bigtable instance to be in the same zone.
- D. Have the Cloud Bigtable instance to be in the same zone as all of the consumers of your data.

**Answer: C**

**Explanation:**

It is recommended to create your Compute Engine instance in the same zone as your Cloud Bigtable instance for the best possible performance,

If it's not possible to create a instance in the same zone, you should create your instance in another zone within the same region. For example, if your Cloud Bigtable instance is located in us-central1-b, you could create your instance in us-central1-f. This change may result in several milliseconds of additional latency for each Cloud Bigtable request.

It is recommended to avoid creating your Compute Engine instance in a different region from

your Cloud Bigtable instance, which can add hundreds of milliseconds of latency to each Cloud Bigtable request.

Reference: <https://cloud.google.com/bigtable/docs/creating-compute-instance>

#### NEW QUESTION 65

- (Exam Topic 5)

When a Cloud Bigtable node fails, is lost.

- A. all data
- B. no data
- C. the last transaction
- D. the time dimension

**Answer: B**

#### Explanation:

A Cloud Bigtable table is sharded into blocks of contiguous rows, called tablets, to help balance the workload of queries. Tablets are stored on Colossus, Google's file system, in SSTable format. Each tablet is associated with a specific Cloud Bigtable node.

Data is never stored in Cloud Bigtable nodes themselves; each node has pointers to a set of tablets that are stored on Colossus. As a result:

Rebalancing tablets from one node to another is very fast, because the actual data is not copied. Cloud

Bigtable simply updates the pointers for each node.

Recovery from the failure of a Cloud Bigtable node is very fast, because only metadata needs to be migrated to the replacement node.

When a Cloud Bigtable node fails, no data is lost Reference: <https://cloud.google.com/bigtable/docs/overview>

#### NEW QUESTION 67

- (Exam Topic 5)

Cloud Dataproc is a managed Apache Hadoop and Apache service.

- A. Blaze
- B. Spark
- C. Fire
- D. Ignite

**Answer: B**

#### Explanation:

Cloud Dataproc is a managed Apache Spark and Apache Hadoop service that lets you use open source data tools for batch processing, querying, streaming, and machine learning.

Reference: <https://cloud.google.com/dataproc/docs/>

#### NEW QUESTION 72

- (Exam Topic 5)

Google Cloud Bigtable indexes a single value in each row. This value is called the .

- A. primary key
- B. unique key
- C. row key
- D. master key

**Answer: C**

#### Explanation:

Cloud Bigtable is a sparsely populated table that can scale to billions of rows and thousands of columns, allowing you to store terabytes or even petabytes of data.

A single value in each row is indexed; this value is known as the row key.

Reference: <https://cloud.google.com/bigtable/docs/overview>

#### NEW QUESTION 75

- (Exam Topic 6)

You decided to use Cloud Datastore to ingest vehicle telemetry data in real time. You want to build a storage system that will account for the long-term data growth, while keeping the costs low. You also want to create snapshots of the data periodically, so that you can make a point-in-time (PIT) recovery, or clone a copy of the data for Cloud Datastore in a different environment. You want to archive these snapshots for a long time. Which two methods can accomplish this? Choose 2 answers.

- A. Use managed export, and store the data in a Cloud Storage bucket using Nearline or Coldline class.
- B. Use managed exportm, and then import to Cloud Datastore in a separate project under a unique namespace reserved for that export.
- C. Use managed export, and then import the data into a BigQuery table created just for that export, and delete temporary export files.
- D. Write an application that uses Cloud Datastore client libraries to read all the entitie
- E. Treat each entity as a BigQuery table row via BigQuery streaming inser
- F. Assign an export timestamp for each export, and attach it as an extra column for each ro
- G. Make sure that the BigQuery table is partitioned using the export timestamp column.
- H. Write an application that uses Cloud Datastore client libraries to read all the entitie
- I. Format the exported data into a JSON fil
- J. Apply compression before storing the data in Cloud Source Repositories.

**Answer: CE**

#### NEW QUESTION 76

- (Exam Topic 6)

You use a dataset in BigQuery for analysis. You want to provide third-party companies with access to the same dataset. You need to keep the costs of data sharing low and ensure that the data is current. Which solution should you choose?

- A. Create an authorized view on the BigQuery table to control data access, and provide third-party companies with access to that view.
- B. Use Cloud Scheduler to export the data on a regular basis to Cloud Storage, and provide third-party companies with access to the bucket.

