

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

NEW QUESTION 2

- (Exam Topic 1)

Your weather app queries a database every 15 minutes to get the current temperature. The frontend is powered by Google App Engine and serves millions of users. How should you design the frontend to respond to a database failure?

- A. Issue a command to restart the database servers.
- B. Retry the query with exponential backoff, up to a cap of 15 minutes.
- C. Retry the query every second until it comes back online to minimize staleness of data.
- D. Reduce the query frequency to once every hour until the database comes back online.

Answer: B

Explanation:

<https://cloud.google.com/sql/docs/mysql/manage-connections#backoff>

NEW QUESTION 3

- (Exam Topic 1)

Your company has hired a new data scientist who wants to perform complicated analyses across very large datasets stored in Google Cloud Storage and in a Cassandra cluster on Google Compute Engine. The scientist primarily wants to create labelled data sets for machine learning projects, along with some visualization tasks. She reports that her laptop is not powerful enough to perform her tasks and it is slowing her down. You want to help her perform her tasks. What should you do?

- A. Run a local version of Jupiter on the laptop.
- B. Grant the user access to Google Cloud Shell.
- C. Host a visualization tool on a VM on Google Compute Engine.
- D. Deploy Google Cloud Datalab to a virtual machine (VM) on Google Compute Engine.

Answer: B

NEW QUESTION 4

- (Exam Topic 1)

You are building a model to predict whether or not it will rain on a given day. You have thousands of input features and want to see if you can improve training speed by removing some features while having a minimum effect on model accuracy. What can you do?

- A. Eliminate features that are highly correlated to the output labels.
- B. Combine highly co-dependent features into one representative feature.
- C. Instead of feeding in each feature individually, average their values in batches of 3.
- D. Remove the features that have null values for more than 50% of the training records.

Answer: B

NEW QUESTION 5

- (Exam Topic 1)

An external customer provides you with a daily dump of data from their database. The data flows into Google Cloud Storage GCS as comma-separated values (CSV) files. You want to analyze this data in Google BigQuery, but the data could have rows that are formatted incorrectly or corrupted. How should you build this pipeline?

- A. Use federated data sources, and check data in the SQL query.
- B. Enable BigQuery monitoring in Google Stackdriver and create an alert.
- C. Import the data into BigQuery using the gcloud CLI and set max_bad_records to 0.
- D. Run a Google Cloud Dataflow batch pipeline to import the data into BigQuery, and push errors to another dead-letter table for analysis.

Answer: D

NEW QUESTION 6

- (Exam Topic 1)

Your company is performing data preprocessing for a learning algorithm in Google Cloud Dataflow. Numerous data logs are being generated during this step, and the team wants to analyze them. Due to the dynamic nature of the campaign, the data is growing exponentially every hour. The data scientists have written the following code to read the data for a new key feature in the logs. `BigQueryIO.Read`

```
.named("ReadLogData")
.from("clouddataflow-readonly:samples.log_data")
```

You want to improve the performance of this data read. What should you do?

- A. Specify the TableReference object in the code.
- B. Use .fromQuery operation to read specific fields from the table.
- C. Use of both the Google BigQuery TableSchema and TableFieldSchema classes.
- D. Call a transform that returns TableRow objects, where each element in the PCollection represents a single row in the table.

Answer: D

NEW QUESTION 7

- (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 8

- (Exam Topic 3)

MJTelco needs you to create a schema in Google Bigtable that will allow for the historical analysis of the last 2 years of records. Each record that comes in is sent every 15 minutes, and contains a unique identifier of the device and a data record. The most common query is for all the data for a given device for a given day. Which schema should you use?

- A. Rowkey: date#device_id Column data: data_point
- B. Rowkey: date Column data: device_id, data_point
- C. Rowkey: device_id Column data: date, data_point
- D. Rowkey: data_point Column data: device_id, date
- E. Rowkey: date#data_point Column data: device_id

Answer: D

NEW QUESTION 9

- (Exam Topic 4)

Your company produces 20,000 files every hour. Each data file is formatted as a comma separated values (CSV) file that is less than 4 KB. All files must be ingested on Google Cloud Platform before they can be processed. Your company site has a 200 ms latency to Google Cloud, and your Internet connection bandwidth is limited as 50 Mbps. You currently deploy a secure FTP (SFTP) server on a virtual machine in Google Compute Engine as the data ingestion point. A local SFTP client runs on a dedicated machine to transmit the CSV files as is. The goal is to make reports with data from the previous day available to the executives by 10:00 a.m. each day. This design is barely able to keep up with the current volume, even though the bandwidth utilization is rather low. You are told that due to seasonality, your company expects the number of files to double for the next three months. Which two actions should you take? (choose two.)

- A. Introduce data compression for each file to increase the rate of file transfer.
- B. Contact your internet service provider (ISP) to increase your maximum bandwidth to at least 100 Mbps.
- C. Redesign the data ingestion process to use gsutil tool to send the CSV files to a storage bucket in parallel.
- D. Assemble 1,000 files into a tape archive (TAR) file.
- E. Transmit the TAR files instead, and disassemble the CSV files in the cloud upon receiving them.
- F. Create an S3-compatible storage endpoint in your network, and use Google Cloud Storage Transfer Service to transfer on-premises data to the designated storage bucket.

