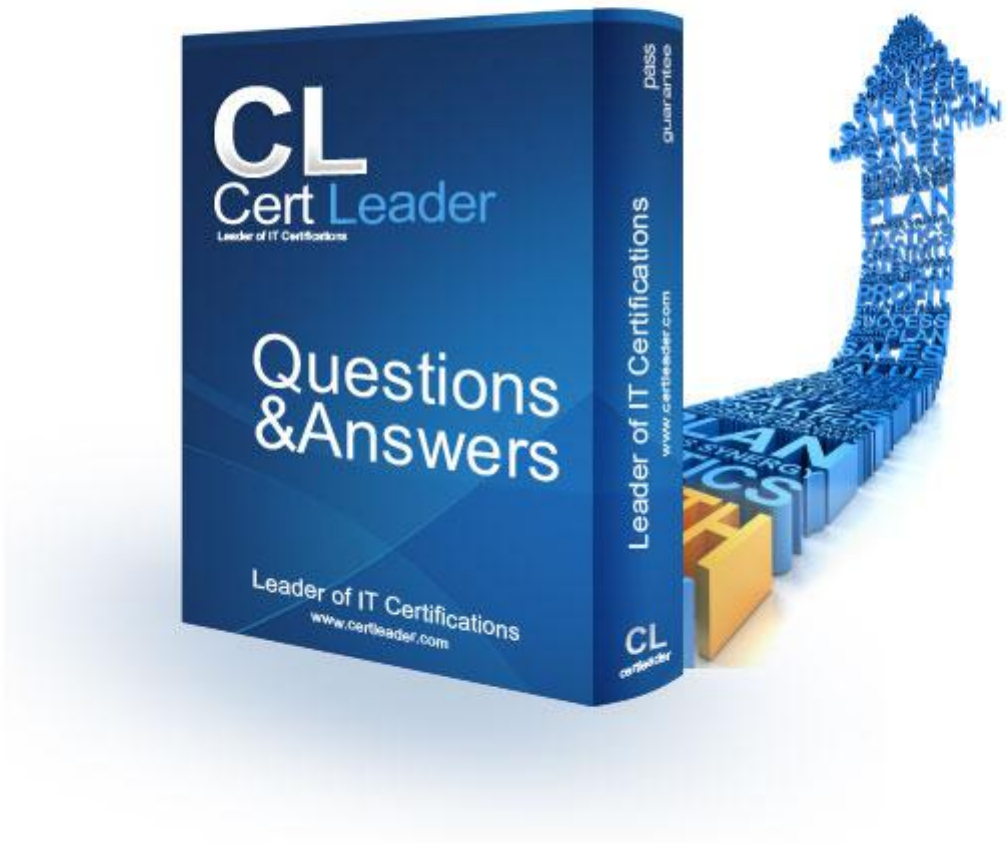
DP-203:

Data Engineering on

Microsoft Azure

Version:

V4.0



Topic 1, Contoso Case StudyTransactional Date

Contoso has three years of customer, transactional, operation, sourcing, and supplier data comprised of 10 billion records stored across multiple on-premises Microsoft SQL Server servers. The SQL server instances contain data from various operational systems. The data is loaded into the instances by using SQL server integration Services (SSIS) packages.

You estimate that combining all product sales transactions into a company-wide sales transactions dataset will result in a single table that contains 5 billion rows, with one row per transaction.

Most queries targeting the sales transactions data will be used to identify which products were sold in retail stores and which products were sold online during different time period. Sales transaction data that is older than three years will be removed monthly.

You plan to create a retail store table that will contain the address of each retail store. The table will be approximately 2 MB. Queries for retail store sales will include the retail store addresses.

You plan to create a promotional table that will contain a promotion ID. The promotion ID will be associated to a specific product. The product will be identified by a product ID. The table will be approximately 5 GB.

Streaming Twitter Data

The ecommerce department at Contoso develops and Azure logic app that captures trending Twitter feeds referencing the company's products and pushes the products to Azure Event Hubs.

Planned Changes

Contoso plans to implement the following changes:

* Load the sales transaction dataset to Azure Synapse Analytics.

* Integrate on-premises data stores with Azure Synapse Analytics by using SSIS packages.

* Use Azure Synapse Analytics to analyze Twitter feeds to assess customer sentiments about products.

Sales Transaction Dataset Requirements

Contoso identifies the following requirements for the sales transaction dataset:

• Partition data that contains sales transaction records. Partitions must be designed to provide efficient loads by month. Boundary values must belong: to the partition on the right.

• Ensure that queries joining and filtering sales transaction records based on product ID complete as quickly as possible.

• Implement a surrogate key to account for changes to the retail store addresses.

• Ensure that data storage costs and performance are predictable.

• Minimize how long it takes to remove old records. Customer Sentiment Analytics Requirement

Contoso identifies the following requirements for customer sentiment analytics:

• Allow Contoso users to use PolyBase in an A/ure Synapse Analytics dedicated SQL pool to query the content of the data records that host the Twitter feeds. Data must be protected by using row-level security (RLS). The users must be authenticated by using their own A/ureAD credentials.

• Maximize the throughput of ingesting Twitter feeds from Event Hubs to Azure Storage without purchasing additional throughput or capacity units.

• Store Twitter feeds in Azure Storage by using Event Hubs Capture. The feeds will be converted into Parquet files.

• Ensure that the data store supports Azure AD-based access control down to the object level.

• Minimize administrative effort to maintain the Twitter feed data records.

• Purge Twitter feed data records;itftaitJ are older than two years.

Data Integration Requirements

Contoso identifies the following requirements for data integration:

Use an Azure service that leverages the existing SSIS packages to ingest on-premises data into datasets stored in a dedicated SQL pool of Azure Synaps Analytics and transform the data.

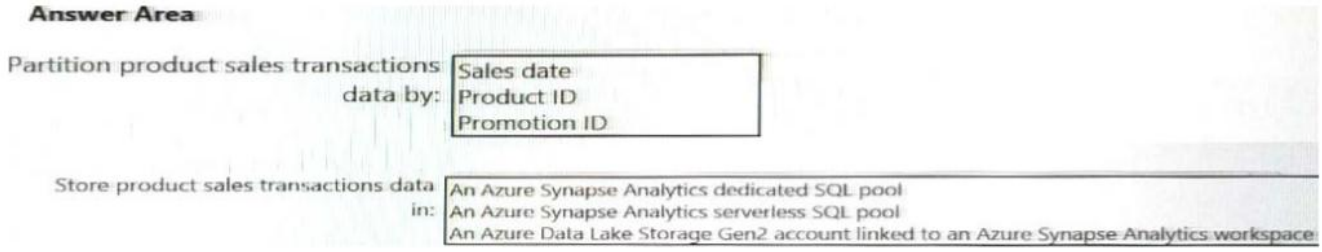
Identify a process to ensure that changes to the ingestion and transformation activities can be version controlled and developed independently by multiple data engineers.

1. - (Exam Topic 1)

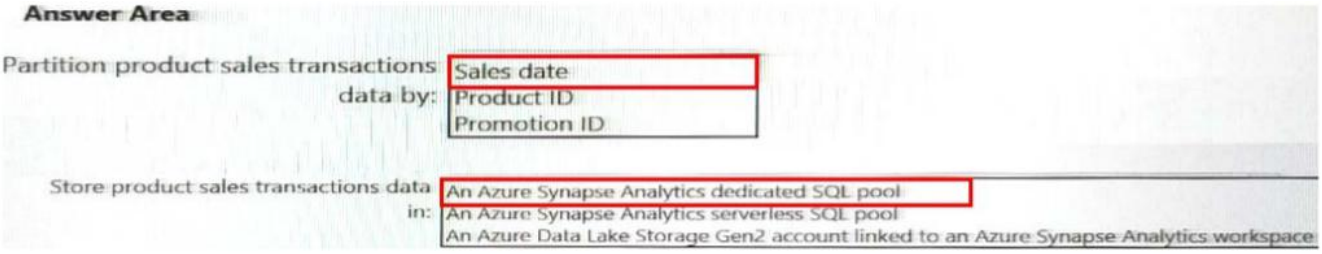
You need to design the partitions for the product sales transactions. The solution must mee the sales transaction dataset requirements.

What should you include in the solution? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

Box 1: Sales date

Scenario: Contoso requirements for data integration include:

- Partition data that contains sales transaction records. Partitions must be designed to provide efficient loads by month. Boundary values must belong to the partition on the right.

Box 2: An Azure Synapse Analytics Dedicated SQL pool Scenario: Contoso requirements for data integration include:

- Ensure that data storage costs and performance are predictable.

The size of a dedicated SQL pool (formerly SQL DW) is determined by Data Warehousing Units (DWU).

Dedicated SQL pool (formerly SQL DW) stores data in relational tables with columnar storage. This format significantly reduces the data storage costs, and improves query performance.

Synapse analytics dedicated sql pool Reference:

https://docs.microsoft.com/en-us/azure/synapse-analytics/sql-data-warehouse/sql-data-warehouse-overview-wha

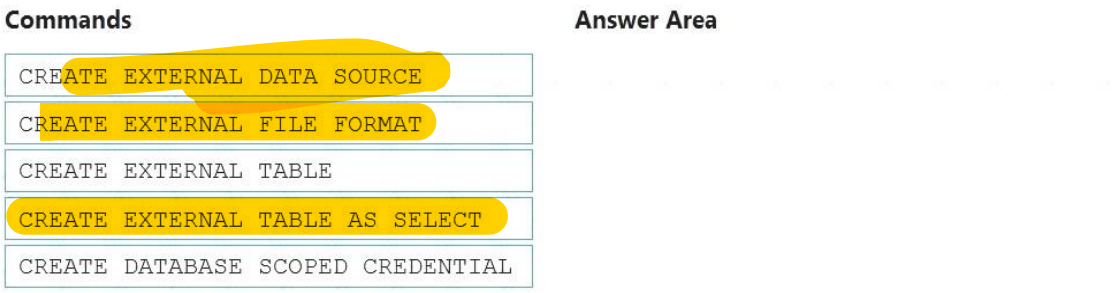
2. - (Exam Topic 1)

You need to ensure that the Twitter feed data can be analyzed in the dedicated SQL pool. The solution must meet the customer sentiment analytics requirements.

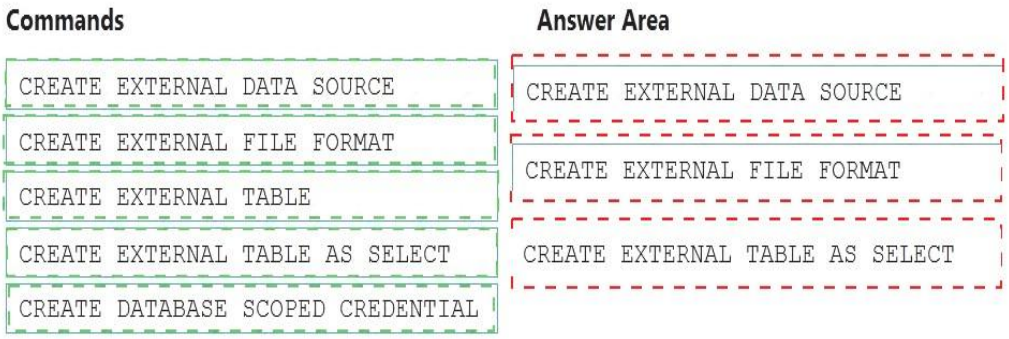
Which three Transaction-SQL DDL commands should you run in sequence? To answer, move the

appropriate commands from the list of commands to the answer area and arrange them in the correct order.

NOTE: More than one order of answer choices is correct. You will receive credit for any of the correct orders you select.



Answer:



Explanation:

Scenario: Allow Contoso users to use PolyBase in an Azure Synapse Analytics dedicated SQL pool to query the content of the data records that host the Twitter feeds. Data must be protected by using row-level security (RLS). The users must be authenticated by using their own Azure AD credentials.

Box 1: CREATE EXTERNAL DATA SOURCE

External data sources are used to connect to storage accounts. Box 2: CREATE EXTERNAL FILE FORMAT

CREATE EXTERNAL FILE FORMAT creates an external file format object that defines external data stored in Azure Blob Storage or Azure Data Lake Storage. Creating an external file format is a prerequisite for creating an external table.

Box 3: CREATE EXTERNAL TABLE AS SELECT

When used in conjunction with the CREATE TABLE AS SELECT statement, selecting from an external table imports data into a table within the SQL pool. In addition to the COPY statement, external tables are useful for loading data.

Reference:

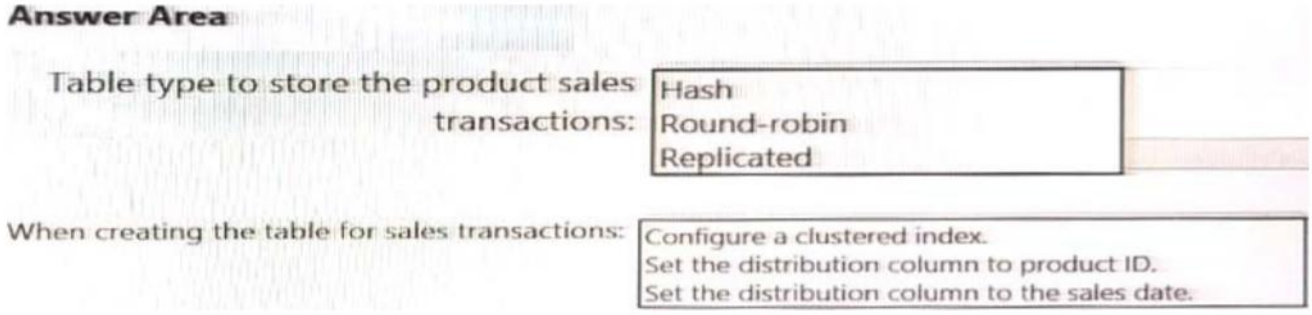
https://docs.microsoft.com/en-us/azure/synapse-analytics/sql/develop-tables-external-tables

3. - (Exam Topic 1)

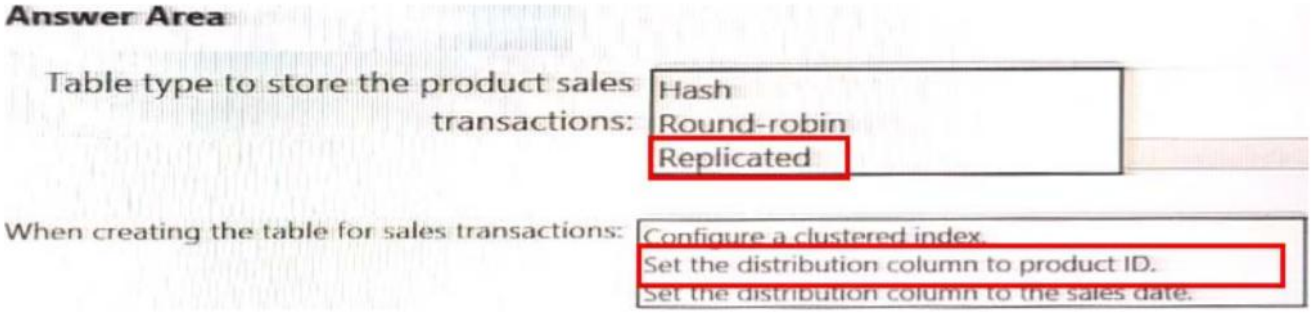
You need to design a data storage structure for the product sales transactions. The solution must meet the sales transaction dataset requirements.

What should you include in the solution? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.



Answer:



4. - (Exam Topic 1)

You need to integrate the on-premises data sources and Azure Synapse Analytics. The solution must meet the data integration requirements.

Which type of integration runtime should you use?

A. Azure-SSIS integration runtime

B. self-hosted integration runtime

C. Azure integration runtime

Answer: C

5. - (Exam Topic 1)

You need to implement the surrogate key for the retail store table. The solution must meet the sales transaction dataset requirements.

What should you create?

A. a table that has an IDENTITY property

B. a system-versioned temporal table

C. a user-defined SEQUENCE object

D. a table that has a FOREIGN KEY constraint

Answer: A

Explanation:

Scenario: Implement a surrogate key to account for changes to the retail store addresses.

A surrogate key on a table is a column with a unique identifier for each row. The key is not generated from the table data. Data modelers like to create surrogate keys on their tables when they design data warehouse models. You can use the IDENTITY property to achieve this goal simply and effectively without affecting load performance.

Reference:

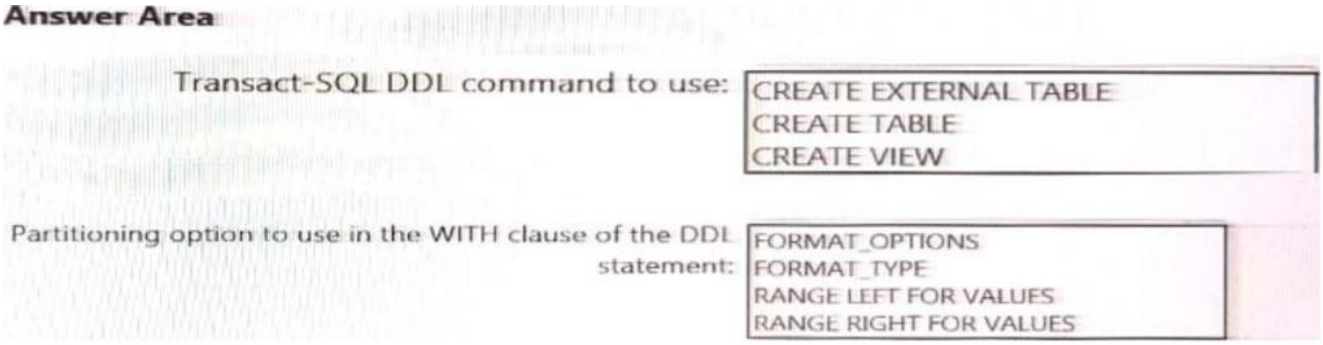
https://docs.microsoft.com/en-us/azure/synapse-analytics/sql-data-warehouse/sql-data-warehouse-tables-identity

6. - (Exam Topic 1)

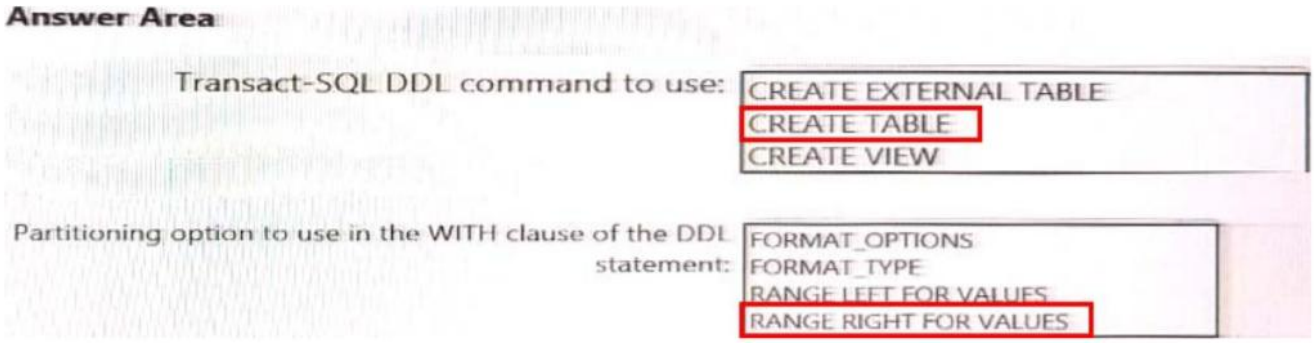
You need to implement an Azure Synapse Analytics database object for storing the sales transactions data. The solution must meet the sales transaction dataset requirements.

What solution must meet the sales transaction dataset requirements.

What should you do? To answer, select the appropriate options in the answer area. NOTE: Each correct selection is worth one point.



Answer:



Topic 2, Litware, inc.

Case study

This is a case study. Case studies are not timed separately. You can use as much exam time as you would like to complete each case. However, there may be additional case studies and sections on this exam. You must manage your time to ensure that you are able to complete all questions included on this exam in the time provided.

To answer the questions included in a case study, you will need to reference information that is provided in the case study. Case studies might contain exhibits and other resources that provide more information about the scenario that is described in the case study. Each question is independent of the other questions in this case study.

At the end of this case study, a review screen will appear. This screen allows you to review your answers and to make changes before you move to the next section of the exam. After you begin a new section, you cannot return to this section.

To start the case study

To display the first question in this case study, click the Next button. Use the buttons in the left pane to

explore the content of the case study before you answer the questions. Clicking these buttons displays information such as business requirements, existing environment, and problem statements. If the case study has an All Information tab, note that the information displayed is identical to the information displayed on the subsequent tabs. When you are ready to answer a question, click the Question button to return to the question.

Overview

Litware, Inc. owns and operates 300 convenience stores across the US. The company sells a variety of packaged foods and drinks, as well as a variety of prepared foods, such as sandwiches and pizzas.

Litware has a loyalty club whereby members can get daily discounts on specific items by providing their membership number at checkout.

Litware employs business analysts who prefer to analyze data by using Microsoft Power BI, and data scientists who prefer analyzing data in Azure Databricks notebooks.

Requirements Business Goals

Litware wants to create a new analytics environment in Azure to meet the following requirements:

- See inventory levels across the stores. Data must be updated as close to real time as possible.
- Execute ad hoc analytical queries on historical data to identify whether the loyalty club discounts increase sales of the discounted products.
- Every four hours, notify store employees about how many prepared food items to produce based on historical demand from the sales data.

Technical Requirements

Litware identifies the following technical requirements:

- Minimize the number of different Azure services needed to achieve the business goals.
- Use platform as a service (PaaS) offerings whenever possible and avoid having to provision virtual machines that must be managed by Litware.
- Ensure that the analytical data store is accessible only to the company's on-premises network and Azure services.
- Use Azure Active Directory (Azure AD) authentication whenever possible.
- Use the principle of least privilege when designing security.
- Stage Inventory data in Azure Data Lake Storage Gen2 before loading the data into the analytical data

store. Litware wants to remove transient data from Data Lake Storage once the data is no longer in use. Files that have a modified date that is older than 14 days must be removed.

- Limit the business analysts' access to customer contact information, such as phone numbers, because this type of data is not analytically relevant.
- Ensure that you can quickly restore a copy of the analytical data store within one hour in the event of corruption or accidental deletion.

Planned Environment

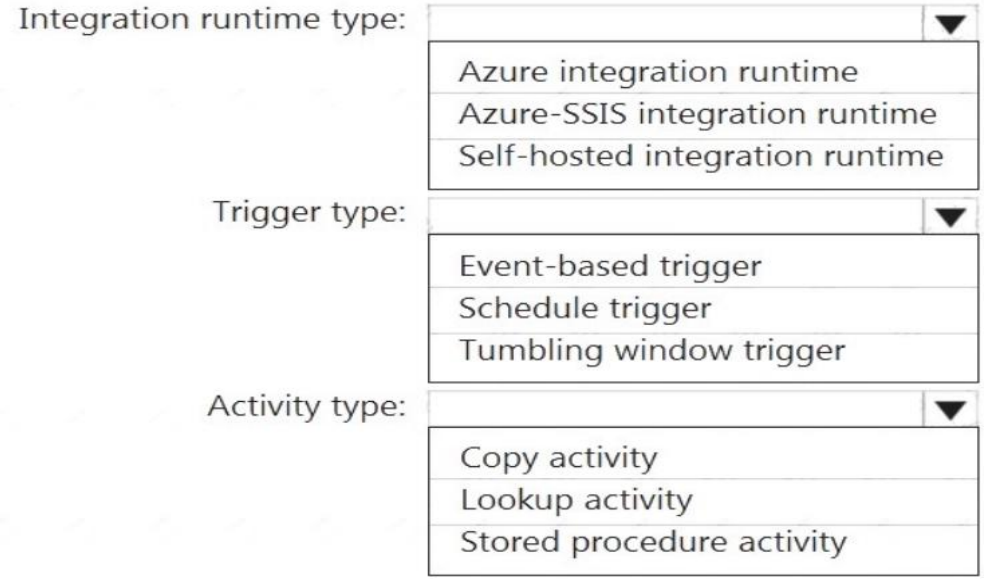
Litware plans to implement the following environment:

- The application development team will create an Azure event hub to receive real-time sales data, including store number, date, time, product ID, customer loyalty number, price, and discount amount, from the point of sale (POS) system and output the data to data storage in Azure.
- Customer data, including name, contact information, and loyalty number, comes from Salesforce, a SaaS application, and can be imported into Azure once every eight hours. Row modified dates are not trusted in the source table.
- Product data, including product ID, name, and category, comes from Salesforce and can be imported into Azure once every eight hours. Row modified dates are not trusted in the source table.
- Daily inventory data comes from a Microsoft SQL server located on a private network.
- Litware currently has 5 TB of historical sales data and 100 GB of customer data. The company expects approximately 100 GB of new data per month for the next year.
- Litware will build a custom application named FoodPrep to provide store employees with the calculation results of how many prepared food items to produce every four hours.
- Litware does not plan to implement Azure ExpressRoute or a VPN between the on-premises network and Azure.

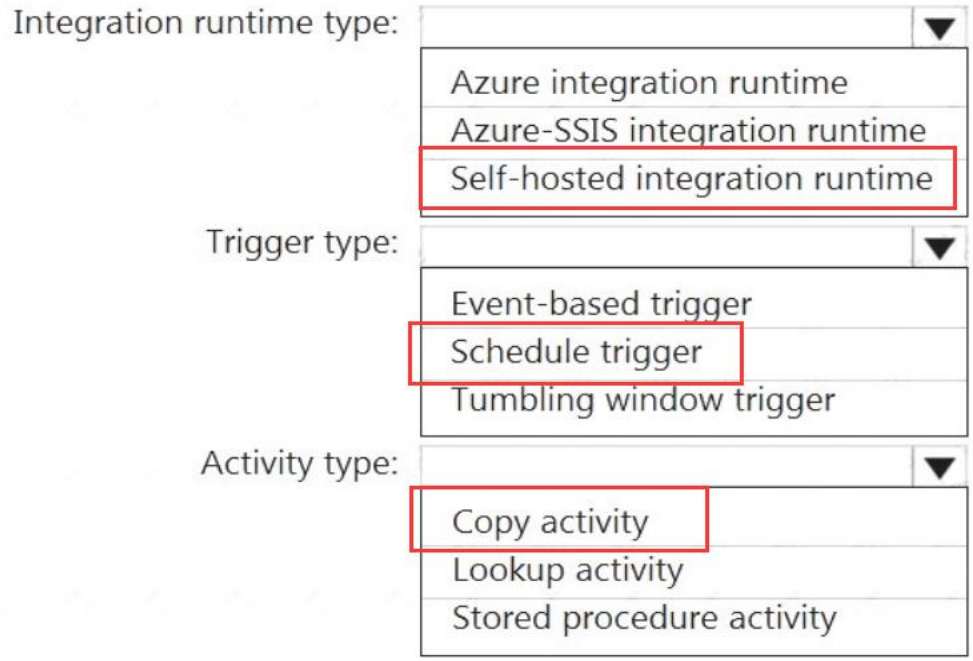
1. - (Exam Topic 2)

Which Azure Data Factory components should you recommend using together to import the daily inventory data from the SQL server to Azure Data Lake Storage? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

Box 1: Self-hosted integration runtime

A self-hosted IR is capable of running copy activity between a cloud data stores and a data store in private network.

Box 2: Schedule trigger

Schedule every 8 hours Box 3: Copy activity Scenario:

- Customer data, including name, contact information, and loyalty number, comes from Salesforce and can be imported into Azure once every eight hours. Row modified dates are not trusted in the source table.

- Product data, including product ID, name, and category, comes from Salesforce and can be imported into Azure once every eight hours. Row modified dates are not trusted in the source table.

2. - (Exam Topic 2)

What should you do to improve high availability of the real-time data processing solution?

A. Deploy identical Azure Stream Analytics jobs to paired regions in Azure.

B. Deploy a High Concurrency Databricks cluster.

C. Deploy an Azure Stream Analytics job and use an Azure Automation runbook to check the status of the job and to start the job if it stops.

D. Set Data Lake Storage to use geo-redundant storage (GRS).

Answer: A

Explanation:

Guarantee Stream Analytics job reliability during service updates

Part of being a fully managed service is the capability to introduce new service functionality and improvements at a rapid pace. As a result, Stream Analytics can have a service update deploy on a weekly (or more frequent) basis. No matter how much testing is done there is still a risk that an existing, running job may break due to the introduction of a bug. If you are running mission critical jobs, these risks need to be avoided. You can reduce this risk by following Azure's paired region model.

Scenario: The application development team will create an Azure event hub to receive real-time sales data, including store number, date, time, product ID, customer loyalty number, price, and discount amount, from the point of sale (POS) system and output the data to data storage in Azure

Reference:

https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-job-reliability

Topic 3, Mix Questions

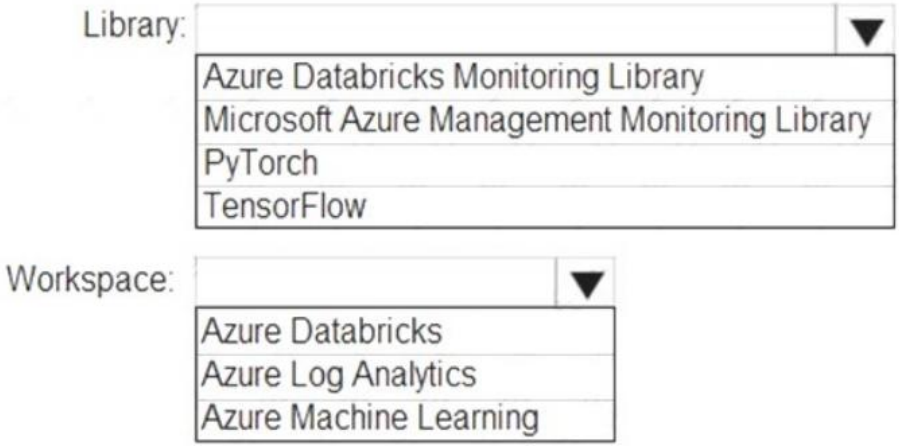
1. - (Exam Topic 3)

You need to collect application metrics, streaming query events, and application log messages for an Azure Databrick cluster.

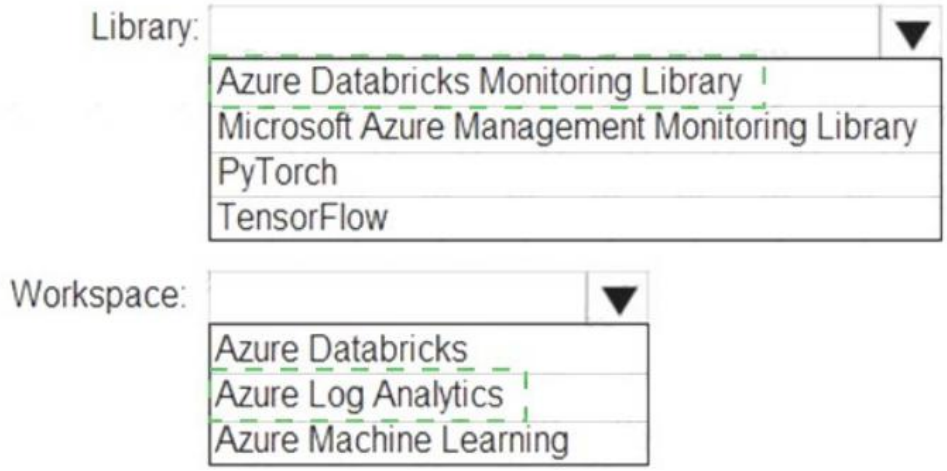
Which type of library and workspace should you implement? To answer, select the appropriate options in

the answer area.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

You can send application logs and metrics from Azure Databricks to a Log Analytics workspace. It uses the Azure Databricks Monitoring Library, which is available on GitHub.

References:

https://docs.microsoft.com/en-us/azure/architecture/databricks-monitoring/application-logs

2. - (Exam Topic 3)

You have an Azure Synapse Analytics dedicated SQL pool.

You need to ensure that data in the pool is encrypted at rest. The solution must NOT require modifying applications that query the data.

What should you do?

A. Enable encryption at rest for the Azure Data Lake Storage Gen2 account.

B. Enable Transparent Data Encryption (TDE) for the pool.

C. Use a customer-managed key to enable double encryption for the Azure Synapse workspace.

D. Create an Azure key vault in the Azure subscription grant access to the pool.

Answer: B

Explanation:

Transparent Data Encryption (TDE) helps protect against the threat of malicious activity by encrypting and decrypting your data at rest. When you encrypt your database, associated backups and transaction log files are encrypted without requiring any changes to your applications. TDE encrypts the storage of an entire database by using a symmetric key called the database encryption key.

Reference:

https://docs.microsoft.com/en-us/azure/synapse-analytics/sql-data-warehouse/sql-data-warehouse-overviewmana

3. - (Exam Topic 3)

A company purchases IoT devices to monitor manufacturing machinery. The company uses an IoT appliance to communicate with the IoT devices.

