Building a Scalable ETL Pipeline for Netflix Content Analysis Using Azure Synapse and Data Lake Storage

Introduction:

The Netflix Titles dataset typically contains information about movies and TV shows available on Netflix. Here's a brief explanation of each column in the dataset:

1. **show_id**: A unique identifier for each show or movie in the dataset.
2. **type**: Indicates whether the entry is a movie or a TV show.
3. **title**: The title of the movie or TV show.
4. **director**: The name(s) of the director(s) of the movie or TV show.
5. **cast**: A list of actors and actresses who appear in the movie or TV show.
6. **country**: The country where the movie or TV show was produced or where it is available.
7. **date_added**: The date when the movie or TV show was added to Netflix.
8. **release_year**: The year in which the movie or TV show was originally released.
9. **rating**: The content rating of the movie or TV show (e.g., PG, R, TV-MA).
10. **duration**: The length of the movie (in minutes) or the duration of each episode (in minutes) for TV shows.
11. **listed_in**: The genre or category under which the movie or TV show is listed on Netflix (e.g., Comedy, Drama).
12. **description**: A summary or synopsis of the movie or TV show.

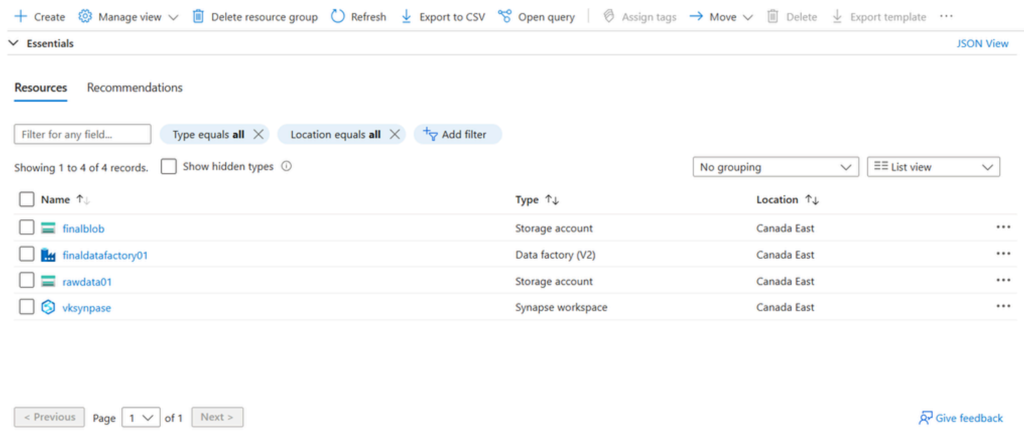
This dataset provides a comprehensive view of Netflix's content catalog, including details about the type, origin, and characteristics of each entry, which can be used for various types of analysis, such as content trends, viewing patterns, and regional availability.

Project Overview:

This project involves building an end-to-end data engineering pipeline using the Netflix Titles dataset. The pipeline will utilize SSMS for hosting the data, Azure Blob for storage, Azure Data Factory for orchestrating data movement, and Synapse Analytics for data transformation and cleaning. The processed data will be loaded into Power BI and will be used to create visual reports and dashboards. The solution ensures automation, scalability, and seamless data visualization.

- **Dataset**: Netflix Titles
- **Services Involved**:
  - Azure Blob Storage
  - SQL server management studio
  - Azure Data Factory
  - Azure Synapse Analytics
  - Power BI for visualization

Scenario 1: Performing ETL activity using Data factory using pipelines and triggers.

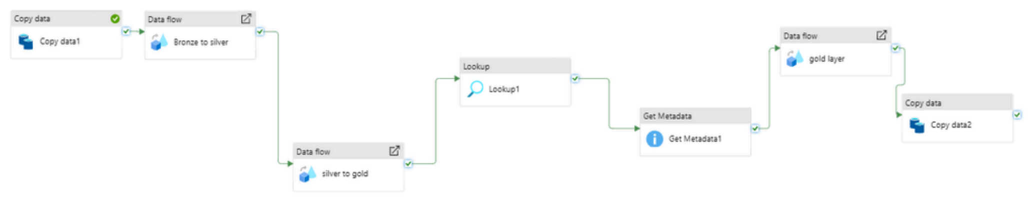


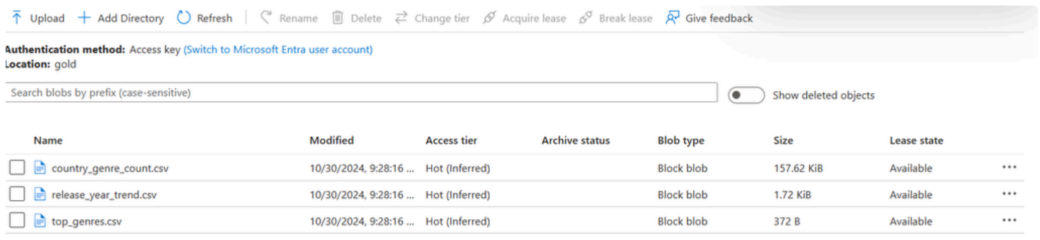
Showing 1 to 4 of 4 records. Show hidden types

Name	Type	Location
finalblob	Storage account	Canada East
finaldatafactory01	Data factory (V2)	Canada East
rawdata01	Storage account	Canada East
vksynpase	Synapse workspace	Canada East

Creating BlobStorage and ADLS gen2 Storage account

Create the pipelines along with the data flow, perform some transformations, and load the cleaned data into ADLS gen2 account.

