QUESTION 123
Case Study 1 - Contoso, Ltd
Overview
Contoso, Ltd. is a clothing retailer based in Seattle. The company has 2,000 retail stores across the United States and an emerging online presence.
The network contains an Active Directory forest named contoso.com. The forest it integrated with an Azure Active Directory (Azure AD) tenant named contoso.com. Contoso has an Azure subscription associated to the contoso.com Azure AD tenant.
Existing Environment
Transactional Data
Contoso has three years of customer, transactional, operational, 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 periods. 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 an Azure logic app that captures trending Twitter feeds referencing the company's products and pushes the products to Azure Event Hubs.
Planned Changes and Requirements
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 Requirements
Contoso identifies the following requirements for customer sentiment analytics:

- 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.
- 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 that 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 Synapse 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

Hotspot Question

You need to design an analytical storage solution for the transactional data. 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 Area

Answer:

Answer Area

Explanation:
Box 1: Round-robin
Round-robin tables are useful for improving loading speed.
Scenario: Partition data that contains sales transaction records. Partitions must be designed to provide efficient loads by month.
Box 2: Hash
Hash-distributed tables improve query performance on large fact tables.
Scenario:
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.
Ensure that queries joining and filtering sales transaction records based on product ID complete as quickly as possible.
Reference:
https://docs.microsoft.com/en-us/azure/synapse-analytics/sql-data-warehouse/sql-data-warehouse-tables-distribute

QUESTION 124
You have an enterprise data warehouse in Azure Synapse Analytics.
Using PolyBase, you create an external table named [Ext].[Items] to query Parquet files stored in Azure Data Lake Storage Gen2 without importing the data to the data warehouse.
The external table has three columns.
You discover that the Parquet files have a fourth column named ItemID.
Which command should you run to add the ItemID column to the external table?

A.
```
ALTER EXTERNAL TABLE [Ext].[Items]
  ADD [ItemID] int;
```

B.
```
DROP EXTERNAL FILE FORMAT parquetfile1;
CREATE EXTERNAL FILE FORMAT parquetfile1
WITH (
     FORMAT_TYPE = PARQUET,
     DATA_COMPRESSION = 'org.apache.hadoop.io.compress.SnappyCodec'
);
```

C.
```
DROP EXTERNAL TABLE [Ext].[Items]
CREATE EXTERNAL TABLE [Ext].[Items]
([ItemID] [int] NULL,
 [ItemName] nvarchar(50) NULL,
 [ItemType] nvarchar(20) NULL,
 [ItemDescription] nvarchar(250))
WITH
(
     LOCATION= '/Items/',
          DATA_SOURCE = AzureDataLakeStore,
          FILE_FORMAT = PARQUET,
          REJECT_TYPE = VALUE,
          REJECT_VALUE = 0
);
```

D.
```
ALTER TABLE [Ext].[Items]
ADD [ItemID] int;
```

Answer: C
Explanation:
Incorrect Answers:
A, D: Only these Data Definition Language (DDL) statements are allowed on external tables:
CREATE TABLE and DROP TABLE
CREATE STATISTICS and DROP STATISTICS
CREATE VIEW and DROP VIEW
Reference:
https://docs.microsoft.com/en-us/sql/t-sql/statements/create-external-table-transact-sql

QUESTION 125
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 have an Azure Storage account that contains 100 GB of files. The files contain rows of 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 copy the files to a table that has a columnstore index.
Does this meet the goal?

A. Yes
B. No

Answer: B
Explanation:
Instead convert the files to compressed delimited text files.
Reference:
https://docs.microsoft.com/en-us/azure/sql-data-warehouse/guidance-for-loading-data

QUESTION 126
A company has a real-time data analysis solution that is hosted on Microsoft Azure. The solution uses Azure Event Hub to ingest data and an Azure Stream Analytics cloud job to analyze the data. The cloud job is configured to use 120

Streaming Units (SU).
You need to optimize performance for the Azure Stream Analytics job.
Which two actions should you perform? Each correct answer presents part of the solution.
NOTE: Each correct selection is worth one point.

A. Implement event ordering.
B. Implement Azure Stream Analytics user-defined functions (UDF).
C. Implement query parallelization by partitioning the data output.
D. Scale the SU count for the job up.
E. Scale the SU count for the job down.
F. Implement query parallelization by partitioning the data input.