The company must be able to monitor the devices in real-time. You need to design the solution.

What should you recommend?

A. Azure Stream Analytics cloud job using Azure PowerShell

B. Azure Analysis Services using Azure Portal

C. Azure Data Factory instance using Azure Portal

D. Azure Analysis Services using Azure PowerShell

Answer: A

Explanation:

Stream Analytics is a cost-effective event processing engine that helps uncover real-time insights from devices, sensors, infrastructure, applications and data quickly and easily.

Monitor and manage Stream Analytics resources with Azure PowerShell cmdlets and powershell scripting

that execute basic Stream Analytics tasks.

Reference:

https://cloudblogs.microsoft.com/sqlserver/2014/10/29/microsoft-adds-iot-streaming-analytics-data-production-a

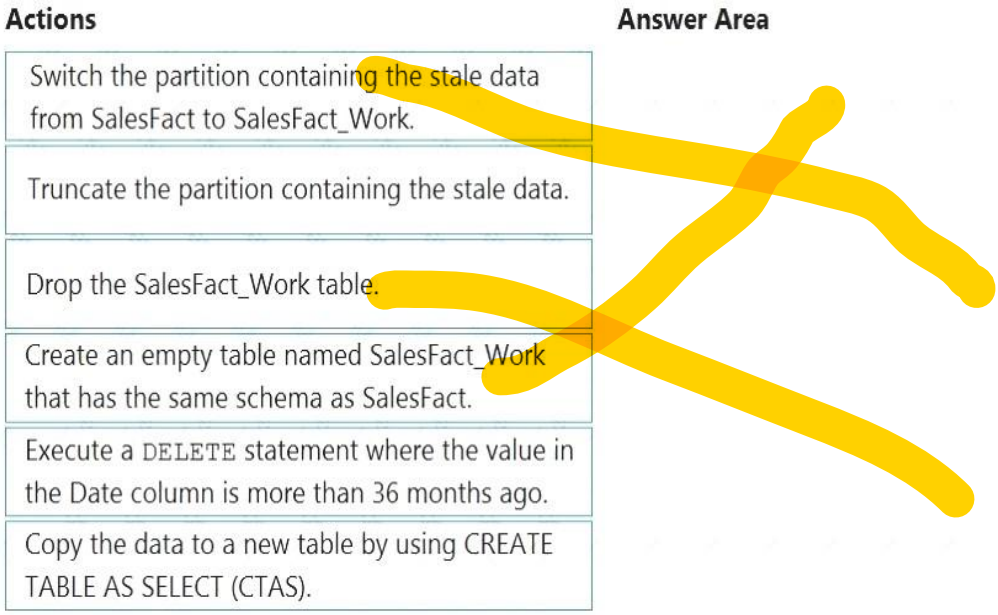
4. - (Exam Topic 3)

You have a table named SalesFact in an enterprise data warehouse in Azure Synapse Analytics. SalesFact contains sales data from the past 36 months and has the following characteristics:

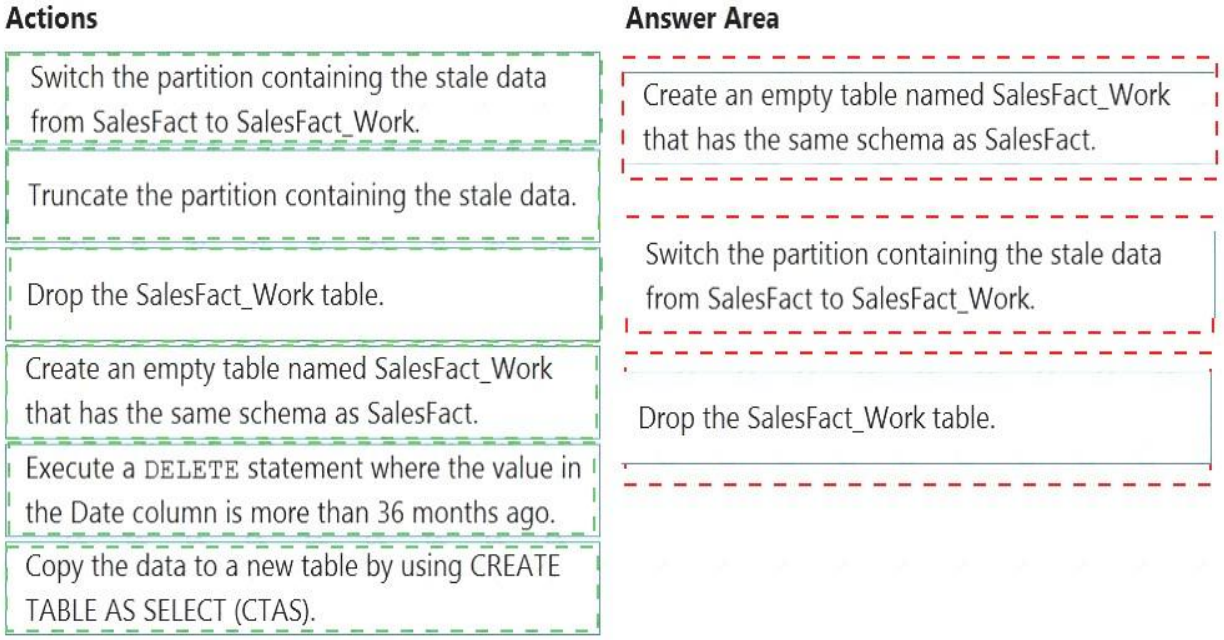
- Is partitioned by month
- Contains one billion rows
- Has clustered columnstore indexes

At the beginning of each month, you need to remove data from SalesFact that is older than 36 months as quickly as possible.

Which three actions should you perform in sequence in a stored procedure? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.



Answer:



Explanation:

Step 1: Create an empty table named SalesFact_work that has the same schema as SalesFact. Step 2: Switch the partition containing the stale data from SalesFact to SalesFact_Work.

SQL Data Warehouse supports partition splitting, merging, and switching. To switch partitions between two tables, you must ensure that the partitions align on their respective boundaries and that the table definitions match.

Loading data into partitions with partition switching is a convenient way stage new data in a table that is not visible to users the switch in the new data.

Step 3: Drop the SalesFact_Work table. Reference:

https://docs.microsoft.com/en-us/azure/sql-data-warehouse/sql-data-warehouse-tables-partition

5. - (Exam Topic 3)

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

After you answer a question in this scenario, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You have an Azure Storage account that contains 100 GB of files. The files contain text and numerical

values. 75% of the rows contain description data that has an average length of 1.1 MB.

You plan to copy the data from the storage account to an enterprise data warehouse in Azure Synapse Analytics.

You need to prepare the files to ensure that the data copies quickly. Solution: You convert the files to compressed delimited text files. Does this meet the goal?

A. Yes

B. No

Answer: A

Explanation:

All file formats have different performance characteristics. For the fastest load, use compressed delimited text files.

Reference:

https://docs.microsoft.com/en-us/azure/sql-data-warehouse/guidance-for-loading-data

6. - (Exam Topic 3)

You have an on-premises data warehouse that includes the following fact tables. Both tables have the following columns: DateKey, ProductKey, RegionKey. There are 120 unique product keys and 65 unique region keys.

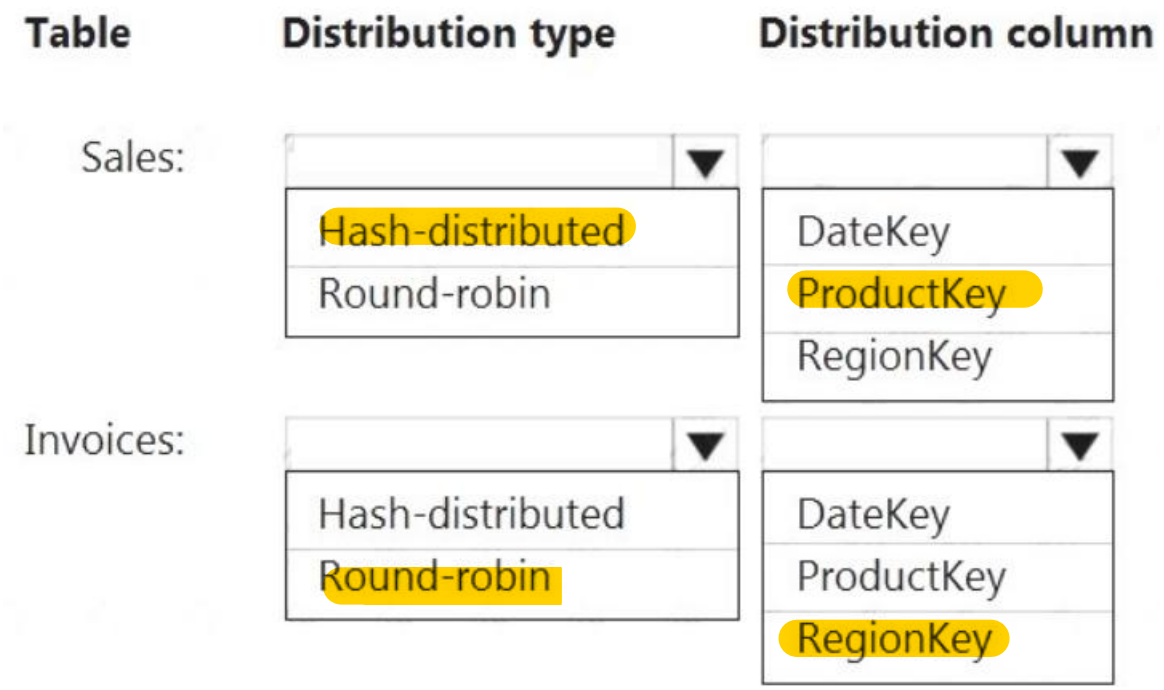
Table	Comments
Sales	The table is 600 GB in size. DateKey is used extensively in the WHERE clause in queries. ProductKey is used extensively in join operations. RegionKey is used for grouping. Severity-five percent of records relate to one of 40 regions.
Invoice	The table is 6 GB in size. DateKey and ProductKey are used extensively in the WHERE clause in queries. RegionKey is used for grouping.

Queries that use the data warehouse take a long time to complete.

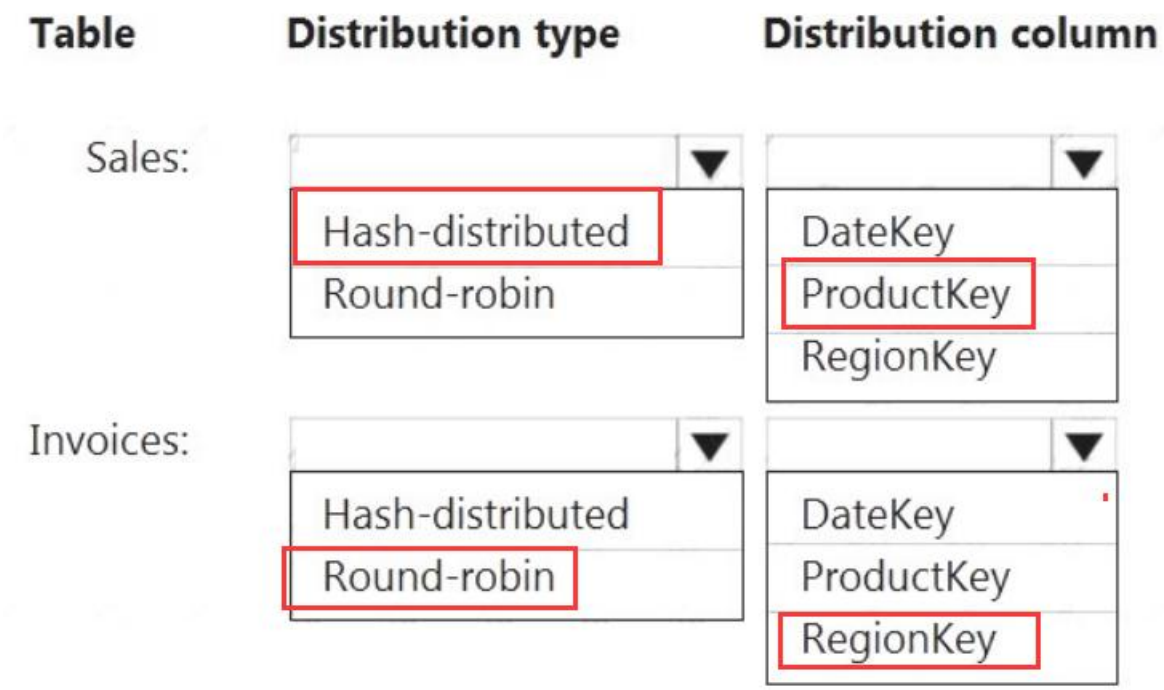
You plan to migrate the solution to use Azure Synapse Analytics. You need to ensure that the Azure-based solution optimizes query performance and minimizes processing skew.

What should you recommend? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point



Answer:



Explanation:

Box 1: Hash-distributed

Box 2: ProductKey

ProductKey is used extensively in joins.

Hash-distributed tables improve query performance on large fact tables.

Box 3: Round-robin

Box 4: RegionKey

Round-robin tables are useful for improving loading speed.

Consider using the round-robin distribution for your table in the following scenarios:

- When getting started as a simple starting point since it is the default
- If there is no obvious joining key
- If there is not good candidate column for hash distributing the table
- If the table does not share a common join key with other tables
- If the join is less significant than other joins in the query
- When the table is a temporary staging table

Note: A distributed table appears as a single table, but the rows are actually stored across 60 distributions. The rows are distributed with a hash or round-robin algorithm.

Reference:

https://docs.microsoft.com/en-us/azure/sql-data-warehouse/sql-data-warehouse-tables-distribute

7. - (Exam Topic 3)

You are designing a slowly changing dimension (SCD) for supplier data in an Azure Synapse Analytics dedicated SQL pool.

You plan to keep a record of changes to the available fields. The supplier data contains the following columns.

Name	Description
SupplierSystemID	Unique supplier ID in an enterprise resource planning (ERP) system
SupplierName	Name of the supplier company
SupplierAddress1	Address of the supplier company
SupplierAddress2	Second address line of the supplier company
SupplierCity	City of the supplier company
SupplierStateProvince	State or province of the supplier company
SupplierCountry	Country of the supplier company
SupplierPostalCode	Postal code of the supplier company
SupplierDescription	Free-text description of the supplier company
SupplierCategory	Category of goods provided by the supplier company

Which three additional columns should you add to the data to create a Type 2 SCD? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

A. surrogate primary key

B. foreign key

C. effective start date

D. effective end date

E. last modified date

F. business key

Answer: B C F

8. - (Exam Topic 3)

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You plan to create an Azure Databricks workspace that has a tiered structure. The workspace will contain

the following three workloads:

- A workload for data engineers who will use Python and SQL.
- A workload for jobs that will run notebooks that use Python, Scala, and SOL.
- A workload that data scientists will use to perform ad hoc analysis in Scala and R.

The enterprise architecture team at your company identifies the following standards for Databricks environments:

- The data engineers must share a cluster.
- The job cluster will be managed by using a request process whereby data scientists and data engineers provide packaged notebooks for deployment to the cluster.
- All the data scientists must be assigned their own cluster that terminates automatically after 120 minutes of inactivity. Currently, there are three data scientists.

You need to create the Databricks clusters for the workloads.

Solution: You create a High Concurrency cluster for each data scientist, a High Concurrency cluster for the data engineers, and a Standard cluster for the jobs.

Does this meet the goal?

A. Yes

B. No

Answer: B

Explanation:

Need a High Concurrency cluster for the jobs.

Standard clusters are recommended for a single user. Standard can run workloads developed in any language: Python, R, Scala, and SQL.

A high concurrency cluster is a managed cloud resource. The key benefits of high concurrency clusters are that they provide Apache Spark-native fine-grained sharing for maximum resource utilization and minimum query latencies.

Reference:

https://docs.azuredatabricks.net/clusters/configure.html

9. - (Exam Topic 3)

You have several Azure Data Factory pipelines that contain a mix of the following types of activities.

* Wrangling data flow

* Notebook

* Copy

* jar

Which two Azure services should you use to debug the activities? Each correct answer presents part of the solution NOTE: Each correct selection is worth one point.

A. Azure HDInsight

B. Azure Databricks

C. Azure Machine Learning

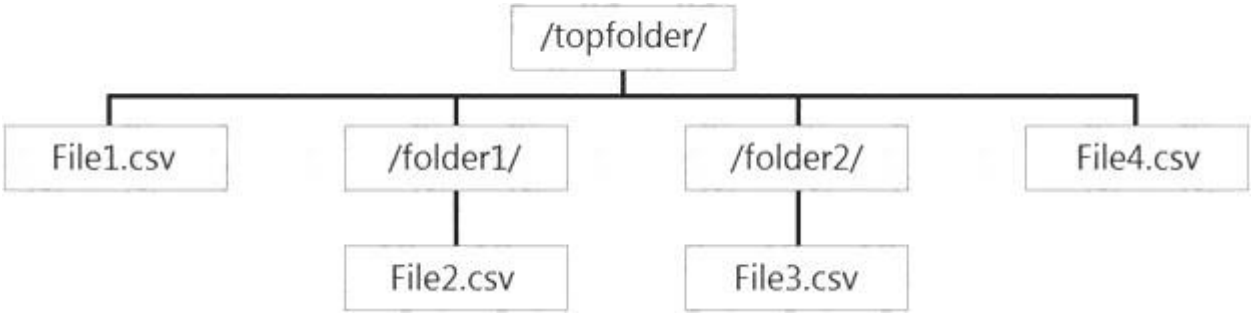
D. Azure Data Factory

E. Azure Synapse Analytics

Answer: C E

10. - (Exam Topic 3)

You have files and folders in Azure Data Lake Storage Gen2 for an Azure Synapse workspace as shown in the following exhibit.



You create an external table named ExtTable that has LOCATION='/topfolder/'.

When you query ExtTable by using an Azure Synapse Analytics serverless SQL pool, which files are returned?

A. File2.csv and File3.csv only

B. File1.csv and File4.csv only

C. File1.csv, File2.csv, File3.csv, and File4.csv

D. File1.csv only

Answer: C

Explanation:

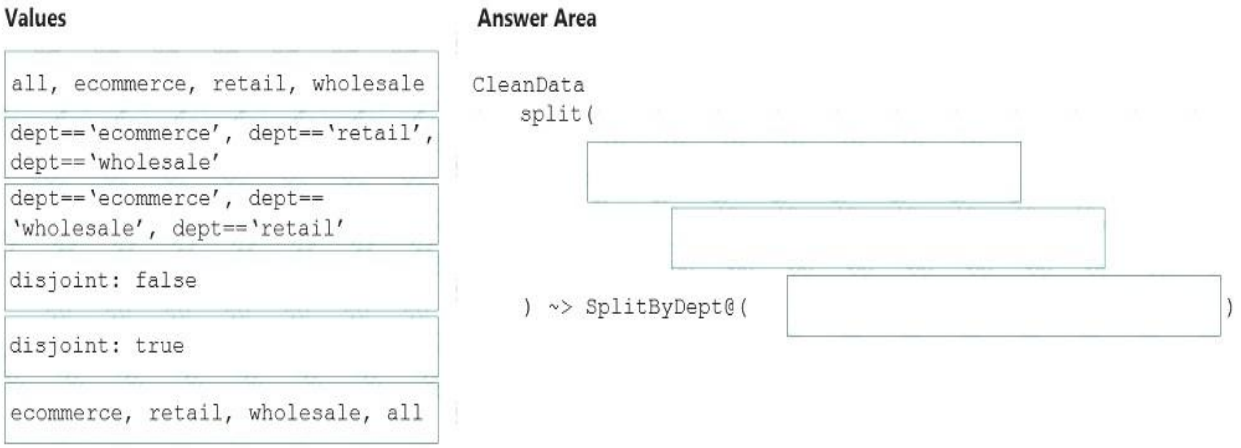
To run a T-SQL query over a set of files within a folder or set of folders while treating them as a single entity or rowset, provide a path to a folder or a pattern (using wildcards) over a set of files or folders. Reference: https://docs.microsoft.com/en-us/azure/synapse-analytics/sql/query-data-storage#query-multiple-files-or-folders

11. - (Exam Topic 3)

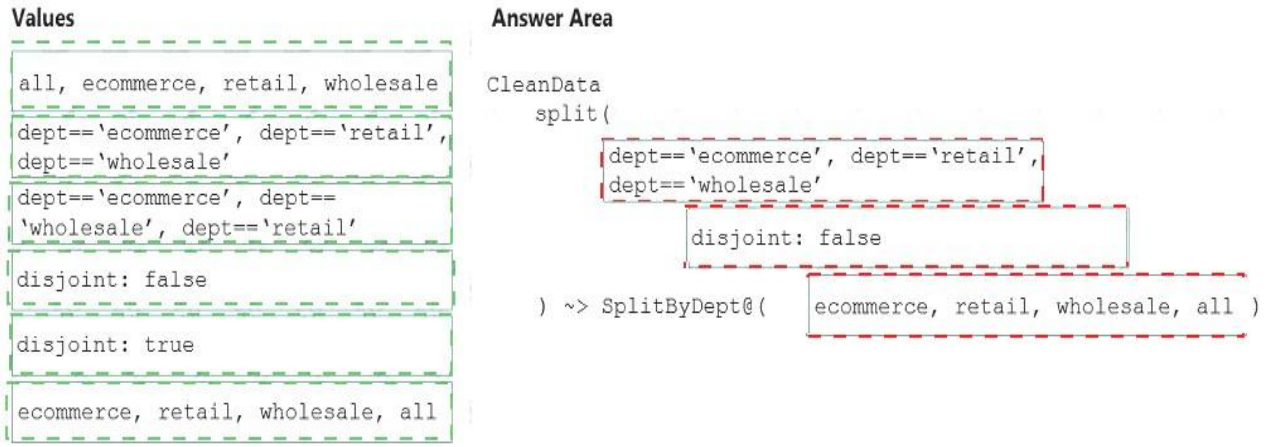
You need to create an Azure Data Factory pipeline to process data for the following three departments at your company: Ecommerce, retail, and wholesale. The solution must ensure that data can also be processed for the entire company.

How should you complete the Data Factory data flow script? To answer, drag the appropriate values to the correct targets. Each value may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

The conditional split transformation routes data rows to different streams based on matching conditions. The conditional split transformation is similar to a CASE decision structure in a programming language. The transformation evaluates expressions, and based on the results, directs the data row to the specified stream.

Box 1: dept=='ecommerce', dept=='retail', dept=='wholesale'

First we put the condition. The order must match the stream labeling we define in Box 3. Syntax:

<incomingStream> split(

<conditionalExpression1>

<conditionalExpression2>

disjoint: {true | false}

) ~> <splitTx>@(stream1, stream2, ..., <defaultStream>)

Box 2: discount : false

disjoint is false because the data goes to the first matching condition. All remaining rows matching the third condition go to output stream all.

Box 3: ecommerce, retail, wholesale, all Label the streams

Reference:

https://docs.microsoft.com/en-us/azure/data-factory/data-flow-conditional-split

12. - (Exam Topic 3)

You are monitoring an Azure Stream Analytics job.

The Backlogged Input Events count has been 20 for the last hour. You need to reduce the Backlogged

Input Events count.

What should you do?

A. Drop late arriving events from the job.

B. Add an Azure Storage account to the job.

C. Increase the streaming units for the job.

D. Stop the job.

Answer: C

Explanation:

General symptoms of the job hitting system resource limits include:

- If the backlog event metric keeps increasing, it's an indicator that the system resource is constrained (either because of output sink throttling, or high CPU).

Note: Backlogged Input Events: Number of input events that are backlogged. A non-zero value for this metric implies that your job isn't able to keep up with the number of incoming events. If this value is slowly increasing or consistently non-zero, you should scale out your job: adjust Streaming Units.

Reference:

https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-scale-jobs

https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-monitoring

13. - (Exam Topic 3)

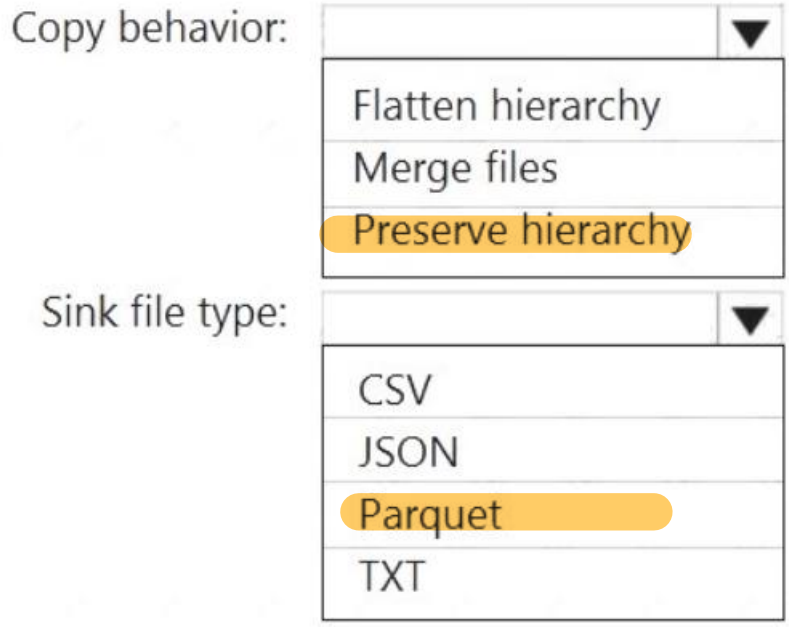
You use Azure Data Factory to prepare data to be queried by Azure Synapse Analytics serverless SQL pools. Files are initially ingested into an Azure Data Lake Storage Gen2 account as 10 small JSON files. Each file contains the same data attributes and data from a subsidiary of your company.

You need to move the files to a different folder and transform the data to meet the following requirements:

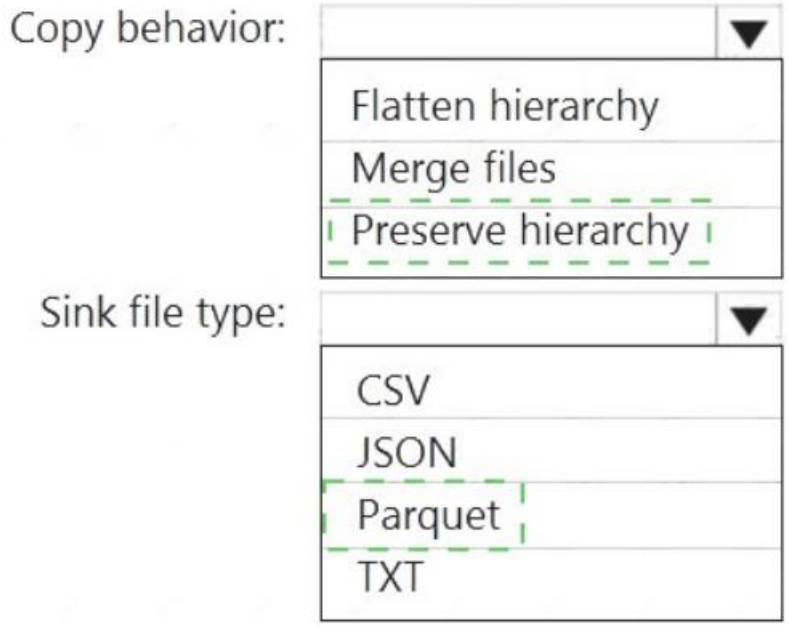
- Provide the fastest possible query times.
- Automatically infer the schema from the underlying files.

How should you configure the Data Factory copy activity? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

Box 1: Preserver herarchy

Compared to the flat namespace on Blob storage, the hierarchical namespace greatly improves the performance of directory management operations, which improves overall job performance.

Box 2: Parquet

Azure Data Factory parquet format is supported for Azure Data Lake Storage Gen2. Parquet supports the schema property.

Reference:

https://docs.microsoft.com/en-us/azure/storage/blobs/data-lake-storage-introduction

https://docs.microsoft.com/en-us/azure/data-factory/format-parquet

14. - (Exam Topic 3)

You need to schedule an Azure Data Factory pipeline to execute when a new file arrives in an Azure Data Lake Storage Gen2 container.

Which type of trigger should you use?

A. on-demand

B. tumbling window

C. schedule

D. event

Answer: D

Explanation:

Event-driven architecture (EDA) is a common data integration pattern that involves production, detection, consumption, and reaction to events. Data integration scenarios often require Data Factory customers to trigger pipelines based on events happening in storage account, such as the arrival or deletion of a file in Azure Blob Storage account.

Reference:

https://docs.microsoft.com/en-us/azure/data-factory/how-to-create-event-trigger

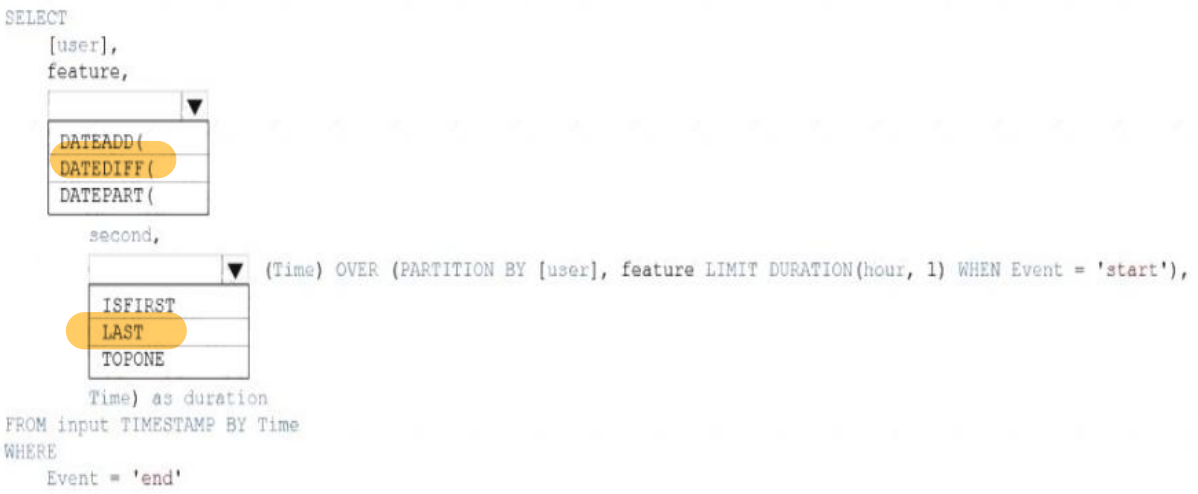
15. - (Exam Topic 3)

You are building an Azure Stream Analytics job to identify how much time a user spends interacting with a feature on a webpage.

The job receives events based on user actions on the webpage. Each row of data represents an event. Each event has a type of either 'start' or 'end'.

You need to calculate the duration between start and end events.

How should you complete the query? To answer, select the appropriate options in the answer area. NOTE: Each correct selection is worth one point.



Answer:

Explanation:

Box 1: DATEDIFF

DATEDIFF function returns the count (as a signed integer value) of the specified datepart boundaries crossed between the specified startdate and enddate.

Syntax: DATEDIFF (datepart , startdate, enddate) Box 2: LAST

The LAST function can be used to retrieve the last event within a specific condition. In this example, the condition is an event of type Start, partitioning the search by PARTITION BY user and feature. This way, every user and feature is treated independently when searching for the Start event. LIMIT DURATION limits the search back in time to 1 hour between the End and Start events.

Example: SELECT

[user], feature, DATEDIFF(

second,

LAST(Time) OVER (PARTITION BY [user], feature LIMIT DURATION(hour,

1) WHEN Event = 'start'), Time) as duration

FROM input TIMESTAMP BY Time

WHERE

Event = 'end' Reference:

https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-stream-analytics-query-patterns

16. - (Exam Topic 3)

You have an Azure Data Lake Storage account that has a virtual network service endpoint configured.

You plan to use Azure Data Factory to extract data from the Data Lake Storage account. The data will then be loaded to a data warehouse in Azure Synapse Analytics by using PolyBase.

Which authentication method should you use to access Data Lake Storage?

A. shared access key authentication

B. managed identity authentication

C. account key authentication

D. service principal authentication

Answer: B

Explanation:

Reference:

https://docs.microsoft.com/en-us/azure/data-factory/connector-azure-sql-data-warehouse#use-polybase-to-load-d

17. - (Exam Topic 3)

You have an enterprise-wide Azure Data Lake Storage Gen2 account. The data lake is accessible only through an Azure virtual network named VNET1.

You are building a SQL pool in Azure Synapse that will use data from the data lake.

Your company has a sales team. All the members of the sales team are in an Azure Active Directory group named Sales. POSIX controls are used to assign the Sales group access to the files in the data lake.

You plan to load data to the SQL pool every hour.

You need to ensure that the SQL pool can load the sales data from the data lake.

Which three actions should you perform? Each correct answer presents part of the solution. NOTE: Each area selection is worth one point.

A. Add the managed identity to the Sales group.

B. Use the managed identity as the credentials for the data load process.

C. Create a shared access signature (SAS).

D. Add your Azure Active Directory (Azure AD) account to the Sales group.

E. Use the snared access signature (SAS) as the credentials for the data load process.

F. Create a managed identity.

Answer: A D F

Explanation:

The managed identity grants permissions to the dedicated SQL pools in the workspace.