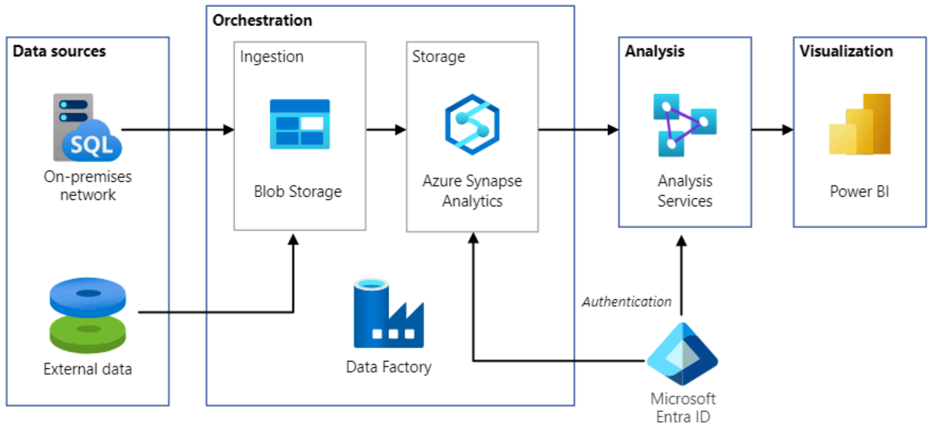




Authentication method: Access key (Switch to Microsoft Entra user account)
Location: gold

Name	Modified	Access tier	Archive status	Blob type	Size	Lease state
country_genre_count.csv	10/30/2024, 9:28:16 ...	Hot (Inferred)		Block blob	157.62 KiB	Available
release_year_trend.csv	10/30/2024, 9:28:16 ...	Hot (Inferred)		Block blob	1.72 KiB	Available
top_genres.csv	10/30/2024, 9:28:16 ...	Hot (Inferred)		Block blob	372 B	Available

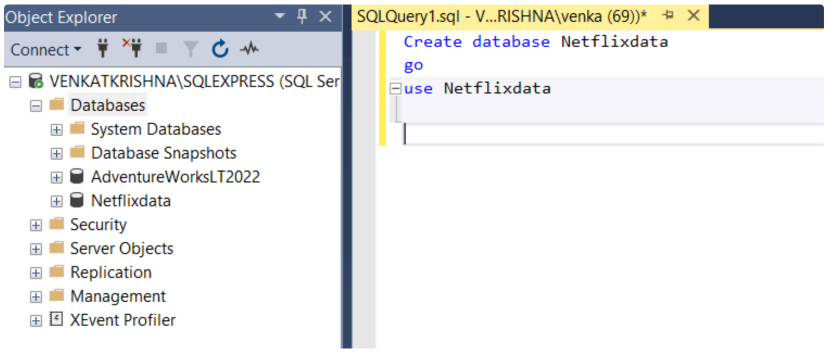
Scenario 2: Performing End-End project using Data factory, synapse, and power BI for extract, transform, and load



Microsoft Azure

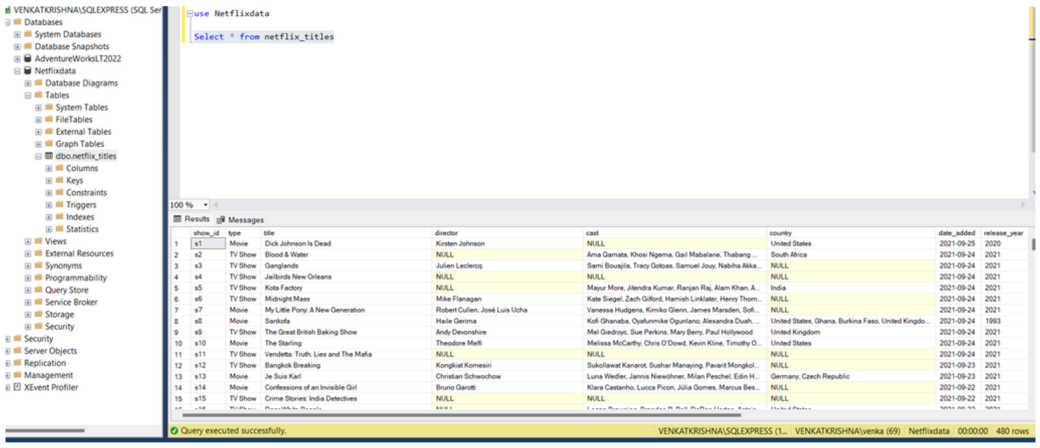
[Data Ingestion:]

Step 1: Install the SQL server Management Studio, connect to a database, and create a new one.



```
Create database Netflixdata
go
use Netflixdata
```

Step 2: Click on that database, import a flat file, upload the CSV file, and run the SQL command.



```
use Netflixdata

Select * from netflix_titles
```