Answer: DF
Explanation:
D: Scale out the query by allowing the system to process each input partition separately.
F: A Stream Analytics job definition includes inputs, a query, and output. Inputs are where the job reads the data stream from.
Reference:
https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-parallelization

QUESTION 127
You need to trigger an Azure Data Factory pipeline when a file arrives in an Azure Data Lake Storage Gen2 container.
Which resource provider should you enable?

A. Microsoft.Sql
B. Microsoft.Automation
C. Microsoft.EventGrid
D. Microsoft.EventHub

Answer: C
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. Data Factory natively integrates with Azure Event Grid, which lets you trigger pipelines on such events.
Reference:
https://docs.microsoft.com/en-us/azure/data-factory/how-to-create-event-trigger
https://docs.microsoft.com/en-us/azure/data-factory/concepts-pipeline-execution-triggers

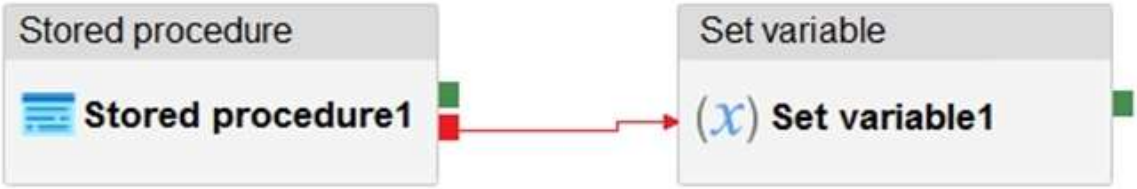
QUESTION 128
You plan to perform batch processing in Azure Databricks once daily.
Which type of Databricks cluster should you use?

A. High Concurrency
B. automated
C. interactive

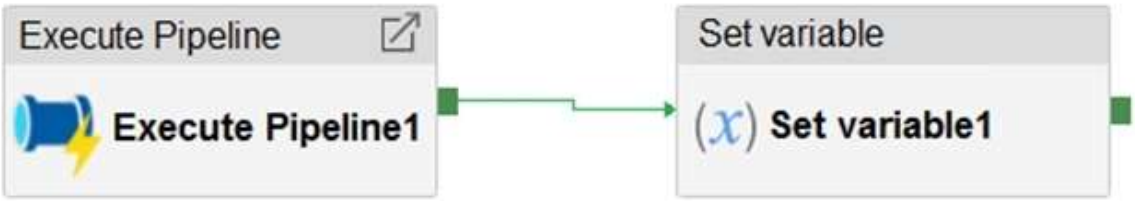
Answer: B
Explanation:
Azure Databricks has two types of clusters: interactive and automated. You use interactive clusters to analyze data collaboratively with interactive notebooks. You use automated clusters to run fast and robust automated jobs.
Example: Scheduled batch workloads (data engineers running ETL jobs) This scenario involves running batch job JARs and notebooks on a regular cadence through the Databricks platform.
The suggested best practice is to launch a new cluster for each run of critical jobs. This helps avoid any issues (failures, missing SLA, and so on) due to an existing workload (noisy neighbor) on a shared cluster.
Reference:

https://docs.databricks.com/administration-guide/cloud-configurations/aws/cmbp.html#scenario-3-scheduled-batch-workloads-data-engineers-running-etl-jobs

QUESTION 129
You have an Azure Data Factory instance that contains two pipelines named Pipeline1 and Pipeline2.
Pipeline1 has the activities shown in the following exhibit.



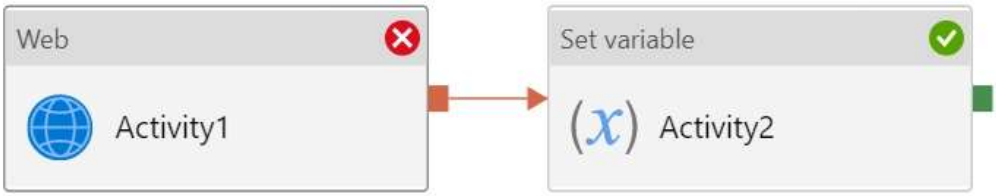
Pipeline2 has the activities shown in the following exhibit.



You execute Pipeline2, and Stored procedure1 in Pipeline1 fails.
What is the status of the pipeline runs?

