POWER BI

PL-300

PART -3

Question 54:

You create a data model in Power BI.
Report developers and users provide feedback that the data model is too complex.

The model contains the following tables:

Table name	Column name	Data type
Sales_Region	region_id	Integer
	name	Varchar
Region_Manager	region_id	Integer
	manager_id	Integer
Sales_Manager	sales_manager_id	Integer
	name	Varchar
	region_id	Integer
Manager	manager_id	Integer
	name	Varchar

The model has the following relationships:

- **One-to-one relationship** between Sales_Region and Region_Manager
- **More records** in Manager than in Region_Manager, but every record in Region_Manager has a corresponding record in Manager
- **More records** in Sales_Manager than in Sales_Region, but every record in Sales_Region has a corresponding record in Sales_Manager

You need to **denormalize the model into a single table**.
Only managers **who are associated with a sales region** must be included in the reports.

Question 55:

Question:

You have a Microsoft Power BI report. The size of the **PBIX file is 550 MB**. The report is accessed using an **App workspace in shared capacity** of **powerbi.com**.

The report uses an **imported dataset** that contains **one fact table with 12 million rows**. The dataset is scheduled to refresh **twice a day at 08:00 and 17:00**.

The report is a **single page** that contains **15 AppSource visuals and 10 default visuals**.

Users report that the **report is slow to load the visuals** when they access and interact with it.

You need to **improve the performance** of the report.

Options:

A. Change any DAX measures to use iterator functions.
B. Enable visual interactions.
C. Replace the default visuals with AppSource visuals.
D. Split the visuals onto multiple pages.

Answer:

✅ **D. Split the visuals onto multiple pages.**

Solution Explanation:

- The report **contains too many visuals (25 in total) on a single page**, which increases the load time because all visuals must be **rendered simultaneously**.
- **Splitting the visuals onto multiple pages** improves performance by reducing the number of visuals loading at once, leading to **faster rendering** and **better interactivity**.

Question 56:

You are creating a Microsoft Power BI imported data model to perform basket analysis. The goal of the analysis is to identify which products are usually bought together in the same transaction across and within sales territories.
You import a fact table named Sales as shown in the exhibit.

Results Messages

	SalesRowID	ProductKey	OrderDateKey	OrderDate	CustomerKey	SalesTerritoryKey	SalesOrderNumber	SalesOrderLineNumber	OrderQuantity	LineTotal	TaxAmt	Freight	LastModified	AuditID
1	1	310	20101229	2010-12-29 00:00:00.000	21768	6	SO43697	1	1	3578.27	286.2616	89.4568	2011-01-10 00:00:00.000	127
2	2	346	20101229	2010-12-29 00:00:00.000	28389	7	SO43698	1	1	3399.99	271.9992	84.9998	2011-01-10 00:00:00.000	127
3	3	346	20101229	2010-12-29 00:00:00.000	25863	1	SO43699	1	1	3399.99	271.9992	84.9998	2011-01-10 00:00:00.000	127
4	4	336	20101229	2010-12-29 00:00:00.000	14501	4	SO43700	1	1	699.0982	55.9279	17.4775	2011-01-10 00:00:00.000	127
5	5	346	20101229	2010-12-29 00:00:00.000	11003	9	SO43701	1	1	3399.99	271.9992	84.9998	2011-01-10 00:00:00.000	127
6	6	311	20101230	2010-12-30 00:00:00.000	27645	4	SO43702	1	1	3578.27	286.2616	89.4568	2011-01-11 00:00:00.000	127
7	7	310	20101230	2010-12-30 00:00:00.000	16624	9	SO43703	1	1	3578.27	286.2616	89.4568	2011-01-11 00:00:00.000	127

The related dimension tables are imported into the model.
Sales contains the data shown in the following table.

Column name	Data type	Description
SalesRowID	Integer	ID of the row from the source system, which represents a unique combination of SalesOrderNumber and SalesOrderLineNumber
ProductKey	Integer	Surrogate key that relates to the product dimension
OrderDateKey	Integer	Surrogate key that relates to the date dimension and is in the YYYYMMDD format
OrderDate	Datetime	Date and time an order was processed
CustomerKey	Integer	Surrogate key that relates to the customer dimension
SalesTerritoryKey	Integer	Surrogate key that relates to the sales territory dimension
SalesOrderNumber	Text	Unique identifier of an order
SalesOrderLineNumber	Integer	Unique identifier of a line within an order
OrderQuantity	Integer	Quantity of the product ordered
LineTotal	Decimal	Total sales amount of a line before tax
TaxAmt	Decimal	Amount of tax charged for the items on a specified line within an order
Freight	Decimal	Amount of freight charged for the items on a specified line within an order
LastModified	Datetime	The date and time that a row was last modified in the source system
AuditID	Integer	The ID of the data load process that last updated a row

