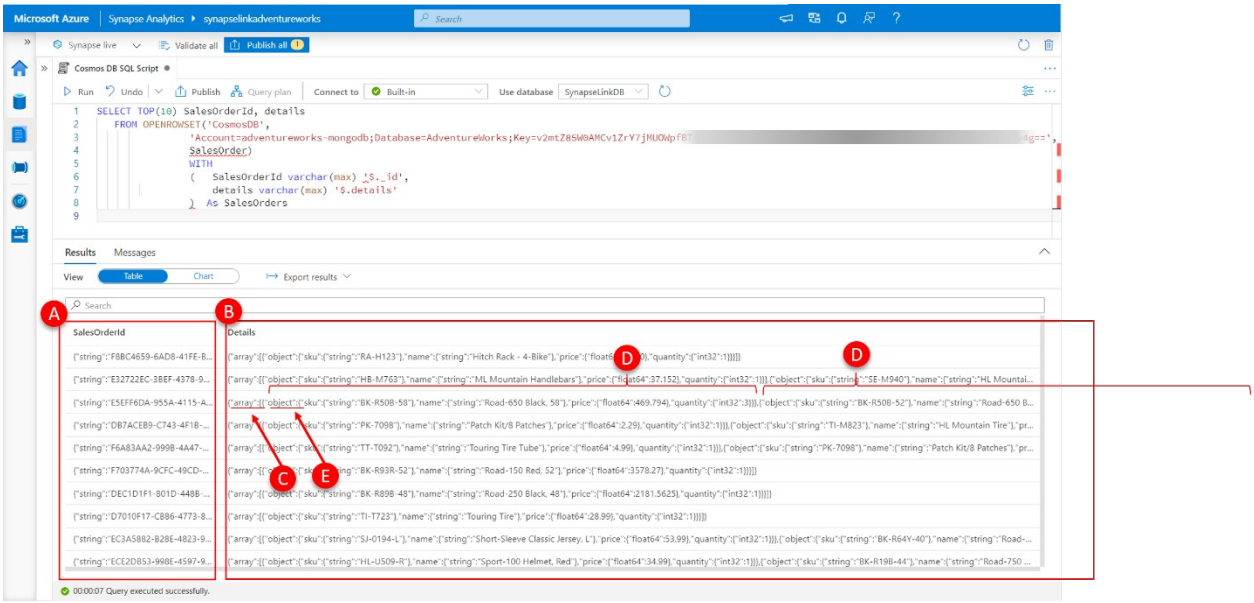
Perform complex queries with JSON data

Note In this reading you can see the steps involved in performing complex queries with JSON data.

Let's focus on extracting the data from sales order details for now. To do that we are going to want to look at the SalesOrderId (contained within the _id property of the document) and the details property that contains the array of sales order details.

Paste the following SQL into the query pane.

```
SELECT TOP(10) SalesOrderId, details
   FROM OPENROWSET('CosmosDB',
                'Account=adventureworks-
mongodb;Database=AdventureWorks;Key=v2mtZ85W0AMCv1ZrY7jMUOWpfBTi1BrUz0Y3Rwmvj9SXS
SIKDU7EQVu5kdEMcwAQfvJBnmHSMyxy50c3gD3v4g==',
                SalesOrder)
                WITH
                (   SalesOrderId varchar(max) '$._id',
                    details varchar(max) '$.details'
                )  As SalesOrders
```



Execute a JSON query in Azure Synapse Studio

Click **run**.

Here we can see the **SalesOrderId column (A)** is retuning a JSON fragment including the data type of the document _id property, in this case the string along with the property values.
The **details column (B)** is also retuning a JSON fragment in this case indicating that the data type is an **array (C)** and that it contains **multiple array elements (D)**.