- C. Create a separate dataset in BigQuery that contains the relevant data to share, and provide third-party companies with access to the new dataset.
- D. Create a Cloud Dataflow job that reads the data in frequent time intervals, and writes it to the relevant BigQuery dataset or Cloud Storage bucket for third-party companies to use.

**Answer:** B

#### NEW QUESTION 78

- (Exam Topic 6)

An online retailer has built their current application on Google App Engine. A new initiative at the company mandates that they extend their application to allow their customers to transact directly via the application. They need to manage their shopping transactions and analyze combined data from multiple datasets using a business intelligence (BI) tool. They want to use only a single database for this purpose. Which Google Cloud database should they choose?

- A. BigQuery
- B. Cloud SQL
- C. Cloud BigTable
- D. Cloud Datastore

**Answer:** C

#### Explanation:

Reference: <https://cloud.google.com/solutions/business-intelligence/>

#### NEW QUESTION 83

- (Exam Topic 6)

You have Cloud Functions written in Node.js that pull messages from Cloud Pub/Sub and send the data to BigQuery. You observe that the message processing rate on the Pub/Sub topic is orders of magnitude higher than anticipated, but there is no error logged in Stackdriver Log Viewer. What are the two most likely causes of this problem? Choose 2 answers.

- A. Publisher throughput quota is too small.
- B. Total outstanding messages exceed the 10-MB maximum.
- C. Error handling in the subscriber code is not handling run-time errors properly.
- D. The subscriber code cannot keep up with the messages.
- E. The subscriber code does not acknowledge the messages that it pulls.

**Answer:** CD

#### NEW QUESTION 87

- (Exam Topic 6)

Your company maintains a hybrid deployment with GCP, where analytics are performed on your anonymized customer data. The data are imported to Cloud Storage from your data center through parallel uploads to a data transfer server running on GCP. Management informs you that the daily transfers take too long and have asked you to fix the problem. You want to maximize transfer speeds. Which action should you take?

- A. Increase the CPU size on your server.
- B. Increase the size of the Google Persistent Disk on your server.
- C. Increase your network bandwidth from your datacenter to GCP.
- D. Increase your network bandwidth from Compute Engine to Cloud Storage.

**Answer:** C

#### NEW QUESTION 88

- (Exam Topic 6)

You store historic data in Cloud Storage. You need to perform analytics on the historic data. You want to use a solution to detect invalid data entries and perform data transformations that will not require programming or knowledge of SQL. What should you do?

- A. Use Cloud Dataflow with Beam to detect errors and perform transformations.
- B. Use Cloud Dataprep with recipes to detect errors and perform transformations.
- C. Use Cloud Dataproc with a Hadoop job to detect errors and perform transformations.
- D. Use federated tables in BigQuery with queries to detect errors and perform transformations.

**Answer:** B

#### NEW QUESTION 92

- (Exam Topic 6)

Your team is working on a binary classification problem. You have trained a support vector machine (SVM) classifier with default parameters, and received an area under the Curve (AUC) of 0.87 on the validation set. You want to increase the AUC of the model. What should you do?

- A. Perform hyperparameter tuning
- B. Train a classifier with deep neural networks, because neural networks would always beat SVMs
- C. Deploy the model and measure the real-world AUC; it's always higher because of generalization
- D. Scale predictions you get out of the model (tune a scaling factor as a hyperparameter) in order to get the highest AUC

**Answer:** A

#### Explanation:

<https://towardsdatascience.com/understanding-hyperparameters-and-its-optimisation-techniques-f0debba07568>

### NEW QUESTION 95

- (Exam Topic 6)

You architect a system to analyze seismic data. Your extract, transform, and load (ETL) process runs as a series of MapReduce jobs on an Apache Hadoop cluster. The ETL process takes days to process a data set because some steps are computationally expensive. Then you discover that a sensor calibration step has been omitted. How should you change your ETL process to carry out sensor calibration systematically in the future?

- A. Modify the transformMapReduce jobs to apply sensor calibration before they do anything else.
- B. Introduce a new MapReduce job to apply sensor calibration to raw data, and ensure all other MapReduce jobs are chained after this.
- C. Add sensor calibration data to the output of the ETL process, and document that all users need to apply sensor calibration themselves.
- D. Develop an algorithm through simulation to predict variance of data output from the last MapReduce job based on calibration factors, and apply the correction to all data.