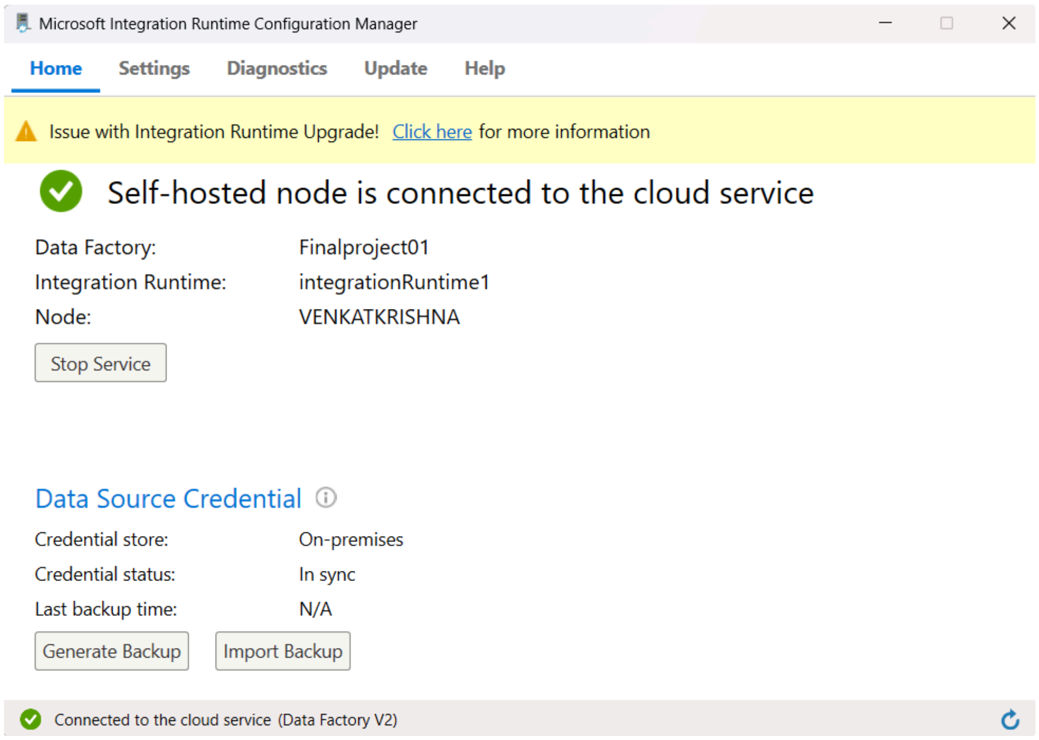
	show_id	type	title	director	cast	country	date_added	release_year
1	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NULL	United States	2021-09-25	2020
2	s2	TV Show	Blood & Water	NULL	Ama Qamata, Khosi Ngema, Gail Mabalane, Thabang ...	South Africa	2021-09-24	2021
3	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabiha Akka...	NULL	2021-09-24	2021
4	s4	TV Show	Jailbirds New Orleans	NULL	NULL	NULL	2021-09-24	2021
5	s5	TV Show	Kota Factory	NULL	Mayur More, Jitendra Kumar, Ranjan Raj, Alam Khan, A...	India	2021-09-24	2021
6	s6	TV Show	Midnight Mass	Mike Flanagan	Kate Siegel, Zach Gilford, Hamish Linklater, Henry Thom...	NULL	2021-09-24	2021
7	s7	Movie	My Little Pony: A New Generation	Robert Cullen, José Luis Ucha	Vanessa Hudgens, Kimiko Glenn, James Marsden, Sofi...	NULL	2021-09-24	2021
8	s8	Movie	Sankofa	Haile Gerima	Kofi Ghanaba, Oyafunmike Ogunlano, Alexandra Duah, ...	United States, Ghana, Burkina Faso, United Kingdo...	2021-09-24	1993
9	s9	TV Show	The Great British Baking Show	Andy Devonshire	Mel Giedroyc, Sue Perkins, Mary Berry, Paul Hollywood	United Kingdom	2021-09-24	2021
10	s10	Movie	The Starling	Theodore Melfi	Melissa McCarthy, Chris O'Dowd, Kevin Kline, Timothy O...	United States	2021-09-24	2021
11	s11	TV Show	Vendetta: Truth, Lies and The Mafia	NULL	NULL	NULL	2021-09-24	2021
12	s12	TV Show	Bangkok Breaking	Kongkiat Komesiri	Sukollawat Kanarot, Sushar Manaying, Pavarit Mongkol...	NULL	2021-09-23	2021
13	s13	Movie	Je Suis Karl	Christian Schwochow	Luna Wedler, Jannis Niewöhner, Milan Peschel, Edin H...	Germany, Czech Republic	2021-09-23	2021
14	s14	Movie	Confessions of an Invisible Girl	Bruno Garotti	Klara Castanho, Lucca Picon, Júlia Gomes, Marcus Bes...	NULL	2021-09-22	2021
15	s15	TV Show	Crime Stories: India Detectives	NULL	NULL	NULL	2021-09-22	2021

Query executed successfully. | VENKATKRISHNA\SQLEXPRESS (1... | VENKATKRISHNA\venka (69) | Netflixdata | 00:00:00 | 480 rows

Step 3: Launch the data factory and perform copy activity from the SQL server to blob storage

To do that we have to create a self-integration run time because this is an on-premises SQL server and we have to self-host it

To do that we have to install the integration run time software enter the key and register for it. once you complete it.



Issue with Integration Runtime Upgrade! Click here for more information

Self-hosted node is connected to the cloud service

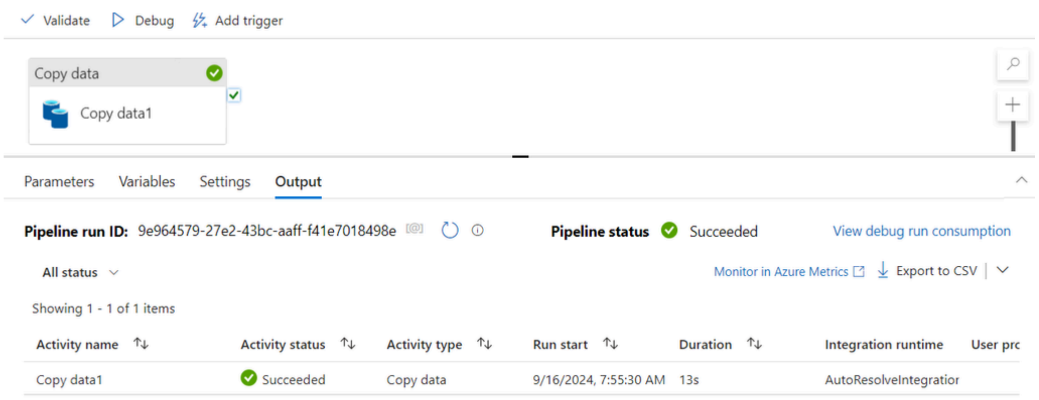
Data Factory:	Finalproject01
Integration Runtime:	integrationRuntime1
Node:	VENKATKRISHNA

Data Source Credential

Credential store:	On-premises
Credential status:	In sync
Last backup time:	N/A

Connected to the cloud service (Data Factory V2)

Use Azure Data Factory to create a pipeline with a "Copy Data" activity that transfers the raw CSV file from the Sql server to the Blob storage (raw data) for processing.