Note: Managed identity for Azure resources is a feature of Azure Active Directory. The feature provides Azure services with an automatically managed identity in Azure AD Reference:

https://docs.microsoft.com/en-us/azure/synapse-analytics/security/synapse-workspace-managed-identity

18. - (Exam Topic 3)

What should you recommend using to secure sensitive customer contact information?

A. data labels

B. column-level security

C. row-level security

D. Transparent Data Encryption (TDE)

Answer: B

Explanation:

Scenario: All cloud data must be encrypted at rest and in transit.

Always Encrypted is a feature designed to protect sensitive data stored in specific database columns from access (for example, credit card numbers, national identification numbers, or data on a need to know basis). This includes database administrators or other privileged users who are authorized to access the database

to perform management tasks, but have no business need to access the particular data in the encrypted columns. The data is always encrypted, which means the encrypted data is decrypted only for processing by client applications with access to the encryption key.

References:

https://docs.microsoft.com/en-us/azure/sql-database/sql-database-security-overview

19. - (Exam Topic 3)

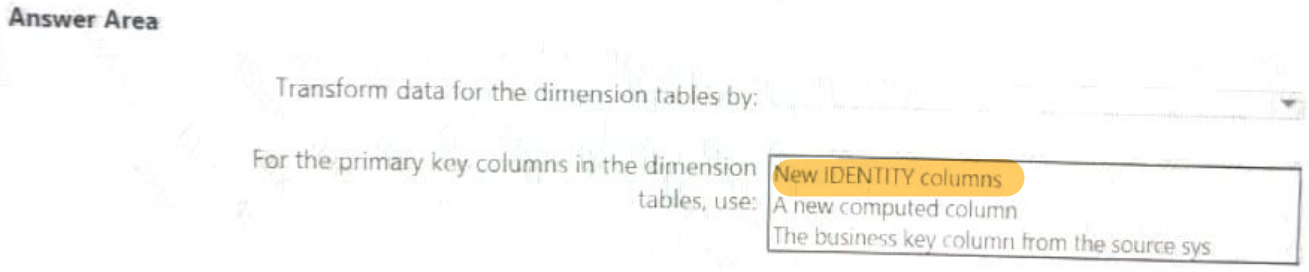
You have a Microsoft SQL Server database that uses a third normal form schema.

You plan to migrate the data in the database to a star schema in an A?\ire Synapse Analytics dedicated SQI pool.

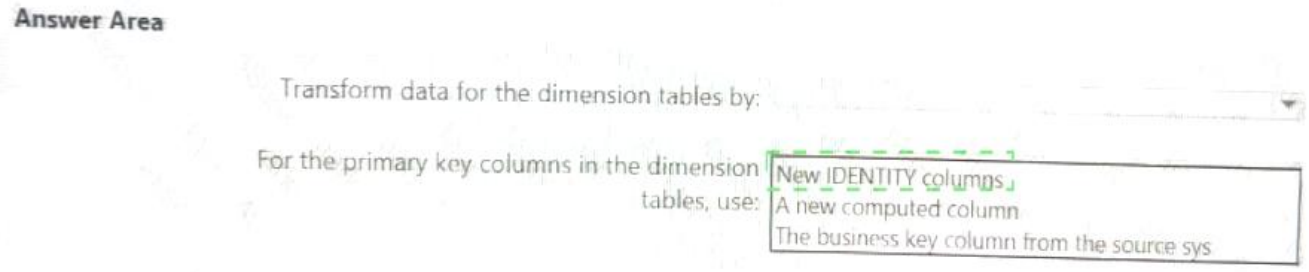
You need to design the dimension tables. The solution must optimize read operations.

What should you include in the solution? to answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.



Answer:



20. - (Exam Topic 3)

You have an Azure Synapse Analytics dedicated SQL pool that contains a table named Table1.

You have files that are ingested and loaded into an Azure Data Lake Storage Gen2 container named

container1.

You plan to insert data from the files into Table1 and azure Data Lake Storage Gen2 container named container1.

You plan to insert data from the files into Table1 and transform the data. Each row of data in the files will produce one row in the serving layer of Table1.

You need to ensure that when the source data files are loaded to container1, the DateTime is stored as an additional column in Table1.

Solution: You use a dedicated SQL pool to create an external table that has a additional DateTime column.

Does this meet the goal?

A. Yes

B. No

Answer: A

21. - (Exam Topic 3)

You develop a dataset named DBTBL1 by using Azure Databricks. DBTBL1 contains the following columns:

• SensorTypeID

• GeographyRegionID

• Year

• Month

• Day

• Hour

• Minute

• Temperature

• WindSpeed

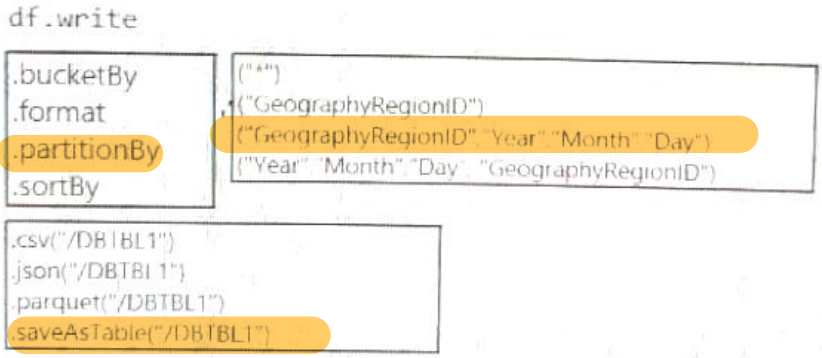
• Other

You need to store the data to support daily incremental load pipelines that vary for each GeographyRegionID. The solution must minimize storage costs.

How should you complete the code? To answer, select the appropriate options in the answer area. NOTE:

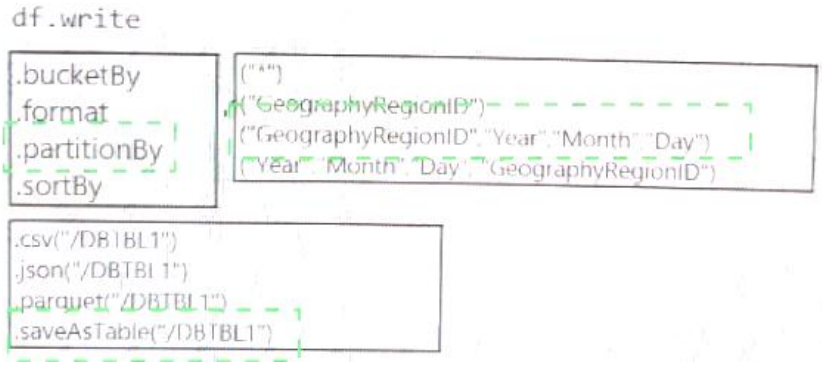
Each correct selection is worth one point.

Answer Area



Answer:

Answer Area



22. - (Exam Topic 3)

You have a self-hosted integration runtime in Azure Data Factory.

The current status of the integration runtime has the following configurations:

- Status: Running
- Type: Self-Hosted
- Version: 4.4.7292.1
- Running / Registered Node(s): 1/1
- High Availability Enabled: False
- Linked Count: 0
- Queue Length: 0
- Average Queue Duration. 0.00s

The integration runtime has the following node details:

- Name: X-M
- Status: Running
- Version: 4.4.7292.1
- Available Memory: 7697MB
- CPU Utilization: 6%
- Network (In/Out): 1.21KBps/0.83KBps
- Concurrent Jobs (Running/Limit): 2/14
- Role: Dispatcher/Worker
- Credential Status: In Sync

Use the drop-down menus to select the answer choice that completes each statement based on the information presented.

NOTE: Each correct selection is worth one point.

If the X-M node becomes unavailable, all executed pipelines will:

- fail until the node comes back online
- switch to another integration runtime
- exceed the CPU limit

The number of concurrent jobs and the CPU usage indicate that the Concurrent Jobs (Running/Limit) value should be:

- raised
- lowered
- left as is

Answer:

If the X-M node becomes unavailable, all executed pipelines will:

- fail until the node comes back online
- switch to another integration runtime
- exceed the CPU limit

The number of concurrent jobs and the CPU usage indicate that the Concurrent Jobs (Running/Limit) value should be:

- raised
- lowered
- left as is

Explanation:

Box 1: fail until the node comes back online We see: High Availability Enabled: False

Note: Higher availability of the self-hosted integration runtime so that it's no longer the single point of failure in your big data solution or cloud data integration with Data Factory.

Box 2: lowered We see:

Concurrent Jobs (Running/Limit): 2/14 CPU Utilization: 6%

Note: When the processor and available RAM aren't well utilized, but the execution of concurrent jobs reaches a node's limits, scale up by increasing the number of concurrent jobs that a node can run

Reference:

https://docs.microsoft.com/en-us/azure/data-factory/create-self-hosted-integration-runtime

23. - (Exam Topic 3)

You are designing a statistical analysis solution that will use custom proprietary1 Python functions on near real-time data from Azure Event Hubs.

You need to recommend which Azure service to use to perform the statistical analysis. The solution must minimize latency.

What should you recommend?

A. Azure Stream Analytics

B. Azure SQL Database

C. Azure Databricks

D. Azure Synapse Analytics

Answer: A

24. - (Exam Topic 3)

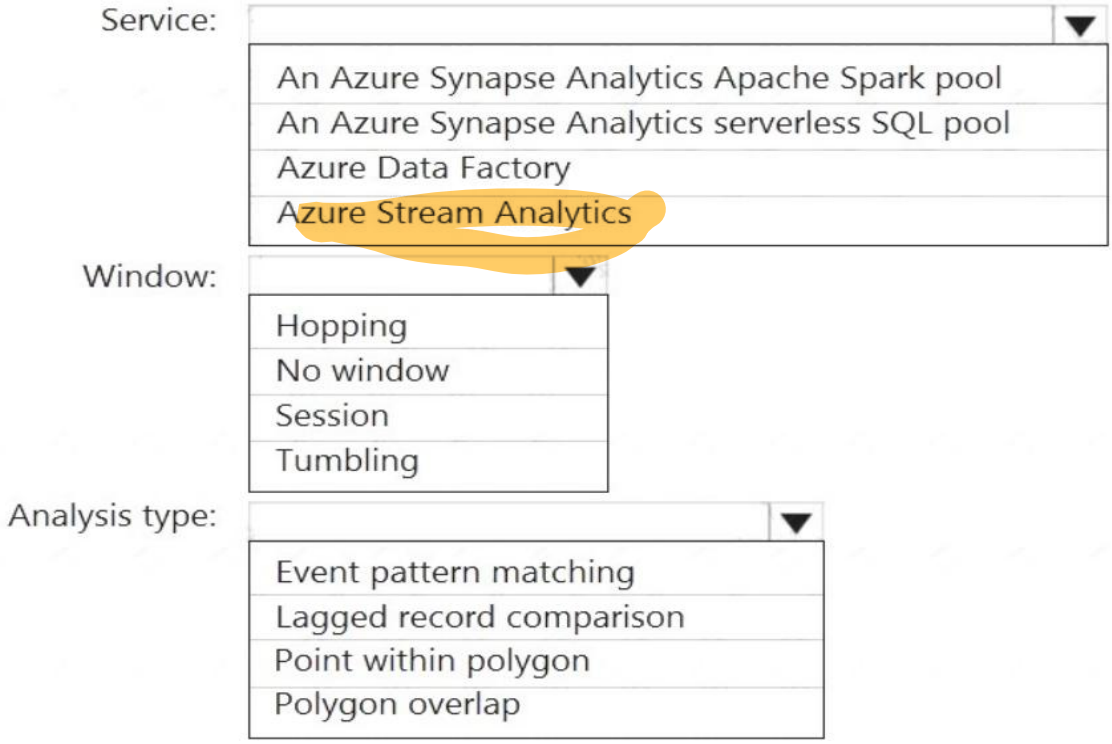
You are designing a monitoring solution for a fleet of 500 vehicles. Each vehicle has a GPS tracking device that sends data to an Azure event hub once per minute.

You have a CSV file in an Azure Data Lake Storage Gen2 container. The file maintains the expected geographical area in which each vehicle should be.

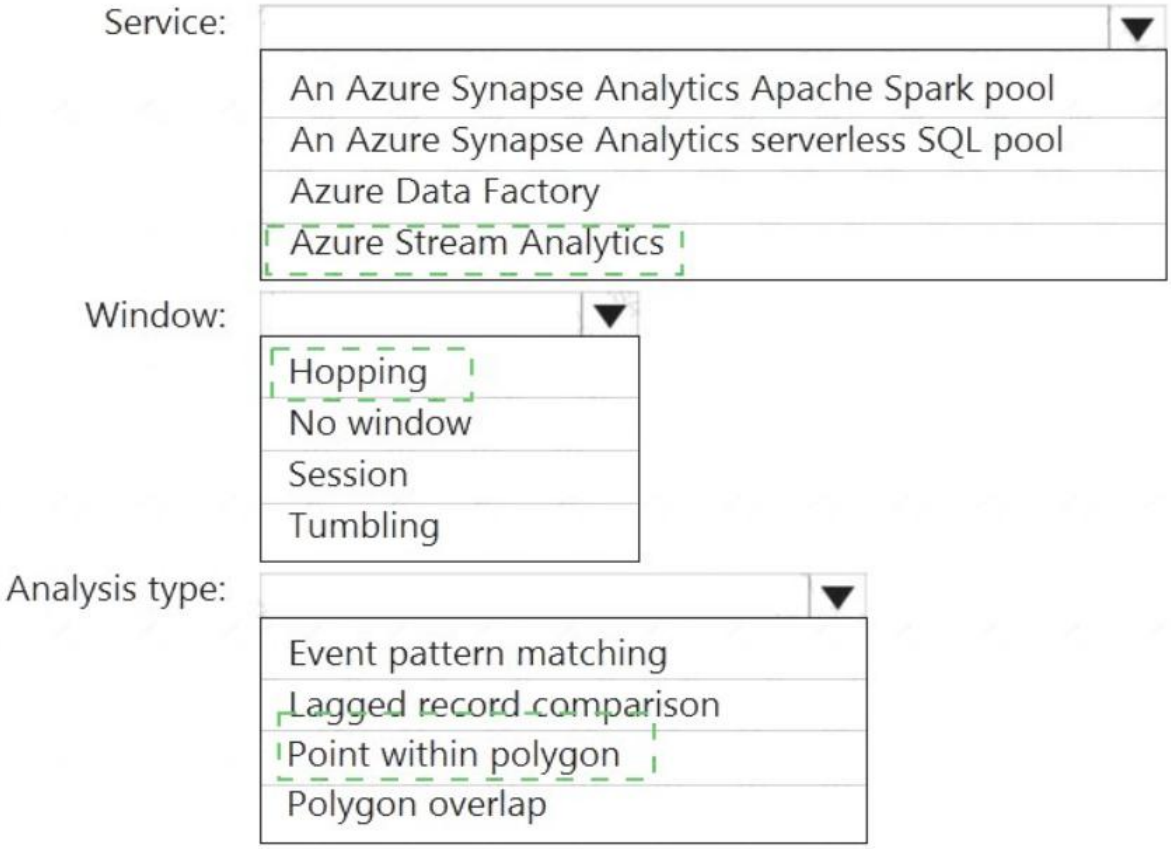
You need to ensure that when a GPS position is outside the expected area, a message is added to another event hub for processing within 30 seconds. The solution must minimize cost.

What should you include in the solution? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

Box 1: Azure Stream Analytics Box 2: Hopping

Hopping window functions hop forward in time by a fixed period. It may be easy to think of them as Tumbling windows that can overlap and be emitted more often than the window size. Events can belong to more than one Hopping window result set. To make a Hopping window the same as a Tumbling window, specify the hop size to be the same as the window size.

Box 3: Point within polygon Reference:

https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-window-functions

25. - (Exam Topic 3)

You have an Apache Spark DataFrame named temperatures. A sample of the data is shown in the following table.

Date	Temp
...	...
18-01-2021	3
19-01-2021	4
20-01-2021	2
21-01-2021	2
...	...

You need to produce the following table by using a Spark SQL query.

Year	JAN	FEB	MAR	APR	MAY
2019	2.3	4.1	5.2	7.6	9.2
2020	2.4	4.2	4.9	7.8	9.1
2021	2.6	5.3	3.4	7.9	9.5

How should you complete the query? To answer, drag the appropriate values to the correct targets. Each value may be used once more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

NOTE: Each correct selection is worth one point.

Values

CAST

COLLATE

CONVERT

FLATTEN

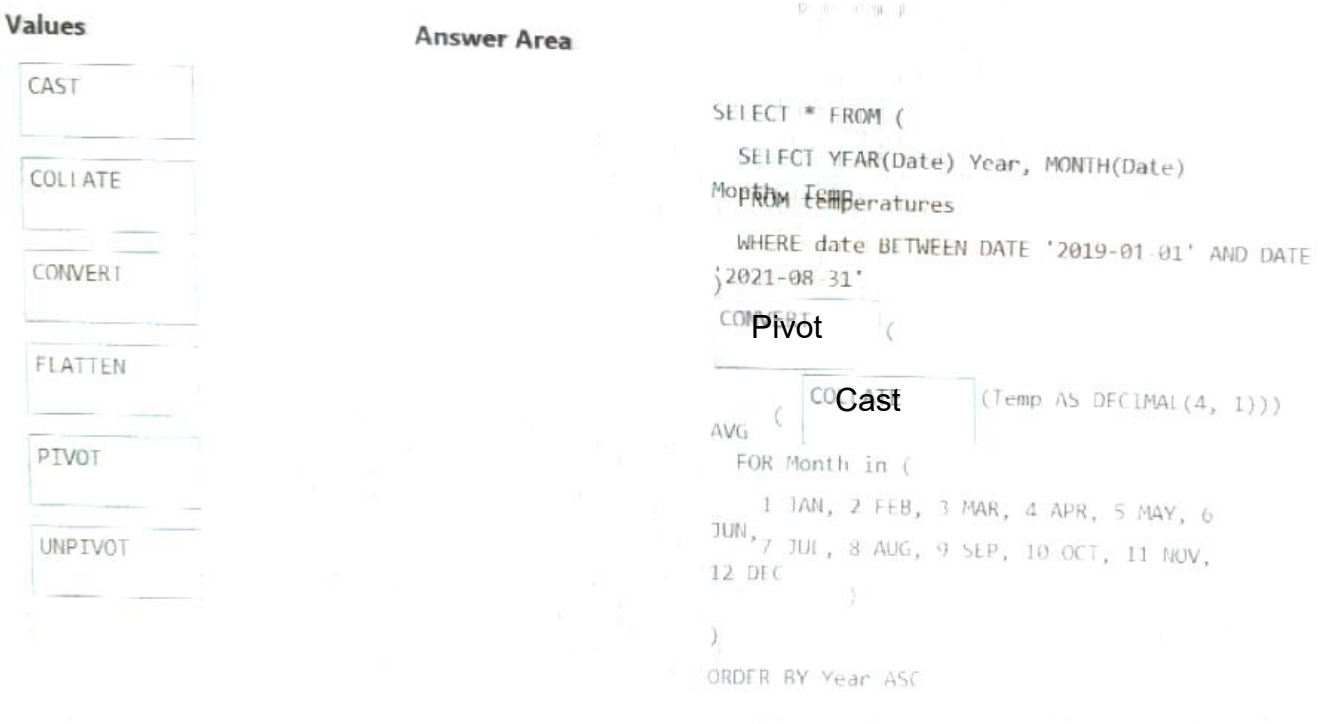
PIVOT

UNPIVOT

Answer Area

```
SELECT * FROM (
  SELECT YEAR(Date) Year, MONTH(Date)
Month, Temp
  FROM temperatures
  WHERE date BETWEEN DATE '2019-01-01' AND DATE
'2021-08-31'
)
    Value    (
        Value    (Temp AS DECIMAL(4, 1)))
AVG (
  FOR Month in (
    1 JAN, 2 FEB, 3 MAR, 4 APR, 5 MAY, 6
JUN, 7 JUL, 8 AUG, 9 SEP, 10 OCT, 11 NOV,
12 DEC
        )
)
ORDER BY Year ASC
```

Answer:



26. - (Exam Topic 3)

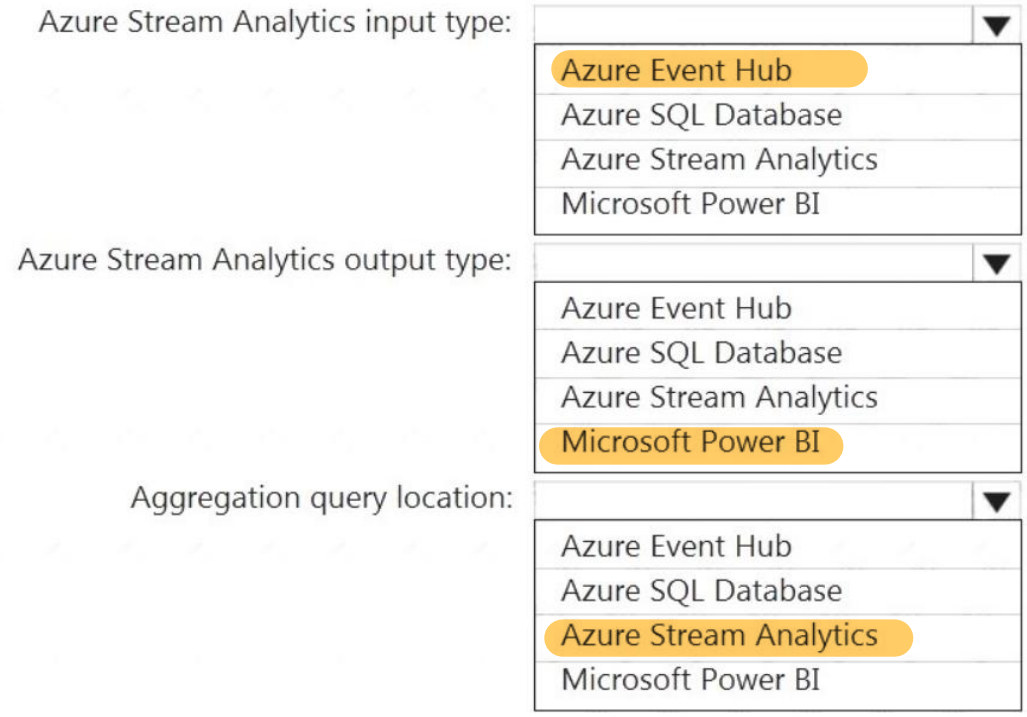
You are designing a real-time dashboard solution that will visualize streaming data from remote sensors that connect to the internet. The streaming data must be aggregated to show the average value of each 10-second interval. The data will be discarded after being displayed in the dashboard.

The solution will use Azure Stream Analytics and must meet the following requirements:

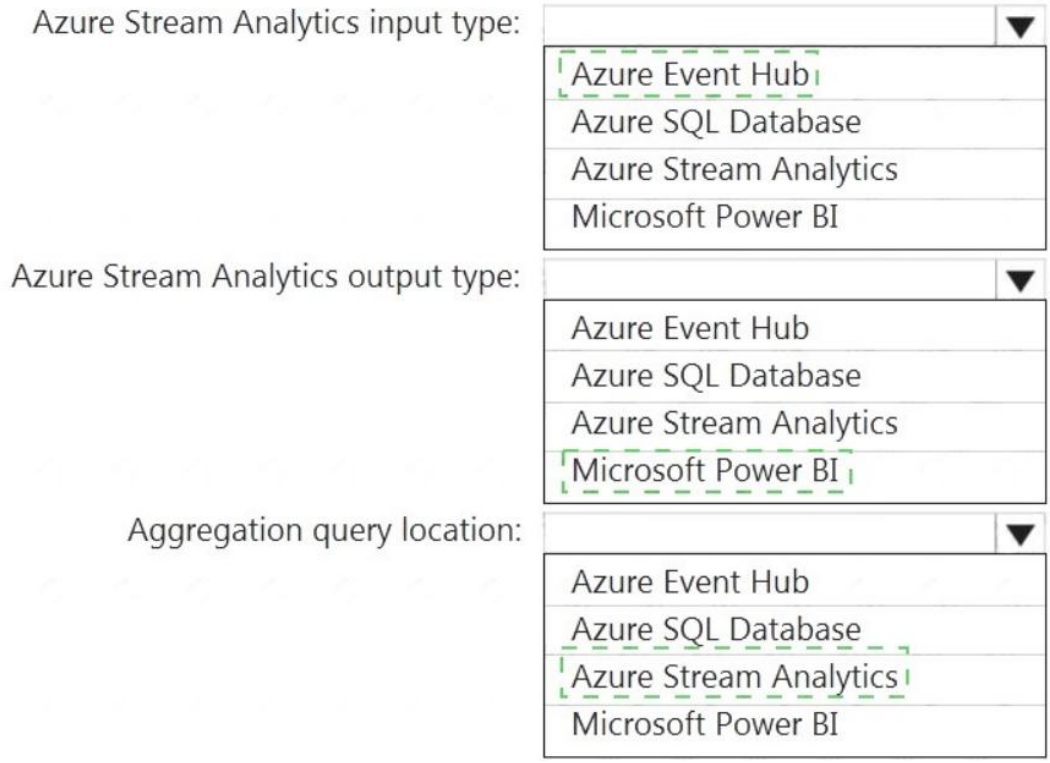
- Minimize latency from an Azure Event hub to the dashboard.
- Minimize the required storage.
- Minimize development effort.

What should you include in the solution? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point



Answer:



Explanation:

Reference:

https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-power-bi-dashboard

27. - (Exam Topic 3)

You have a C# application that process data from an Azure IoT hub and performs complex transformations.

You need to replace the application with a real-time solution. The solution must reuse as much code as possible from the existing application.

A. Azure Databricks

B. Azure Event Grid

C. Azure Stream Analytics

D. Azure Data Factory

Answer: C

Explanation:

Azure Stream Analytics on IoT Edge empowers developers to deploy near-real-time analytical intelligence closer to IoT devices so that they can unlock the full value of device-generated data. UDF are available in C# for IoT Edge jobs

Azure Stream Analytics on IoT Edge runs within the Azure IoT Edge framework. Once the job is created in Stream Analytics, you can deploy and manage it using IoT Hub.

References:

https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-edge

28. - (Exam Topic 3)

You are developing a solution using a Lambda architecture on Microsoft Azure. The data at test layer must meet the following requirements:

Data storage:

•Serve as a repository (or high volumes of large files in various formats.

•Implement optimized storage for big data analytics workloads.

•Ensure that data can be organized using a hierarchical structure. Batch processing:

•Use a managed solution for in-memory computation processing.

•Natively support Scala, Python, and R programming languages.

•Provide the ability to resize and terminate the cluster automatically. Analytical data store:

•Support parallel processing.

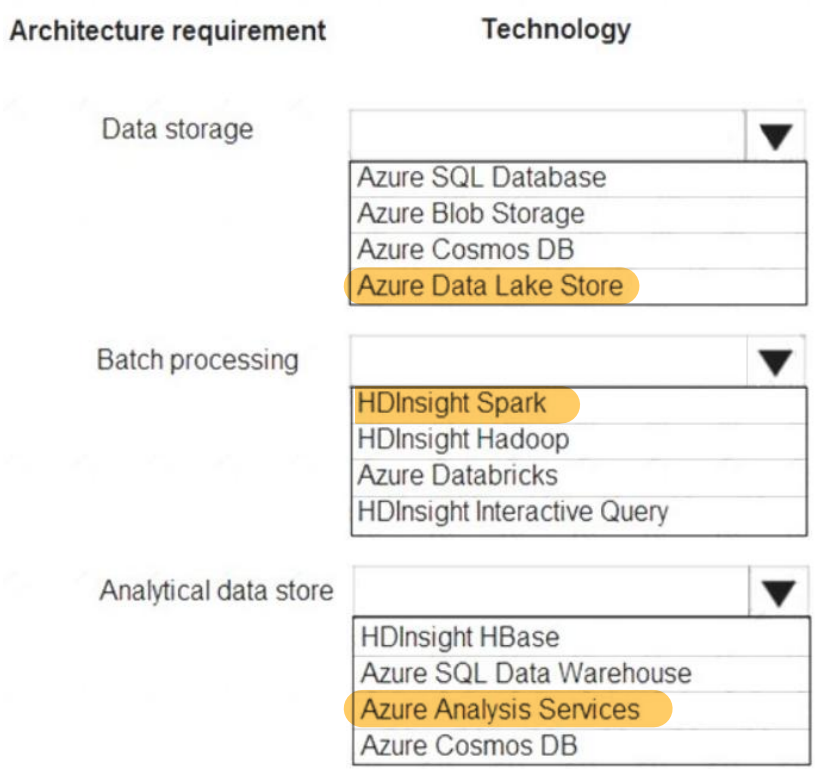
•Use columnar storage.

•Support SQL-based languages.

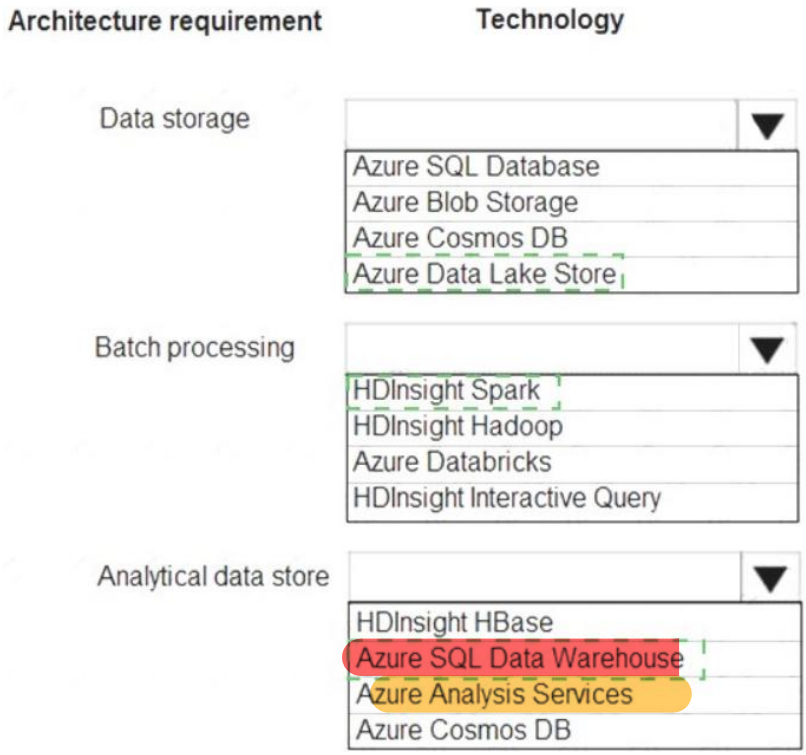
You need to identify the correct technologies to build the Lambda architecture.

Which technologies should you use? To answer, select the appropriate options in the answer area NOTE:

Each correct selection is worth one point.



Answer:



Explanation:

Data storage: Azure Data Lake Store

A key mechanism that allows Azure Data Lake Storage Gen2 to provide file system performance at object storage scale and prices is the addition of a hierarchical namespace. This allows the collection of objects/files within an account to be organized into a hierarchy of directories and nested subdirectories in the same way that the file system on your computer is organized. With the hierarchical namespace enabled, a storage account becomes capable of providing the scalability and cost-effectiveness of object storage, with file system semantics that are familiar to analytics engines and frameworks.

Batch processing: HD Insight Spark

Aparch Spark is an open-source, parallel-processing framework that supports in-memory processing to boost the performance of big-data analysis applications.

HDInsight is a managed Hadoop service. Use it deploy and manage Hadoop clusters in Azure. For batch processing, you can use Spark, Hive, Hive LLAP, MapReduce.

Languages: R, Python, Java, Scala, SQL Analytic data store: SQL Data Warehouse

SQL Data Warehouse is a cloud-based Enterprise Data Warehouse (EDW) that uses Massively Parallel Processing (MPP).

SQL Data Warehouse stores data into relational tables with columnar storage. References:

https://docs.microsoft.com/en-us/azure/storage/blobs/data-lake-storage-namespace

https://docs.microsoft.com/en-us/azure/architecture/data-guide/technology-choices/batch-processing

https://docs.microsoft.com/en-us/azure/sql-data-warehouse/sql-data-warehouse-overview-what-is

29. - (Exam Topic 3)

What should you recommend to prevent users outside the Litware on-premises network from accessing the analytical data store?

A. a server-level virtual network rule

B. a database-level virtual network rule

C. a database-level firewall IP rule

D. a server-level firewall IP rule

Answer: A

Explanation:

Virtual network rules are one firewall security feature that controls whether the database server for your single databases and elastic pool in Azure SQL Database or for your databases in SQL Data Warehouse accepts communications that are sent from particular subnets in virtual networks.

Server-level, not database-level: Each virtual network rule applies to your whole Azure SQL Database server, not just to one particular database on the server. In other words, virtual network rule applies at the serverlevel, not at the database-level.