**Answer:** A

### NEW QUESTION 98

- (Exam Topic 6)

You are building a teal-time prediction engine that streams files, which may contain PII (personal identifiable information) data, into Cloud Storage and eventually into BigQuery. You want to ensure that the sensitive data is masked but still maintains referential integrity, because names and emails are often used as join keys. How should you use the Cloud Data Loss Prevention API (DLP API) to ensure that the PII data is not accessible by unauthorized individuals?

- A. Create a pseudonym by replacing the PII data with cryptogenic tokens, and store the non-tokenized data in a locked-down bucket.
- B. Redact all PII data, and store a version of the unredacted data in a locked-down bucket.
- C. Scan every table in BigQuery, and mask the data it finds that has PII.
- D. Create a pseudonym by replacing PII data with a cryptographic format-preserving token.

**Answer:** A

### NEW QUESTION 103

- (Exam Topic 6)

You work for an advertising company, and you've developed a Spark ML model to predict click-through rates at advertisement blocks. You've been developing everything at your on-premises data center, and now your company is migrating to Google Cloud. Your data center will be migrated to BigQuery. You periodically retrain your Spark ML models, so you need to migrate existing training pipelines to Google Cloud. What should you do?

- A. Use Cloud ML Engine for training existing Spark ML models.
- B. Rewrite your models on TensorFlow, and start using Cloud ML Engine.
- C. Use Cloud Dataproc for training existing Spark ML models, but start reading data directly from BigQuery.
- D. Spin up a Spark cluster on Compute Engine, and train Spark ML models on the data exported from BigQuery.

**Answer:** C

#### Explanation:

<https://cloud.google.com/dataproc/docs/tutorials/bigquery-sparkml>

### NEW QUESTION 108

- (Exam Topic 6)

You are using Google BigQuery as your data warehouse. Your users report that the following simple query is running very slowly, no matter when they run the query:

```
SELECT country, state, city FROM [myproject:mydataset.mytable] GROUP BY country
```

You check the query plan for the query and see the following output in the Read section of Stage:1:



What is the most likely cause of the delay for this query?

- A. Users are running too many concurrent queries in the system.
- B. The [myproject:mydataset.mytable] table has too many partitions.
- C. Either the state or the city columns in the [myproject:mydataset.mytable] table have too many NULL values.
- D. Most rows in the [myproject:mydataset.mytable] table have the same value in the country column, causing data skew.

**Answer:** A

### NEW QUESTION 113

- (Exam Topic 6)

Each analytics team in your organization is running BigQuery jobs in their own projects. You want to enable each team to monitor slot usage within their projects. What should you do?

- A. Create a Stackdriver Monitoring dashboard based on the BigQuery metric query/scanned\_bytes.
- B. Create a Stackdriver Monitoring dashboard based on the BigQuery metric slots/allocated\_for\_project.
- C. Create a log export for each project, capture the BigQuery job execution logs, create a custom metric based on the totalSlotMs, and create a Stackdriver Monitoring dashboard based on the custom metric.
- D. Create an aggregated log export at the organization level, capture the BigQuery job execution logs, create a custom metric based on the totalSlotMs, and create a Stackdriver Monitoring dashboard based on the custom metric.

**Answer:** D

### NEW QUESTION 117

- (Exam Topic 6)

You have data pipelines running on BigQuery, Cloud Dataflow, and Cloud Dataproc. You need to perform health checks and monitor their behavior, and then notify

the team managing the pipelines if they fail. You also need to be able to work across multiple projects. Your preference is to use managed products of features of the platform. What should you do?

- A. Export the information to Cloud Stackdriver, and set up an Alerting policy
- B. Run a Virtual Machine in Compute Engine with Airflow, and export the information to Stackdriver
- C. Export the logs to BigQuery, and set up App Engine to read that information and send emails if you find a failure in the logs
- D. Develop an App Engine application to consume logs using GCP API calls, and send emails if you find a failure in the logs

**Answer: B**

#### NEW QUESTION 118

- (Exam Topic 6)

You need to create a new transaction table in Cloud Spanner that stores product sales data. You are deciding what to use as a primary key. From a performance perspective, which strategy should you choose?