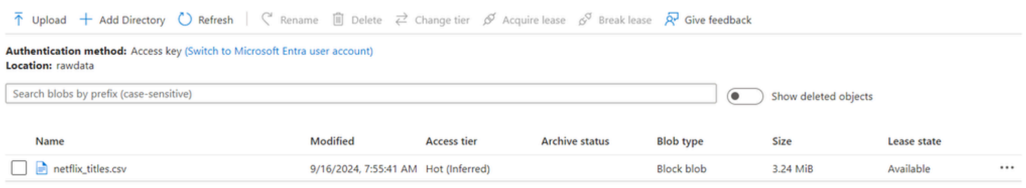


Pipeline run ID: 9e964579-27e2-43bc-aaff-f41e7018498e **Pipeline status** Succeeded View debug run consumption

All status Monitor in Azure Metrics Export to CSV

Showing 1 - 1 of 1 items

Activity name	Activity status	Activity type	Run start	Duration	Integration runtime	User prc
Copy data1	Succeeded	Copy data	9/16/2024, 7:55:30 AM	13s	AutoResolveIntegratior	



Authentication method: Access key (Switch to Microsoft Entra user account)
Location: rawdata

Search blobs by prefix (case-sensitive) Show deleted objects

Name	Modified	Access tier	Archive status	Blob type	Size	Lease state
netflix_titles.csv	9/16/2024, 7:55:41 AM	Hot (Inferred)		Block blob	3.24 MiB	Available

Data Transformation:

Step 1: Bronze Layer (Raw Data Ingestion)

Objective: Collect raw data and store it in a data lake (Azure Data Lake Storage - ADLS) without any modifications.

In this project:

- We assume you have already ingested the Netflix data into Azure Data Lake Storage (ADLS) Gen2.
- The data should be stored in a folder structure that makes it easy to identify as the Bronze layer.

```
/bronze/netflix/raw/
```

The data in this layer should be treated as immutable and will serve as the source for all downstream transformations.

Step 2: Silver Layer (Data Cleaning and Enrichment)

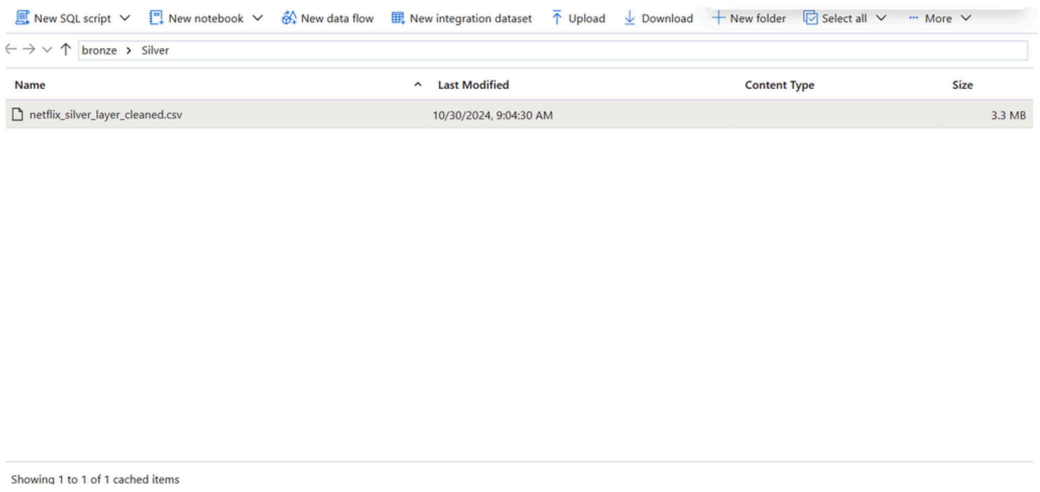
Objective: Perform data cleaning and minimal transformations to make the data reliable and consistent. This involves removing duplicates, handling null values, and casting data types.

Steps:

1. **Load Data from Bronze Layer**:
   - Use PySpark to read data from the Bronze layer. PySpark, a Spark API for Python, is available in Synapse Analytics and enables distributed data processing.
2. **Data Cleaning**:
   - Drop duplicates, remove rows with null values in critical columns (like `title`), and trim whitespace from string columns.
   - Convert columns to appropriate data types (e.g., cast `date_added` to date format and `release_year` to integer).
3. **Save Data to Silver Layer**:
   - Save the cleaned data as Parquet files (optimized for analytical querying) in the Silver layer.

PySpark Code for Bronze to Silver Transformation:

```
from pyspark.sql import SparkSession
from pyspark.sql.functions import col, trim

# Initialize Spark session in Synapse
spark = SparkSession.builder.getOrCreate()

# Load raw data from Bronze layer
bronze_df = spark.read.format("csv") \
               .option("header", "true") \
               .load("abfss://Bronze@rawad;sgen2.dfs.core.windows.net/bronze/netflix/raw/")

# Clean and transform the data
silver_df = bronze_df.dropna(subset=["title"]) \
                     .dropDuplicates() \
                     .withColumn("title", trim(col("title"))) \
                     .withColumn("date_added", col("date_added").cast("date")) \
                     .withColumn("release_year", col("release_year").cast("int"))

# Save to Silver layer
silver_df.write.format("parquet") \
               .mode("overwrite") \
               .save("abfss://Silver@rawadlsgen2.dfs.core.windows.net/silver/netflix/cleaned/")

```



bronze > Silver

Name	Last Modified	Content Type	Size
netflix_silver_layer_cleaned.csv	10/30/2024, 9:04:30 AM		3.3 MB

Showing 1 to 1 of 1 cached items

Key Points:

- **Drop Duplicates**: Ensures each record is unique.
- **Handle Nulls**: Avoids issues during analysis by excluding rows missing essential data.
- **Data Type Casting**: Necessary for accurate reporting and querying.

Step 3: Gold Layer (Aggregation and Analytics-Ready Data)

Objective: Further transform and aggregate data to make it ready for analytics and reporting. This layer should contain pre-aggregated data (like counts and summaries) to reduce processing time for reporting tools.