References:

https://docs.microsoft.com/en-us/azure/sql-database/sql-database-vnet-service-endpoint-rule-overview

30. - (Exam Topic 3)

You are designing a solution that will copy Parquet files stored in an Azure Blob storage account to an Azure Data Lake Storage Gen2 account.

The data will be loaded daily to the data lake and will use a folder structure of {Year}/{Month}/{Day}/.

You need to design a daily Azure Data Factory data load to minimize the data transfer between the two accounts.

Which two configurations should you include in the design? Each correct answer presents part of the solution. NOTE: Each correct selection is worth one point.

A. Delete the files in the destination before loading new data.

B. Filter by the last modified date of the source files.

C. Delete the source files after they are copied.

D. Specify a file naming pattern for the destination.

Answer: B C

Explanation:

Reference:

https://docs.microsoft.com/en-us/azure/data-factory/connector-azure-data-lake-storage

31. - (Exam Topic 3)

You are designing a partition strategy for a fact table in an Azure Synapse Analytics dedicated SQL pool. The table has the following specifications:

• Contain sales data for 20,000 products.

• Use hash distribution on a column named ProduclID,

• Contain 2.4 billion records for the years 20l9 and 2020.

Which number of partition ranges provides optimal compression and performance of the clustered columnstore index?

A. 40

B. 240

C. 400

D. 2,400

Answer: B

32. - (Exam Topic 3)

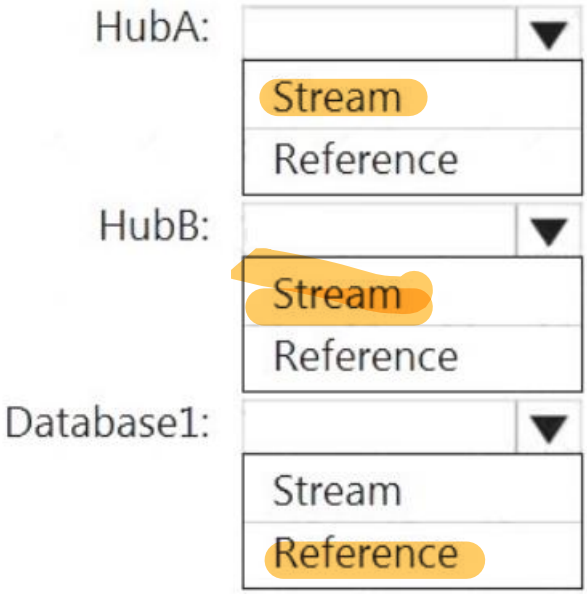
You have an Azure SQL database named Database1 and two Azure event hubs named HubA and HubB. The data consumed from each source is shown in the following table.

Source	Data
Database1	Driver's name Driver's license number
HubA	Ride route Ride distance Ride duration
HubB	Ride fare Ride payment

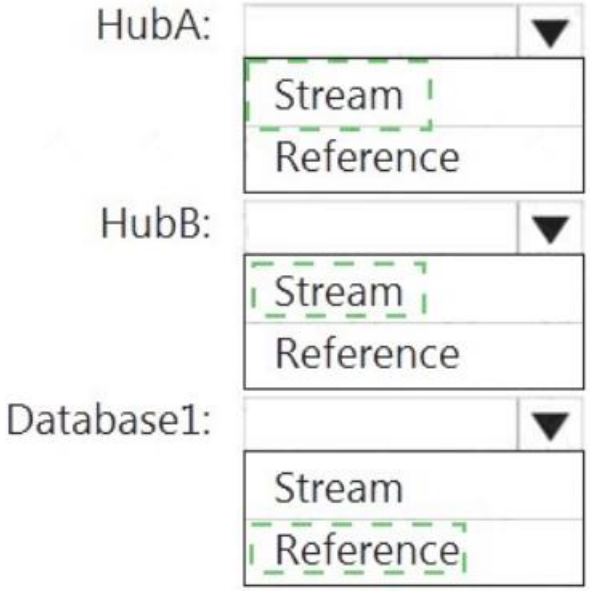
You need to implement Azure Stream Analytics to calculate the average fare per mile by driver.

How should you configure the Stream Analytics input for each source? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

HubA: Stream HubB: Stream

Database1: Reference

Reference data (also known as a lookup table) is a finite data set that is static or slowly changing in nature, used to perform a lookup or to augment your data streams. For example, in an IoT scenario, you could store metadata about sensors (which don't change often) in reference data and join it with real time IoT data streams. Azure Stream Analytics loads reference data in memory to achieve low latency stream processing

33. - (Exam Topic 3)

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

After you answer a question in this scenario, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You have an Azure Storage account that contains 100 GB of files. The files contain text and numerical values. 75% of the rows contain description data that has an average length of 1.1 MB.

You plan to copy the data from the storage account to an Azure SQL data warehouse. You need to prepare the files to ensure that the data copies quickly.

Solution: You modify the files to ensure that each row is more than 1 MB. Does this meet the goal?

A. Yes

B. No

Answer: B

Explanation:

Instead modify the files to ensure that each row is less than 1 MB. References:

https://docs.microsoft.com/en-us/azure/sql-data-warehouse/guidance-for-loading-data

34. - (Exam Topic 3)

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You are designing an Azure Stream Analytics solution that will analyze Twitter data.

You need to count the tweets in each 10-second window. The solution must ensure that each tweet is counted only once.

Does this meet the goal?

A. Yes

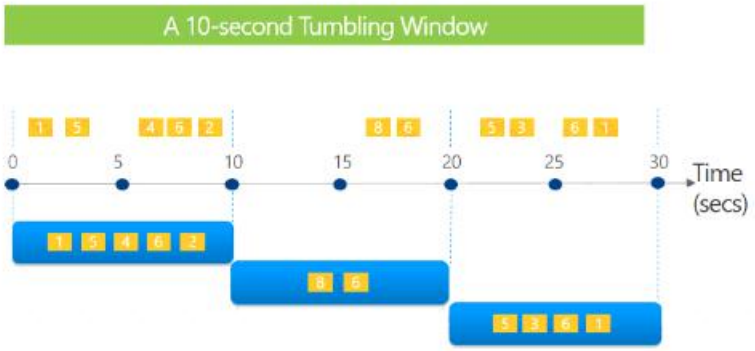
B. No

Answer: A

Explanation:

Tumbling windows are a series of fixed-sized, non-overlapping and contiguous time intervals. The following diagram illustrates a stream with a series of events and how they are mapped into 10-second tumbling windows.

Tell me the count of tweets per time zone every 10 seconds




```
SELECT TimeZone, COUNT(*) AS Count
FROM TwitterStream TIMESTAMP BY CreatedAt
GROUP BY TimeZone, TumblingWindow(second,10)
```

Reference:

https://docs.microsoft.com/en-us/stream-analytics-query/tumbling-window-azure-stream-analytics

35. - (Exam Topic 3)

You have an Azure Databricks workspace named workspace1 in the Standard pricing tier.

You need to configure workspace1 to support autoscaling all-purpose clusters. The solution must meet the following requirements:

- Automatically scale down workers when the cluster is underutilized for three minutes.
- Minimize the time it takes to scale to the maximum number of workers.
- Minimize costs.

What should you do first?

A. Enable container services for workspace1.

B. Upgrade workspace1 to the Premium pricing tier.

C. Set Cluster Mode to High Concurrency.

D. Create a cluster policy in workspace1.

Answer: B

Explanation:

For clusters running Databricks Runtime 6.4 and above, optimized autoscaling is used by all-purpose

clusters in the Premium plan

Optimized autoscaling:

Scales up from min to max in 2 steps.

Can scale down even if the cluster is not idle by looking at shuffle file state. Scales down based on a percentage of current nodes.

On job clusters, scales down if the cluster is underutilized over the last 40 seconds.

On all-purpose clusters, scales down if the cluster is underutilized over the last 150 seconds.

The spark.databricks.aggressiveWindowDownS Spark configuration property specifies in seconds how often a cluster makes down-scaling decisions. Increasing the value causes a cluster to scale down more slowly. The maximum value is 600.

Note: Standard autoscaling

Starts with adding 8 nodes. Thereafter, scales up exponentially, but can take many steps to reach the max.

You can customize the first step by setting the spark.databricks.autoscaling.standardFirstStepUp Spark configuration property.

Scales down only when the cluster is completely idle and it has been underutilized for the last 10 minutes.

Scales down exponentially, starting with 1 node.

Reference:

36. - (Exam Topic 3)

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You plan to create an Azure Databricks workspace that has a tiered structure. The workspace will contain the following three workloads:

- A workload for data engineers who will use Python and SQL.
- A workload for jobs that will run notebooks that use Python, Scala, and SOL.
- A workload that data scientists will use to perform ad hoc analysis in Scala and R.

The enterprise architecture team at your company identifies the following standards for Databricks environments:

- The data engineers must share a cluster.
- The job cluster will be managed by using a request process whereby data scientists and data engineers provide packaged notebooks for deployment to the cluster.
- All the data scientists must be assigned their own cluster that terminates automatically after 120 minutes of inactivity. Currently, there are three data scientists.

You need to create the Databricks clusters for the workloads.

Solution: You create a Standard cluster for each data scientist, a High Concurrency cluster for the data engineers, and a Standard cluster for the jobs.

Does this meet the goal?

A. Yes

B. No

Answer: B

Explanation:

We would need a High Concurrency cluster for the jobs. Note:

Standard clusters are recommended for a single user. Standard can run workloads developed in any language: Python, R, Scala, and SQL.

A high concurrency cluster is a managed cloud resource. The key benefits of high concurrency clusters are that they provide Apache Spark-native fine-grained sharing for maximum resource utilization and minimum query latencies.

Reference: https://docs.azuredatabricks.net/clusters/configure.html

37. - (Exam Topic 3)

You have an Azure subscription that contains the following resources:

* An Azure Active Directory (Azure AD) tenant that contains a security group named Group1.

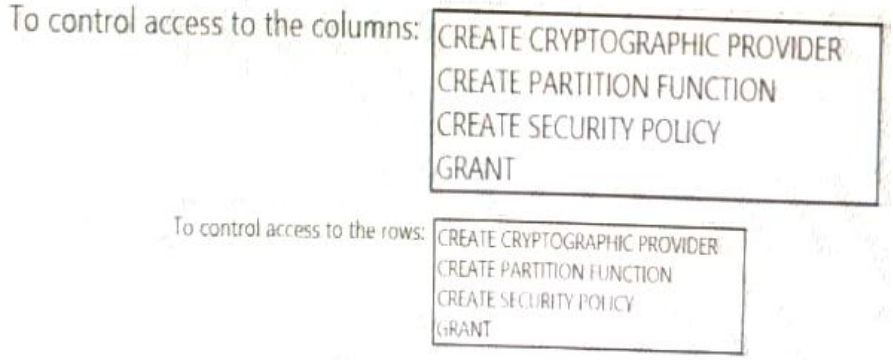
* An Azure Synapse Analytics SQL pool named Pool1.

You need to control the access of Group1 to specific columns and rows in a table in Pool1

Which Transact-SQL commands should you use? To answer, select the appropriate options in the answer

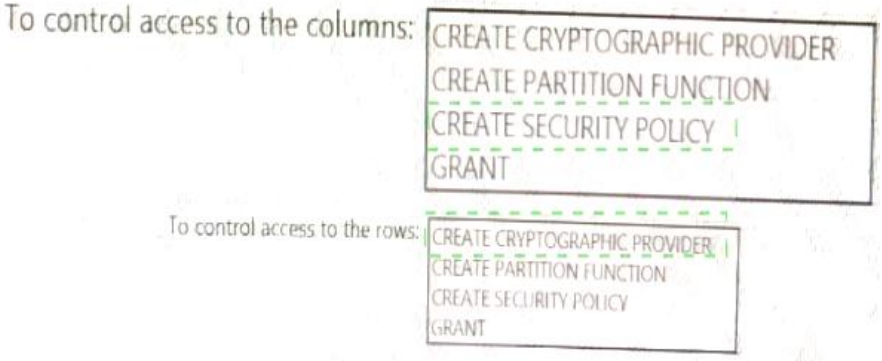
area. NOTE: Each appropriate options in the answer area.

Answer Area



Answer:

Answer Area



38. - (Exam Topic 3)

You plan to implement an Azure Data Lake Gen2 storage account.

You need to ensure that the data lake will remain available if a data center fails in the primary Azure region.

The solution must minimize costs.

Which type of replication should you use for the storage account?

A. geo-redundant storage (GRS)

B. zone-redundant storage (ZRS)

C. locally-redundant storage (LRS)

D. geo-zone-redundant storage (GZRS)

Answer: A

Explanation:

Geo-redundant storage (GRS) copies your data synchronously three times within a single physical location in the primary region using LRS. It then copies your data asynchronously to a single physical location in the secondary region.

Reference:

https://docs.microsoft.com/en-us/azure/storage/common/storage-redundancy

39. - (Exam Topic 3)

You are designing an Azure Synapse Analytics dedicated SQL pool.

You need to ensure that you can audit access to Personally Identifiable information (PII). What should you include in the solution?

A. dynamic data masking

B. row-level security (RLS)

C. sensitivity classifications

D. column-level security

Answer: D

40. - (Exam Topic 3)

You have an Azure Synapse Analytics dedicated SQL pool that contains the users shown in the following table.

Name	Role
User1	Server admin
User2	db_datareader

User1 executes a query on the database, and the query returns the results shown in the following exhibit.

```
SELECT c.name,
    tbl.name as table_name,
    typ.name as datatype,
    c.is_masked,
    c.masking_function
FROM sys.masked_columns AS c
INNER JOIN sys.tables AS tbl ON c.[object_id] = tbl.[object_id]
INNER JOIN sys.types typ ON c.user_type_id = typ.user_type_id
WHERE is_masked = 1;
```

Results | Messages

	name	table_name	datatype	is_masked	masking_function
1	BirthDate	DimCustomer	date	1	default()
2	Gender	DimCustomer	nvarchar	1	default()
3	EmailAddress	DimCustomer	nvarchar	1	email()
4	YearlyIncome	DimCustomer	money	1	default()

User1 is the only user who has access to the unmasked data.

Use the drop-down menus to select the answer choice that completes each statement based on the information presented in the graphic.

Answer Area

When User2 queries the YearlyIncome column, the values returned will be [answer choice]. (a random number / the values stored in the database / XXXX / 0)

When User1 queries the BirthDate column, the values returned will be [answer choice]. (a random date / the values stored in the database / XXXX / 1900-01-01)

Answer:

Answer Area

When User2 queries the YearlyIncome column, the values returned will be [answer choice]. (a random number / the values stored in the database / XXXX / 0)

When User1 queries the BirthDate column, the values returned will be [answer choice]. (a random date / the values stored in the database / XXXX / 1900-01-01)

41. - (Exam Topic 3)

You are developing a solution that will stream to Azure Stream Analytics. The solution will have both

streaming data and reference data.

Which input type should you use for the reference data?

A. Azure Cosmos DB

B. Azure Blob storage

C. Azure IoT Hub

D. Azure Event Hubs

Answer: B

Explanation:

Stream Analytics supports Azure Blob storage and Azure SQL Database as the storage layer for Reference Data.

Reference:

https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-use-reference-data

42. - (Exam Topic 3)

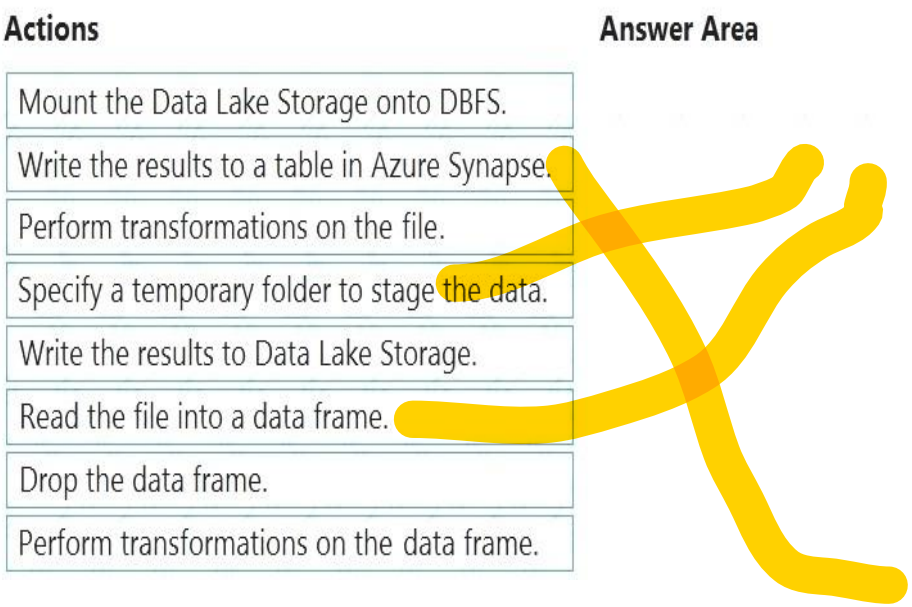
You have an Azure Data Lake Storage Gen2 account that contains a JSON file for customers. The file contains two attributes named FirstName and LastName.

You need to copy the data from the JSON file to an Azure Synapse Analytics table by using Azure Databricks. A new column must be created that concatenates the FirstName and LastName values.

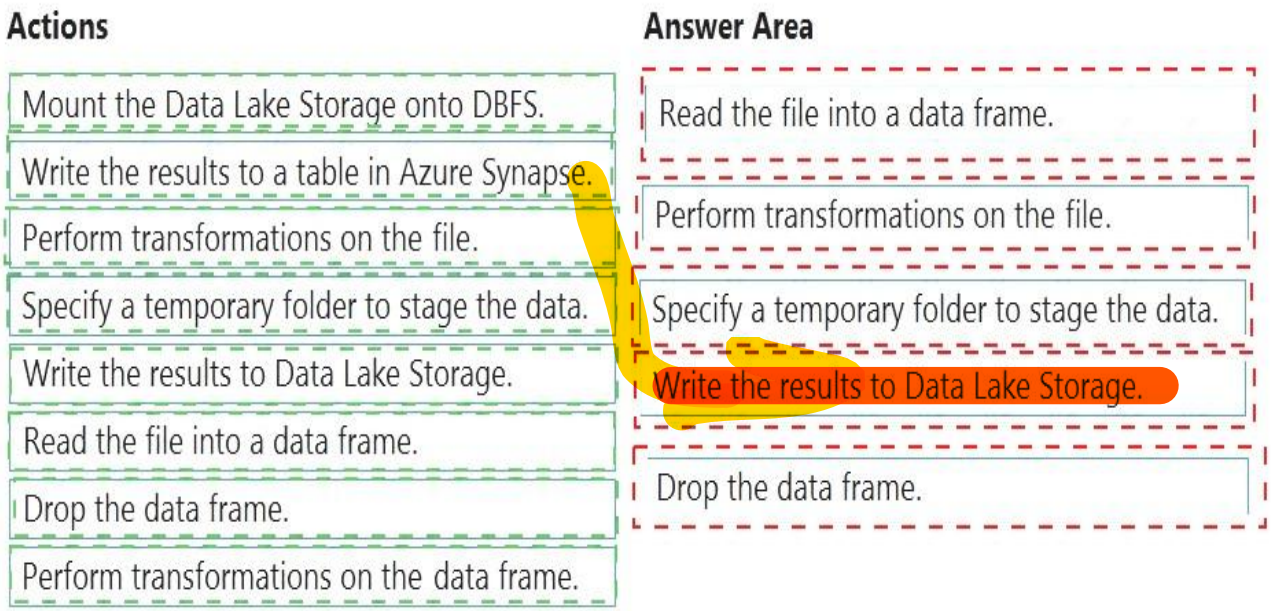
You create the following components:

- A destination table in Azure Synapse
- An Azure Blob storage container
- A service principal

Which five actions should you perform in sequence next in is Databricks notebook? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.



Answer:



Explanation:

Step 1: Read the file into a data frame.

You can load the json files as a data frame in Azure Databricks. Step 2: Perform transformations on the data frame.

Step 3:Specify a temporary folder to stage the data

Specify a temporary folder to use while moving data between Azure Databricks and Azure Synapse. Step 4: Write the results to a table in Azure Synapse.

You upload the transformed data frame into Azure Synapse. You use the Azure Synapse connector for Azure Databricks to directly upload a dataframe as a table in a Azure Synapse.

Step 5: Drop the data frame

Clean up resources. You can terminate the cluster. From the Azure Databricks workspace, select Clusters on the left. For the cluster to terminate, under Actions, point to the ellipsis (...) and select the Terminate icon.

Reference:

https://docs.microsoft.com/en-us/azure/azure-databricks/databricks-extract-load-sql-data-warehouse

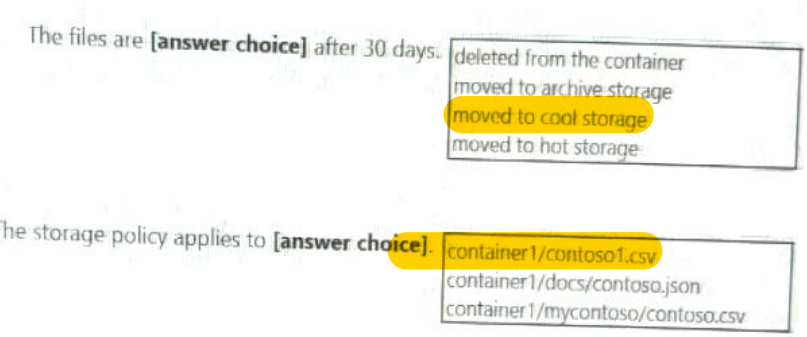
43. - (Exam Topic 3)

You store files in an Azure Data Lake Storage Gen2 container. The container has the storage policy shown in the following exhibit.

Use the drop-down menus to select the answer choice that completes each statement based on the information presented in the graphic.

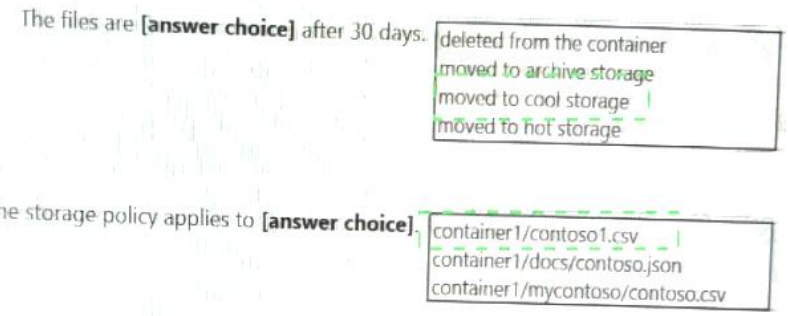
NOTE: Each correct selection Is worth one point.

Answer Area



Answer:

Answer Area

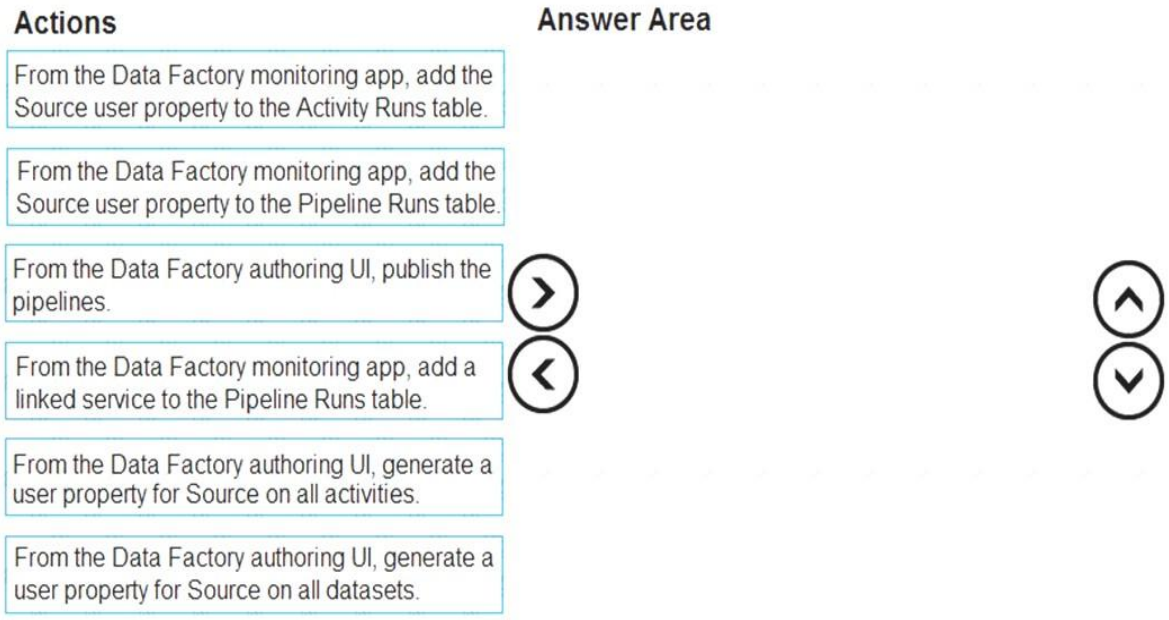


44. - (Exam Topic 3)

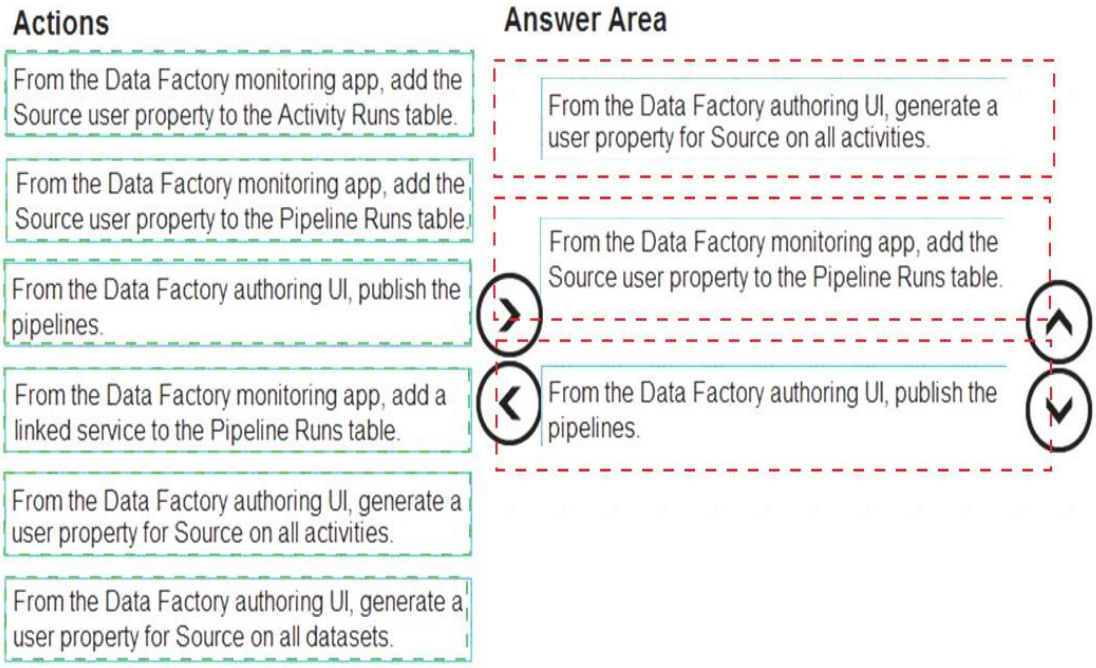
You plan to monitor an Azure data factory by using the Monitor & Manage app.

You need to identify the status and duration of activities that reference a table in a source database.

Which three actions should you perform in sequence? To answer, move the actions from the list of actions to the answer are and arrange them in the correct order.



Answer:



Explanation:

Step 1: From the Data Factory authoring UI, generate a user property for Source on all activities. Step 2: From the Data Factory monitoring app, add the Source user property to Activity Runs table.

You can promote any pipeline activity property as a user property so that it becomes an entity that you can monitor. For example, you can promote the Source and Destination properties of the copy activity in your pipeline as user properties. You can also select Auto Generate to generate the Source and Destination

user properties for a copy activity.

Step 3: From the Data Factory authoring UI, publish the pipelines

Publish output data to data stores such as Azure SQL Data Warehouse for business intelligence (BI) applications to consume.

References:

https://docs.microsoft.com/en-us/azure/data-factory/monitor-visually

45. - (Exam Topic 3)

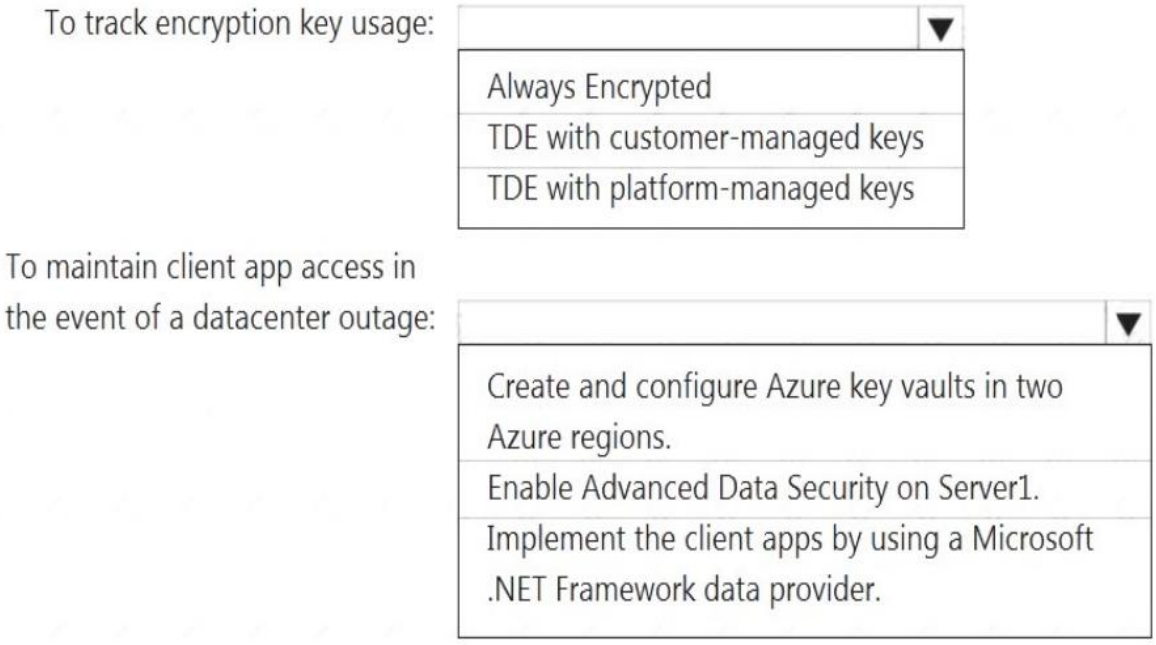
You have an Azure subscription that contains a logical Microsoft SQL server named Server1. Server1 hosts an Azure Synapse Analytics SQL dedicated pool named Pool1.

You need to recommend a Transparent Data Encryption (TDE) solution for Server1. The solution must meet the following requirements:

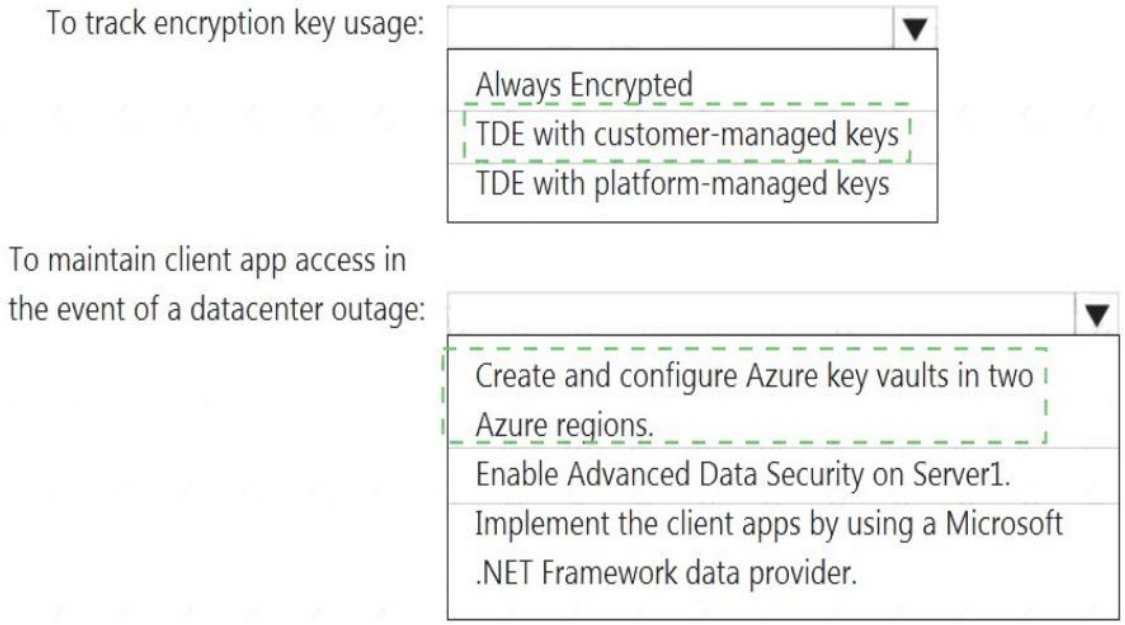
- Track the usage of encryption keys.
- Maintain the access of client apps to Pool1 in the event of an Azure datacenter outage that affects the availability of the encryption keys.