Answer: CE

NEW QUESTION 10

- (Exam Topic 5)

Cloud Bigtable is Google's Big Data database service.

- A. Relational
- B. MySQL
- C. NoSQL
- D. SQL Server

Answer: C

Explanation:

Cloud Bigtable is Google's NoSQL Big Data database service. It is the same database that Google uses for services, such as Search, Analytics, Maps, and Gmail. It is used for requirements that are low latency and high throughput including Internet of Things (IoT), user analytics, and financial data analysis. Reference: <https://cloud.google.com/bigtable/>

NEW QUESTION 11

- (Exam Topic 5)

Why do you need to split a machine learning dataset into training data and test data?

- A. So you can try two different sets of features
- B. To make sure your model is generalized for more than just the training data
- C. To allow you to create unit tests in your code
- D. So you can use one dataset for a wide model and one for a deep model

Answer: B

Explanation:

The flaw with evaluating a predictive model on training data is that it does not inform you on how well the model has generalized to new unseen data. A model that is selected for its accuracy on the training dataset rather than its accuracy on an unseen test dataset is very likely to have lower accuracy on an unseen test dataset. The reason is that the model is not as generalized. It has specialized to the structure in the training dataset. This is called overfitting.

Reference: <https://machinelearningmastery.com/a-simple-intuition-for-overfitting/>

NEW QUESTION 12

- (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 13

- (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 an 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 14

- (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 export, 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 entities
- E. Treat each entity as a BigQuery table row via BigQuery streaming insert
- F. Assign an export timestamp for each export, and attach it as an extra column for each row
- 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 entities
- I. Format the exported data into a JSON file
- J. Apply compression before storing the data in Cloud Source Repositories.

Answer: CE

NEW QUESTION 15

- (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 16

- (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 17

- (Exam Topic 6)

You're training a model to predict housing prices based on an available dataset with real estate properties. Your plan is to train a fully connected neural net, and you've discovered that the dataset contains latitude and longitude of the property. Real estate professionals have told you that the location of the property is highly influential on price, so you'd like to engineer a feature that incorporates this physical dependency.

What should you do?

- A. Provide latitude and longitude as input vectors to your neural net.
- B. Create a numeric column from a feature cross of latitude and longitude.
- C. Create a feature cross of latitude and longitude, bucketize at the minute level and use L1 regularization during optimization.
- D. Create a feature cross of latitude and longitude, bucketize it at the minute level and use L2 regularization during optimization.

Answer: C

Explanation:

Reference <https://cloud.google.com/bigquery/docs/gis-dataa>

NEW QUESTION 18

- (Exam Topic 6)

A TensorFlow machine learning model on Compute Engine virtual machines (n2-standard-32) takes two days to complete training. The model has custom TensorFlow operations that must run partially on a CPU. You want to reduce the training time in a cost-effective manner. What should you do?

- A. Change the VM type to n2-highmem-32
- B. Change the VM type to e2 standard-32
- C. Train the model using a VM with a GPU hardware accelerator
- D. Train the model using a VM with a TPU hardware accelerator

Answer: C

NEW QUESTION 19

- (Exam Topic 6)

You receive data files in CSV format monthly from a third party. You need to cleanse this data, but every third month the schema of the files changes. Your requirements for implementing these transformations include:

- > Executing the transformations on a schedule
- > Enabling non-developer analysts to modify transformations
- > Providing a graphical tool for designing transformations

What should you do?

- A. Use Cloud Dataprep to build and maintain the transformation recipes, and execute them on a scheduled basis
- B. Load each month's CSV data into BigQuery, and write a SQL query to transform the data to a standard schema
- C. Merge the transformed tables together with a SQL query
- D. Help the analysts write a Cloud Dataflow pipeline in Python to perform the transformation
- E. The Python code should be stored in a revision control system and modified as the incoming data's schema changes
- F. Use Apache Spark on Cloud Dataproc to infer the schema of the CSV file before creating a Dataframe. Then implement the transformations in Spark SQL before writing the data out to Cloud Storage and loading into BigQuery

Answer: A

Explanation:

you can use dataprep for continuously changing target schema

In general, a target consists of the set of information required to define the expected data in a dataset. Often referred to as a "schema," this target schema information can include:

Names of columns

Order of columns Column data types Data type format Example rows of data

A dataset associated with a target is expected to conform to the requirements of the schema. Where there are differences between target schema and dataset schema, a validation indicator (or schema tag) is displayed.

https://cloud.google.com/dataprep/docs/html/Overview-of-RapidTarget_136155049

NEW QUESTION 20

- (Exam Topic 6)

Your team is responsible for developing and maintaining ETLs in your company. One of your Dataflow jobs is failing because of some errors in the input data, and you need to improve reliability of the pipeline (incl. being able to reprocess all failing data).

What should you do?