A. Pipeline1 and Pipeline2 succeeded.
B. Pipeline1 and Pipeline2 failed.
C. Pipeline1 succeeded and Pipeline2 failed.
D. Pipeline1 failed and Pipeline2 succeeded.

Answer: A
Explanation:
Activities are linked together via dependencies. A dependency has a condition of one of the following: Succeeded, Failed, Skipped, or Completed.
Consider Pipeline1:
If we have a pipeline with two activities where Activity2 has a failure dependency on Activity1, the pipeline will not fail just because Activity1 failed. If Activity1 fails and Activity2 succeeds, the pipeline will succeed.
This scenario is treated as a try-catch block by Data Factory.



The failure dependency means this pipeline reports success.
Note:
If we have a pipeline containing Activity1 and Activity2, and Activity2 has a success dependency on Activity1, it will only execute if Activity1 is successful. In this scenario, if Activity1 fails, the pipeline will fail.
Reference:
https://datasavvy.me/category/azure-data-factory/

QUESTION 130
You have an Azure Data Factory that contains 10 pipelines.
You need to label each pipeline with its main purpose of either ingest, transform, or load. The labels must be available for grouping and filtering when using the monitoring experience in Data Factory.

What should you add to each pipeline?

A. a resource tag
B. a correlation ID
C. a run group ID
D. an annotation

Answer: D
Explanation:
Annotations are additional, informative tags that you can add to specific factory resources: pipelines, datasets, linked services, and triggers. By adding annotations, you can easily filter and search for specific factory resources.
Reference:
https://www.cathrinewilhelmsen.net/annotations-user-properties-azure-data-factory/

QUESTION 131
You are designing a statistical analysis solution that will use custom proprietary 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 Synapse Analytics
B. Azure Databricks
C. Azure Stream Analytics
D. Azure SQL Database

Answer: C
Explanation:
https://docs.microsoft.com/en-us/azure/event-hubs/process-data-azure-stream-analytics

QUESTION 132
You need to implement a Type 3 slowly changing dimension (SCD) for product category data in an Azure Synapse Analytics dedicated SQL pool.
You have a table that was created by using the following Transact-SQL statement.

```
CREATE TABLE [DBO].[DimProduct] (
[ProductKey] [int] IDENTITY(1,1) NOT NULL,
[ProductSourceID] [int] NOT NULL,
[ProductName] [nvarchar] (100) NULL,
[Color] [nvarchar] (15) NULL,
[SellStartDate] [date] NOT NULL,
[SellEndDate] [date] NULL,
[RowInsertedDateTime] [datetime] NOT NULL,
[RowUpdatedDateTime] [datetime] NOT NULL,
[ETLAuditID] [int] NOT NULL
)
```

Which two columns should you add to the table? Each correct answer presents part of the solution.
NOTE: Each correct selection is worth one point.

A. [EffectiveStartDate] [datetime] NOT NULL,
B. [CurrentProductCategory] [nvarchar] (100) NOT NULL,
C. [EffectiveEndDate] [datetime] NULL,
D. [ProductCategory] [nvarchar] (100) NOT NULL,
E. [OriginalProductCategory] [nvarchar] (100) NOT NULL,

Answer: BE
Explanation:
A Type 3 SCD supports storing two versions of a dimension member as separate columns. The table includes a column for the current value of a member plus either the original or previous value of the member. So Type 3 uses additional columns to track one key instance of history, rather than storing additional rows to track each change like in a Type 2 SCD.
This type of tracking may be used for one or two columns in a dimension table. It is not common to use it for many members of the same table. It is often used in combination with Type 1 or Type 2 members.

CustomerID	FirstName	LastName	CurrentEmail	OriginalEmail	CompanyName	InsertedDate	ModifiedDate
2	Keith	Harris	keith0@aw.com	keith0@aw.com	Progressive Sports	2021-03-20	2021-03-20
3	Donna	Carreras	donna0@aw.com	donna0@aw.com	A Bike Store	2021-03-20	2021-03-20

CustomerID	FirstName	LastName	CurrentEmail	OriginalEmail	CompanyName	InsertedDate	ModifiedDate
2	Keith	Harris	keith0@aw.com	keith0@aw.com	Progressive Sports	2021-03-20	2021-03-20
3	Donna	Carreras	dc3@aw.com	donna0@aw.com	A Bike Store	2021-03-20	2021-03-22

Reference:
https://k21academy.com/microsoft-azure/azure-data-engineer-dp203-q-a-day-2-live-session-review/

QUESTION 133
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 10 seconds and a window 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

QUESTION 134
You have an Azure Data Factory version 2 (V2) resource named Df1. Df1 contains a linked service.
You have an Azure Key vault named vault1 that contains an encryption key named key1.
You need to encrypt Df1 by using key1.
What should you do first?