You are evaluating how to optimize the model.
For each of the following statements, select Yes if the statement is true. Otherwise, select No.
NOTE: Each correct selection is worth one point.
Hot Area:

Answer Area

Statements	Yes	No
The SalesRowID and AuditID columns can be removed from the model without impeding the analysis goals.	◯	◯
Both the OrderDateKey and OrderDate columns are necessary to perform the basket analysis.	◯	◯
The TaxAmt column must retain the current number of decimal places to perform the basket analysis.	◯	◯

Answer:

Answer Area

Statements	Yes	No
The SalesRowID and AuditID columns can be removed from the model without impeding the analysis goals.	◯	◯
Both the OrderDateKey and OrderDate columns are necessary to perform the basket analysis.	◯	◯
The TaxAmt column must retain the current number of decimal places to perform the basket analysis.	◯	◯

Question 57:

Question:

You have a Microsoft Power BI data model that contains three tables:

- **Orders**
- **Date**
- **City**

There is a **one-to-many relationship** between:

- **Date → Orders**
- **City → Orders**

The model contains two **row-level security (RLS) roles**:

- **Role1:** City[State Province] = "Kentucky"
- **Role2:** Date[Calendar Year] = 2020

If a user is a member of **both Role1 and Role2**, what data will they see in a report that uses the model?

Options:

A. The user will see data for which the **State Province** value is **Kentucky** or where the **Calendar Year** is **2020**.
B. The user will **receive an error** and will not be able to see the data in the report.
C. The user will **only see data** for which the **State Province** value is **Kentucky**.
D. The user will **only see data** for which the **State Province** value is **Kentucky** and the **Calendar Year** is **2020**.

Answer:

✅ **D. The user will only see data for which the State Province value is Kentucky and the Calendar Year is 2020.**

Solution Explanation:

- **Power BI applies RLS roles using an AND condition** when a user is assigned to multiple roles.
- **Role1 filters data** where City[State Province] = "Kentucky", meaning the user **only sees orders** from Kentucky.
- **Role2 filters data** where Date[Calendar Year] = 2020, meaning the user **only sees orders** from 2020.

- Since the user is assigned **both roles**, Power BI applies **both filters simultaneously** (Kentucky AND 2020).

Result:

- The user **will only see orders from Kentucky that occurred in 2020**.
- They **will not see** orders from other states or years.

🔹 **Key Concept: Multiple RLS roles combine using AND logic, not OR logic.**

Question 58:

Question Recap:

You are working with a **large SQL Server table (Order) containing more than 100 million records** in **Power BI**. You need to **import a sample of the data** during the development process.

Proposed Solution:

- **Use Power Query Editor**
- **Import the full table**
- **Apply a filter step to the query**

Does this meet the goal?

Answer:

❌ **B. No**

Explanation:

The proposed solution **imports all 100 million records first** and then applies a filter **inside Power Query Editor**. This **does not optimize performance**, because:

✅ **Better Approach:** Instead of importing all data and then filtering it in Power Query, you should **limit the data at the source level** before loading it into Power BI.

🔹 **Alternative Methods:**

1. **Use a SQL Query**: Instead of importing the full table, use a SELECT TOP or WHERE clause in the Power BI query editor:
2. SELECT TOP 10000 * FROM Order

   or

   SELECT * FROM Order WHERE OrderDate >= '2023-01-01'

3. **Enable Query Folding**: If filtering in Power Query, ensure that the filter is **pushed to the SQL Server query** rather than processing it locally.

Why the Given Solution is Incorrect?

- Power BI will **import all 100M rows first** and **then** filter them, which is inefficient.
- Large datasets should be **filtered at the source level** to reduce memory and processing load.

Question 59:

Question Recap:

You are working with a **large SQL Server table (Order) containing more than 100 million records** in **Power BI**. You need to **import a sample of the data** during the development process.

Proposed Solution:

- Use a **DAX expression with the FILTER function** to limit the data.

Does this meet the goal?

Answer:

❌ **B. No**

Explanation:

Using the **FILTER function in DAX** applies filtering **after** the data has already been loaded into the Power BI model. This **does not reduce the initial dataset size before import**, which is the primary goal of the question.

Why is this solution incorrect?