What should you include in the recommendation? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

Box 1: TDE with customer-managed keys

Customer-managed keys are stored in the Azure Key Vault. You can monitor how and when your key vaults are accessed, and by whom. You can do this by enabling logging for Azure Key Vault, which saves information in an Azure storage account that you provide.

Box 2: Create and configure Azure key vaults in two Azure regions

The contents of your key vault are replicated within the region and to a secondary region at least 150 miles away, but within the same geography to maintain high durability of your keys and secrets.

Reference:

https://docs.microsoft.com/en-us/azure/synapse-analytics/security/workspaces-encryption

https://docs.microsoft.com/en-us/azure/key-vault/general/logging

46. - (Exam Topic 3)

You have an Azure Synapse Analytics serverless SQL pool named Pool1 and an Azure Data Lake Storage Gen2 account named storage1. The AllowedBlobpublicAccess porperty is disabled for storage1.

You need to create an external data source that can be used by Azure Active Directory (Azure AD) users to access storage1 from Pool1.

What should you create first?

A. an external resource pool

B. a remote service binding

C. database scoped credentials

D. an external library

Answer: C

47. - (Exam Topic 3)

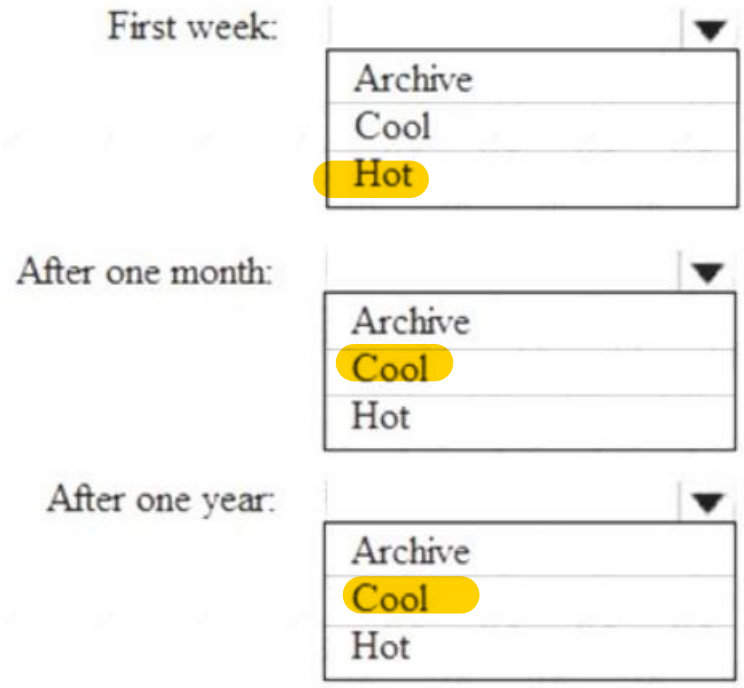
You are designing an application that will store petabytes of medical imaging data

When the data is first created, the data will be accessed frequently during the first week. After one month, the data must be accessible within 30 seconds, but files will be accessed infrequently. After one year, the data will be accessed infrequently but must be accessible within five minutes.

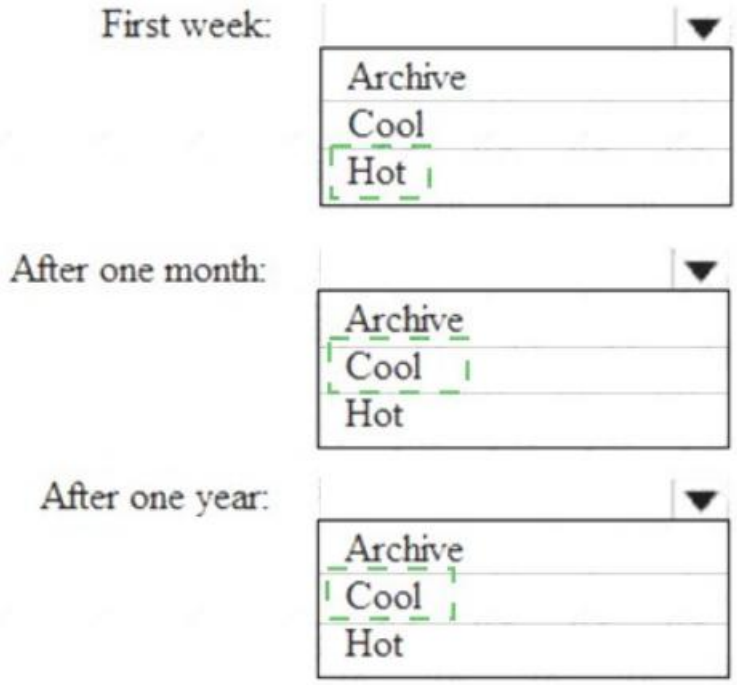
You need to select a storage strategy for the data. The solution must minimize costs.

Which storage tier should you use for each time frame? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

First week: Hot

Hot - Optimized for storing data that is accessed frequently. After one month: Cool

Cool - Optimized for storing data that is infrequently accessed and stored for at least 30 days.

After one year: Cool

48. - (Exam Topic 3)

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You plan to create an Azure Databricks workspace that has a tiered structure. The workspace will contain the following three workloads:

- A workload for data engineers who will use Python and SQL.
- A workload for jobs that will run notebooks that use Python, Scala, and SOL.
- A workload that data scientists will use to perform ad hoc analysis in Scala and R.

The enterprise architecture team at your company identifies the following standards for Databricks

environments:

- The data engineers must share a cluster.
- The job cluster will be managed by using a request process whereby data scientists and data engineers provide packaged notebooks for deployment to the cluster.
- All the data scientists must be assigned their own cluster that terminates automatically after 120 minutes of inactivity. Currently, there are three data scientists.

You need to create the Databricks clusters for the workloads.

Solution: You create a Standard cluster for each data scientist, a High Concurrency cluster for the data engineers, and a High Concurrency cluster for the jobs.

Does this meet the goal?

A. Yes

B. No

Answer: A

Explanation:

We need a High Concurrency cluster for the data engineers and the jobs. Note:

Standard clusters are recommended for a single user. Standard can run workloads developed in any language: Python, R, Scala, and SQL.

A high concurrency cluster is a managed cloud resource. The key benefits of high concurrency clusters are that they provide Apache Spark-native fine-grained sharing for maximum resource utilization and minimum query latencies.

Reference: https://docs.azuredatabricks.net/clusters/configure.html

49. - (Exam Topic 3)

You plan to create an Azure Synapse Analytics dedicated SQL pool.

You need to minimize the time it takes to identify queries that return confidential information as defined by the company's data privacy regulations and the users who executed the queues.

Which two components should you include in the solution? Each correct answer presents part of the solution. NOTE: Each correct selection is worth one point.

A. sensitivity-classification labels applied to columns that contain confidential information

B. resource tags for databases that contain confidential information

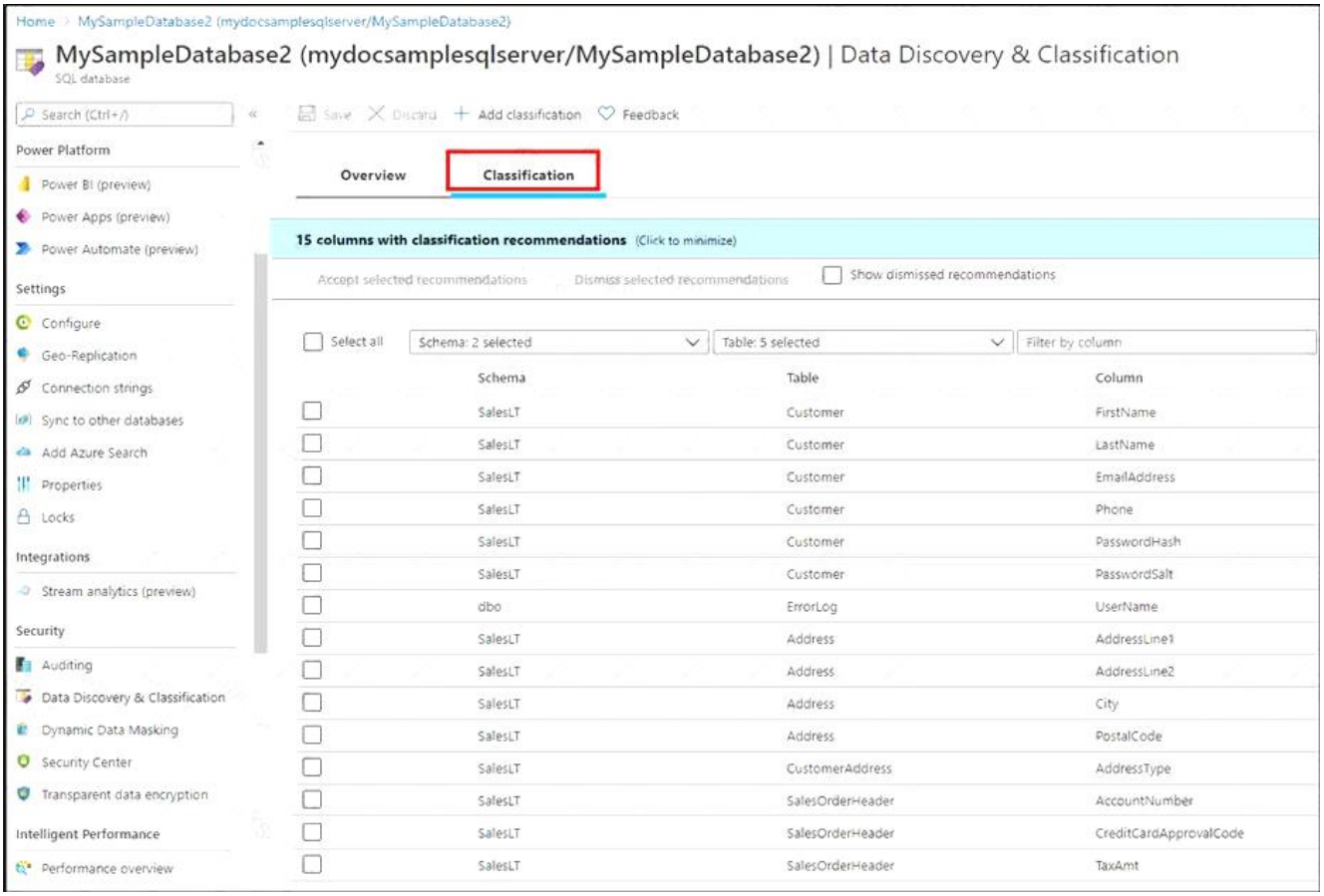
C. audit logs sent to a Log Analytics workspace

D. dynamic data masking for columns that contain confidential information

Answer: A C

Explanation:

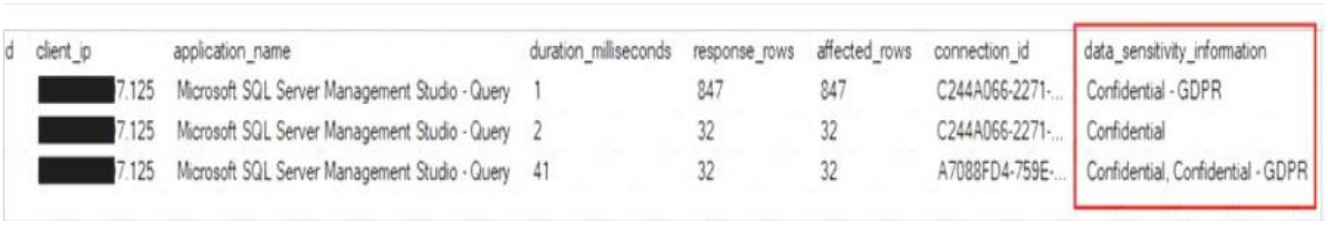
A: You can classify columns manually, as an alternative or in addition to the recommendation-based classification:



- Select Add classification in the top menu of the pane.
- In the context window that opens, select the schema, table, and column that you want to classify, and the information type and sensitivity label.
- Select Add classification at the bottom of the context window.

C: An important aspect of the information-protection paradigm is the ability to monitor access to sensitive data. Azure SQL Auditing has been enhanced to include a new field in the audit log called data_sensitivity_information. This field logs the sensitivity classifications (labels) of the data that was

returned by a query. Here's an example:



d	client_ip	application_name	duration_milliseconds	response_rows	affected_rows	connection_id	data_sensitivity_information
	[redacted]7.125	Microsoft SQL Server Management Studio - Query	1	847	847	C244A066-2271-...	Confidential - GDPR
	[redacted]7.125	Microsoft SQL Server Management Studio - Query	2	32	32	C244A066-2271-...	Confidential
	[redacted]7.125	Microsoft SQL Server Management Studio - Query	41	32	32	A7088FD4-759E-...	Confidential, Confidential - GDPR

Reference:

https://docs.microsoft.com/en-us/azure/azure-sql/database/data-discovery-and-classification-overview

50. - (Exam Topic 3)

You are designing an Azure Databricks table. The table will ingest an average of 20 million streaming events per day.

You need to persist the events in the table for use in incremental load pipeline jobs in Azure Databricks. The solution must minimize storage costs and incremental load times.

What should you include in the solution?

A. Partition by DateTime fields.

B. Sink to Azure Queue storage.

C. Include a watermark column.

D. Use a JSON format for physical data storage.

Answer: B

Explanation:

The Databricks ABS-AQS connector uses Azure Queue Storage (AQS) to provide an optimized file source that lets you find new files written to an Azure Blob storage (ABS) container without repeatedly listing all of the files.

This provides two major advantages:

- Lower latency: no need to list nested directory structures on ABS, which is slow and resource intensive.
- Lower costs: no more costly LIST API requests made to ABS.

Reference:

https://docs.microsoft.com/en-us/azure/databricks/spark/latest/structured-streaming/aqs

51. - (Exam Topic 3)

You have an Azure Synapse Analytics dedicated SQL pool that contains a large fact table. The table contains 50 columns and 5 billion rows and is a heap.

Most queries against the table aggregate values from approximately 100 million rows and return only two columns.

You discover that the queries against the fact table are very slow. Which type of index should you add to provide the fastest query times?

A. nonclustered columnstore

B. clustered columnstore

C. nonclustered

D. clustered

Answer: B

Explanation:

Clustered columnstore indexes are one of the most efficient ways you can store your data in dedicated SQL pool.

Columnstore tables won't benefit a query unless the table has more than 60 million rows. Reference: https://docs.microsoft.com/en-us/azure/synapse-analytics/sql/best-practices-dedicated-sql-pool

52. - (Exam Topic 3)

You have an Azure data factory.

You need to examine the pipeline failures from the last 60 days. What should you use?

A. the Activity log blade for the Data Factory resource

B. the Monitor & Manage app in Data Factory

C. the Resource health blade for the Data Factory resource

D. Azure Monitor

Answer: D

Explanation:

Data Factory stores pipeline-run data for only 45 days. Use Azure Monitor if you want to keep that data for a longer time.

Reference:

https://docs.microsoft.com/en-us/azure/data-factory/monitor-using-azure-monitor

53. - (Exam Topic 3)

You are designing an Azure Stream Analytics job to process incoming events from sensors in retail environments.

You need to process the events to produce a running average of shopper counts during the previous 15 minutes, calculated at five-minute intervals.

Which type of window should you use?

A. snapshot

B. tumbling

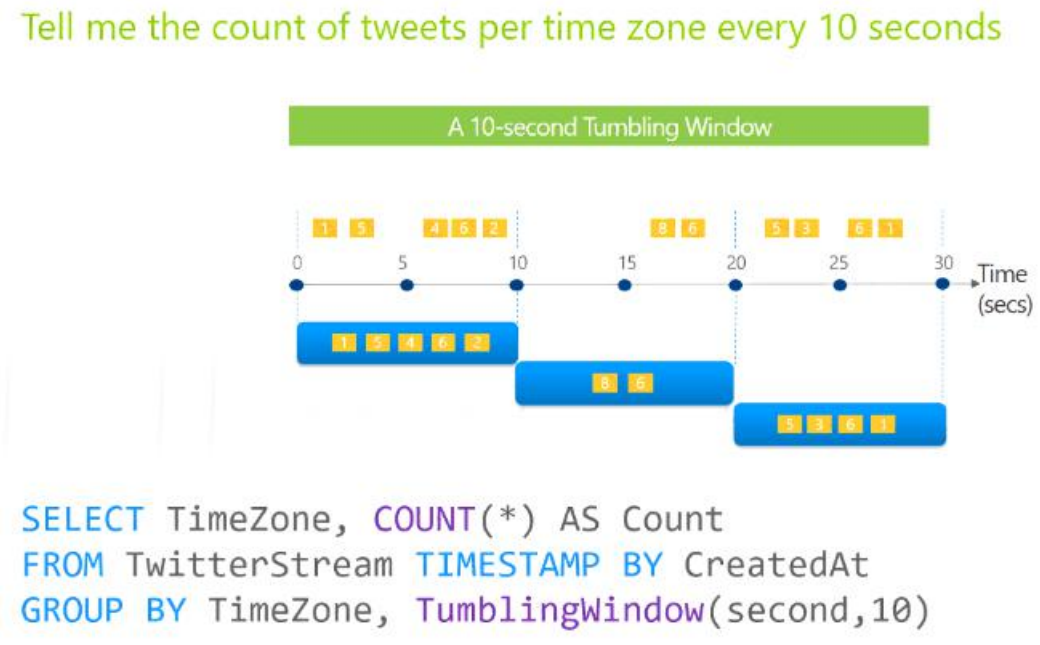
C. hopping

D. sliding

Answer: B

Explanation:

Tumbling windows are a series of fixed-sized, non-overlapping and contiguous time intervals. The following diagram illustrates a stream with a series of events and how they are mapped into 10-second tumbling windows.



Reference:

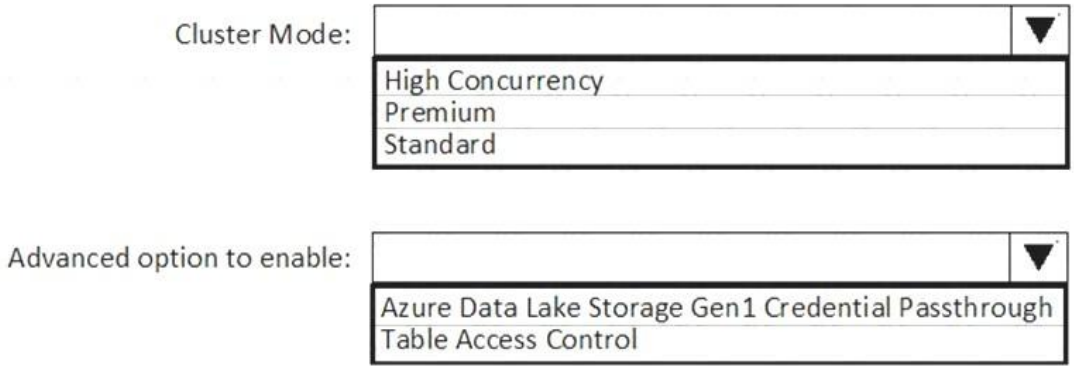
https://docs.microsoft.com/en-us/stream-analytics-query/tumbling-window-azure-stream-analytics

54. - (Exam Topic 3)

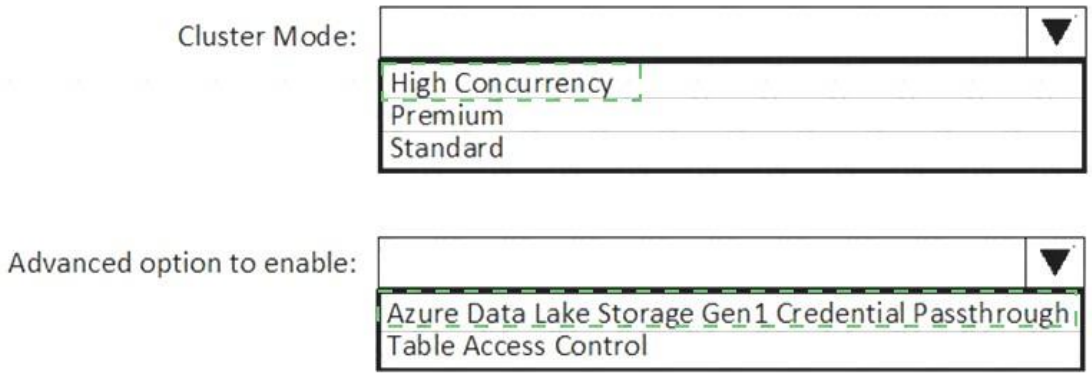
You need to implement an Azure Databricks cluster that automatically connects to Azure Data Lake Storage Gen2 by using Azure Active Directory (Azure AD) integration.

How should you configure the new cluster? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

Box 1: High Concurrency

Enable Azure Data Lake Storage credential passthrough for a high-concurrency cluster. Incorrect:

Support for Azure Data Lake Storage credential passthrough on standard clusters is in Public Preview.

Standard clusters with credential passthrough are supported on Databricks Runtime 5.5 and above and are

limited to a single user.

Box 2: Azure Data Lake Storage Gen1 Credential Passthrough

You can authenticate automatically to Azure Data Lake Storage Gen1 and Azure Data Lake Storage Gen2 from Azure Databricks clusters using the same Azure Active Directory (Azure AD) identity that you use to log into Azure Databricks. When you enable your cluster for Azure Data Lake Storage credential passthrough, commands that you run on that cluster can read and write data in Azure Data Lake Storage without requiring you to configure service principal credentials for access to storage.

References:

https://docs.azuredatabricks.net/spark/latest/data-sources/azure/adls-passthrough.html

55. - (Exam Topic 3)

You implement an enterprise data warehouse in Azure Synapse Analytics. You have a large fact table that is 10 terabytes (TB) in size.

Incoming queries use the primary key SaleKey column to retrieve data as displayed in the following table:

SaleKey	CityKey	CustomerKey	StockItemKey	InvoiceDateKey	Quantity	UnitPrice	TotalExcludingTax
49309	90858	70	69	10/22/13	8	16	128
49313	55710	126	69	10/22/13	2	16	32
49343	44710	234	68	10/22/13	10	16	160
49352	66109	163	70	10/22/13	4	16	64
49488	65312	230	70	10/22/13	8	16	128
49646	85877	271	70	10/24/13	1	16	16
49798	41238	288	69	10/24/13	1	16	16

You need to distribute the large fact table across multiple nodes to optimize performance of the table.

Which technology should you use?

A. hash distributed table with clustered index

B. hash distributed table with clustered Columnstore index

C. round robin distributed table with clustered index

D. round robin distributed table with clustered Columnstore index

E. heap table with distribution replicate

Answer: B

Explanation:

Hash-distributed tables improve query performance on large fact tables.

Columnstore indexes can achieve up to 100x better performance on analytics and data warehousing workloads and up to 10x better data compression than traditional rowstore indexes.

Reference:

https://docs.microsoft.com/en-us/azure/sql-data-warehouse/sql-data-warehouse-tables-distribute

https://docs.microsoft.com/en-us/sql/relational-databases/indexes/columnstore-indexes-query-performance

56. - (Exam Topic 3)

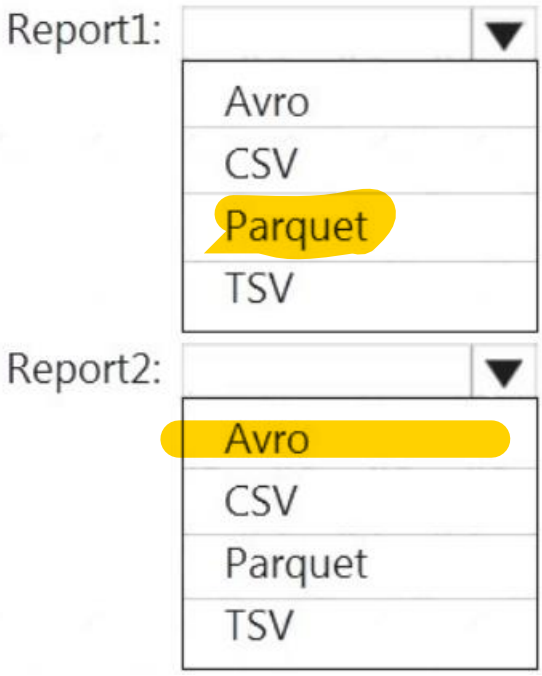
You are planning the deployment of Azure Data Lake Storage Gen2. You have the following two reports that will access the data lake:

- Report1: Reads three columns from a file that contains 50 columns.
- Report2: Queries a single record based on a timestamp.

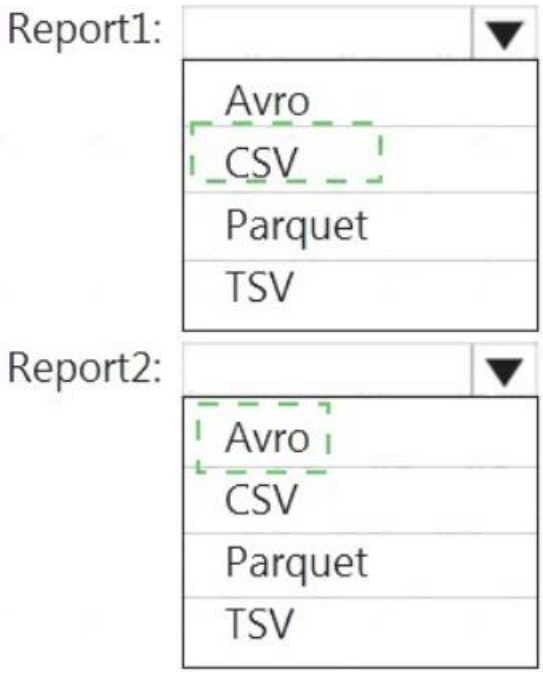
You need to recommend in which format to store the data in the data lake to support the reports. The solution must minimize read times.

What should you recommend for each report? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

Report1: CSV

CSV: The destination writes records as delimited data. Report2: AVRO

AVRO supports timestamps.

Not Parquet, TSV: Not options for Azure Data Lake Storage Gen2. Reference:

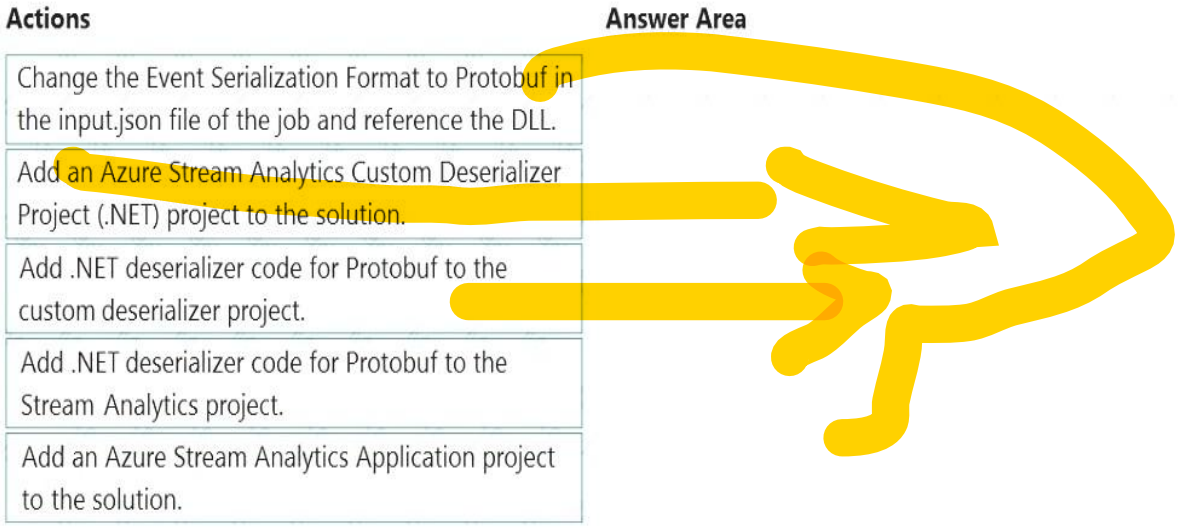
https://streamsets.com/documentation/datacollector/latest/help/datacollector/UserGuide/Destinations/ADLS-G2

57. - (Exam Topic 3)

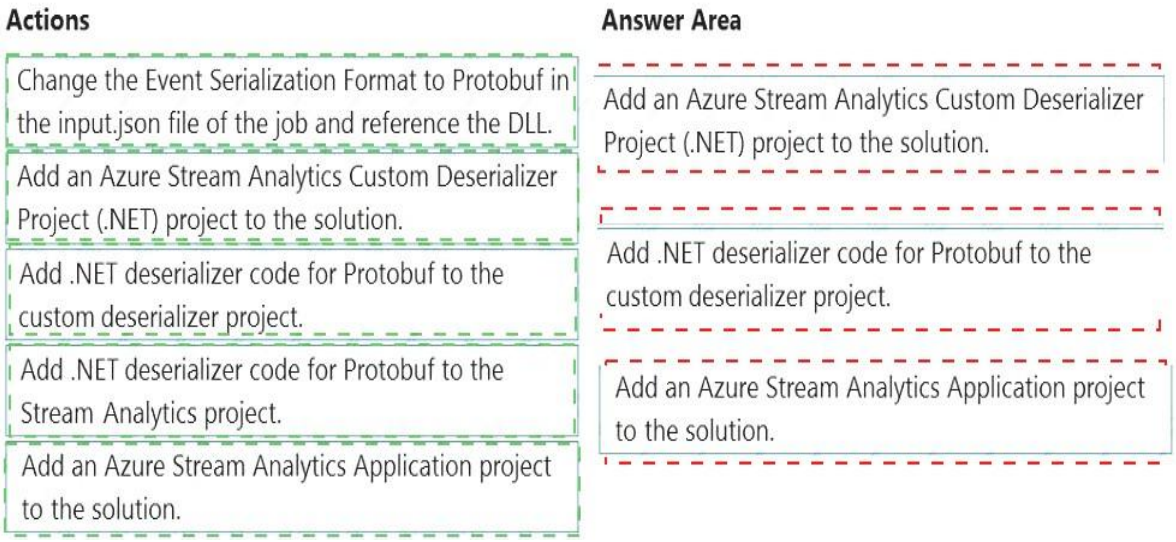
You have an Azure Stream Analytics job that is a Stream Analytics project solution in Microsoft Visual Studio. The job accepts data generated by IoT devices in the JSON format.

You need to modify the job to accept data generated by the IoT devices in the Protobuf format.

Which three actions should you perform from Visual Studio on sequence? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.



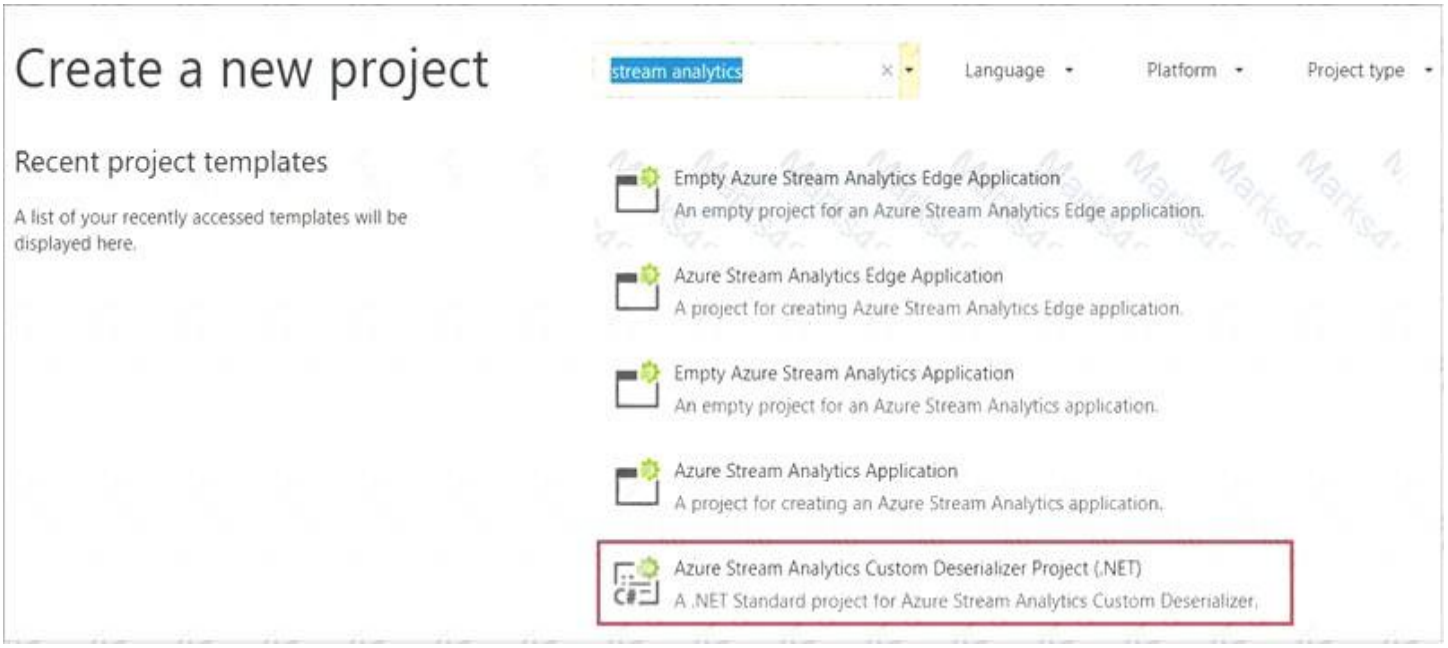
Answer:



Explanation:

Step 1: Add an Azure Stream Analytics Custom Deserializer Project (.NET) project to the solution. Create a custom deserializer

* 1. Open Visual Studio and select File > New > Project. Search for Stream Analytics and select Azure Stream Analytics Custom Deserializer Project (.NET). Give the project a name, like Protobuf Deserializer.