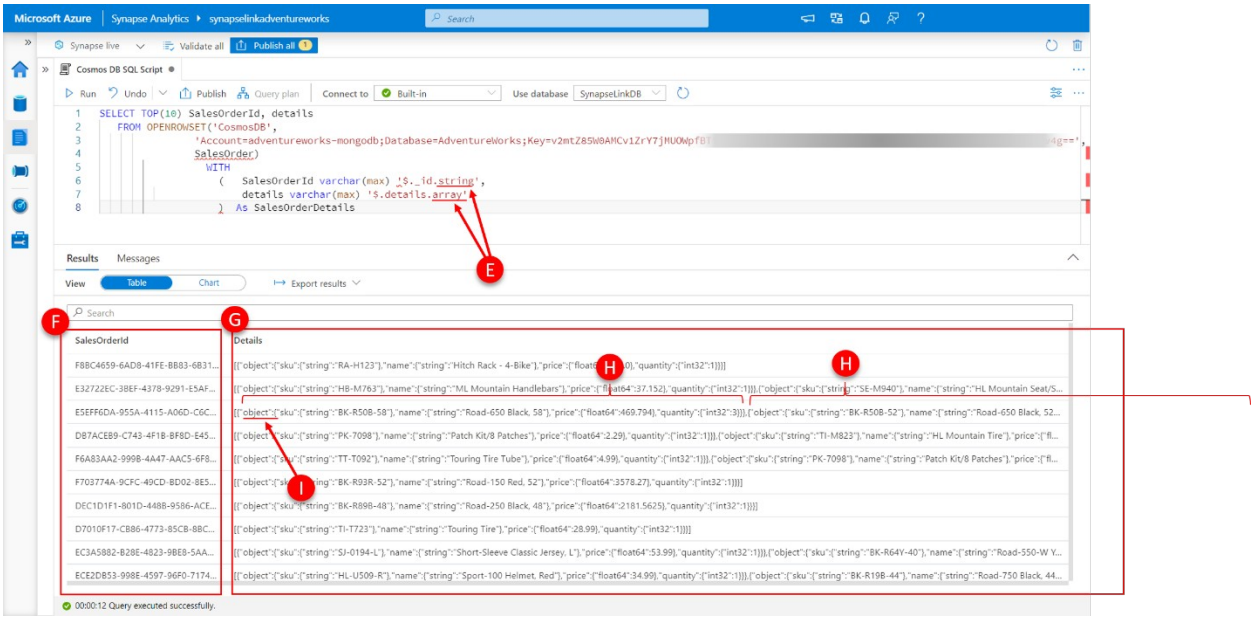
Let's now access these properties by correctly specifying the path, including the type suffix for each property (in this case “string” for _id and “array” for the details attributes).

Paste the following SQL into the query pane.

```
1
2
3
4
5
6
7
8
```

```
SELECT TOP(10) SalesOrderId, details
   FROM OPENROWSET('CosmosDB',
                'Account=adventureworks-
mongodb;Database=AdventureWorks;Key=v2mtZ85W0AMCv1ZrY7jMUOWpfBTi1BrUz0Y3Rwmvj9SXS
SIKDU7EQVu5kdEMcwAQfvJBnmHSMyxy50c3gD3v4g==',
                SalesOrder)
                  WITH
                    (    SalesOrderId varchar(max) '$._id.string',
                         details varchar(max) '$.details.array'
```

```
    )  As SalesOrderDetails
```



Accessing JSON Properties in a query in Azure Synapse Studio

Click **run**.

Now, we can see that the SalesOrderId column contains just the appropriate value, and the details column just contains the JSON array, starting with the array designator "[" and ending with "]" and can contain **multiple array elements (H)** of object type, as indicated in the JSON with **object type suffix (I)**.

Let's now create a SalesOrderDetails view.

Paste the following SQL into the query pane.

```
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
```

```
17
18
CREATE VIEW SalesOrderDetails
AS
SELECT SalesOrderId, SalesOrderArray.[key]+1 as SalesOrderLine, SKUCode, SKUName
,Price, Quantity
   FROM OPENROWSET('CosmosDB',
                'Account=adventureworks-
mongodb;Database=AdventureWorks;Key=v2mtZ85W0AMCv1ZrY7jMUOWpfBTi1BrUz0Y3Rwmvj9SXS
SIKDU7EQVu5kdEMcwAQfvJBnmHSMyxy50c3gD3v4g==',
                SalesOrder)
                    WITH
                    (   SalesOrderId varchar(max) '$._id.string',
                        details varchar(max) '$.details.array'
                    )  As SalesOrders
        CROSS APPLY OPENJSON(SalesOrders.details) AS SalesOrderArray
            CROSS APPLY OPENJSON(SalesOrderArray.[value])
            WITH
                (SKUCode varchar(max) '$.object.sku.string',
                SKUName varchar(max)    '$.object.name.string',
                Price decimal(10,4) '$.object.price.float64' ,
                Quantity int    '$.object.quantity.int32'
            ) As SalesOrderDetails
```

The first OPENJSON clause provides the SalesOrders.details value we extracted using the WITH clause of the OPENROWSET. When you call OPENJSON without a WITH clause and provide it with a JSON fragment that represents an array (as is the case in our example) the function returns a table with the following columns:

- Key- A value that contains the zero-based index of the element in the specified array.
- Value - A varchar(max) value that contains the value of the property itself. This will be the object value for each of the array elements in our example.
- Type - An int value that contains the type of the value, which we don't use in our example.