- **DAX operates on imported data** (after it's loaded into Power BI), so the full 100 million rows would still be loaded first.
- The goal is to **import only a sample** of the data, which should be done at the **source level** before loading into Power BI.
- Using **DAX FILTER does not impact the import process**, only how data is calculated or displayed after import.

Correct Approach:

✅ **Filter data before importing** using one of the following methods:

1. **Use a SQL Query in Power BI**
    - Instead of importing the entire table, use a query like:
    - SELECT TOP 10000 * FROM Order

or

SELECT * FROM Order WHERE OrderDate >= '2023-01-01'

2. **Use Power Query Filtering (with Query Folding)**
    - Apply a filter **before loading data** in Power Query (ensuring query folding pushes the filter to SQL Server).
3. **Use DirectQuery Mode**
    - If working with large datasets, consider **DirectQuery** instead of **Import Mode** to query data dynamically from SQL Server.

Question 60:

Question Recap:

You are working with a **large SQL Server table (Order) with more than 100 million records** in **Power BI**. You need to **import a sample of the data** during the development process.

Proposed Solution:

- Add a **WHERE clause to the SQL statement** to limit the number of records being imported.

Does this meet the goal?

Answer:

✅ **A. Yes**

Explanation:

Using a **WHERE clause in the SQL statement** effectively **filters the data at the source** before it is imported into Power BI. This **reduces the dataset size** before loading, which is the correct approach.

Question 61:

You are preparing a financial report in Power BI.
You connect to the data stored in a Microsoft Excel spreadsheet by using Power Query Editor as

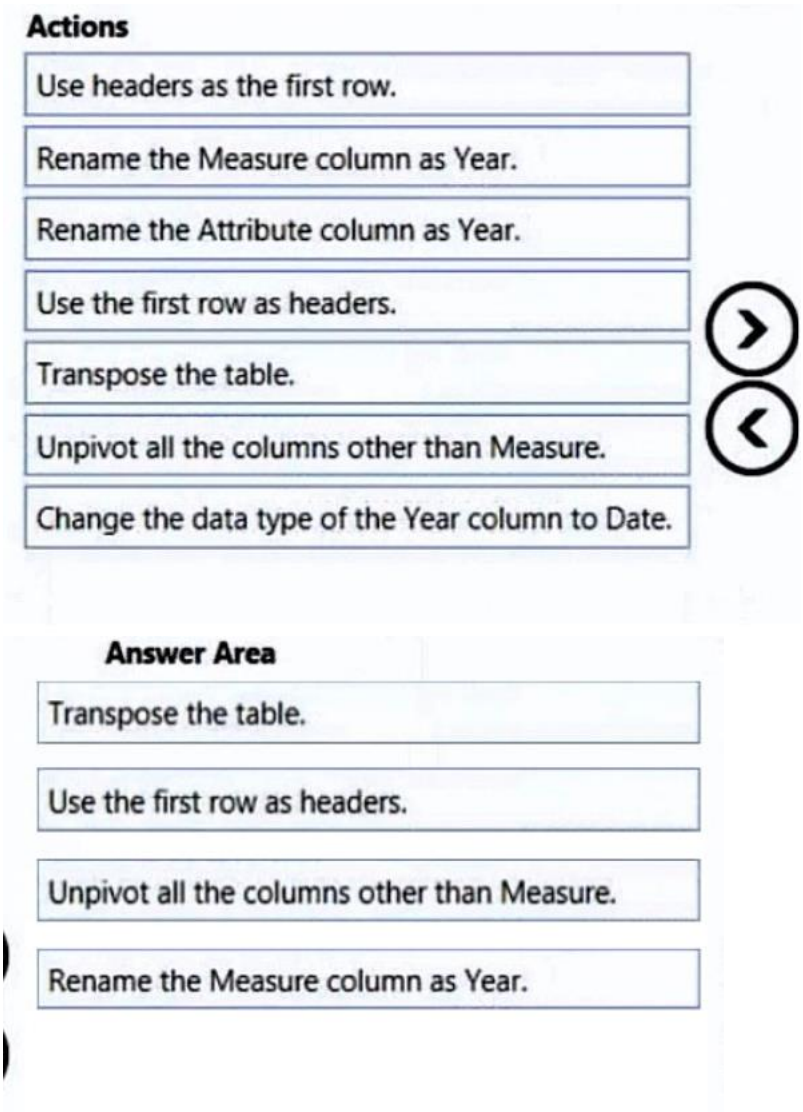
shown in the following exhibit.