* 2. In Solution Explorer, right-click your Protobuf Deserializer project and select Manage NuGet Packages from the menu. Then install the Microsoft.Azure.StreamAnalytics and Google.Protobuf NuGet packages.

* 3. Add the MessageBodyProto class and the MessageBodyDeserializer class to your project.

* 4. Build the Protobuf Deserializer project.

Step 2: Add .NET deserializer code for Protobuf to the custom deserializer project

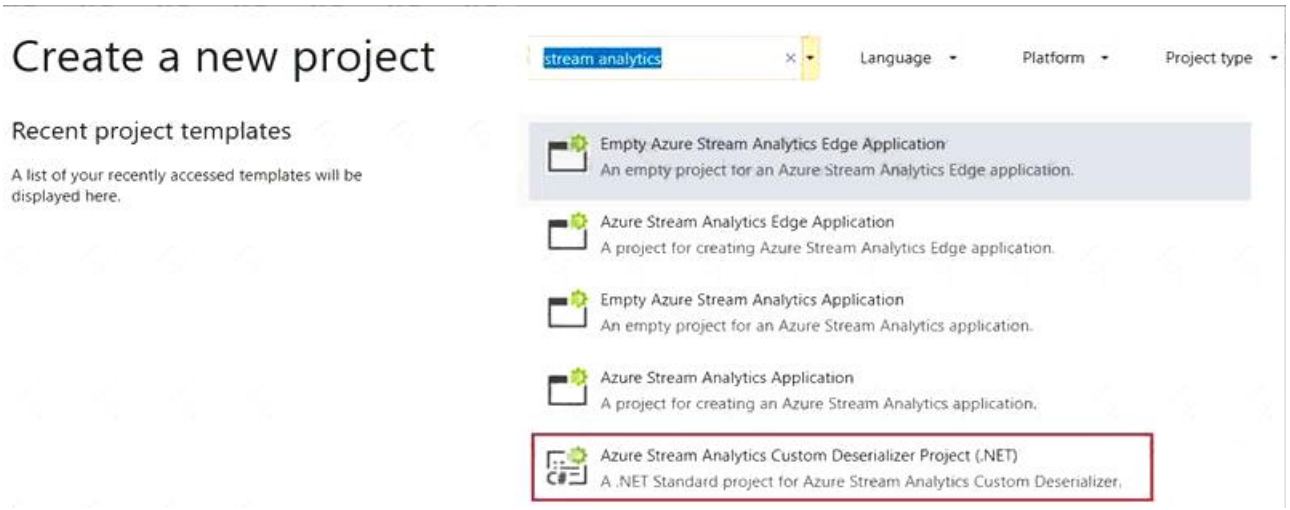
Azure Stream Analytics has built-in support for three data formats: JSON, CSV, and Avro. With custom .NET deserializers, you can read data from other formats such as Protocol Buffer, Bond and other user defined formats for both cloud and edge jobs.

Step 3: Add an Azure Stream Analytics Application project to the solution Add an Azure Stream Analytics project

- In Solution Explorer, right-click the Protobuf Deserializer solution and select Add > New Project. Under Azure Stream Analytics > Stream Analytics, choose Azure Stream Analytics Application. Name it ProtobufCloudDeserializer and select OK.
- Right-click References under the ProtobufCloudDeserializer Azure Stream Analytics project. Under Projects, add Protobuf Deserializer. It should be automatically populated for you.

Reference:

https://docs.microsoft.com/en-us/azure/stream-analytics/custom-deserializer



58. - (Exam Topic 3)

You have an Azure data factory.

You need to ensure that pipeline-run data is retained for 120 days. The solution must ensure that you can query the data by using the Kusto query language.

Which four actions should you perform in sequence? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

NOTE: More than one order of answer choices is correct. You will receive credit for any of the correct orders you select.

Actions	Answer Area
Select the PipelineRuns category.	
Create a Log Analytics workspace that has Data Retention set to 120 days.	
Stream to an Azure event hub.	
Create an Azure Storage account that has a lifecycle policy.	
From the Azure portal, add a diagnostic setting.	
Send the data to a Log Analytics workspace.	
Select the TriggerRuns category.	

Answer:

Actions	Answer Area
Select the PipelineRuns category.	Create an Azure Storage account that has a lifecycle policy.
Create a Log Analytics workspace that has Data Retention set to 120 days.	Create a Log Analytics workspace that has Data Retention set to 120 days.
Stream to an Azure event hub.	From the Azure portal, add a diagnostic setting.
Create an Azure Storage account that has a lifecycle policy.	Send the data to a Log Analytics workspace.
From the Azure portal, add a diagnostic setting.	
Send the data to a Log Analytics workspace.	
Select the TriggerRuns category.	

Explanation:

Step 1: Create an Azure Storage account that has a lifecycle policy

To automate common data management tasks, Microsoft created a solution based on Azure Data Factory. The service, Data Lifecycle Management, makes frequently accessed data available and archives or purges other data according to retention policies. Teams across the company use the service to reduce

storage costs, improve app performance, and comply with data retention policies.

Step 2: Create a Log Analytics workspace that has Data Retention set to 120 days.

Data Factory stores pipeline-run data for only 45 days. Use Azure Monitor if you want to keep that data for a longer time. With Monitor, you can route diagnostic logs for analysis to multiple different targets, such as a Storage Account: Save your diagnostic logs to a storage account for auditing or manual inspection. You can use the diagnostic settings to specify the retention time in days.

Step 3: From Azure Portal, add a diagnostic setting. Step 4: Send the data to a log Analytics workspace,

Event Hub: A pipeline that transfers events from services to Azure Data Explorer. Keeping Azure Data Factory metrics and pipeline-run data.

Configure diagnostic settings and workspace.

Create or add diagnostic settings for your data factory.

- In the portal, go to Monitor. Select Settings > Diagnostic settings.
- Select the data factory for which you want to set a diagnostic setting.
- If no settings exist on the selected data factory, you're prompted to create a setting. Select Turn on diagnostics.
- Give your setting a name, select Send to Log Analytics, and then select a workspace from Log Analytics Workspace.
- Select Save. Reference:

https://docs.microsoft.com/en-us/azure/data-factory/monitor-using-azure-monitor

59. - (Exam Topic 3)

You have an Azure Factory instance named DF1 that contains a pipeline named PL1.PL1 includes a tumbling window trigger.

You create five clones of PL1. You configure each clone pipeline to use a different data source.

You need to ensure that the execution schedules of the clone pipeline match the execution schedule of PL1.

What should you do?

A. Add a new trigger to each cloned pipeline

B. Associate each cloned pipeline to an existing trigger.

C. Create a tumbling window trigger dependency for the trigger of PL1.

D. Modify the Concurrency setting of each pipeline.

Answer: B

60. - (Exam Topic 3)

You are designing an inventory updates table in an Azure Synapse Analytics dedicated SQL pool. The table will have a clustered columnstore index and will include the following columns:

• EventDate: 1 million per day

• EventTypeID: 10 million per event type

• WarehouseID: 100 million per warehouse

• ProductCategoryTypeiD: 25 million per product category type You identify the following usage patterns:

Analyst will most commonly analyze transactions for a warehouse.

Queries will summarize by product category type, date, and/or inventory event type. You need to recommend a partition strategy for the table to minimize query times. On which column should you recommend partitioning the table?

A. ProductCategoryTypeID

B. EventDate

C. WarehouseID

D. EventTypeID

Answer: D

61. - (Exam Topic 3)

You are designing an enterprise data warehouse in Azure Synapse Analytics that will contain a table named Customers. Customers will contain credit card information.

You need to recommend a solution to provide salespeople with the ability to view all the entries in Customers. The solution must prevent all the salespeople from viewing or inferring the credit card information.

What should you include in the recommendation?

A. data masking

B. Always Encrypted

C. column-level security

D. row-level security

Answer: A

Explanation:

SQL Database dynamic data masking limits sensitive data exposure by masking it to non-privileged users. The Credit card masking method exposes the last four digits of the designated fields and adds a constant string as a prefix in the form of a credit card.

Example: XXXX-XXXX-XXXX-1234

Reference:

https://docs.microsoft.com/en-us/azure/sql-database/sql-database-dynamic-data-masking-get-started

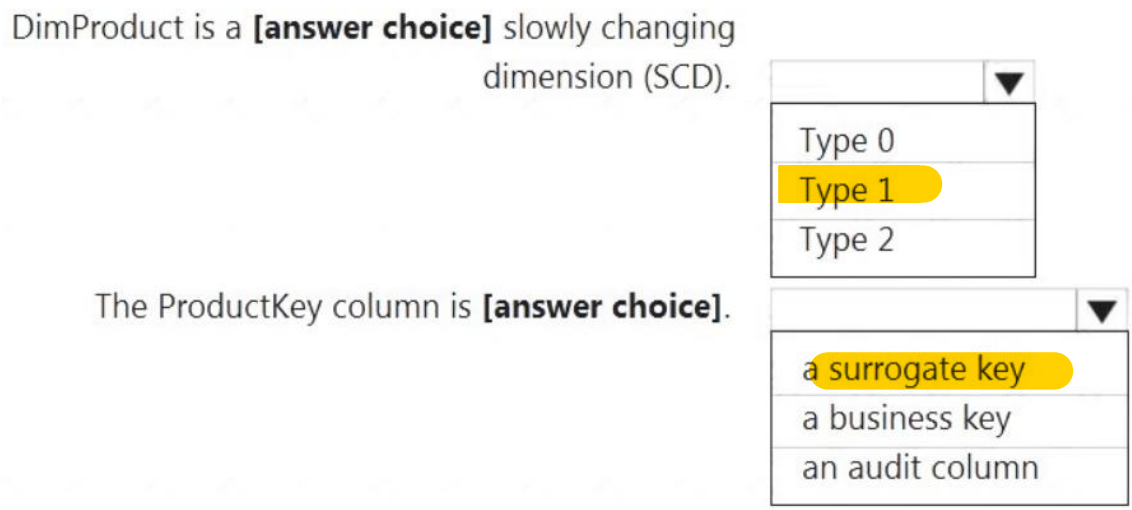
62. - (Exam Topic 3)

You are creating dimensions for a data warehouse in an Azure Synapse Analytics dedicated SQL pool. You create a table by using the Transact-SQL statement shown in the following exhibit.

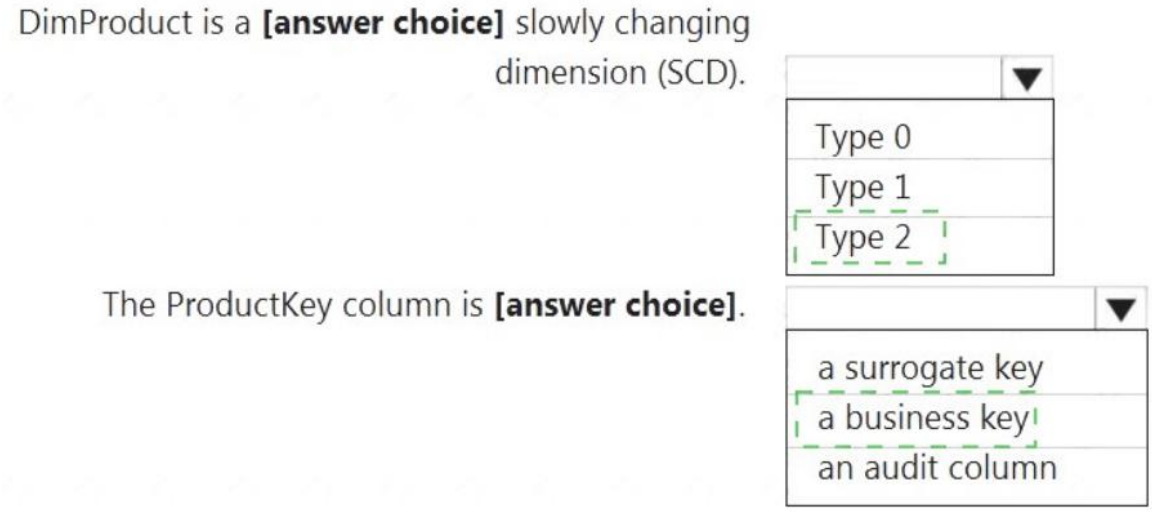
```
CREATE TABLE [DBO].[DimProduct](
        [ProductKey] [int] IDENTITY(1,1) NOT NULL,
        [ProductSourceID] [int] NOT NULL,
        [ProductName] [nvarchar](100) NOT NULL,
        [ProductNumber] [nvarchar](25) NOT NULL,
        [Color] [nvarchar](15) NULL,
        [Size] [nvarchar](5) NULL,
        [Weight] [decimal](8, 2) NULL,
        [ProductCategory] [nvarchar](100) NULL,
        [SellStartDate] [date] NOT NULL,
        [SellEndDate] [date] NULL,
        [RowInsertedDateTime] [datetime] NOT NULL,
        [RowUpdatedDateTime] [datetime] NOT NULL,
        [ETLAuditID] [int] NOT NULL
)
```

Use the drop-down menus to select the answer choice that completes each statement based on the information presented in the graphic.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

Box 1: Type 2

A Type 2 SCD supports versioning of dimension members. Often the source system doesn't store versions, so the data warehouse load process detects and manages changes in a dimension table. In this case, the dimension table must use a surrogate key to provide a unique reference to a version of the dimension member. It also includes columns that define the date range validity of the version (for example, StartDate and EndDate) and possibly a flag column (for example, IsCurrent) to easily filter by current dimension members.

Reference:

https://docs.microsoft.com/en-us/learn/modules/populate-slowly-changing-dimensions-azure-synapse-analytics

63. - (Exam Topic 3)

You are designing a fact table named FactPurchase in an Azure Synapse Analytics dedicated SQL pool.

The table contains purchases from suppliers for a retail store. FactPurchase will contain the following columns.

Name	Data type	Nullable
PurchaseKey	Bigint	No
DateKey	Int	No
SupplierKey	Int	No
StockItemKey	Int	No
PurchaseOrderID	Int	Yes
OrderedQuantity	Int	No
OrderedOuters	Int	No
ReceivedOuters	Int	No
Package	Nvarchar(50)	No
IsOrderFinalized	Bit	No
LineageKey	Int	No

FactPurchase will have 1 million rows of data added daily and will contain three years of data.

Transact-SQL queries similar to the following query will be executed daily.

```
SELECT
SupplierKey, StockItemKey, COUNT(*)
FROM FactPurchase
WHERE DateKey >= 20210101
AND DateKey <= 20210131
GROUP By SupplierKey, StockItemKey
```

Which table distribution will minimize query times?

A. round-robin

B. replicated

C. hash-distributed on DateKey

D. hash-distributed on PurchaseKey

Answer: D

Explanation:

Hash-distributed tables improve query performance on large fact tables, and are the focus of this article.

Round-robin tables are useful for improving loading speed.

Reference:

https://docs.microsoft.com/en-us/azure/synapse-analytics/sql-data-warehouse/sql-data-warehouse-tables-distribu

64. - (Exam Topic 3)

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

After you answer a question in this scenario, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You have an Azure Storage account that contains 100 GB of files. The files contain text and numerical values. 75% of the rows contain description data that has an average length of 1.1 MB.

You plan to copy the data from the storage account to an Azure SQL data warehouse. You need to prepare the files to ensure that the data copies quickly.

Solution: You modify the files to ensure that each row is less than 1 MB. Does this meet the goal?

A. Yes

B. No

Answer: A

Explanation:

When exporting data into an ORC File Format, you might get Java out-of-memory errors when there are large text columns. To work around this limitation, export only a subset of the columns.

References:

https://docs.microsoft.com/en-us/azure/sql-data-warehouse/guidance-for-loading-data

65. - (Exam Topic 3)

You have a SQL pool in Azure Synapse.

A user reports that queries against the pool take longer than expected to complete. You need to add monitoring to the underlying storage to help diagnose the issue.

Which two metrics should you monitor? Each correct answer presents part of the solution. NOTE: Each correct selection is worth one point.

A. Cache used percentage

B. DWU Limit

C. Snapshot Storage Size

D. Active queries

E. Cache hit percentage

Answer: A E

Explanation:

A: Cache used is the sum of all bytes in the local SSD cache across all nodes and cache capacity is the sum of the storage capacity of the local SSD cache across all nodes.

E: Cache hits is the sum of all columnstore segments hits in the local SSD cache and cache miss is the columnstore segments misses in the local SSD cache summed across all nodes

Reference:

https://docs.microsoft.com/en-us/azure/synapse-analytics/sql-data-warehouse/sql-data-warehouse-concept-resou

66. - (Exam Topic 3)

You are planning a streaming data solution that will use Azure Databricks. The solution will stream sales transaction data from an online store. The solution has the following specifications:

* The output data will contain items purchased, quantity, line total sales amount, and line total tax amount.

* Line total sales amount and line total tax amount will be aggregated in Databricks.

* Sales transactions will never be updated. Instead, new rows will be added to adjust a sale.

You need to recommend an output mode for the dataset that will be processed by using Structured Streaming. The solution must minimize duplicate data.

What should you recommend?

A. Append

B. Update

C. Complete

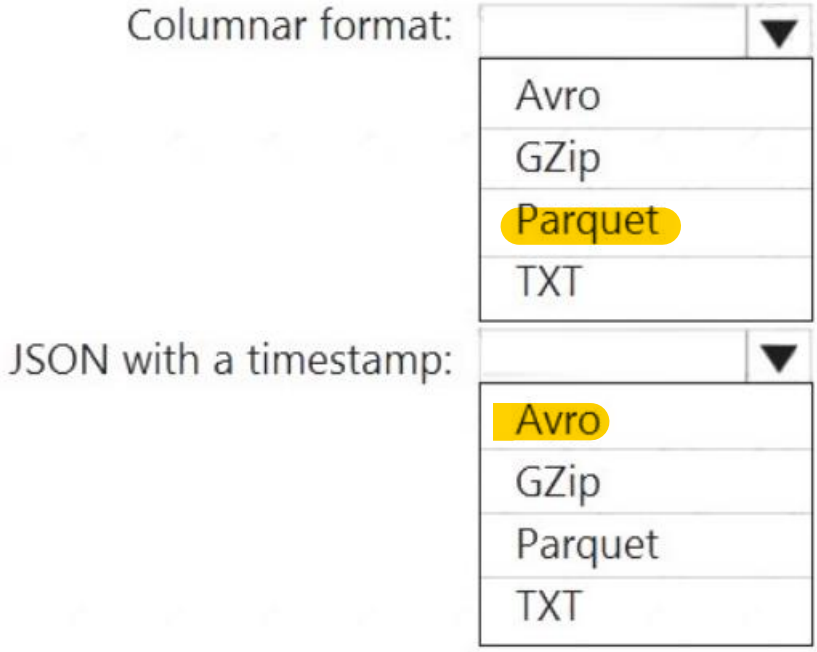
Answer: C

67. - (Exam Topic 3)

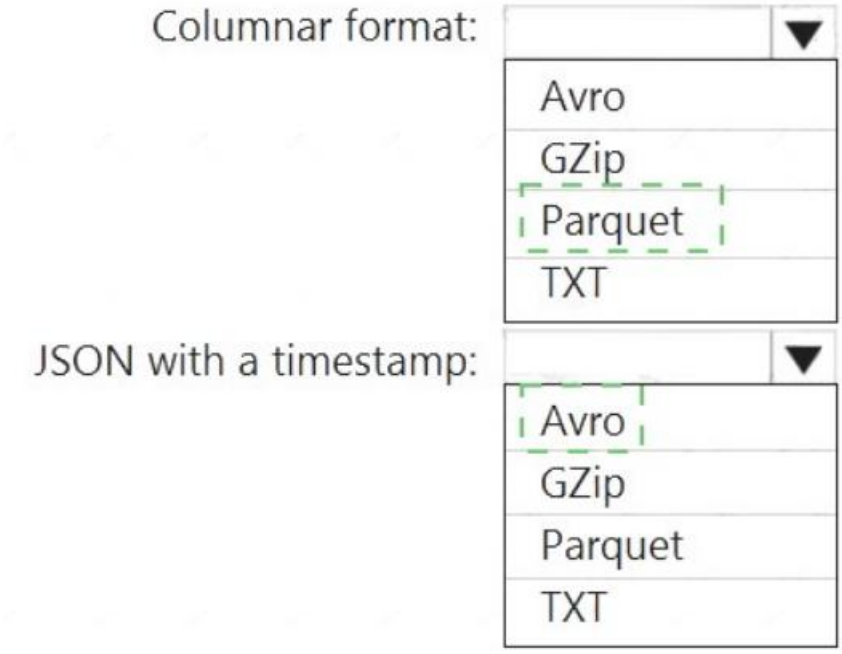
You need to output files from Azure Data Factory.

Which file format should you use for each type of output? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

Box 1: Parquet

Parquet stores data in columns, while Avro stores data in a row-based format. By their very nature, column-oriented data stores are optimized for read-heavy analytical workloads, while row-based databases are best for write-heavy transactional workloads.

Box 2: Avro

An Avro schema is created using JSON format.

AVRO supports timestamps.

Note: Azure Data Factory supports the following file formats (not GZip or TXT).

- Avro format
- Binary format
- Delimited text format
- Excel format
- JSON format
- ORC format
- Parquet format
- XML format

Reference:

https://www.datanami.com/2018/05/16/big-data-file-formats-demystified

68. - (Exam Topic 3)

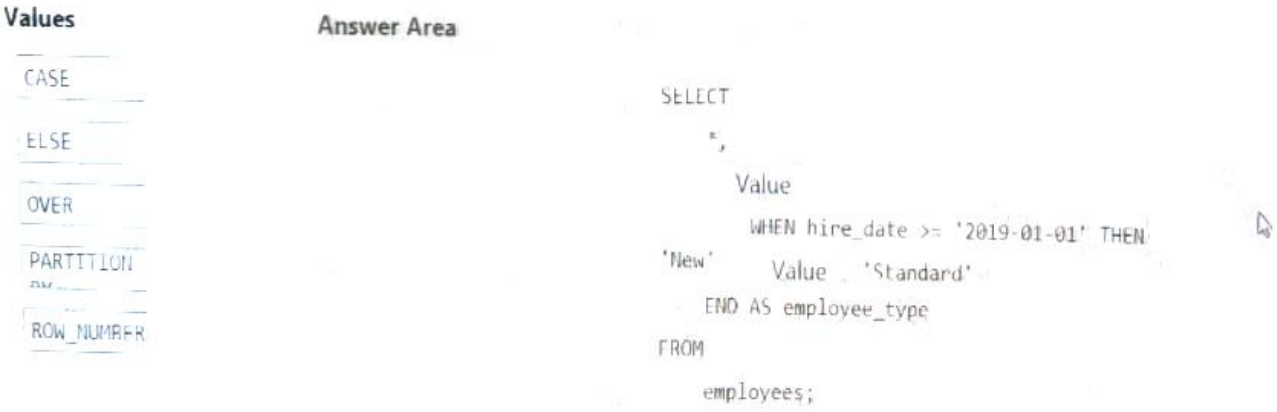
You have the following table named Employees.

first_name	last_name	hire_date	employee_type
Jane	Doe	2019-08-23	new
Ben	Smith	2017-12-15	Standard

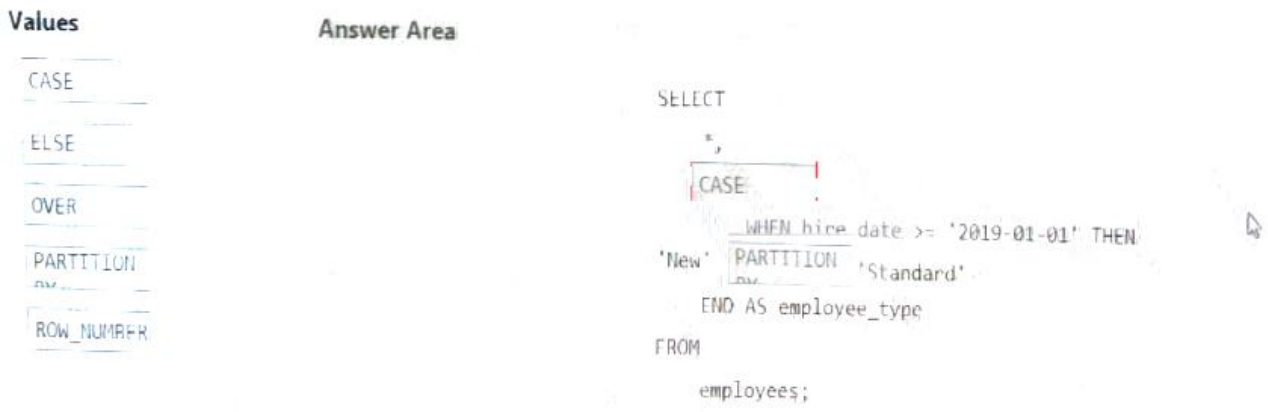
You need to calculate the employee _type value based on the hire date value.

How should you complete the Transact-SQL statement? To answer, drag the appropriate values to the correct targets. Each value may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content

NOTE: Each correct selection is worth one point.



Answer:



69. - (Exam Topic 3)

You have two Azure Data Factory instances named ADFdev and ADFprod. ADFdev connects to an Azure DevOps Git repository.

You publish changes from the main branch of the Git repository to ADFdev. You need to deploy the artifacts from ADFdev to ADFprod.

What should you do first?

A. From ADFdev, modify the Git configuration.

B. From ADFdev, create a linked service.

C. From Azure DevOps, create a release pipeline.

D. From Azure DevOps, update the main branch.

Answer: C

Explanation:

In Azure Data Factory, continuous integration and delivery (CI/CD) means moving Data Factory pipelines from one environment (development, test, production) to another.

Note:

The following is a guide for setting up an Azure Pipelines release that automates the deployment of a data factory to multiple environments.

- In Azure DevOps, open the project that's configured with your data factory.
- On the left side of the page, select Pipelines, and then select Releases.
- Select New pipeline, or, if you have existing pipelines, select New and then New release pipeline.
- In the Stage name box, enter the name of your environment.
- Select Add artifact, and then select the git repository configured with your development data factory. Select the publish branch of the repository for the Default branch. By default, this publish branch is adf_publish.
- Select the Empty job template. Reference: https://docs.microsoft.com/en-us/azure/data-factory/continuous-integration-deployment

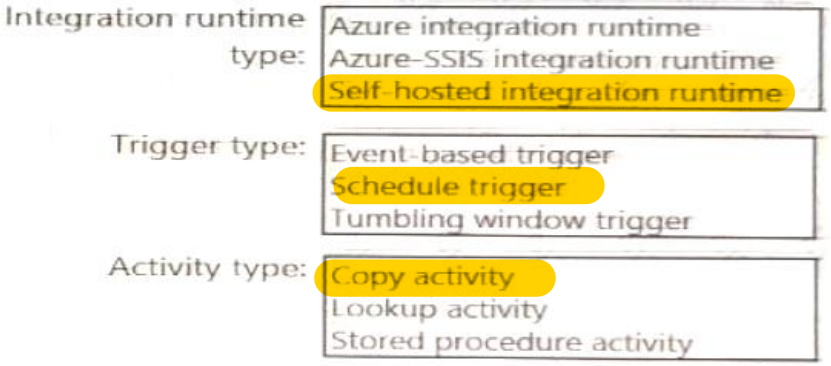
70. - (Exam Topic 3)

Which Azure Data Factory components should you recommend using together to import the daily inventory

data from the SQL server to Azure Data Lake Storage? To answer, select the appropriate options in the answer area.

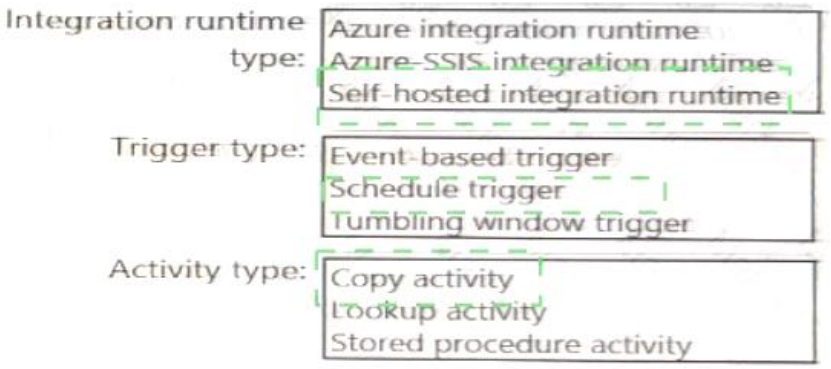
NOTE: Each correct selection is worth one point.

Answer Area



Answer:

Answer Area



71. - (Exam Topic 3)

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You are designing an Azure Stream Analytics solution that will analyze Twitter data.

You need to count the tweets in each 10-second window. The solution must ensure that each tweet is counted only once.

Solution: You use a hopping window that uses a hop size of 5 seconds and a window size 10 seconds.

Does this meet the goal?

A. Yes

B. No

Answer: B

Explanation:

Instead use a tumbling window. Tumbling windows are a series of fixed-sized, non-overlapping and contiguous time intervals.

Reference:

https://docs.microsoft.com/en-us/stream-analytics-query/tumbling-window-azure-stream-analytics

72. - (Exam Topic 3)

You use Azure Data Lake Storage Gen2.

You need to ensure that workloads can use filter predicates and column projections to filter data at the time the data is read from disk.

Which two actions should you perform? Each correct answer presents part of the solution. NOTE: Each correct selection is worth one point.

A. Reregister the Microsoft Data Lake Store resource provider.

B. Reregister the Azure Storage resource provider.

C. Create a storage policy that is scoped to a container.

D. Register the query acceleration feature.

E. Create a storage policy that is scoped to a container prefix filter.

Answer: B D

73. - (Exam Topic 3)

You are designing a sales transactions table in an Azure Synapse Analytics dedicated SQL pool. The table will contains approximately 60 million rows per month and will be partitioned by month. The table will use a clustered column store index and round-robin distribution.

Approximately how many rows will there be for each combination of distribution and partition?

A. 1 million

B. 5 million

C. 20 million

D. 60 million

Answer: D

Explanation:

https://docs.microsoft.com/en-us/azure/synapse-analytics/sql-data-warehouse/sql-data-warehouse-tables-partitio

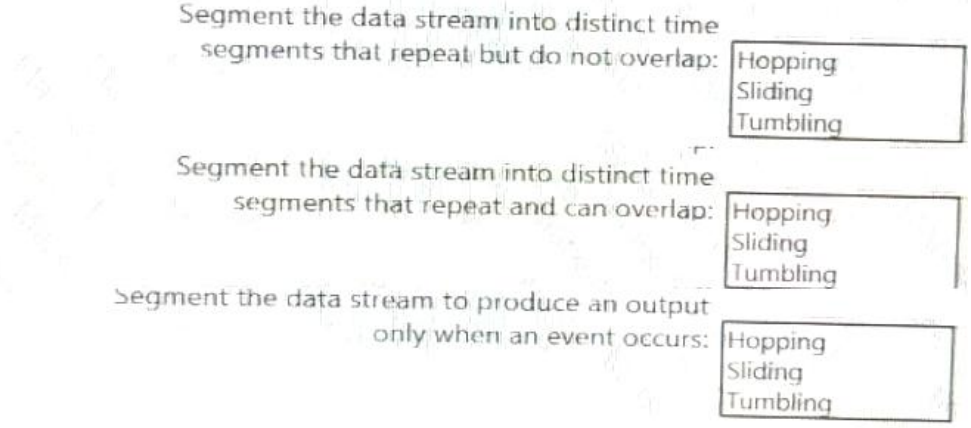
74. - (Exam Topic 3)

You are implementing Azure Stream Analytics windowing functions.

Which windowing function should you use for each requirement? To answer, select the appropriate options in the answer area.