- A. The current epoch time
- B. A concatenation of the product name and the current epoch time
- C. A random universally unique identifier number (version 4 UUID)
- D. The original order identification number from the sales system, which is a monotonically increasing integer

**Answer: C**

#### NEW QUESTION 119

- (Exam Topic 6)

You have a data pipeline that writes data to Cloud Bigtable using well-designed row keys. You want to monitor your pipeline to determine when to increase the size of your Cloud Bigtable cluster. Which two actions can you take to accomplish this? Choose 2 answers.

- A. Review Key Visualizer metric
- B. Increase the size of the Cloud Bigtable cluster when the Read pressure index is above 100.
- C. Review Key Visualizer metric
- D. Increase the size of the Cloud Bigtable cluster when the Write pressure index is above 100.
- E. Monitor the latency of write operation
- F. Increase the size of the Cloud Bigtable cluster when there is a sustained increase in write latency.
- G. Monitor storage utilization
- H. Increase the size of the Cloud Bigtable cluster when utilization increases above 70% of max capacity.
- I. Monitor latency of read operation
- J. Increase the size of the Cloud Bigtable cluster if read operations take longer than 100 ms.

**Answer: AC**

#### NEW QUESTION 122

- (Exam Topic 6)

You are deploying MariaDB SQL databases on GCE VM Instances and need to configure monitoring and alerting. You want to collect metrics including network connections, disk IO and replication status from MariaDB with minimal development effort and use StackDriver for dashboards and alerts. What should you do?

- A. Install the OpenCensus Agent and create a custom metric collection application with a StackDriver exporter.
- B. Place the MariaDB instances in an Instance Group with a Health Check.
- C. Install the StackDriver Logging Agent and configure fluentd in\_tail plugin to read MariaDB logs.
- D. Install the StackDriver Agent and configure the MySQL plugin.

**Answer: C**

#### NEW QUESTION 126

- (Exam Topic 6)

You are selecting services to write and transform JSON messages from Cloud Pub/Sub to BigQuery for a data pipeline on Google Cloud. You want to minimize service costs. You also want to monitor and accommodate input data volume that will vary in size with minimal manual intervention. What should you do?

- A. Use Cloud Dataproc to run your transformation
- B. Monitor CPU utilization for the cluster
- C. Resize the number of worker nodes in your cluster via the command line.
- D. Use Cloud Dataproc to run your transformation
- E. Use the diagnose command to generate an operational output archive
- F. Locate the bottleneck and adjust cluster resources.
- G. Use Cloud Dataflow to run your transformation
- H. Monitor the job system lag with Stackdriver
- I. Use the default autoscaling setting for worker instances.
- J. Use Cloud Dataflow to run your transformation
- K. Monitor the total execution time for a sampling of job
- L. Configure the job to use non-default Compute Engine machine types when needed.

**Answer: B**

#### NEW QUESTION 128

- (Exam Topic 6)

You are implementing several batch jobs that must be executed on a schedule. These jobs have many interdependent steps that must be executed in a specific order. Portions of the jobs involve executing shell scripts, running Hadoop jobs, and running queries in BigQuery. The jobs are expected to run for many minutes up to several hours. If the steps fail, they must be retried a fixed number of times. Which service should you use to manage the execution of these jobs?

- A. Cloud Scheduler
- B. Cloud Dataflow
- C. Cloud Functions
- D. Cloud Composer

**Answer:** A

#### NEW QUESTION 129

- (Exam Topic 6)

You have a petabyte of analytics data and need to design a storage and processing platform for it. You must be able to perform data warehouse-style analytics on the data in Google Cloud and expose the dataset as files for batch analysis tools in other cloud providers. What should you do?

- A. Store and process the entire dataset in BigQuery.
- B. Store and process the entire dataset in Cloud Bigtable.
- C. Store the full dataset in BigQuery, and store a compressed copy of the data in a Cloud Storage bucket.
- D. Store the warm data as files in Cloud Storage, and store the active data in BigQuery.
- E. Keep this ratio as 80% warm and 20% active.

**Answer:** C

#### NEW QUESTION 133

- (Exam Topic 6)

Your globally distributed auction application allows users to bid on items. Occasionally, users place identical bids at nearly identical times, and different application servers process those bids. Each bid event contains the item, amount, user, and timestamp. You want to collate those bid events into a single location in real time to determine which user bid first. What should you do?