	Column1	1.2 Column2	1.2 Column3	1.2 Column4	1.2 Column5	1.2 Column6
1	Measure	2016	2017	2018	2019	2020
2	Revenue	0.5	0.6	0.55	0.61	0.42
3	Overheads	0.11	0.330410907	0.167055779	0.360178153	0.183179995
4	Cost of Goods	0.204388253	0.165848321	0.25	0.17	0.109073918

You need to prepare the data to support the following:

- Visualizations that include all measures in the data over time
- Year-over-year calculations for all the measures

Which four actions should you perform in sequence? To answer, move the appropriate actions

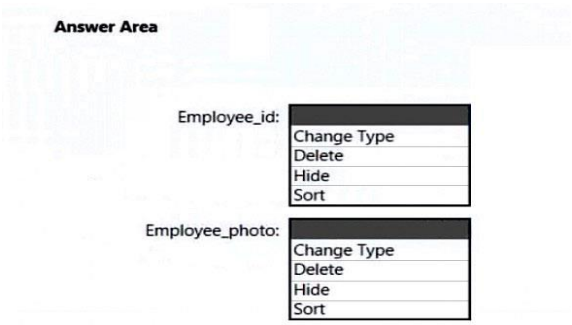


Question 62:

You are creating an analytics report that will consume data from the tables shown in the following table.

Table name	Column name	Data type
Sales	sales_id	Integer
	sales_date	Datetime
	Customer_id	Integer
	sales_amount	Floating
	employee_id	Integer
	sales_ship_date	Datetime
	store_id	Varchar(100)
Employee	employee_id	Integer
	first_name	Varchar(100)
	last_name	Varchar(100)
	employee_photo	Binary

There is a relationship between the tables.
There are no reporting requirements on employee_id and employee_photo.
You need to optimize the data model.
What should you configure for employee_id and employee_photo? To answer, select the appropriate options in the answer area.
NOTE: Each correct selection is worth one point.
Hot Area:



Answer:

✅ **A. HIDE**

✅ **B. DELETE**

Question 63:

You plan to create Power BI dataset to analyze attendance at a school. Data will come from two separate views named View1 and View2 in an Azure SQL database.
View1 contains the columns shown in the following table.

Name	Data type
Attendance Date	Date
Student ID	Bigint
Period Number	Tinyint
Class ID	Int

View2 contains the columns shown in the following table.

Name	Data type
Class ID	Bigint
Class Name	Varchar(200)
Class Subject	Varchar(100)
Teacher ID	Int
Teacher First Name	Varchar(100)
Teacher Last Name	Varchar(100)
Period Number	Tinyint
School Year	Varchar(50)
Period Start Time	Time
Period End Time	Time

The views can be related based on the Class ID column.
Class ID is the unique identifier for the specified class, period, teacher, and school year. For example, the same class can be taught by the same teacher during two different periods, but the class will have a different class ID.
You need to design a star schema data model by using the data in both views. The solution must facilitate the following analysis:

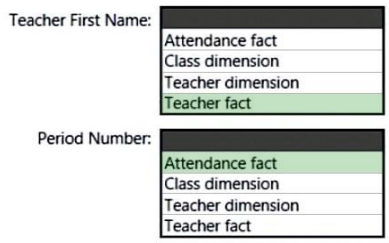
☞ The count of classes that occur by period

☞ The count of students in attendance by period by day

☞ The average number of students attending a class each month

In which table should you include the Teacher First Name and Period Number fields? To answer,

Answer Area



Final Answer:

- **Teacher First Name → Class Dimension**
- **Period Number → Attendance Fact Table**

Box 1: Teacher fact -
Fact tables store observations or events, and can be sales orders, stock balances, exchange rates, temperatures, etc. A fact table contains dimension key columns that relate to dimension tables, and numeric measure columns.
Note: Star schema is a mature modeling approach widely adopted by relational data warehouses. It requires modelers to classify their model tables as either dimension or fact.

Box 2: Attendance fact -
Incorrect:
Dimension tables describe business entities

the things you model. Entities can include products, people, places, and concepts including time itself. The most consistent table you'll find in a star schema is a date dimension table. A dimension table contains a key column (or columns) that acts as a unique identifier, and descriptive columns.

Question 64:

You have the Power BI model shown in the following exhibit.

There are four departments in the **Departments** table.
You need to ensure that users can see the data of their respective department only.

Options:

A. Create a slicer that filters Departments based on DepartmentID.
B. Create a row-level security (RLS) role for each department, and then define the membership of the role.
C. Create a DepartmentID parameter to filter the Departments table.
D. To the ConfidentialData table, add a calculated measure that uses the CURRENTGROUP DAX function.