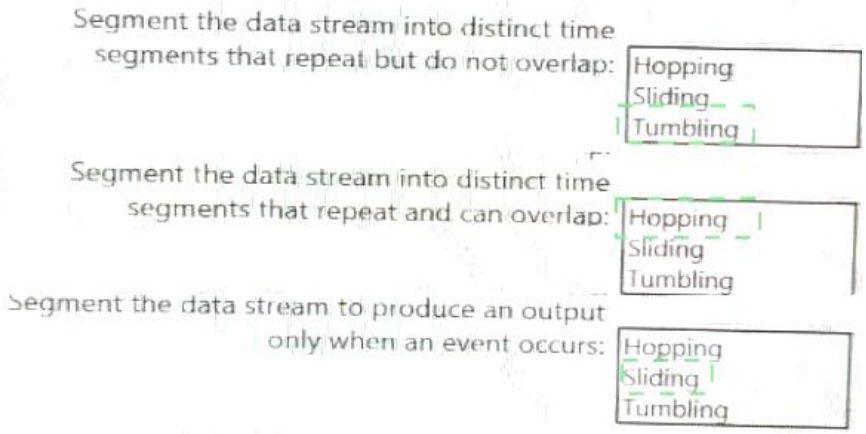
NOTE: Each correct selection is worth one point.

Answer Area



Answer:

Answer Area



75. - (Exam Topic 3)

You create an Azure Databricks cluster and specify an additional library to install. When you attempt to load the library to a notebook, the library in not found.

You need to identify the cause of the issue. What should you review?

A. notebook logs

B. cluster event logs

C. global init scripts logs

D. workspace logs

Answer: C

Explanation:

Cluster-scoped Init Scripts: Init scripts are shell scripts that run during the startup of each cluster node before the Spark driver or worker JVM starts. Databricks customers use init scripts for various purposes such as installing custom libraries, launching background processes, or applying enterprise security policies.

Logs for Cluster-scoped init scripts are now more consistent with Cluster Log Delivery and can be found in the same root folder as driver and executor logs for the cluster.

Reference:

https://databricks.com/blog/2018/08/30/introducing-cluster-scoped-init-scripts.html

76. - (Exam Topic 3)

You have an Azure Stream Analytics query. The query returns a result set that contains 10,000 distinct values for a column named clusterID.

You monitor the Stream Analytics job and discover high latency. You need to reduce the latency.

Which two actions should you perform? Each correct answer presents a complete solution. NOTE: Each correct selection is worth one point.

A. Add a pass-through query.

B. Add a temporal analytic function.

C. Scale out the query by using PARTITION BY.

D. Convert the query to a reference query.

E. Increase the number of streaming units.

Answer: C E

Explanation:

C: Scaling a Stream Analytics job takes advantage of partitions in the input or output. Partitioning lets you divide data into subsets based on a partition key. A process that consumes the data (such as a Streaming Analytics job) can consume and write different partitions in parallel, which increases throughput.

E: Streaming Units (SUs) represents the computing resources that are allocated to execute a Stream Analytics job. The higher the number of SUs, the more CPU and memory resources are allocated for your job. This capacity lets you focus on the query logic and abstracts the need to manage the hardware to run your Stream Analytics job in a timely manner.

References:

https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-parallelization

https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-streaming-unit-consumption

77. - (Exam Topic 3)

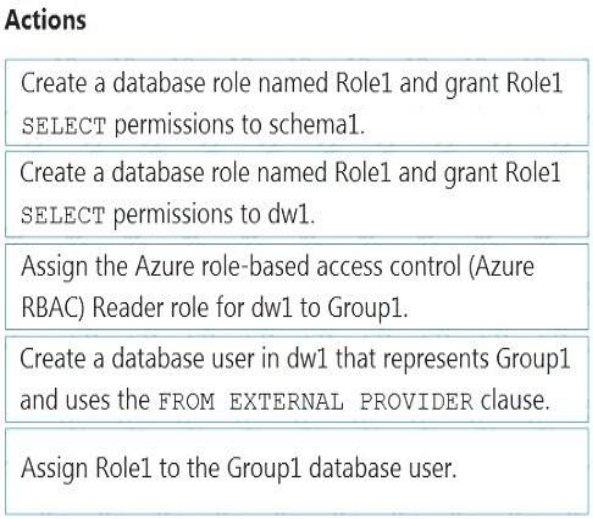
You have an Azure Active Directory (Azure AD) tenant that contains a security group named Group1. You have an Azure Synapse Analytics dedicated SQL pool named dw1 that contains a schema named schema1.

You need to grant Group1 read-only permissions to all the tables and views in schema1. The solution must

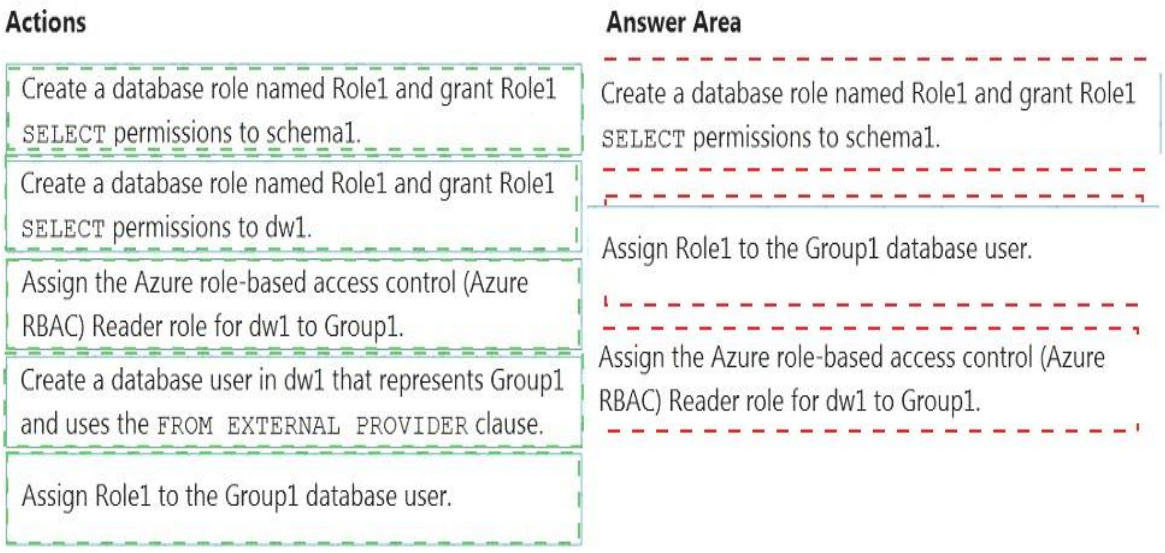
use the principle of least privilege.

Which three actions should you perform in sequence? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

NOTE: More than one order of answer choices is correct. You will receive credit for any of the correct orders you select.



Answer:



Explanation:

Step 1: Create a database role named Role1 and grant Role1 SELECT permissions to schema You need to grant Group1 read-only permissions to all the tables and views in schema1.

Place one or more database users into a database role and then assign permissions to the database role.

Step 2: Assign Rol1 to the Group database user

Step 3: Assign the Azure role-based access control (Azure RBAC) Reader role for dw1 to Group1

Reference:

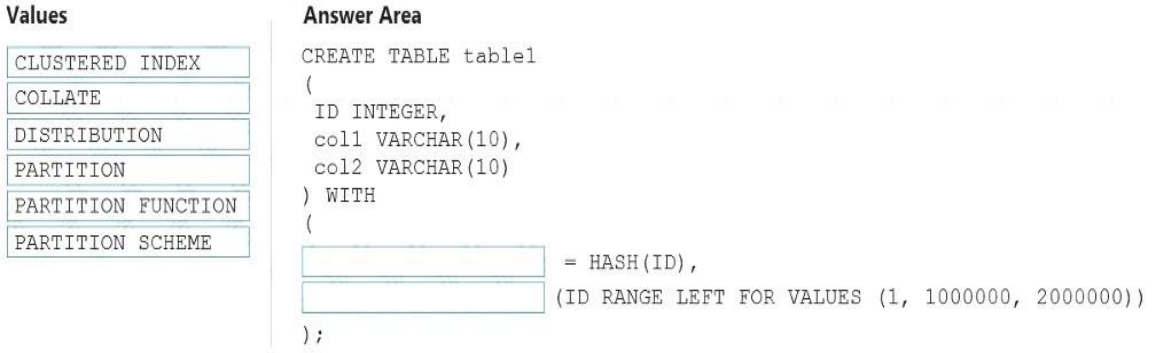
https://docs.microsoft.com/en-us/azure/data-share/how-to-share-from-sql

78. - (Exam Topic 3)

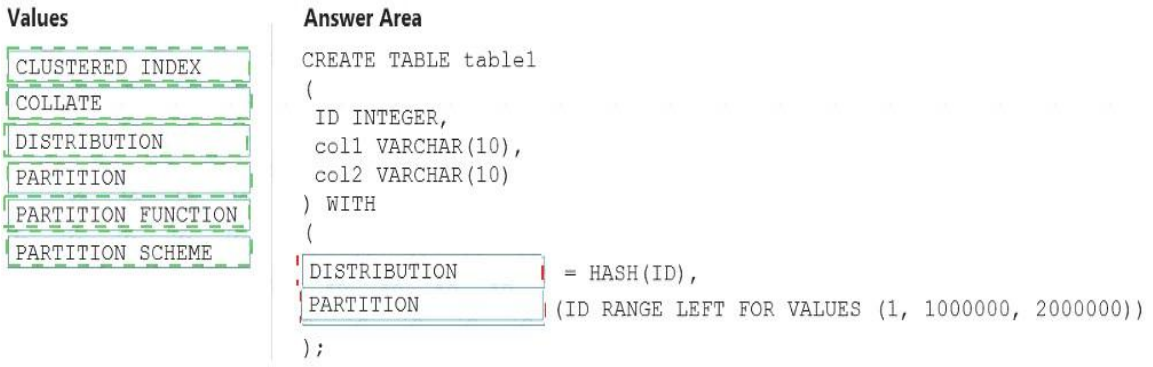
You need to create a partitioned table in an Azure Synapse Analytics dedicated SQL pool.

How should you complete the Transact-SQL statement? To answer, drag the appropriate values to the correct targets. Each value may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

Box 1: DISTRIBUTION

Table distribution options include DISTRIBUTION = HASH (distribution_column_name), assigns each row to one distribution by hashing the value stored in distribution_column_name. Box 2: PARTITION

Table partition options. Syntax:

PARTITION (partition_column_name RANGE [LEFT | RIGHT] FOR VALUES ([boundary_value [,...n]]

))

Reference:

https://docs.microsoft.com/en-us/sql/t-sql/statements/create-table-azure-sql-data-warehouse?

79. - (Exam Topic 3)

You build an Azure Data Factory pipeline to move data from an Azure Data Lake Storage Gen2 container to a database in an Azure Synapse Analytics dedicated SQL pool.

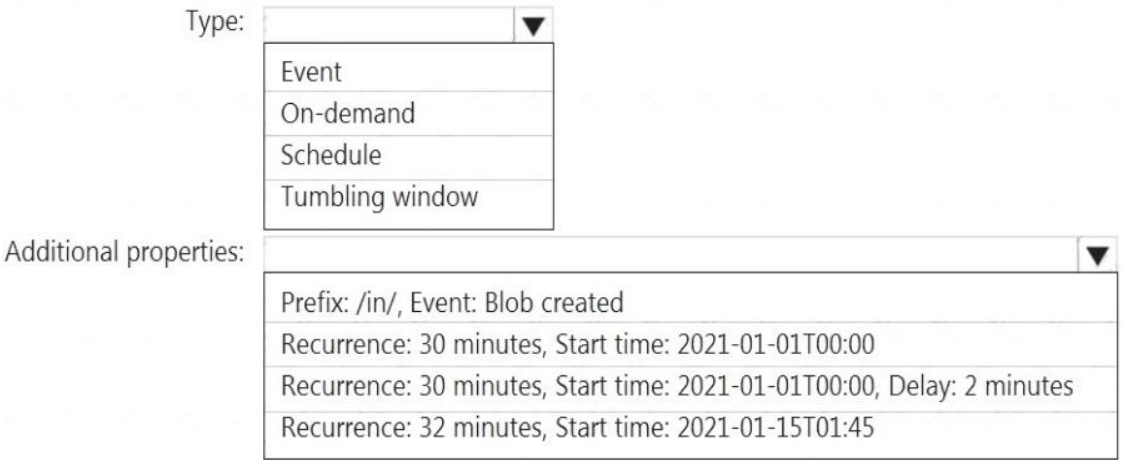
Data in the container is stored in the following folder structure.

/in/{YYYY}/{MM}/{DD}/{HH}/{mm}

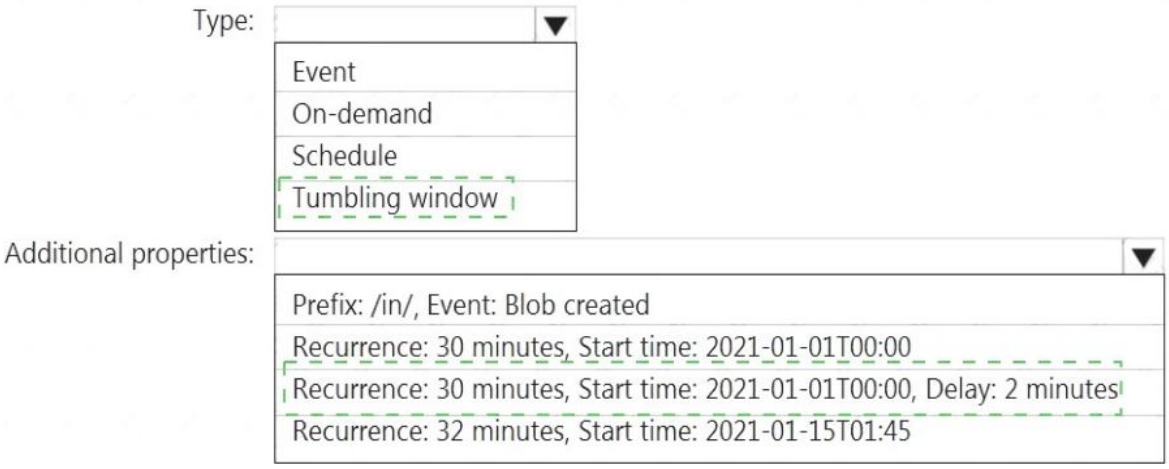
The earliest folder is /in/2021/01/01/00/00. The latest folder is /in/2021/01/15/01/45. You need to configure a pipeline trigger to meet the following requirements:

- Existing data must be loaded.
- Data must be loaded every 30 minutes.
- Late-arriving data of up to two minutes must he included in the load for the time at which the data should have arrived.

How should you configure the pipeline trigger? To answer, select the appropriate options in the answer area. NOTE: Each correct selection is worth one point.



Answer:



Explanation:

Box 1: Tumbling window

To be able to use the Delay parameter we select Tumbling window. Box 2:

Recurrence: 30 minutes, not 32 minutes

Delay: 2 minutes.

The amount of time to delay the start of data processing for the window. The pipeline run is started after the expected execution time plus the amount of delay. The delay defines how long the trigger waits past the due time before triggering a new run. The delay doesn't alter the window startTime.

Reference:

https://docs.microsoft.com/en-us/azure/data-factory/how-to-create-tumbling-window-trigger

80. - (Exam Topic 3)

You have an Azure Storage account and a data warehouse in Azure Synapse Analytics in the UK South region. You need to copy blob data from the storage account to the data warehouse by using Azure Data Factory. The solution must meet the following requirements:

- Ensure that the data remains in the UK South region at all times.
- Minimize administrative effort.

Which type of integration runtime should you use?

A. Azure integration runtime

B. Azure-SSIS integration runtime

C. Self-hosted integration runtime

Answer: A

Explanation:

IR type	Public network	Private network
Azure	Data Flow Data movement Activity dispatch	
Self-hosted	Data movement Activity dispatch	Data movement Activity dispatch
Azure-SSIS	SSIS package execution	SSIS package execution

Reference:

https://docs.microsoft.com/en-us/azure/data-factory/concepts-integration-runtime

81. - (Exam Topic 3)

You have an Azure Synapse Analytics dedicated SQL pool that contains a table named Table1. You have files that are ingested and loaded into an Azure Data Lake Storage Gen2 container named container1.

You plan to insert data from the files into Table1 and azure Data Lake Storage Gen2 container named container1.

You plan to insert data from the files into Table1 and transform the data. Each row of data in the files will produce one row in the serving layer of Table1.

You need to ensure that when the source data files are loaded to container1, the DateTime is stored as an additional column in Table1.

Solution: In an Azure Synapse Analytics pipeline, you use a data flow that contains a Derived Column transformation.

A. Yes

B. No

Answer: B

82. - (Exam Topic 3)

You have an Azure Stream Analytics job that receives clickstream data from an Azure event hub.

You need to define a query in the Stream Analytics job. The query must meet the following requirements:

- Count the number of clicks within each 10-second window based on the country of a visitor.
- Ensure that each click is NOT counted more than once. How should you define the Query?

A. SELECT Country, Avg(*) AS Average

FROM ClickStream TIMESTAMP BY CreatedAt GROUP BY Country, SlidingWindow(second, 10)

B. SELECT Country, Count(*) AS Count

FROM ClickStream TIMESTAMP BY CreatedAt GROUP BY Country, TumblingWindow(second, 10)

C. SELECT Country, Avg(*) AS Average

FROM ClickStream TIMESTAMP BY CreatedAt GROUP BY Country, HoppingWindow(second, 10, 2)

D. SELECT Country, Count(*) AS Count

FROM ClickStream TIMESTAMP BY CreatedAt GROUP BY Country, SessionWindow(second, 5, 10)

Answer: B

Explanation:

Tumbling window functions are used to segment a data stream into distinct time segments and perform a function against them, such as the example below. The key differentiators of a Tumbling window are that they repeat, do not overlap, and an event cannot belong to more than one tumbling window.

Example: Reference:

https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-window-functions

83. - (Exam Topic 3)

You develop data engineering solutions for a company.

A project requires the deployment of data to Azure Data Lake Storage.

You need to implement role-based access control (RBAC) so that project members can manage the Azure Data Lake Storage resources.

Which three actions should you perform? Each correct answer presents part of the solution. NOTE: Each correct selection is worth one point.

A. Assign Azure AD security groups to Azure Data Lake Storage.

B. Configure end-user authentication for the Azure Data Lake Storage account.

C. Configure service-to-service authentication for the Azure Data Lake Storage account.

D. Create security groups in Azure Active Directory (Azure AD) and add project members.

E. Configure access control lists (ACL) for the Azure Data Lake Storage account.

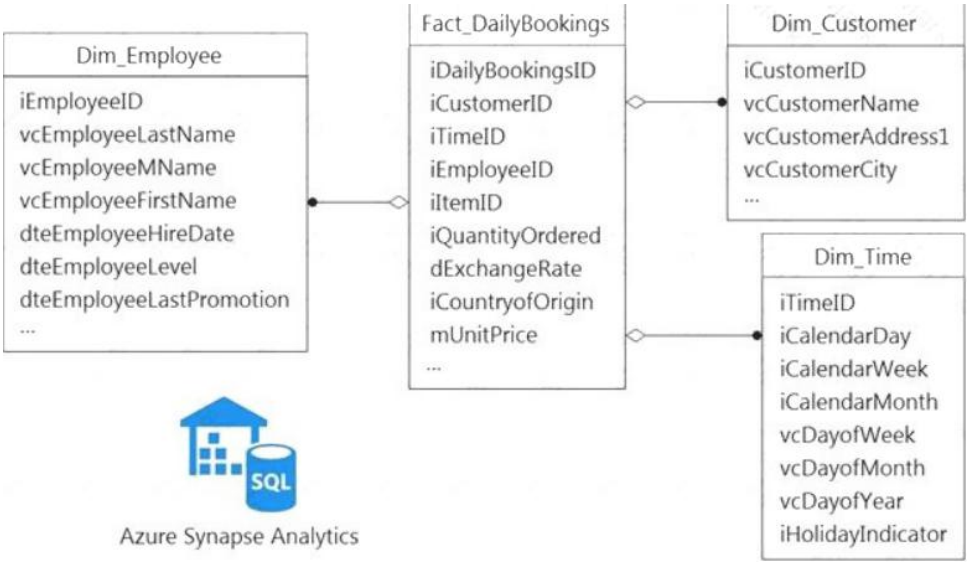
Answer: A D E

Explanation: References:

https://docs.microsoft.com/en-us/azure/data-lake-store/data-lake-store-secure-data

84. - (Exam Topic 3)

You have a data model that you plan to implement in a data warehouse in Azure Synapse Analytics as shown in the following exhibit.

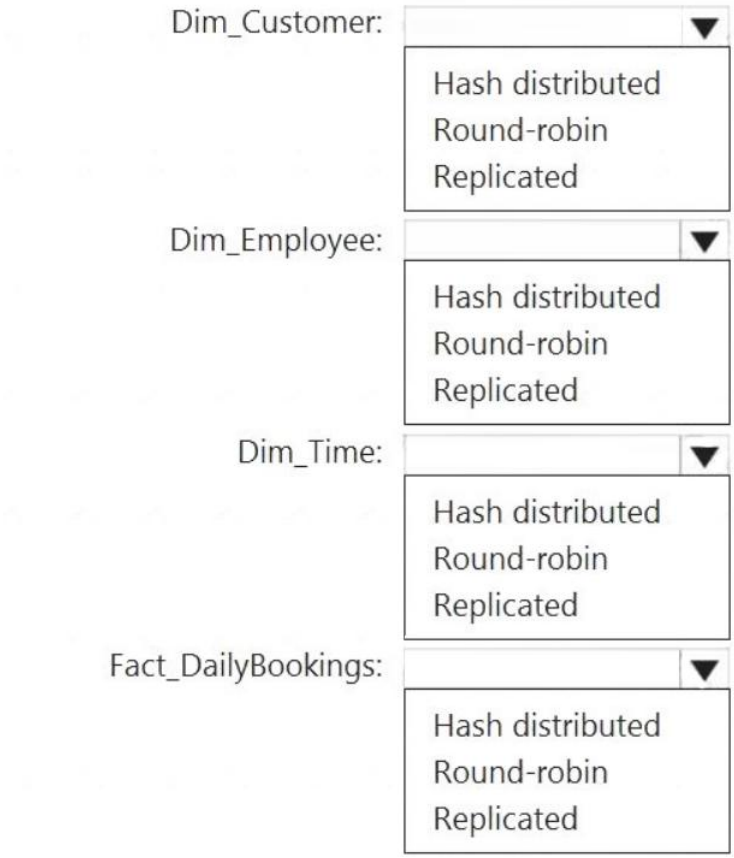


All the dimension tables will be less than 2 GB after compression, and the fact table will be approximately 6 TB.

Which type of table should you use for each table? To answer, select the appropriate options in the answer area.

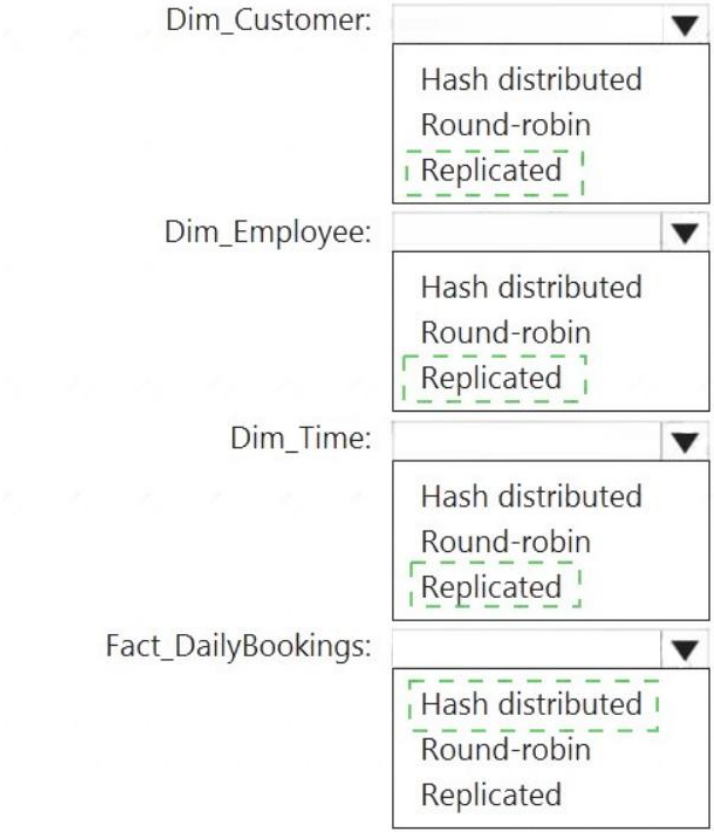
NOTE: Each correct selection is worth one point.

Answer Area



Answer:

Answer Area



85. - (Exam Topic 3)

You have an enterprise data warehouse in Azure Synapse Analytics named DW1 on a server named Server1. You need to verify whether the size of the transaction log file for each distribution of DW1 is smaller than 160 GB.

What should you do?

A. On the master database, execute a query against the sys.dm_pdw_nodes_os_performance_counters dynamic management view.

B. From Azure Monitor in the Azure portal, execute a query against the logs of DW1.

C. On DW1, execute a query against the sys.database_files dynamic management view.

D. Execute a query against the logs of DW1 by using the Get-AzOperationalInsightSearchResult PowerShell cmdlet.

Answer: A

Explanation:

The following query returns the transaction log size on each distribution. If one of the log files is reaching 160 GB, you should consider scaling up your instance or limiting your transaction size.

-- Transaction log size SELECT

instance_name as distribution_db, cntr_value*1.0/1048576 as log_file_size_used_GB, pdw_node_id

FROM sys.dm_pdw_nodes_os_performance_counters WHERE

instance_name like 'Distribution_%'

AND counter_name = 'Log File(s) Used Size (KB)' References:

https://docs.microsoft.com/en-us/azure/sql-data-warehouse/sql-data-warehouse-manage-monitor

86. - (Exam Topic 3)

You have an Azure Data Lake Storage Gen2 container that contains 100 TB of data.

You need to ensure that the data in the container is available for read workloads in a secondary region if an outage occurs in the primary region. The solution must minimize costs.

Which type of data redundancy should you use?

A. zone-redundant storage (ZRS)

B. read-access geo-redundant storage (RA-GRS)

C. locally-redundant storage (LRS)

D. geo-redundant storage (GRS)

Answer: C

87. - (Exam Topic 3)

You plan to implement an Azure Data Lake Storage Gen2 container that will contain CSV files. The size of the files will vary based on the number of events that occur per hour.

File sizes range from 4.KB to 5 GB.

You need to ensure that the files stored in the container are optimized for batch processing. What should you do?

A. Compress the files.

B. Merge the files.

C. Convert the files to JSON

D. Convert the files to Avro.

Answer: D

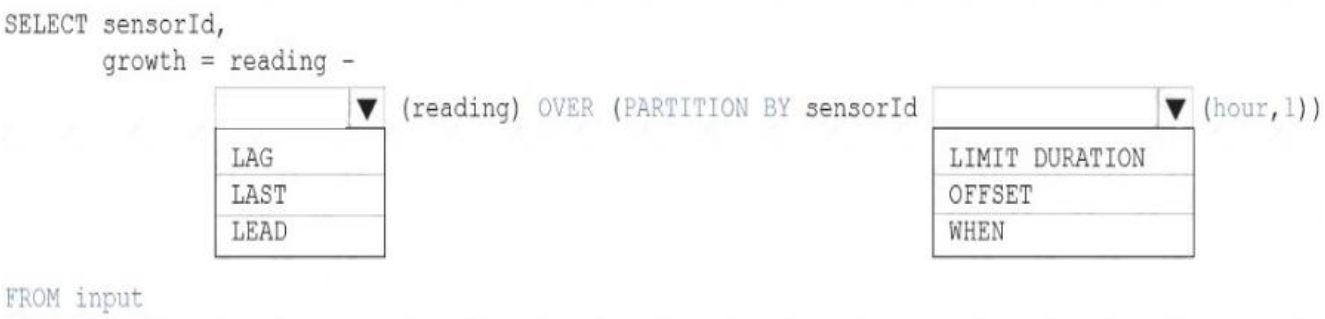
88. - (Exam Topic 3)

You are building an Azure Analytics query that will receive input data from Azure IoT Hub and write the results to Azure Blob storage.

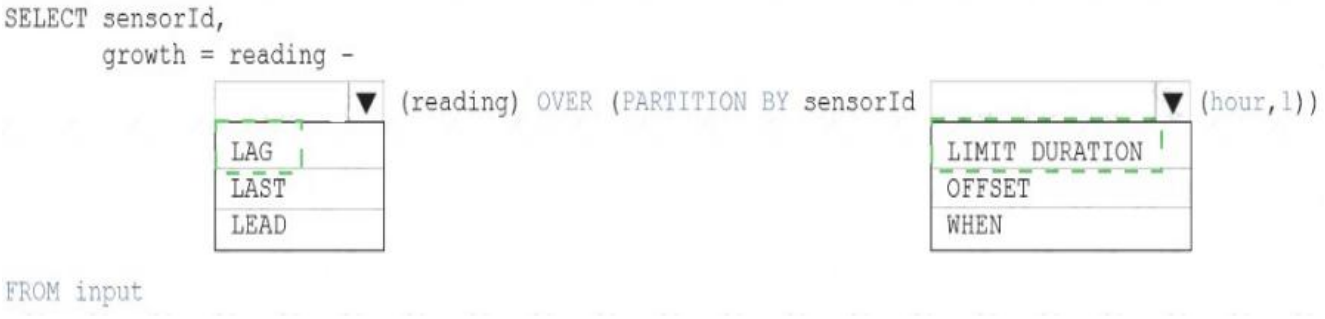
You need to calculate the difference in readings per sensor per hour.

How should you complete the query? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

Box 1: LAG

The LAG analytic operator allows one to look up a “previous” event in an event stream, within certain constraints. It is very useful for computing the rate of growth of a variable, detecting when a variable crosses a threshold, or when a condition starts or stops being true.

Box 2: LIMIT DURATION

Example: Compute the rate of growth, per sensor: SELECT sensorId,

growth = reading

LAG(reading) OVER (PARTITION BY sensorId LIMIT DURATION(hour, 1)) FROM input

Reference:

https://docs.microsoft.com/en-us/stream-analytics-query/lag-azure-stream-analytics

89. - (Exam Topic 3)

You need to design an Azure Synapse Analytics dedicated SQL pool that meets the following requirements:

- Can return an employee record from a given point in time.
- Maintains the latest employee information.
- Minimizes query complexity.

How should you model the employee data?

A. as a temporal table

B. as a SQL graph table

C. as a degenerate dimension table

D. as a Type 2 slowly changing dimension (SCD) table

Answer: D

Explanation:

A Type 2 SCD supports versioning of dimension members. Often the source system doesn't store versions, so the data warehouse load process detects and manages changes in a dimension table. In this case, the dimension table must use a surrogate key to provide a unique reference to a version of the dimension member. It also includes columns that define the date range validity of the version (for example, StartDate and EndDate) and possibly a flag column (for example, IsCurrent) to easily filter by current dimension members.

Reference:

https://docs.microsoft.com/en-us/learn/modules/populate-slowly-changing-dimensions-azure-synapse-analytics

90. - (Exam Topic 3)

You have an Azure Synapse Analytics dedicated SQL Pool1. Pool1 contains a partitioned fact table named dbo.Sales and a staging table named stg.Sales that has the matching table and partition definitions.

You need to overwrite the content of the first partition in dbo.Sales with the content of the same partition in stg.Sales. The solution must minimize load times.

What should you do?

A. Switch the first partition from dbo.Sales to stg.Sales.

B. Switch the first partition from stg.Sales to dbo. Sales.

C. Update dbo.Sales from stg.Sales.

D. Insert the data from stg.Sales into dbo.Sales.

Answer: D

91. - (Exam Topic 3)

You are designing the folder structure for an Azure Data Lake Storage Gen2 container.

Users will query data by using a variety of services including Azure Databricks and Azure Synapse Analytics serverless SQL pools. The data will be secured by subject area. Most queries will include data from the current year or current month.

Which folder structure should you recommend to support fast queries and simplified folder security?

A. /{SubjectArea}/{DataSource}/{DD}/{MM}/{YYYY}/{FileData}_{YYYY}_{MM}_{DD}.csv

B. /{DD}/{MM}/{YYYY}/{SubjectArea}/{DataSource}/{FileData}_{YYYY}_{MM}_{DD}.csv

C. /{YYYY}/{MM}/{DD}/{SubjectArea}/{DataSource}/{FileData}_{YYYY}_{MM}_{DD}.csv

D. /{SubjectArea}/{DataSource}/{YYYY}/{MM}/{DD}/{FileData}_{YYYY}_{MM}_{DD}.csv

Answer: D

Explanation:

There's an important reason to put the date at the end of the directory structure. If you want to lock down certain regions or subject matters to users/groups, then you can easily do so with the POSIX permissions. Otherwise, if there was a need to restrict a certain security group to viewing just the UK data or certain planes, with the date structure in front a separate permission would be required for numerous directories under every hour directory. Additionally, having the date structure in front would exponentially increase the number of directories as time went on.