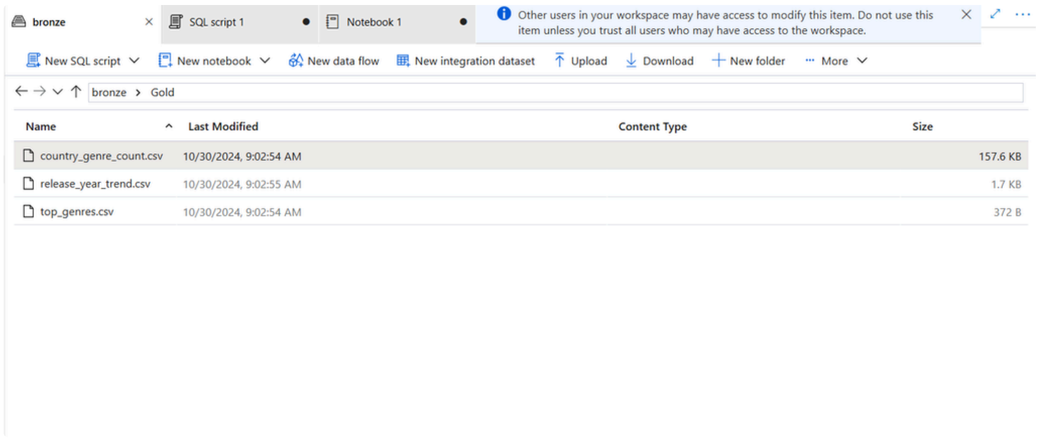
Steps:

1. **Load Data from Silver Layer**:
   - Read the cleaned and transformed data from the Silver layer.
2. **Data Aggregations**:
   - **Genre Count**: Count the number of titles for each genre.
   - **Yearly Release Count**: Count the number of titles released each year.
   - **Monthly Addition Count**: Count the number of titles added per month.
3. **Save Aggregated Data to Gold Layer**:
   - Save these aggregated datasets to the Gold layer, ready for Power BI reporting.

PySpark Code for Silver to Gold Transformation:

```
# Load cleaned data from Silver layer
silver_df = spark.read.format("parquet") \
               .load("abfss://<container>@<storage_account>.dfs.core.windows.net/silver/netflix/cleaned/")

# Transformation examples
# 1. Count by Genre
genre_count_df = silver_df.groupBy("listed_in").count()

# 2. Count of Titles by Release Year
year_count_df = silver_df.groupBy("release_year").count()

# 3. Monthly count of Titles added
monthly_count_df = silver_df.groupBy("date_format(date_added, 'yyyy-MM')").count()

```

```
# Save to Gold layer
genre_count_df.write.format("parquet") \
                   .mode("overwrite") \
                   .save("abfss://Gold@rawadlsgen2.dfs.core.windows.net/gold/netflix/genre_count/")

year_count_df.write.format("parquet") \
                  .mode("overwrite") \
                  .save("abfss://Gold@rawadlsgen2.dfs.core.windows.net/gold/netflix/year_count/")

monthly_count_df.write.format("parquet") \
                      .mode("overwrite") \
                      .save("abfss://Gold@rawadlsgen2.dfs.core.windows.net/gold/netflix/monthly_count/")

```



Other users in your workspace may have access to modify this item. Do not use this item unless you trust all users who may have access to the workspace.

bronze > Gold

Name	Last Modified	Content Type	Size
country_genre_count.csv	10/30/2024, 9:02:54 AM		157.6 KB
release_year_trend.csv	10/30/2024, 9:02:55 AM		1.7 KB
top_genres.csv	10/30/2024, 9:02:54 AM		372 B

Key Points:

- Aggregated datasets make reporting faster, as Power BI can directly use these precomputed metrics.
- **File Format**: Saving as Parquet files ensures efficient storage and faster query performance.

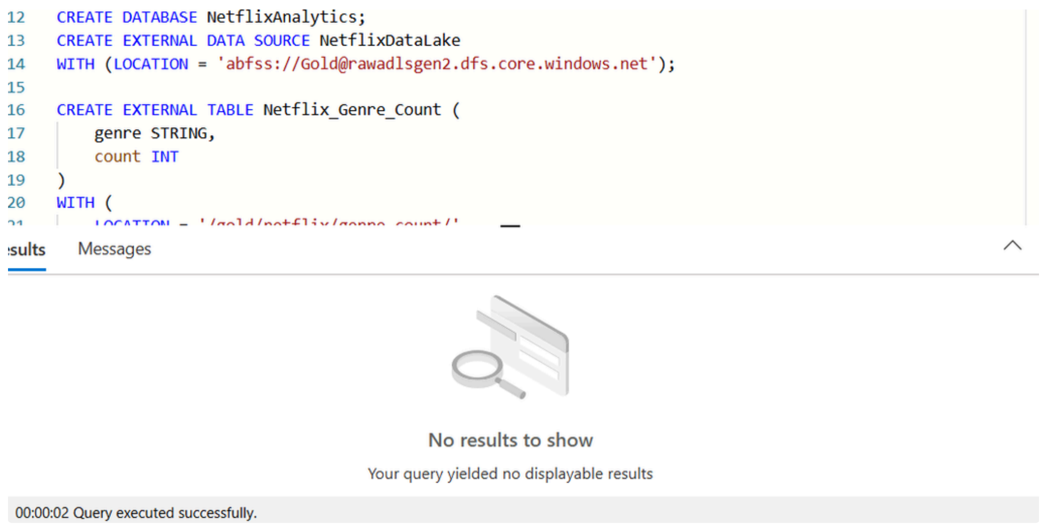
Step 4: Loading into Synapse SQL Pool (for Power BI Reporting)

To allow Power BI to connect to and query the data in the Gold layer, create external tables in Synapse SQL Pool that point to the data stored in ADLS.

SQL Script to Create External Tables:

```
CREATE DATABASE NetflixAnalytics;
CREATE EXTERNAL DATA SOURCE NetflixDataLake
WITH (LOCATION = 'abfss://Gold@rawadlsgen2.dfs.core.windows.net');

CREATE EXTERNAL TABLE Netflix_Genre_Count (
    genre STRING,
    count INT
)
WITH (
    LOCATION = '/gold/netflix/genre_count/',
    DATA_SOURCE = NetflixDataLake,
    FILE_FORMAT = SynapseParquetFormat
);

```

```
CREATE EXTERNAL TABLE Netflix_Year_Count (
    release_year INT,
    count INT
)
WITH (
    LOCATION = '/gold/netflix/year_count/',
    DATA_SOURCE = NetflixDataLake,
    FILE_FORMAT = SynapseParquetFormat
);

CREATE EXTERNAL TABLE Netflix_Monthly_Count (
    month STRING,
    count INT
)
WITH (
    LOCATION = '/gold/netflix/monthly_count/',
    DATA_SOURCE = NetflixDataLake,
    FILE_FORMAT = SynapseParquetFormat
);