- A. Create a file on a shared file and have the application servers write all bid events to that file.
- B. Process the file with Apache Hadoop to identify which user bid first.
- C. Have each application server write the bid events to Cloud Pub/Sub as they occur.
- D. Push the events from Cloud Pub/Sub to a custom endpoint that writes the bid event information into Cloud SQL.
- E. Set up a MySQL database for each application server to write bid events into.
- F. Periodically query each of those distributed MySQL databases and update a master MySQL database with bid event information.
- G. Have each application server write the bid events to Google Cloud Pub/Sub as they occur.
- H. Use a pull subscription to pull the bid events using Google Cloud Dataflow.
- I. Give the bid for each item to the user in the bid event that is processed first.

**Answer:** C

#### NEW QUESTION 137

- (Exam Topic 6)

You have a data pipeline with a Cloud Dataflow job that aggregates and writes time series metrics to Cloud Bigtable. This data feeds a dashboard used by thousands of users across the organization. You need to support additional concurrent users and reduce the amount of time required to write the data. Which two actions should you take? (Choose two.)

- A. Configure your Cloud Dataflow pipeline to use local execution.
- B. Increase the maximum number of Cloud Dataflow workers by setting `maxNumWorkers` in `PipelineOptions`.
- C. Increase the number of nodes in the Cloud Bigtable cluster.
- D. Modify your Cloud Dataflow pipeline to use the `Flatten` transform before writing to Cloud Bigtable.
- E. Modify your Cloud Dataflow pipeline to use the `CoGroupByKey` transform before writing to Cloud Bigtable.

**Answer:** BC

#### NEW QUESTION 139

- (Exam Topic 6)

You are using BigQuery and Data Studio to design a customer-facing dashboard that displays large quantities of aggregated data. You expect a high volume of concurrent users. You need to optimize the dashboard to provide quick visualizations with minimal latency. What should you do?

- A. Use BigQuery BI Engine with materialized views.
- B. Use BigQuery BI Engine with streaming data.
- C. Use BigQuery BI Engine with authorized views.
- D. Use BigQuery BI Engine with logical views.

**Answer:** B

#### NEW QUESTION 144

- (Exam Topic 6)

Your financial services company is moving to cloud technology and wants to store 50 TB of financial time series data in the cloud. This data is updated frequently and new data will be streaming in all the time. Your company also wants to move their existing Apache Hadoop jobs to the cloud to get insights into this data. Which product should they use to store the data?

- A. Cloud Bigtable
- B. Google BigQuery
- C. Google Cloud Storage
- D. Google Cloud Datastore

**Answer:** A

**Explanation:**

Reference: <https://cloud.google.com/bigtable/docs/schema-design-time-series>

#### NEW QUESTION 148

- (Exam Topic 6)

You set up a streaming data insert into a Redis cluster via a Kafka cluster. Both clusters are running on Compute Engine instances. You need to encrypt data at rest with encryption keys that you can create, rotate, and destroy as needed. What should you do?

- A. Create a dedicated service account, and use encryption at rest to reference your data stored in your Compute Engine cluster instances as part of your API service calls.
- B. Create encryption keys in Cloud Key Management Service
- C. Use those keys to encrypt your data in all of the Compute Engine cluster instances.
- D. Create encryption keys locally
- E. Upload your encryption keys to Cloud Key Management Service
- F. Use those keys to encrypt your data in all of the Compute Engine cluster instances.
- G. Create encryption keys in Cloud Key Management Service
- H. Reference those keys in your API service calls when accessing the data in your Compute Engine cluster instances.

**Answer: C**

#### NEW QUESTION 149

- (Exam Topic 6)

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

**Answer: C**

#### NEW QUESTION 150

- (Exam Topic 6)

You want to migrate an on-premises Hadoop system to Cloud Dataproc. Hive is the primary tool in use, and the data format is Optimized Row Columnar (ORC). All ORC files have been successfully copied to a Cloud Storage bucket. You need to replicate some data to the cluster's local Hadoop Distributed File System (HDFS) to maximize performance. What are two ways to start using Hive in Cloud Dataproc? (Choose two.)

- A. Run the gsutil utility to transfer all ORC files from the Cloud Storage bucket to HDFS
- B. Mount the Hive tables locally.
- C. Run the gsutil utility to transfer all ORC files from the Cloud Storage bucket to any node of the Dataproc cluster
- D. Mount the Hive tables locally.
- E. Run the gsutil utility to transfer all ORC files from the Cloud Storage bucket to the master node of the Dataproc cluster
- F. Then run the Hadoop utility to copy them to HDFS
- G. Mount the Hive tables from HDFS.
- H. Leverage Cloud Storage connector for Hadoop to mount the ORC files as external Hive tables
- I. Replicate external Hive tables to the native ones.
- J. Load the ORC files into BigQuery
- K. Leverage BigQuery connector for Hadoop to mount the BigQuery tables as external Hive tables
- L. Replicate external Hive tables to the native ones.