Note: In IoT workloads, there can be a great deal of data being landed in the data store that spans across numerous products, devices, organizations, and customers. It’s important to pre-plan the directory layout

for organization, security, and efficient processing of the data for down-stream consumers. A general template to consider might be the following layout:

{Region}/{SubjectMatter(s)}/{yyyy}/{mm}/{dd}/{hh}/

92. - (Exam Topic 3)

You configure monitoring for a Microsoft Azure SQL Data Warehouse implementation. The implementation uses PolyBase to load data from comma-separated value (CSV) files stored in Azure Data Lake Gen 2 using an external table.

Files with an invalid schema cause errors to occur. You need to monitor for an invalid schema error. For which error should you monitor?

A. EXTERNAL TABLE access failed due to internal error: 'Java exception raised on call to HdfsBridge_Connect: Error [com.microsoft.polybase.client.KerberosSecureLogin] occurred while accessing external files.'

B. EXTERNAL TABLE access failed due to internal error: 'Java exception raised on call to HdfsBridge_Connect: Error [No FileSystem for scheme: wasbs] occurred while accessing external file.'

C. Cannot execute the query "Remote Query" against OLE DB provider "SQLNCLI11": for linked server "(null)", Query aborted- the maximum reject threshold (o rows) was reached while regarding from an external source: 1 rows rejected out of total 1 rows processed.

D. EXTERNAL TABLE access failed due to internal error: 'Java exception raised on call to HdfsBridge_Connect: Error [Unable to instantiate LoginClass] occurred while accessing external files.'

Answer: C

Explanation: Customer Scenario:

SQL Server 2016 or SQL DW connected to Azure blob storage. The CREATE EXTERNAL TABLE DDL points to a directory (and not a specific file) and the directory contains files with different schemas.

SSMS Error:

Select query on the external table gives the following error: Msg 7320, Level 16, State 110, Line 14

Cannot execute the query "Remote Query" against OLE DB provider "SQLNCLI11" for linked server "(null)". Query aborted-- the maximum reject threshold (0 rows) was reached while reading from an external source:

1 rows rejected out of total 1 rows processed.

Possible Reason:

The reason this error happens is because each file has different schema. The PolyBase external table DDL when pointed to a directory recursively reads all the files in that directory. When a column or data type mismatch happens, this error could be seen in SSMS.

Possible Solution:

If the data for each table consists of one file, then use the filename in the LOCATION section prepended by the directory of the external files. If there are multiple files per table, put each set of files into different directories in Azure Blob Storage and then you can point LOCATION to the directory instead of a particular file. The latter suggestion is the best practices recommended by SQLCAT even if you have one file per table.

93. - (Exam Topic 3)

You have the following Azure Stream Analytics query.

```
WITH

step1 AS (SELECT *
      FROM input1
      PARTITION BY StateID
      INTO 10),
step1 AS (SELECT *
      FROM input2
      PARTITION BY StateID
      INTO 10)

SELECT *
INTO output
FROM step1
PARTITION BY StateID
UNION step2
  BY StateID
```

For each of the following statements, select Yes if the statement is true. Otherwise, select No.

NOTE: Each correct selection is worth one point.

Statements	Yes	No
The query joins two streams of partitioned data.	○	○
The stream scheme key and count must match the output scheme.	○	○
Providing 60 streaming units will optimize the performance of the query.	○	○

Answer:

Statements	Yes	No
The query joins two streams of partitioned data.	○	○
The stream scheme key and count must match the output scheme.	○	○
Providing 60 streaming units will optimize the performance of the query.	○	○

Explanation:

Box 1: Yes

You can now use a new extension of Azure Stream Analytics SQL to specify the number of partitions of a stream when reshuffling the data.

The outcome is a stream that has the same partition scheme. Please see below for an example: WITH step1 AS (SELECT * FROM [input1] PARTITION BY DeviceID INTO 10),

step2 AS (SELECT * FROM [input2] PARTITION BY DeviceID INTO 10)

SELECT * INTO [output] FROM step1 PARTITION BY DeviceID UNION step2 PARTITION BY DeviceID

Note: The new extension of Azure Stream Analytics SQL includes a keyword INTO that allows you to specify

the number of partitions for a stream when performing reshuffling using a PARTITION BY statement.

Box 2: Yes

When joining two streams of data explicitly repartitioned, these streams must have the same partition key and partition count.

Box 3: Yes

10 partitions x six SUs = 60 SUs is fine.

Note: Remember, Streaming Unit (SU) count, which is the unit of scale for Azure Stream Analytics, must be adjusted so the number of physical resources available to the job can fit the partitioned flow. In general, six SUs is a good number to assign to each partition. In case there are insufficient resources assigned to the job, the system will only apply the repartition if it benefits the job.

Reference:

https://azure.microsoft.com/en-in/blog/maximize-throughput-with-repartitioning-in-azure-stream-analytics/

94. - (Exam Topic 3)

You are creating an Azure Data Factory data flow that will ingest data from a CSV file, cast columns to specified types of data, and insert the data into a table in an Azure Synapse Analytic dedicated SQL pool. The CSV file contains three columns named username, comment, and date.

The data flow already contains the following:

- A source transformation.
- A Derived Column transformation to set the appropriate types of data.
- A sink transformation to land the data in the pool.

You need to ensure that the data flow meets the following requirements:

- All valid rows must be written to the destination table.
- Truncation errors in the comment column must be avoided proactively.
- Any rows containing comment values that will cause truncation errors upon insert must be written to a file in blob storage.

Which two actions should you perform? Each correct answer presents part of the solution. NOTE: Each correct selection is worth one point.

A. To the data flow, add a sink transformation to write the rows to a file in blob storage.

B. To the data flow, add a Conditional Split transformation to separate the rows that will cause truncation errors.

C. To the data flow, add a filter transformation to filter out rows that will cause truncation errors.

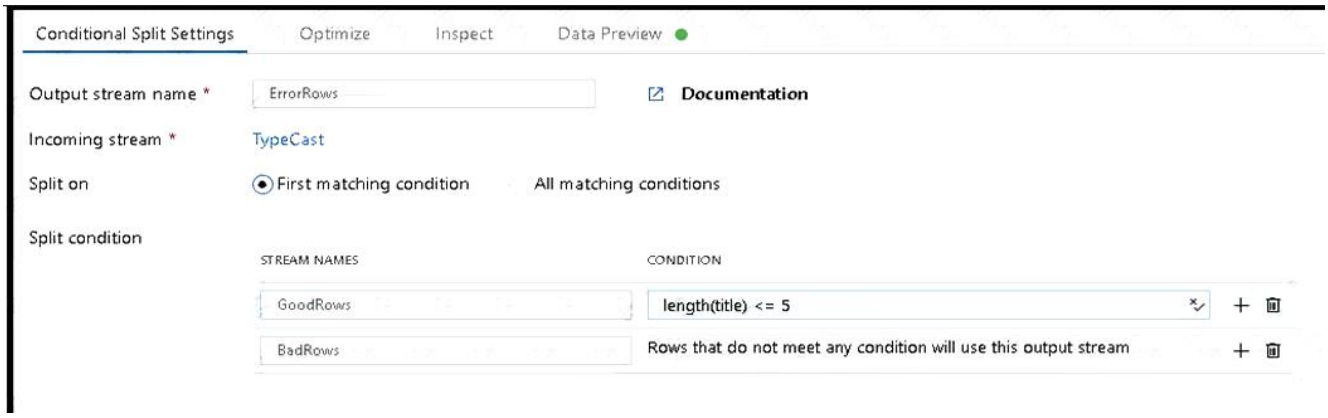
D. Add a select transformation to select only the rows that will cause truncation errors.

Answer: A B

Explanation:

B: Example:

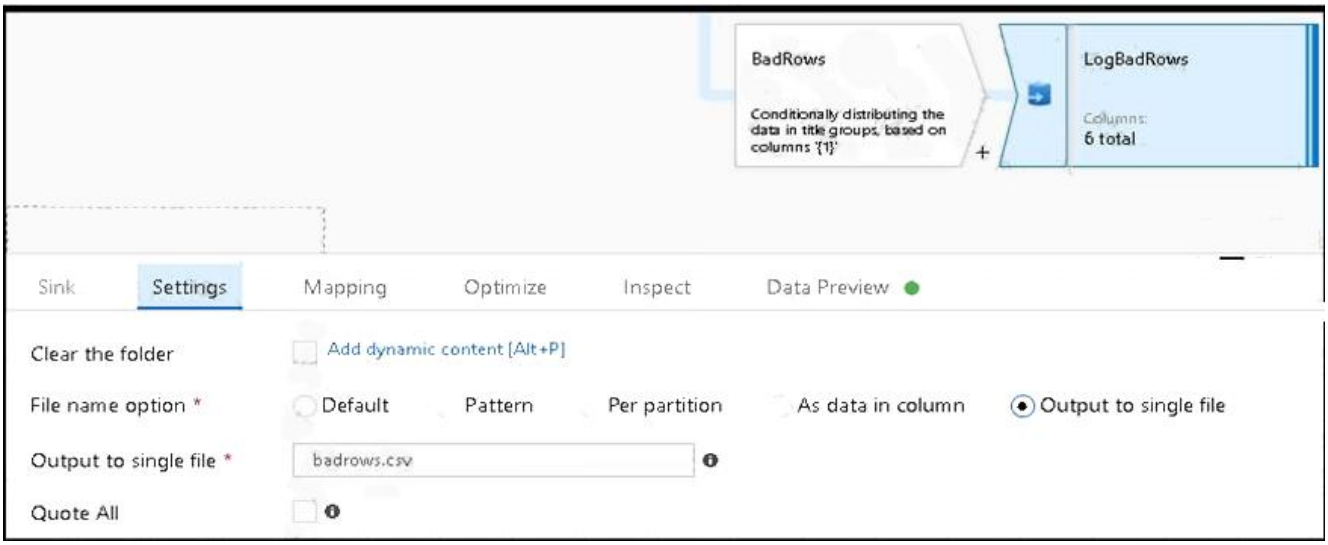
* 1. This conditional split transformation defines the maximum length of "title" to be five. Any row that is less than or equal to five will go into the GoodRows stream. Any row that is larger than five will go into the BadRows stream.



* 2. This conditional split transformation defines the maximum length of "title" to be five. Any row that is less than or equal to five will go into the GoodRows stream. Any row that is larger than five will go into the BadRows stream.

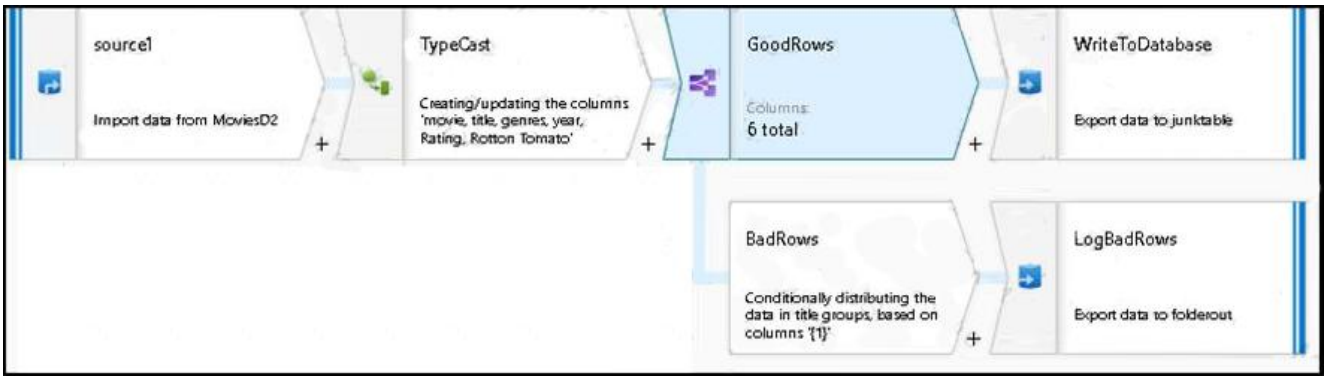
A:

* 3. Now we need to log the rows that failed. Add a sink transformation to the BadRows stream for logging. Here, we'll "auto-map" all of the fields so that we have logging of the complete transaction record. This is a text-delimited CSV file output to a single file in Blob Storage. We'll call the log file "badrows.csv".



* 4. The completed data flow is shown below. We are now able to split off error rows to avoid the SQL truncation errors and put those entries into a log file. Meanwhile, successful rows can continue to write to

our target database.



Reference:

https://docs.microsoft.com/en-us/azure/data-factory/how-to-data-flow-error-rows

95. - (Exam Topic 3)

You are designing an Azure Stream Analytics solution that receives instant messaging data from an Azure event hub.

You need to ensure that the output from the Stream Analytics job counts the number of messages per time zone every 15 seconds.

How should you complete the Stream Analytics query? To answer, select the appropriate options in the answer area.

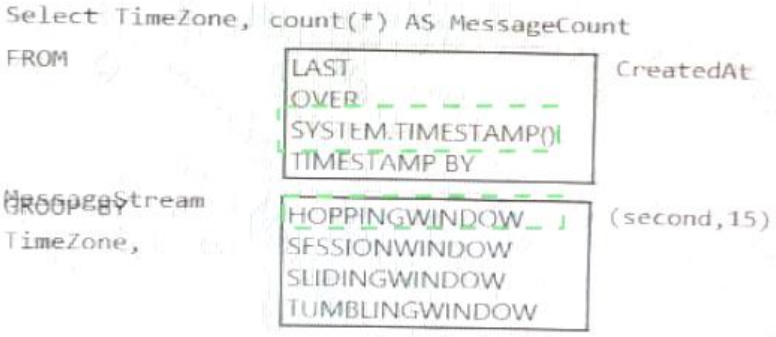
NOTE: Each correct selection is worth one point.

Answer Area

```
Select TimeZone, count(*) AS MessageCount
FROM                                          CreatedAt
                    LAST
                    OVER
                    SYSTEM.TIMESTAMP()
                    TIMESTAMP BY
MessageStream
GROUP BY                                      (second,15)
TimeZone,           HOPPINGWINDOW
                    SESSIONWINDOW
                    SLIDINGWINDOW
                    TUMBLINGWINDOW
```

Answer:

Answer Area



96. - (Exam Topic 3)

You plan to ingest streaming social media data by using Azure Stream Analytics. The data will be stored in files in Azure Data Lake Storage, and then consumed by using Azure Datiabricks and PolyBase in Azure Synapse Analytics.

You need to recommend a Stream Analytics data output format to ensure that the queries from Databricks and PolyBase against the files encounter the fewest possible errors. The solution must ensure that the tiles can be queried quickly and that the data type information is retained.

What should you recommend?

A. Parquet

B. Avro

C. CSV

D. JSON

Answer: B

Explanation:

The Avro format is great for data and message preservation.Avro schema with its support for evolution is essential for making the data robust for streaming architectures like Kafka, and with the metadata that schema provides, you can reason on the data. Having a schema provides robustness in providing meta-data about the data stored in Avro records which are self- documenting the data.References: http://cloudurable.com/blog/avro/index.html

97. - (Exam Topic 3)

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You are designing an Azure Stream Analytics solution that will analyze Twitter data.

You need to count the tweets in each 10-second window. The solution must ensure that each tweet is counted only once.

Solution: You use a session window that uses a timeout size of 10 seconds. Does this meet the goal?

A. Yes

B. No

Answer: B

Explanation:

Instead use a tumbling window. Tumbling windows are a series of fixed-sized, non-overlapping and contiguous

time intervals. Reference:

https://docs.microsoft.com/en-us/stream-analytics-query/tumbling-window-azure-stream-analytics

98. - (Exam Topic 3)

You have an Azure Synapse workspace named MyWorkspace that contains an Apache Spark database named mytestdb.

You run the following command in an Azure Synapse Analytics Spark pool in MyWorkspace. CREATE TABLE mytestdb.myParquetTable(

EmployeeID int, EmployeeName string, EmployeeStartDate date) USING Parquet

You then use Spark to insert a row into mytestdb.myParquetTable. The row contains the following data.

EmployeeName	EmployeeID	EmployeeStartDate
Alice	24	2020-01-25

One minute later, you execute the following query from a serverless SQL pool in MyWorkspace. SELECT EmployeeID

FROM mytestdb.dbo.myParquetTable WHERE name = 'Alice';

What will be returned by the query?

A. 24

B. an error

C. a null value

Answer: A

Explanation:

Once a database has been created by a Spark job, you can create tables in it with Spark that use Parquet as the storage format. Table names will be converted to lower case and need to be queried using the lower case name. These tables will immediately become available for querying by any of the Azure Synapse workspace Spark pools. They can also be used from any of the Spark jobs subject to permissions.

Note: For external tables, since they are synchronized to serverless SQL pool asynchronously, there will be a delay until they appear.

Reference:

https://docs.microsoft.com/en-us/azure/synapse-analytics/metadata/table

99. - (Exam Topic 3)

You have an Azure Synapse Analytics job that uses Scala. You need to view the status of the job.

What should you do?

A. From Azure Monitor, run a Kusto query against the AzureDiagnostics table.

B. From Azure Monitor, run a Kusto query against the SparkLogying1 Event.CL table.

C. From Synapse Studio, select the workspace. From Monitor, select Apache Sparks applications.

D. From Synapse Studio, select the workspace. From Monitor, select SQL requests.

Answer: C

100. - (Exam Topic 3)

You have an Azure event hub named retailhub that has 16 partitions. Transactions are posted to retailhub. Each transaction includes the transaction ID, the individual line items, and the payment details. The transaction ID is used as the partition key.

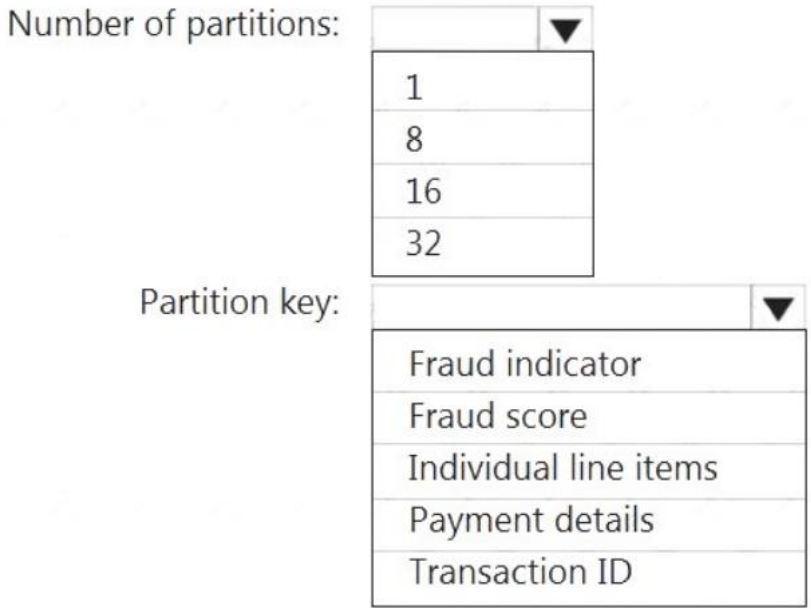
You are designing an Azure Stream Analytics job to identify potentially fraudulent transactions at a retail store. The job will use retailhub as the input. The job will output the transaction ID, the individual line items, the payment details, a fraud score, and a fraud indicator.

You plan to send the output to an Azure event hub named fraudhub.

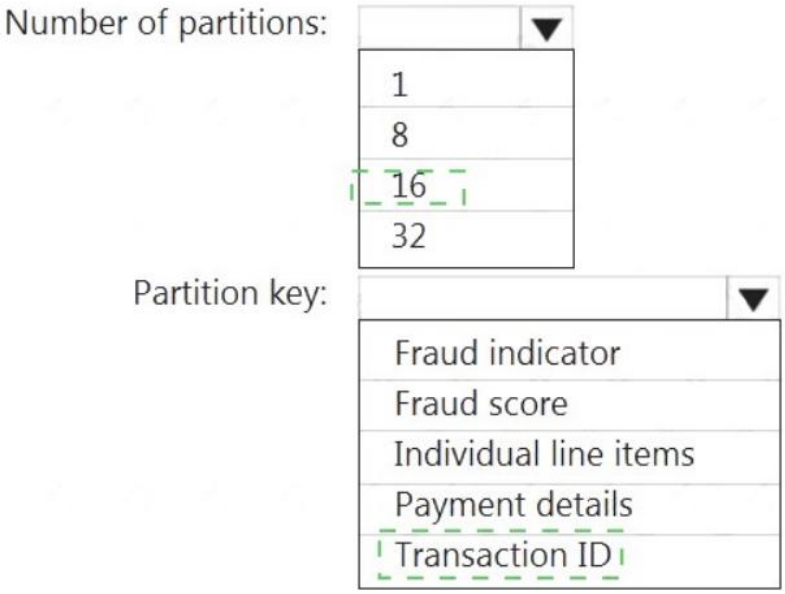
You need to ensure that the fraud detection solution is highly scalable and processes transactions as quickly as possible.

How should you structure the output of the Stream Analytics job? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.



Answer:



Explanation:

Box 1: 16

For Event Hubs you need to set the partition key explicitly.

An embarrassingly parallel job is the most scalable scenario in Azure Stream Analytics. It connects one partition of the input to one instance of the query to one partition of the output.

Box 2: Transaction ID Reference:

https://docs.microsoft.com/en-us/azure/event-hubs/event-hubs-features#partitions

101. - (Exam Topic 3)

You are designing an Azure Databricks interactive cluster. The cluster will be used infrequently and will be configured for auto-termination.

You need to ensure that the cluster configuration is retained indefinitely after the cluster is terminated. The solution must minimize costs.

What should you do?

A. Clone the cluster after it is terminated.

B. Terminate the cluster manually when processing completes.

C. Create an Azure runbook that starts the cluster every 90 days.

D. Pin the cluster.

Answer: D

Explanation:

To keep an interactive cluster configuration even after it has been terminated for more than 30 days, an administrator can pin a cluster to the cluster list.

References:

https://docs.azuredatabricks.net/clusters/clusters-manage.html#automatic-termination

102. - (Exam Topic 3)

You are designing a dimension table for a data warehouse. The table will track the value of the dimension attributes over time and preserve the history of the data by adding new rows as the data changes.

Which type of slowly changing dimension (SCD) should use?

A. Type 0

B. Type 1

C. Type 2

D. Type 3

Answer: C

Explanation:

Type 2 - Creating a new additional record. In this methodology all history of dimension changes is kept in the database. You capture attribute change by adding a new row with a new surrogate key to the dimension table. Both the prior and new rows contain as attributes the natural key(or other durable identifier). Also 'effective date' and 'current indicator' columns are used in this method. There could be only one record with current indicator set to 'Y'. For 'effective date' columns, i.e. start_date and end_date, the end_date for current record usually is set to value 9999-12-31. Introducing changes to the dimensional model in type 2 could be very expensive database operation so it is not recommended to use it in dimensions where a new attribute could be added in the future.

https://www.datawarehouse4u.info/SCD-Slowly-Changing-Dimensions.html

103. - (Exam Topic 3)

You have a partitioned table in an Azure Synapse Analytics dedicated SQL pool.

You need to design queries to maximize the benefits of partition elimination. What should you include in the

Transact-SQL queries?

A. JOIN

B. WHERE

C. DISTINCT

D. GROUP BY

Answer: B

104. - (Exam Topic 3)

You use Azure Stream Analytics to receive Twitter data from Azure Event Hubs and to output the data to an Azure Blob storage account.

You need to output the count of tweets during the last five minutes every five minutes. Each tweet must only be counted once.

Which windowing function should you use?

A. a five-minute Session window

B. a five-minute Sliding window

C. a five-minute Tumbling window

D. a five-minute Hopping window that has one-minute hop

Answer: C

Explanation:

Tumbling window functions are used to segment a data stream into distinct time segments and perform a function against them, such as the example below. The key differentiators of a Tumbling window are that they repeat, do not overlap, and an event cannot belong to more than one tumbling window.

References:

https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-window-functions

105. - (Exam Topic 3)

You have an Azure Data Lake Storage Gen2 container.

Data is ingested into the container, and then transformed by a data integration application. The data is NOT modified after that. Users can read files in the container but cannot modify the files.

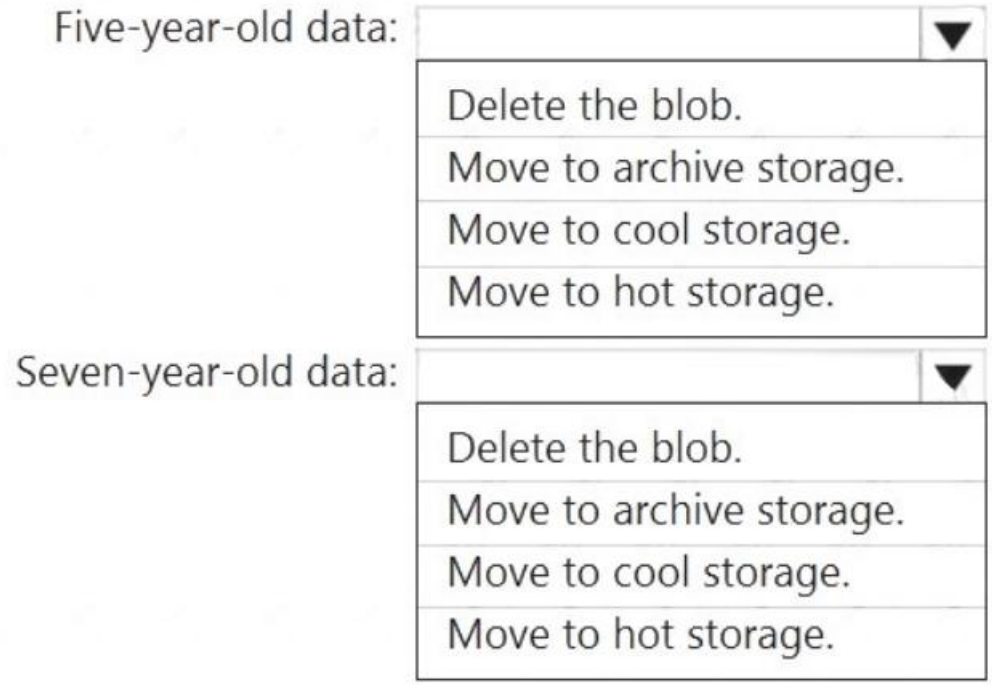
You need to design a data archiving solution that meets the following requirements: ➢ New data is accessed frequently and must be available as quickly as possible.

➢ Data that is older than five years is accessed infrequently but must be available within one second when requested.

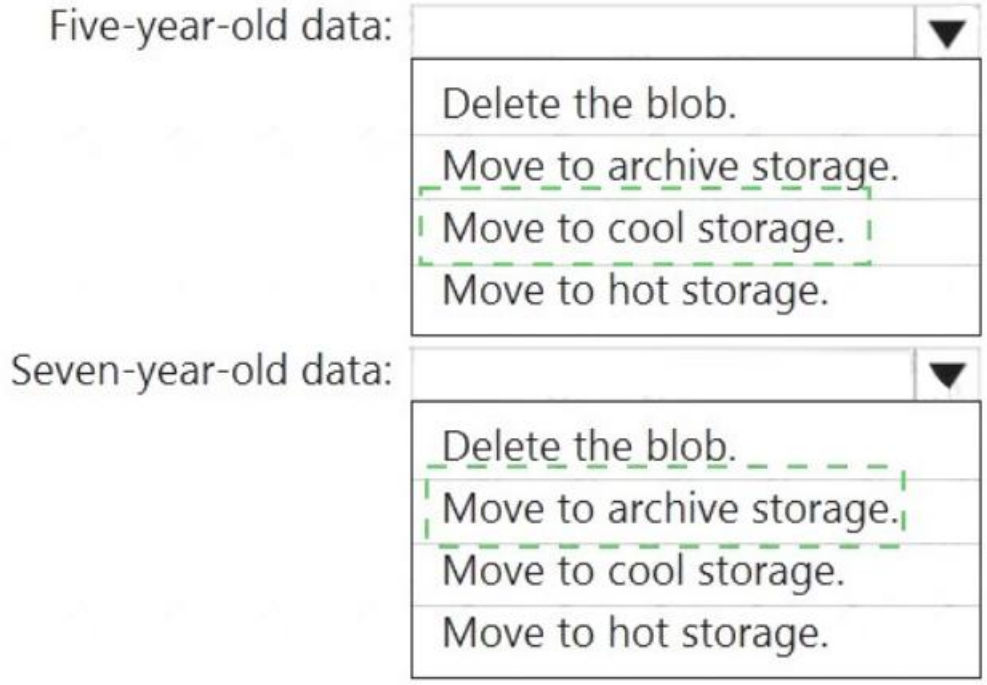
➢ Data that is older than seven years is NOT accessed. After seven years, the data must be persisted at the lowest cost possible.

➢ Costs must be minimized while maintaining the required availability.

How should you manage the data? To answer, select the appropriate options in the answer area. NOTE: Each correct selection is worth one point



Answer:



Explanation:

Box 1: Move to cool storage Box 2: Move to archive storage

Archive - Optimized for storing data that is rarely accessed and stored for at least 180 days with flexible latency requirements, on the order of hours.

The following table shows a comparison of premium performance block blob storage, and the hot, cool, and archive access tiers.

	Premium performance	Hot tier	Cool tier	Archive tier
Availability	99.9%	99.9%	99%	Offline
Availability (RA-GRS reads)	N/A	99.99%	99.9%	Offline
Usage charges	Higher storage costs, lower access, and transaction cost	Higher storage costs, lower access, and transaction costs	Lower storage costs, higher access, and transaction costs	Lowest storage costs, highest access, and transaction costs
Minimum storage duration	N/A	N/A	30 days[1]	180 days
Latency (Time to first byte)	Single-digit milliseconds	milliseconds	milliseconds	hours[2]

Reference:

https://docs.microsoft.com/en-us/azure/storage/blobs/storage-blob-storage-tiers

Explanation::

Box 1: Replicated

Replicated tables are ideal for small star-schema dimension tables, because the fact table is often distributed on a column that is not compatible with the connected dimension tables. If this case applies to your schema, consider changing small dimension tables currently implemented as round-robin to replicated.

Box 2: Replicated

Box 3: Replicated

Box 4: Hash-distributed

For Fact tables use hash-distribution with clustered columnstore index. Performance improves when two hash tables are joined on the same distribution column.

Reference:

https://azure.microsoft.com/en-us/updates/reduce-data-movement-and-make-your-queries-more-efficient-

with-th

https://azure.microsoft.com/en-us/blog/replicated-tables-now-generally-available-in-azure-sql-data-warehouse/

106. - (Exam Topic 3)

You have an Azure Synapse Analytics dedicated SQL pool that contains a table named Table1. You have files that are ingested and loaded into an Azure Data Lake Storage Gen2 container named container1.

You plan to insert data from the files into Table1 and azure Data Lake Storage Gen2 container named container1.

You plan to insert data from the files into Table1 and transform the data. Each row of data in the files will produce one row in the serving layer of Table1.

You need to ensure that when the source data files are loaded to container1, the DateTime is stored as an additional column in Table1.

Solution: In an Azure Synapse Analytics pipeline, you use a Get Metadata activity that retrieves the DateTime of the files.

Does this meet the goal?

A. Yes

B. No

Answer: B

107. - (Exam Topic 3)

You have an Azure Synapse Analystics dedicated SQL pool that contains a table named Contacts. Contacts contains a column named Phone.

You need to ensure that users in a specific role only see the last four digits of a phone number when querying the Phone column.

What should you include in the solution?

A. a default value

B. dynamic data masking

C. row-level security (RLS)

D. column encryption

E. table partitions

Answer: C

108. - (Exam Topic 3)

You have a table in an Azure Synapse Analytics dedicated SQL pool. The table was created by using the following Transact-SQL statement.

```
CREATE TABLE [dbo].[DimEmployee](
  [EmployeeKey] [int] IDENTITY(1,1) NOT NULL,
  [EmployeeID] [int] NOT NULL,
  [FirstName] [varchar](100) NOT NULL,
  [LastName] [varchar](100) NOT NULL,
  [JobTitle] [varchar](100) NULL,
  [LastHireDate] [date] NULL,
  [StreetAddress] [varchar](500) NOT NULL,
  [City] [varchar](200) NOT NULL,
  [StateProvince] [varchar](50) NOT NULL,
  [Portalcode] [varchar](10) NOT NULL
  )
```

You need to alter the table to meet the following requirements:

- Ensure that users can identify the current manager of employees.
- Support creating an employee reporting hierarchy for your entire company.
- Provide fast lookup of the managers' attributes such as name and job title.

Which column should you add to the table?

A. [ManagerEmployeeID] [int] NULL

B. [ManagerEmployeeID] [smallint] NULL

C. [ManagerEmployeeKey] [int] NULL

D. [ManagerName] [varchar](200) NULL

Answer: A

Explanation:

Use the same definition as the EmployeeID column. Reference:

https://docs.microsoft.com/en-us/analysis-services/tabular-models/hierarchies-ssas-tabular