```

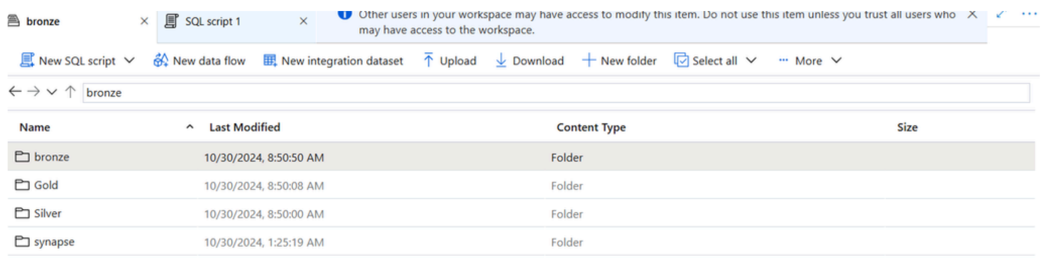


```
CREATE DATABASE NetflixAnalytics;
CREATE EXTERNAL DATA SOURCE NetflixDataLake
WITH (LOCATION = 'abfss://Gold@rawadlsgen2.dfs.core.windows.net');

CREATE EXTERNAL TABLE Netflix_Genre_Count (
    genre STRING,
    count INT
)
WITH (
    LOCATION = '/gold/netflix/genre_count/'
```

No results to show

Your query yielded no displayable results

00:00:02 Query executed successfully.

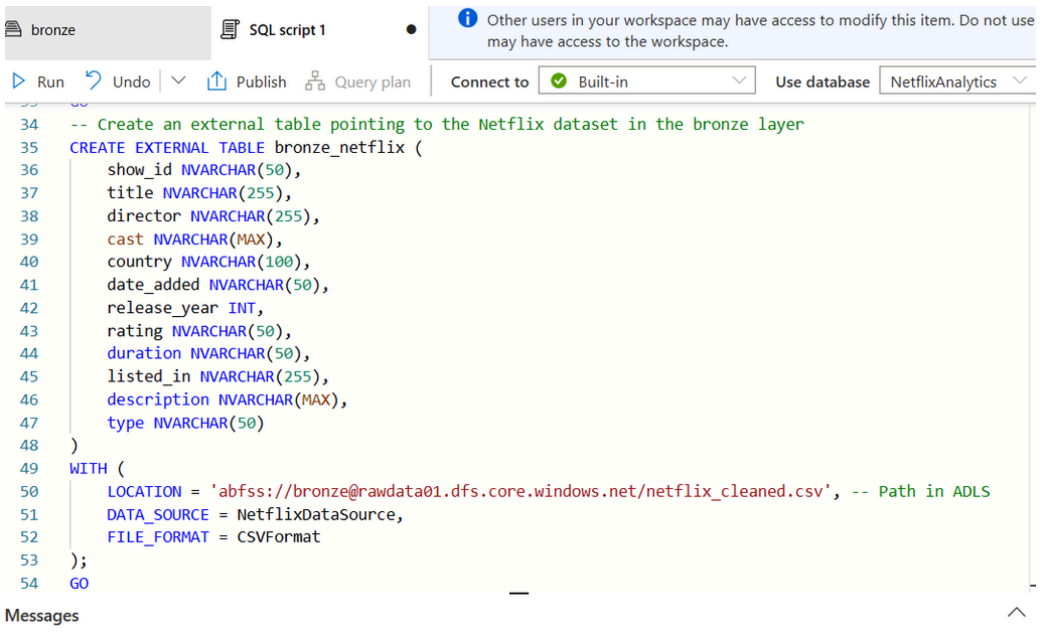


Other users in your workspace may have access to modify this item. Do not use this item unless you trust all users who may have access to the workspace.

Name	Last Modified	Content Type	Size
bronze	10/30/2024, 8:50:50 AM	Folder	
Gold	10/30/2024, 8:50:08 AM	Folder	
Silver	10/30/2024, 8:50:00 AM	Folder	
synapse	10/30/2024, 1:25:19 AM	Folder	

Scenario 3: Data Modelling in Azure Synapse.

Step 1: Load Data to Synapse (Bronze Layer)

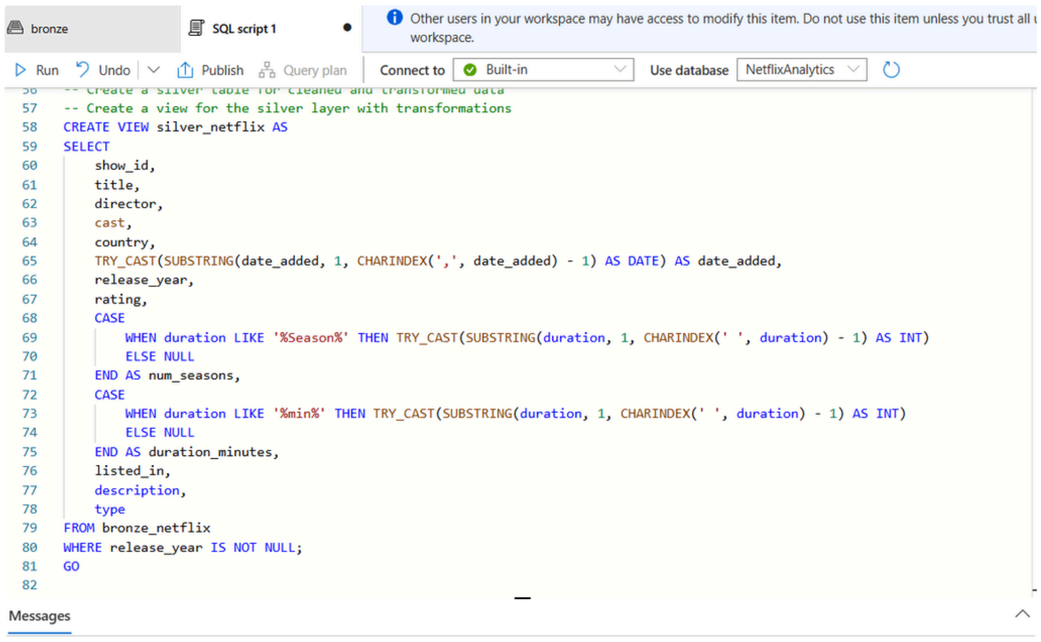


Other users in your workspace may have access to modify this item. Do not use
may have access to the workspace.