**Answer: BC**

#### NEW QUESTION 153

- (Exam Topic 6)

You need to move 2 PB of historical data from an on-premises storage appliance to Cloud Storage within six months, and your outbound network capacity is constrained to 20 Mb/sec. How should you migrate this data to Cloud Storage?

- A. Use Transfer Appliance to copy the data to Cloud Storage
- B. Use gsutil cp -J to compress the content being uploaded to Cloud Storage
- C. Create a private URL for the historical data, and then use Storage Transfer Service to copy the data to Cloud Storage
- D. Use trickle or ionice along with gsutil cp to limit the amount of bandwidth gsutil utilizes to less than 20 Mb/sec so it does not interfere with the production traffic

**Answer: A**

#### NEW QUESTION 158

- (Exam Topic 6)

You have uploaded 5 years of log data to Cloud Storage. A user reported that some data points in the log data are outside of their expected ranges, which indicates errors. You need to address this issue and be able to run the process again in the future while keeping the original data for compliance reasons. What should you do?

- A. Import the data from Cloud Storage into BigQuery. Create a new BigQuery table, and skip the rows with errors.
- B. Create a Compute Engine instance and create a new copy of the data in Cloud Storage. Skip the rows with errors.
- C. Create a Cloud Dataflow workflow that reads the data from Cloud Storage, checks for values outside the expected range, sets the value to an appropriate default, and writes the updated records to a new dataset in Cloud Storage.
- D. Create a Cloud Dataflow workflow that reads the data from Cloud Storage, checks for values outside the expected range, sets the value to an appropriate default, and writes the updated records to the same dataset in Cloud Storage.

**Answer:** D

**NEW QUESTION 162**

- (Exam Topic 6)

You are building a report-only data warehouse where the data is streamed into BigQuery via the streaming API. Following Google's best practices, you have both a staging and a production table for the data. How should you design your data loading to ensure that there is only one master dataset without affecting performance on either the ingestion or reporting pieces?

- A. Have a staging table that is an append-only model, and then update the production table every three hours with the changes written to staging
- B. Have a staging table that is an append-only model, and then update the production table every ninety minutes with the changes written to staging
- C. Have a staging table that moves the staged data over to the production table and deletes the contents of the staging table every three hours
- D. Have a staging table that moves the staged data over to the production table and deletes the contents of the staging table every thirty minutes

**Answer:** D

**NEW QUESTION 163**

- (Exam Topic 6)

Your organization has been collecting and analyzing data in Google BigQuery for 6 months. The majority of the data analyzed is placed in a time-partitioned table named `events_partitioned`. To reduce the cost of queries, your organization created a view called `events`, which queries only the last 14 days of data. The view is described in legacy SQL. Next month, existing applications will be connecting to BigQuery to read the events data via an ODBC connection. You need to ensure the applications can connect. Which two actions should you take? (Choose two.)

- A. Create a new view over `events` using standard SQL
- B. Create a new partitioned table using a standard SQL query
- C. Create a new view over `events_partitioned` using standard SQL
- D. Create a service account for the ODBC connection to use for authentication
- E. Create a Google Cloud Identity and Access Management (Cloud IAM) role for the ODBC connection and shared "events"

**Answer:** AE

**NEW QUESTION 164**

- (Exam Topic 6)

Your infrastructure includes a set of YouTube channels. You have been tasked with creating a process for sending the YouTube channel data to Google Cloud for analysis. You want to design a solution that allows your world-wide marketing teams to perform ANSI SQL and other types of analysis on up-to-date YouTube channels log data. How should you set up the log data transfer into Google Cloud?

- A. Use Storage Transfer Service to transfer the offsite backup files to a Cloud Storage Multi-Regional storage bucket as a final destination.
- B. Use Storage Transfer Service to transfer the offsite backup files to a Cloud Storage Regional bucket as a final destination.
- C. Use BigQuery Data Transfer Service to transfer the offsite backup files to a Cloud Storage Multi-Regional storage bucket as a final destination.
- D. Use BigQuery Data Transfer Service to transfer the offsite backup files to a Cloud Storage Regional storage bucket as a final destination.