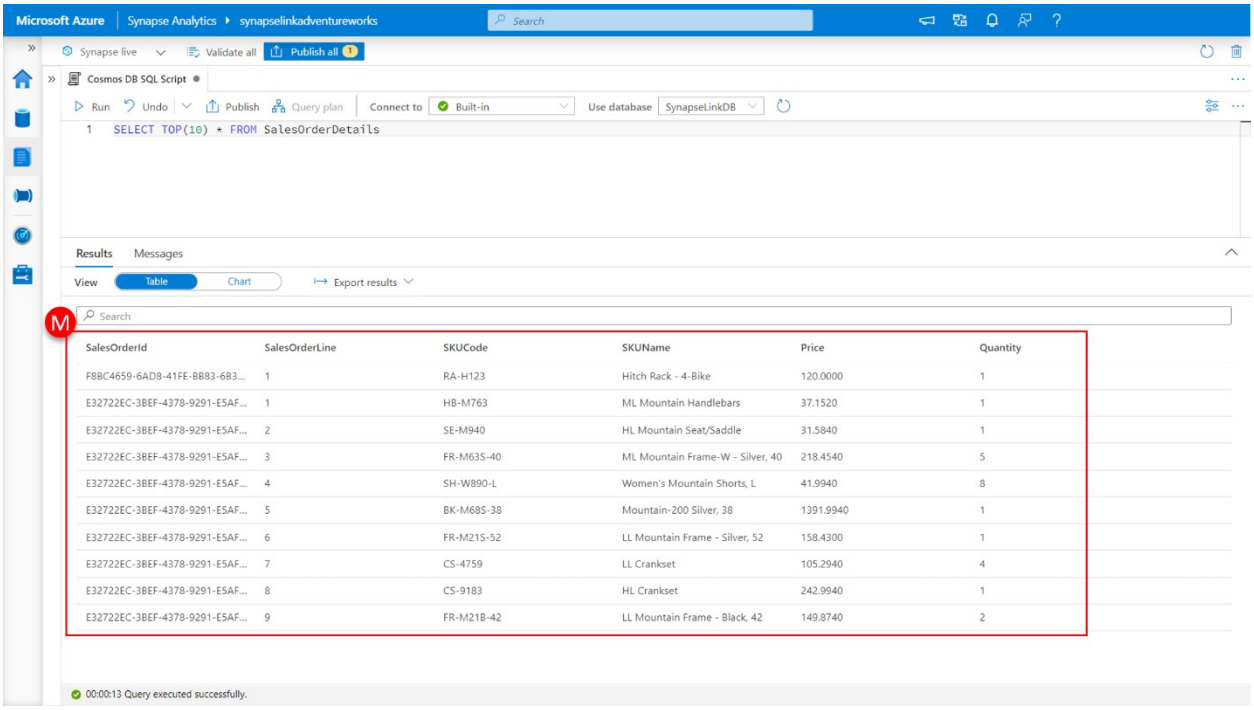
The second OPENJSON clause is provided with an input value of the value returned by the first OPENJSON clause, in our example the JSON fragment that represents the object of each element within the array. In this case, we use the WITH clause to further specify the column alias, and the column data type, and the element path we want to access (remembering to include the type suffix).

Lastly, we will project all of the needed columns including the key value returned by the first OPENJSON function (L), which will provide us with the SalesOrderLine, which by convention starts at 1 for each order at AdventureWorks, so needs to be adjusted from its zero-based value.

Let's see the result of all this transformation work that the view now contains.

Paste the following SQL into the query pane.

```
SELECT TOP(10) * FROM SalesOrderDetails
```



View results from a query in Azure Synapse Studio
Click **run**.

As you can see, we have now extracted the order details information from within the sales order details array including its crucial revenue and unit sales data.

We are now able to create the statistical information needed to answer the questions we set to resolve.