Connect to Built-in | Use database NetflixAnalytics

```sql
-- Create an external table pointing to the Netflix dataset in the bronze layer
CREATE EXTERNAL TABLE bronze_netflix (
    show_id NVARCHAR(50),
    title NVARCHAR(255),
    director NVARCHAR(255),
    cast NVARCHAR(MAX),
    country NVARCHAR(100),
    date_added NVARCHAR(50),
    release_year INT,
    rating NVARCHAR(50),
    duration NVARCHAR(50),
    listed_in NVARCHAR(255),
    description NVARCHAR(MAX),
    type NVARCHAR(50)
)
WITH (
    LOCATION = 'abfss://bronze@rawdata01.dfs.core.windows.net/netflix_cleaned.csv', -- Path in ADLS
    DATA_SOURCE = NetflixDataSource,
    FILE_FORMAT = CSVFormat
);
GO
```

Step 2: Transform Data for Silver Layer



Other users in your workspace may have access to modify this item. Do not use this item unless you trust all
workspace.

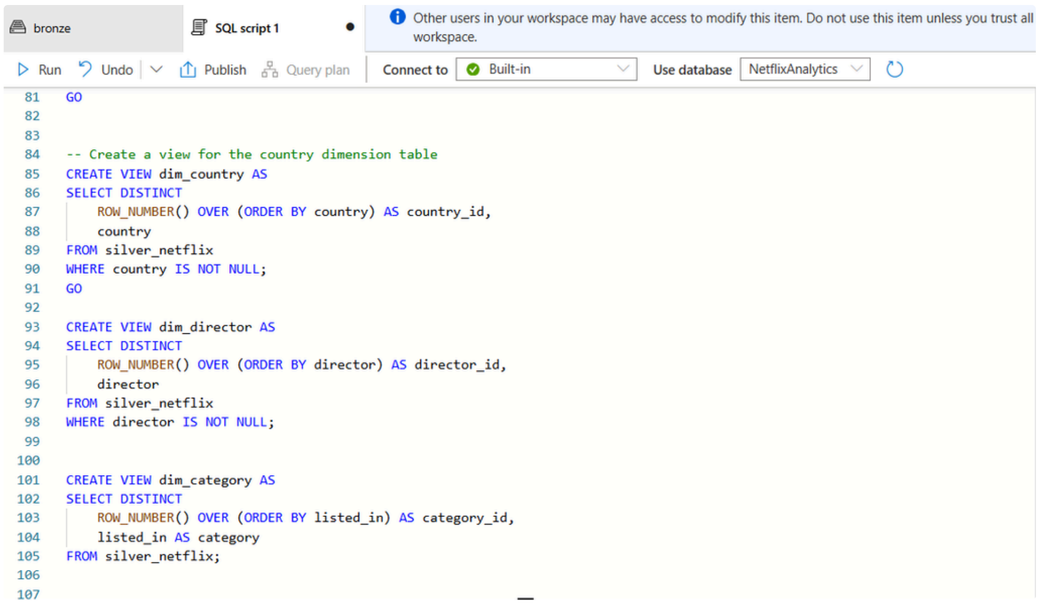
Connect to Built-in | Use database NetflixAnalytics

```sql
-- Create a silver table for cleaned and transformed data
-- Create a view for the silver layer with transformations
CREATE VIEW silver_netflix AS
SELECT
    show_id,
    title,
    director,
    cast,
    country,
    TRY_CAST(SUBSTRING(date_added, 1, CHARINDEX(',', date_added) - 1) AS DATE) AS date_added,
    release_year,
    rating,
    CASE
        WHEN duration LIKE '%Season%' THEN TRY_CAST(SUBSTRING(duration, 1, CHARINDEX(' ', duration) - 1) AS INT)
        ELSE NULL
    END AS num_seasons,
    CASE
        WHEN duration LIKE '%min%' THEN TRY_CAST(SUBSTRING(duration, 1, CHARINDEX(' ', duration) - 1) AS INT)
        ELSE NULL
    END AS duration_minutes,
    listed_in,
    description,
    type
FROM bronze_netflix
WHERE release_year IS NOT NULL;
GO
```

Step 3: Define Dimension and Fact Tables for Gold Layer

Create `dim_country` Table

1. **Objective**: Define a dimension table for the `Country`, director and category.

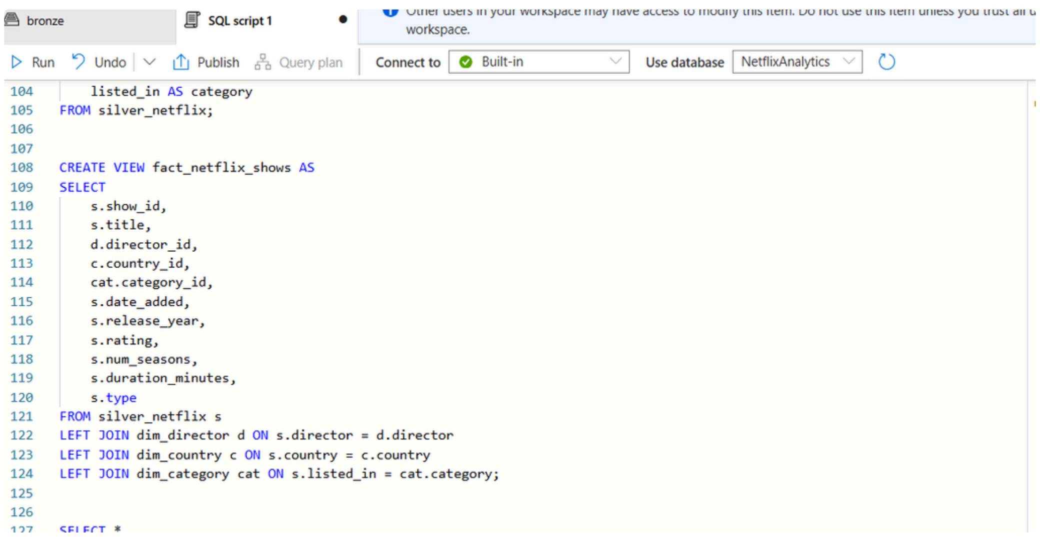

bronze | SQL script 1

Other users in your workspace may have access to modify this item. Do not use this item unless you trust all workspace.