Answer:

✅ **B. Create a row-level security (RLS) role for each department, and then define the membership of the role.**

Solution Explanation:

Row-Level Security (RLS) is the best way to restrict users' access to data in Power BI based on their department. By creating RLS roles and applying a filter on the **DepartmentID** column, users will only see the data related to their department.
This is done by defining roles in Power BI Desktop and then assigning users to those roles in the Power BI Service. Unlike slicers or parameters, RLS enforces data security at the model level, ensuring users cannot bypass restrictions.
Other options, like slicers and parameters, allow manual selection, making them unsuitable for security purposes. CURRENTGROUP is mainly used for aggregations and does not help in access control.

Question 65:

Question:

In Power BI Desktop, you are building a sales report that contains two tables. Both tables have **row-level security (RLS)** configured.

You need to create a relationship between the tables. The solution must ensure that **bidirectional cross-filtering honors the RLS settings**.
What should you do?

Options:

A. Create an **inactive** relationship between the tables and select **Apply security filter in both directions**.
B. Create an **active** relationship between the tables and select **Apply security filter in both directions**.
C. Create an **inactive** relationship between the tables and select **Assume referential integrity**.
D. Create an **active** relationship between the tables and select **Assume referential integrity**.

Answer:

✅ **B. Create an active relationship between the tables and select Apply security filter in both directions.**

Solution Explanation:

To ensure that **RLS works correctly across related tables**, you must:

1. **Create an active relationship** so that filtering can work automatically.
2. **Enable "Apply security filter in both directions"** to ensure that RLS settings **propagate** from one table to another in both directions.
3. This is important when dealing with **dimension and fact tables** where access control must be enforced consistently.

Choosing **Assume referential integrity** (options C and D) is only for **optimizing performance** when working with DirectQuery but does not impact security.
An **inactive relationship** (option A and C) does not automatically filter data and would require DAX to activate it, making it less efficient. 🚀

Question 66:

You are modelling data by using Microsoft Power BI. Part of the data model is a large Microsoft SQL Server table named **Order** that has more than 100 million records.
During the development process, you need to import a sample of the data from the **Order** table.
Solution: You add a **report-level filter** that filters based on the order date.
Does this meet the goal?

Options:

A. Yes
B. No

Answer:

✅ **B. No**

Solution Explanation:

A **report-level filter** only affects the **visualization layer** and is not used during the data import process. It will not limit the data that is being imported into the model.
To import a sample of the data, you should use **Power Query Editor** or a **SQL query** to filter the records during the data load process itself. You can also use **DirectQuery** or **parameters** to limit the data retrieved from the database during the development phase.

Question 67:

Question:

You have a Power BI report that imports a **date table** and a **sales table** from an Azure SQL database data source. The sales table has the following date foreign keys:

- Due Date
- Order Date
- Delivery Date

You need to support the analysis of sales over time based on all the date foreign keys.
Solution: For each date foreign key, you add **inactive relationships** between the sales table and the date table.
Does this meet the goal?

Options:

A. Yes
B. No

Answer:

✅ **A. Yes**

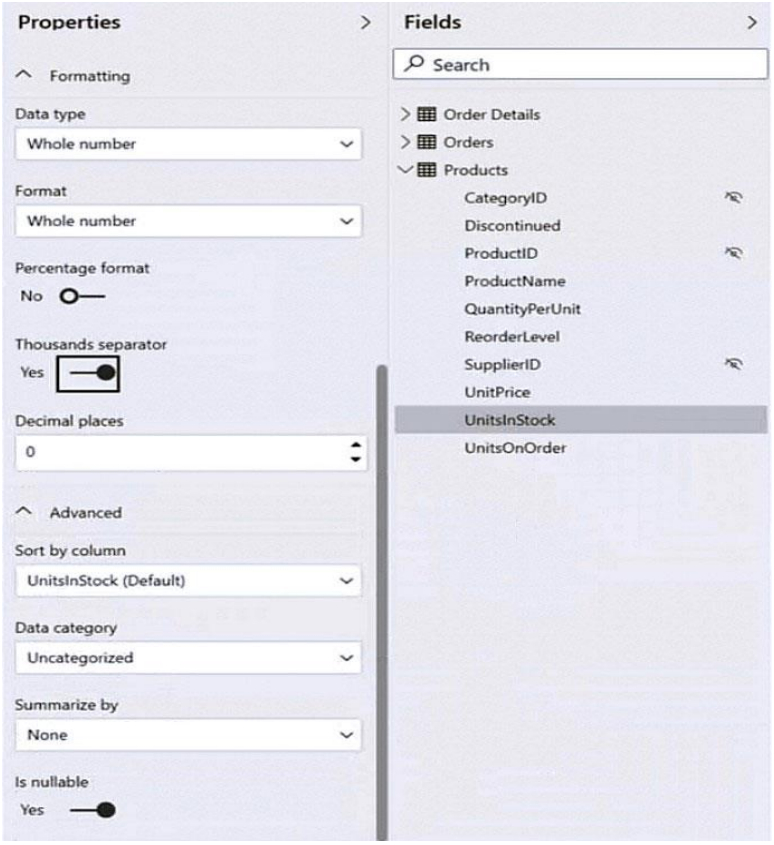
Solution Explanation:

By creating **inactive relationships** between the sales table and the date table for each of the foreign keys (Due Date, Order Date, Delivery Date), you can support the analysis of sales over time for each date field.
In Power BI, you can activate these relationships dynamically using the **USERELATIONSHIP** DAX function in measures to ensure that the inactive relationships are used in specific

calculations without affecting the overall model or filters. This setup allows for analyzing data based on different date columns, which is a common requirement in sales reporting.

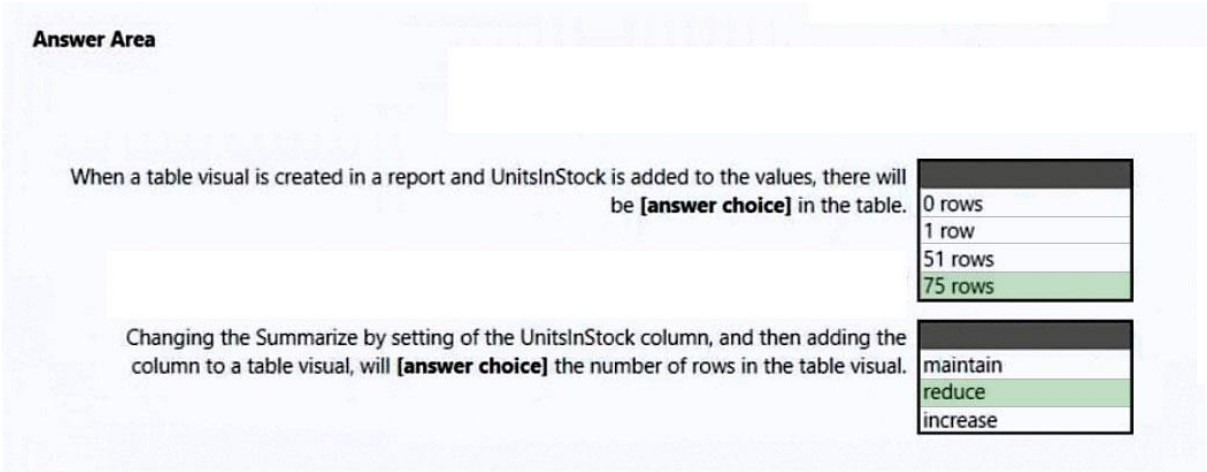
Question 68:

You have a column named UnitsInStock as shown in the following exhibit.



UnitsInStock has 75 non-null values, of which 51 are unique.
Use the drop-down menus to select the answer choice that completes each statement based on the information presented in the graphic.

Answer:



Question 69:

You have a Power BI report.
You have the following tables.

Name	Description
Balances	The table contains daily records of closing balances for every active bank account. The closing balances appear for every day the account is live, including the last day.
Date	The table contains a record per day for the calendar years of 2000 to 2025. There is a hierarchy for financial year, quarter, month, and day.

You have the following DAX measure.

Accounts :=
CALCULATE (DISTINCTCOUNT (Balances[AccountID]),LASTDATE ('Date'[Date])

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

Answer:

Answer Area

Statements	Yes	No
A table visual that displays the date hierarchy at the year level and the `[Accounts]` measure will show the total number of accounts that were live throughout the year.	○	○
A table visual that displays the date hierarchy at the month level and the `[Accounts]` measure will show the total number of accounts that were live throughout the month.	○	○
A table visual that displays the date hierarchy at the day level and the `[Accounts]` measure will show the total number of accounts that were live that day.	○	○

Note:
DISTINCTCOUNT counts the number of distinct values in a column.
LASTDATE returns the last date in the current context for the specified column of dates.