**Answer:** B

**NEW QUESTION 166**

- (Exam Topic 6)

You have developed three data processing jobs. One executes a Cloud Dataflow pipeline that transforms data uploaded to Cloud Storage and writes results to BigQuery. The second ingests data from on-premises servers and uploads it to Cloud Storage. The third is a Cloud Dataflow pipeline that gets information from third-party data providers and uploads the information to Cloud Storage. You need to be able to schedule and monitor the execution of these three workflows and manually execute them when needed. What should you do?

- A. Create a Direct Acyclic Graph in Cloud Composer to schedule and monitor the jobs.
- B. Use Stackdriver Monitoring and set up an alert with a Webhook notification to trigger the jobs.
- C. Develop an App Engine application to schedule and request the status of the jobs using GCP API calls.
- D. Set up cron jobs in a Compute Engine instance to schedule and monitor the pipelines using GCP API calls.

**Answer:** D

**NEW QUESTION 170**

- (Exam Topic 6)

You are operating a Cloud Dataflow streaming pipeline. The pipeline aggregates events from a Cloud Pub/Sub subscription source, within a window, and sinks the resulting aggregation to a Cloud Storage bucket. The source has consistent throughput. You want to monitor an alert on behavior of the pipeline with Cloud Stackdriver to ensure that it is processing data. Which Stackdriver alerts should you create?

- A. An alert based on a decrease of `subscription/num_undelivered_messages` for the source and a rate of change increase of `instance/storage/used_bytes` for the destination
- B. An alert based on an increase of `subscription/num_undelivered_messages` for the source and a rate of change decrease of `instance/storage/used_bytes` for the destination
- C. An alert based on a decrease of `instance/storage/used_bytes` for the source and a rate of change increase of `subscription/num_undelivered_messages` for the destination
- D. An alert based on an increase of `instance/storage/used_bytes` for the source and a rate of change decrease of `subscription/num_undelivered_messages` for the destination

**Answer:** B

**NEW QUESTION 174**

- (Exam Topic 6)

You currently have a single on-premises Kafka cluster in a data center in the us-east region that is responsible for ingesting messages from IoT devices globally.

Because large parts of globe have poor internet connectivity, messages sometimes batch at the edge, come in all at once, and cause a spike in load on your Kafka cluster. This is becoming difficult to manage and prohibitively expensive. What is the Google-recommended cloud native architecture for this scenario?

- A. Edge TPUs as sensor devices for storing and transmitting the messages.
- B. Cloud Dataflow connected to the Kafka cluster to scale the processing of incoming messages.
- C. An IoT gateway connected to Cloud Pub/Sub, with Cloud Dataflow to read and process the messages from Cloud Pub/Sub.
- D. A Kafka cluster virtualized on Compute Engine in us-east with Cloud Load Balancing to connect to the devices around the world.

**Answer: C**

#### **NEW QUESTION 177**

- (Exam Topic 6)

You want to archive data in Cloud Storage. Because some data is very sensitive, you want to use the "Trust No One" (TNO) approach to encrypt your data to prevent the cloud provider staff from decrypting your data. What should you do?

- A. Use `gcloud kms keys create` to create a symmetric key
- B. Then use `gcloud kms encrypt` to encrypt each archival file with the key and unique additional authenticated data (AAD). Use `gsutil cp` to upload each encrypted file to the Cloud Storage bucket, and keep the AAD outside of Google Cloud.
- C. Use `gcloud kms keys create` to create a symmetric key
- D. Then use `gcloud kms encrypt` to encrypt each archival file with the key
- E. Use `gsutil cp` to upload each encrypted file to the Cloud Storage bucket
- F. Manually destroy the key previously used for encryption, and rotate the key once and rotate the key once.
- G. Specify customer-supplied encryption key (CSEK) in the `.boto` configuration file
- H. Use `gsutil cp` to upload each archival file to the Cloud Storage bucket
- I. Save the CSEK in Cloud Memorystore as permanent storage of the secret.
- J. Specify customer-supplied encryption key (CSEK) in the `.boto` configuration file
- K. Use `gsutil cp` to upload each archival file to the Cloud Storage bucket
- L. Save the CSEK in a different project that only the security team can access.

**Answer: B**

#### **NEW QUESTION 178**

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