- A. Add a filtering step to skip these types of errors in the future, extract erroneous rows from logs.
- B. Add a try... catch block to your DoFn that transforms the data, extract erroneous rows from logs.
- C. Add a try... catch block to your DoFn that transforms the data, write erroneous rows to PubSub directly from the DoFn.
- D. Add a try... catch block to your DoFn that transforms the data, use a sideOutput to create a PCollection that can be stored to PubSub later.

Answer: C

NEW QUESTION 21

- (Exam Topic 6)

Your financial services company is moving to cloud technology and wants to store 50 TB of financial timeseries 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 22

- (Exam Topic 6)

You want to optimize your queries for cost and performance. How should you structure your data?

- A. Partition table data by create_date, location_id and device_version
- B. Partition table data by create_date cluster table data by location_id and device_version
- C. Cluster table data by create_date location_id and device_version
- D. Cluster table data by create_date partition by location_id and device_version

Answer: B

NEW QUESTION 23

- (Exam Topic 6)

You are designing a cloud-native historical data processing system to meet the following conditions:

- The data being analyzed is in CSV, Avro, and PDF formats and will be accessed by multiple analysis tools including Cloud Dataproc, BigQuery, and Compute Engine.
- A streaming data pipeline stores new data daily.
- Performance is not a factor in the solution.
- The solution design should maximize availability.

How should you design data storage for this solution?

- A. Create a Cloud Dataproc cluster with high availability
- B. Store the data in HDFS, and perform analysis as needed.
- C. Store the data in BigQuery
- D. Access the data using the BigQuery Connector or Cloud Dataproc and Compute Engine.
- E. Store the data in a regional Cloud Storage bucket
- F. Access the bucket directly using Cloud Dataproc, BigQuery, and Compute Engine.
- G. Store the data in a multi-regional Cloud Storage bucket
- H. Access the data directly using Cloud Dataproc, BigQuery, and Compute Engine.

Answer: D

NEW QUESTION 24

- (Exam Topic 6)

A data scientist has created a BigQuery ML model and asks you to create an ML pipeline to serve predictions. You have a REST API application with the requirement to serve predictions for an individual user ID with latency under 100 milliseconds. You use the following query to generate predictions: `SELECT predicted_label, user_id FROM ML.PREDICT (MODEL 'dataset.model', table user_features)`. How should you create the ML pipeline?

- A. Add a WHERE clause to the query, and grant the BigQuery Data Viewer role to the application service account.
- B. Create an Authorized View with the provided query
- C. Share the dataset that contains the view with the application service account.
- D. Create a Cloud Dataflow pipeline using BigQueryIO to read results from the query
- E. Grant the Dataflow Worker role to the application service account.
- F. Create a Cloud Dataflow pipeline using BigQueryIO to read predictions for all users from the query. Write the results to Cloud Bigtable using BigtableIO
- G. Grant the Bigtable Reader role to the application service account so that the application can read predictions for individual users from Cloud Bigtable.

Answer: D

NEW QUESTION 25

- (Exam Topic 6)

You have enabled the free integration between Firebase Analytics and Google BigQuery. Firebase now automatically creates a new table daily in BigQuery in the format `app_events_YYYYMMDD`. You want to query all of the tables for the past 30 days in legacy SQL. What should you do?

- A. Use the `TABLE_DATE_RANGE` function
- B. Use the `WHERE_PARTITIONTIME` pseudo column
- C. Use `WHERE date BETWEEN YYYY-MM-DD AND YYYY-MM-DD`
- D. Use `SELECT IF.(date >= YYYY-MM-DD AND date <= YYYY-MM-DD)`

Answer: A

Explanation:

Reference:

<https://cloud.google.com/blog/products/gcp/using-bigquery-and-firebase-analytics-to-understandyour-mobile-ap>

NEW QUESTION 26

- (Exam Topic 6)

A shipping company has live package-tracking data that is sent to an Apache Kafka stream in real time. This is then loaded into BigQuery. Analysts in your company want to query the tracking data in BigQuery to analyze geospatial trends in the lifecycle of a package. The table was originally created with `ingest-date` partitioning. Over time, the query processing time has increased. You need to implement a change that would improve query performance in BigQuery. What should you do?

- A. Implement clustering in BigQuery on the `ingest date` column.
- B. Implement clustering in BigQuery on the package-tracking ID column.
- C. Tier older data onto Cloud Storage files, and leverage extended tables.
- D. Re-create the table using data partitioning on the package delivery date.

Answer: A

NEW QUESTION 27

- (Exam Topic 6)

You are migrating your data warehouse to Google Cloud and decommissioning your on-premises data center. Because this is a priority for your company, you know that bandwidth will be made available for the initial data load to the cloud. The files being transferred are not large in number, but each file is 90 GB. Additionally, you want your transactional systems to continually update the warehouse on Google Cloud in real time. What tools should you use to migrate the data and ensure that it continues to write to your warehouse?

- A. Storage Transfer Service for the migration, Pub/Sub and Cloud Data Fusion for the real-time updates
- B. BigQuery Data Transfer Service for the migration, Pub/Sub and Dataproc for the real-time updates
- C. `gsutil` for the migration; Pub/Sub and Dataflow for the real-time updates
- D. `gsutil` for both the migration and the real-time updates

Answer: A

NEW QUESTION 28

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