Question 70:

The **Impressions** table contains approximately 30 million records per month.
You need to create an ad analytics system to meet the following requirements:
☞ Present ad impression counts for the **day**, **campaign**, and **site_name**. The analytics for the last year are required.
Minimize the data model size.

Table name	Column name
Campaigns	Campaign_ID
	Name
Ads	Ad_id
	Name
	Campaign_id
Impressions	Impression_id
	Ad_id
	Site_name
	Impression_time
	Impression_date

Which two actions should you perform? Each correct answer presents part of the solution.

Options:

A. Create one-to-many relationships between the tables.
B. Group the Impressions query in Power Query by Ad_id, Site_name, and Impression_date. Aggregate by using the CountRows function.
C. Create a calculated table that contains Ad_id, Site_name, and Impression_date.
D. Create a calculated measure that aggregates by using the COUNTROWS function.

Answer:

✅ **B. Group the Impressions query in Power Query by Ad_id, Site_name, and Impression_date. Aggregate by using the CountRows function.**
✅ **D. Create a calculated measure that aggregates by using the COUNTROWS function.**

Solution Explanation:

1. **B. Group the Impressions query in Power Query by Ad_id, Site_name, and Impression_date. Aggregate by using the CountRows function:**
    - This approach allows you to **pre-aggregate** the data in Power Query, reducing the amount of data that is loaded into the model. By grouping the data by the necessary columns and counting rows in each group, you minimize the data size while still capturing the required analytics.
2. **D. Create a calculated measure that aggregates by using the COUNTROWS function:**
    - Calculated measures in Power BI are more efficient than storing large volumes of aggregated data in tables. The **COUNTROWS** function enables you to count rows in a table dynamically, allowing for aggregation based on filters such as day, campaign, or site_name, without duplicating data in the model. This further optimizes performance and minimizes the data model size.

Why not the others?

- **A. Create one-to-many relationships between the tables:**
  This is generally a good practice for building a relational model, but the main focus here is on reducing the data model size by minimizing the records in the **Impressions** table and using measures for analysis. The relationships are not the main solution here.
- **C. Create a calculated table that contains Ad_id, Site_name, and Impression_date:**
  While a calculated table may be helpful in some scenarios, creating a large calculated table with **Ad_id, Site_name, and Impression_date** would actually increase the data model size. The goal is to minimize the data size, not add more records.

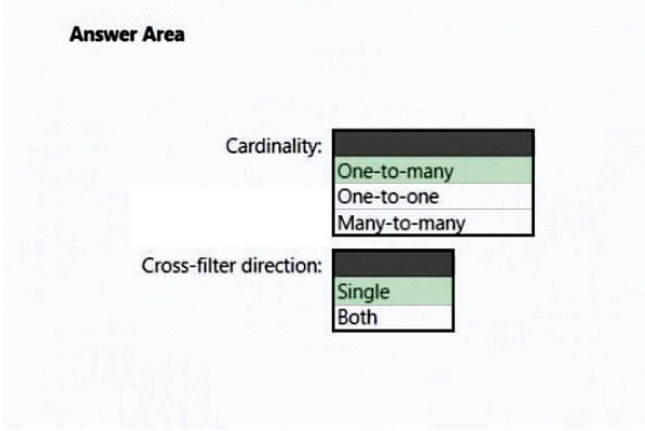
Question 71:

You are creating a Microsoft Power BI data model that has the tables shown in the following table.

Table name	Column name
Sales	SalesID
	ProductID
	DateKey
	SalesAmount
Products	ProductID
	ProductName
	ProductCategoryID
ProductCategory	ProductCategoryID
	CategoryName

The Products table is related to the ProductCategory table through the ProductCategoryID column. Each product has one product category.
You need to ensure that you can analyze sales by product category.
How should you configure the relationship from ProductCategory to Products? To answer, select the appropriate options in the answer area.

ANSWER:



- **Cardinality → One to many**
- **Cross-filter direction → Single**

Question 72:

Question:

You import a Power BI dataset that contains the following tables:

☞ **Date**
☞ **Product**
☞ **Product Inventory**

The **Product Inventory** table contains 25 million rows. A sample of the data is shown in the following table.

ProductKey	DateKey	MovementDate	UnitCost	UnitsIn	UnitsOut	UnitsBalance
167	20101228	28-Dec-10	0.19	0	0	875
167	20101229	29-Dec-10	0.19	0	0	875
167	20110119	19-Jan-11	0.19	0	0	875
167	20110121	21-Jan-11	0.19	0	0	875
167	20110122	22-Jan-11	0.19	0	0	875

The **Product Inventory** table relates to the **Date** table by using the **DateKey** column. The **Product Inventory** table relates to the **Product** table by using the **ProductKey** column.
You need to reduce the size of the data model without losing information.