A. Add a private endpoint connection to vaul1.
B. Enable Azure role-based access control on vault1.
C. Remove the linked service from Df1.
D. Create a self-hosted integration runtime.

Answer: C
Explanation:
Linked services are much like connection strings, which define the connection information needed for Data Factory to

connect to external resources.
Incorrect Answers:
D: A self-hosted integration runtime copies data between an on-premises store and cloud storage.
Reference:
https://docs.microsoft.com/en-us/azure/data-factory/enable-customer-managed-key
https://docs.microsoft.com/en-us/azure/data-factory/concepts-linked-services
https://docs.microsoft.com/en-us/azure/data-factory/create-self-hosted-integration-runtime

QUESTION 135
You have a data warehouse in Azure Synapse Analytics.
You need to ensure that the data in the data warehouse is encrypted at rest.
What should you enable?

A. Advanced Data Security for this database
B. Transparent Data Encryption (TDE)
C. Secure transfer required
D. Dynamic Data Masking

Answer: B
Explanation:
Azure SQL Database currently supports encryption at rest for Microsoft-managed service side and client-side encryption scenarios.
Support for server encryption is currently provided through the SQL feature called Transparent Data Encryption.
Client-side encryption of Azure SQL Database data is supported through the Always Encrypted feature.
Reference:
https://docs.microsoft.com/en-us/azure/security/fundamentals/encryption-atrest

QUESTION 136
You are designing a streaming data solution that will ingest variable volumes of data.
You need to ensure that you can change the partition count after creation.
Which service should you use to ingest the data?

A. Azure Event Hubs Dedicated
B. Azure Stream Analytics
C. Azure Data Factory
D. Azure Synapse Analytics

Answer: A
Explanation:
You can't change the partition count for an event hub after its creation except for the event hub in a dedicated cluster.
Reference:
https://docs.microsoft.com/en-us/azure/event-hubs/event-hubs-features

QUESTION 137
You are designing a date dimension table in an Azure Synapse Analytics dedicated SQL pool. The date dimension table will be used by all the fact tables.
Which distribution type should you recommend to minimize data movement?

A. HASH
B. REPLICATE
C. ROUND_ROBIN

Answer: B
Explanation:
A replicated table has a full copy of the table available on every Compute node. Queries run fast on replicated tables since joins on replicated tables don't require data movement. Replication requires extra storage, though, and isn't practical for large tables.

Incorrect Answers:
A: A hash distributed table is designed to achieve high performance for queries on large tables.
C: A round-robin table distributes table rows evenly across all distributions. The rows are distributed randomly. Loading data into a round-robin table is fast. Keep in mind that queries can require more data movement than the other distribution methods.
Reference:
https://docs.microsoft.com/en-us/azure/synapse-analytics/sql-data-warehouse/sql-data-warehouse-tables-overview

QUESTION 138
You have an Azure data solution that contains an enterprise data warehouse in Azure Synapse Analytics named DW1.
Several users execute ad hoc queries to DW1 concurrently.
You regularly perform automated data loads to DW1.
You need to ensure that the automated data loads have enough memory available to complete quickly and successfully when the adhoc queries run.
What should you do?

A. Hash distribute the large fact tables in DW1 before performing the automated data loads.
B. Assign a smaller resource class to the automated data load queries.
C. Assign a larger resource class to the automated data load queries.
D. Create sampled statistics for every column in each table of DW1.

Answer: C
Explanation:
The performance capacity of a query is determined by the user's resource class. Resource classes are pre-determined resource limits in Synapse SQL pool that govern compute resources and concurrency for query execution.
Resource classes can help you configure resources for your queries by setting limits on the number of queries that run concurrently and on the compute-resources assigned to each query. There's a trade-off between memory and concurrency.
Smaller resource classes reduce the maximum memory per query, but increase concurrency.
Larger resource classes increase the maximum memory per query, but reduce concurrency.
Reference:
https://docs.microsoft.com/en-us/azure/synapse-analytics/sql-data-warehouse/resource-classes-for-workload-management