What should you do?

Options:

A. Change Summarization for DateKey to Don't Summarize.
B. Remove the relationship between Date and Product Inventory.
C. Change the data type of UnitCost to Integer.
D. Remove MovementDate.

Answer:

✅ **D. Remove MovementDate.**

Solution Explanation:

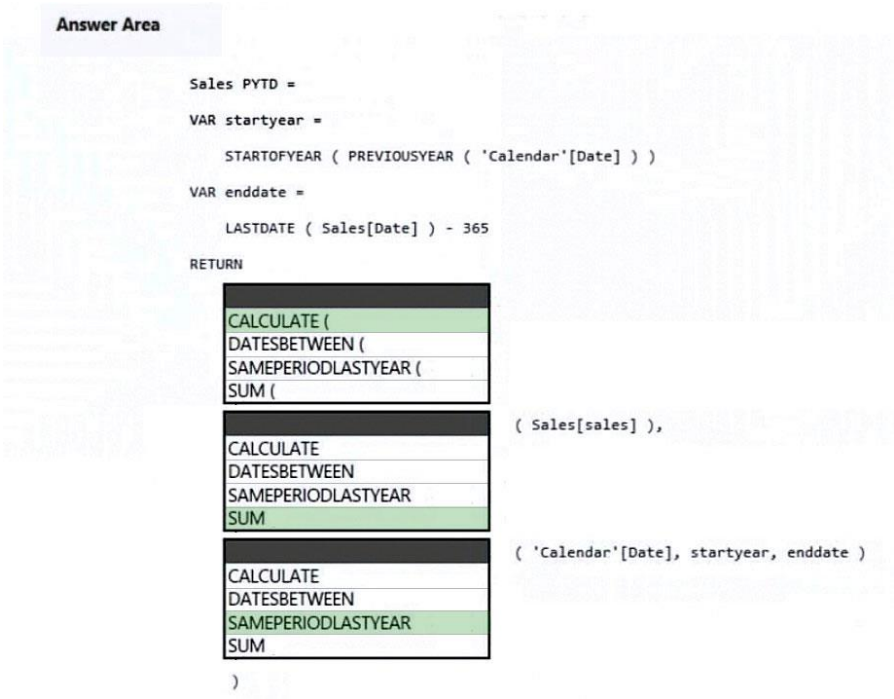
1. **D. Remove MovementDate:**
    - The **MovementDate** column is likely a non-essential field that could be contributing to the increase in the size of the **Product Inventory** table. If this field is not required for your analysis (i.e., it's not providing valuable information for your reports or visualizations), removing it can reduce the model size without losing important information.
2. **Why not the others?**
    - **A. Change Summarization for DateKey to Don't Summarize:**
      This action will not reduce the data model size. Changing the summarization only affects how data is aggregated in reports, not how much data is stored.
    - **B. Remove the relationship between Date and Product Inventory:**
      This would break the connection between the **Product Inventory** table and the **Date** table, which is essential for time-based analysis (e.g., filtering data by date). Removing the relationship would negatively impact the report functionality.

- **C. Change the data type of UnitCost to Integer:**
  Changing the data type of **UnitCost** to **Integer** could lead to loss of precision, especially if the values are decimal-based. This may not be suitable if you need to maintain accuracy for cost calculations or financial analysis.

Question 73:

You are enhancing a Power BI model that has DAX calculations.
You need to create a measure that returns the year-to-date total sales from the same date of the previous calendar year.
Which DAX functions should you use? To answer, select the appropriate options in the answer area.

Answer:



Box 1: CALCULATE -
Example:
Total sales on the last selected date =
CALCULATE (
SUM (Sales[Sales Amount]),
'Sales'[OrderDateKey] = MAX ('Sales'[OrderDateKey])
)

Box 2: SUM -

Box 3: SAMEPERIODLASTYEAR -
SAMEPERIODLASTYEAR returns a set of dates in the current selection from the previous year.
Example:
-- SAMEPERIODLASTYEAR returns the selected period shifted back one year.

```
EVALUATE -
VAR StartDate = DATE ( 2008, 07, 25 )
VAR EndDate = DATE ( 2008, 07, 31 )

RETURN -
CALCULATETABLE (
SAMEPERIODLASTYEAR ( 'Date'[Date] ),
'Date'[Date] >= StartDate &&
'Date'[Date] <= EndDate
)
ORDER BY [Date]
```