Run | Undo | Publish | Query plan | Connect to: Built-in | Use database: NetflixAnalytics

```sql
GO


-- Create a view for the country dimension table
CREATE VIEW dim_country AS
SELECT DISTINCT
    ROW_NUMBER() OVER (ORDER BY country) AS country_id,
    country
FROM silver_netflix
WHERE country IS NOT NULL;
GO

CREATE VIEW dim_director AS
SELECT DISTINCT
    ROW_NUMBER() OVER (ORDER BY director) AS director_id,
    director
FROM silver_netflix
WHERE director IS NOT NULL;


CREATE VIEW dim_category AS
SELECT DISTINCT
    ROW_NUMBER() OVER (ORDER BY listed_in) AS category_id,
    listed_in AS category
FROM silver_netflix;
```

Step 4: . Create `fact_netflix_shows` Table


bronze | SQL script 1

Other users in your workspace may have access to modify this item. Do not use this item unless you trust all workspace.

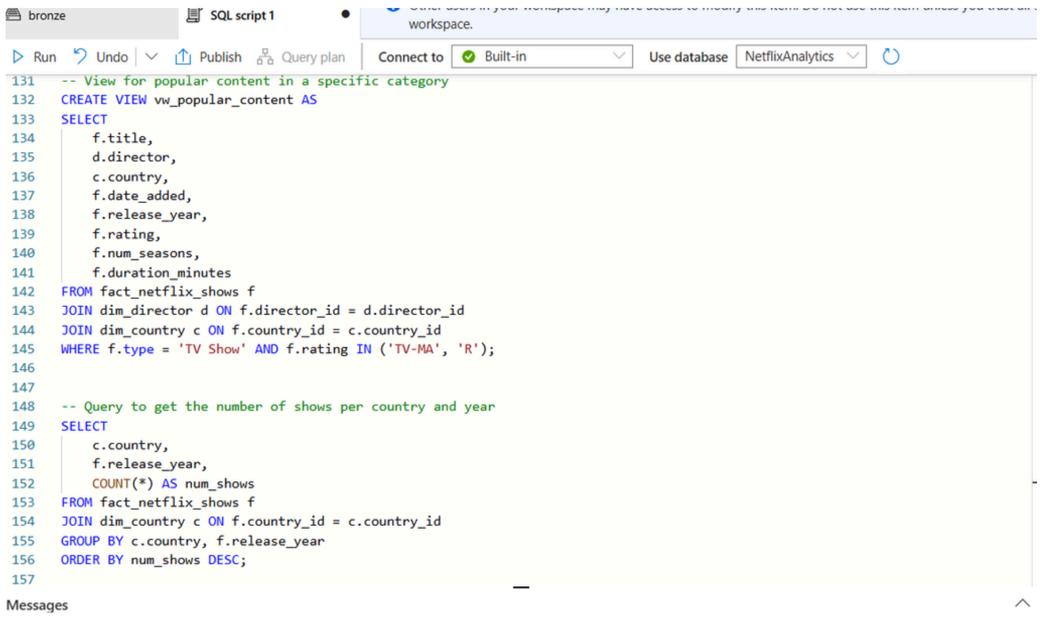
Run | Undo | Publish | Query plan | Connect to: Built-in | Use database: NetflixAnalytics

```sql
    listed_in AS category
FROM silver_netflix;


CREATE VIEW fact_netflix_shows AS
SELECT
    s.show_id,
    s.title,
    d.director_id,
    c.country_id,
    cat.category_id,
    s.date_added,
    s.release_year,
    s.rating,
    s.num_seasons,
    s.duration_minutes,
    s.type
FROM silver_netflix s
LEFT JOIN dim_director d ON s.director = d.director
LEFT JOIN dim_country c ON s.country = c.country
LEFT JOIN dim_category cat ON s.listed_in = cat.category;


SELECT *
```

Step 4: Optimize the Fact Table

```sql
SELECT *
FROM fact_netflix_shows
WHERE release_year = 2021;
```

Step 5: Create Analytical Views



Other users in your workspace may have access to modify this item. Do not use this item unless you trust all workspace.

Connect to: Built-in

Use database: NetflixAnalytics

```sql
-- View for popular content in a specific category
CREATE VIEW vw_popular_content AS
SELECT
    f.title,
    d.director,
    c.country,
    f.date_added,
    f.release_year,
    f.rating,
    f.num_seasons,
    f.duration_minutes
FROM fact_netflix_shows f
JOIN dim_director d ON f.director_id = d.director_id
JOIN dim_country c ON f.country_id = c.country_id
WHERE f.type = 'TV Show' AND f.rating IN ('TV-MA', 'R');


-- Query to get the number of shows per country and year
SELECT
    c.country,
    f.release_year,
    COUNT(*) AS num_shows
FROM fact_netflix_shows f
JOIN dim_country c ON f.country_id = c.country_id
GROUP BY c.country, f.release_year
ORDER BY num_shows DESC;
```

Step 6: Run an Example Query on the Fact Table

```sql
SELECT
    c.country,
    f.release_year,
    COUNT(*) AS num_shows
FROM fact_netflix_shows f
JOIN dim_country c ON f.country_id = c.country_id
GROUP BY c.country, f.release_year
ORDER BY num_shows DESC;
```

Explanation:

- **External Tables**: Allow Synapse SQL Pool to access data directly from ADLS without copying it into Synapse.
- **Data Source**: Points to the data lake storage account.
- **File Format**: Set up as Parquet for optimized analytics performance.

Step 5: Reporting with Power BI

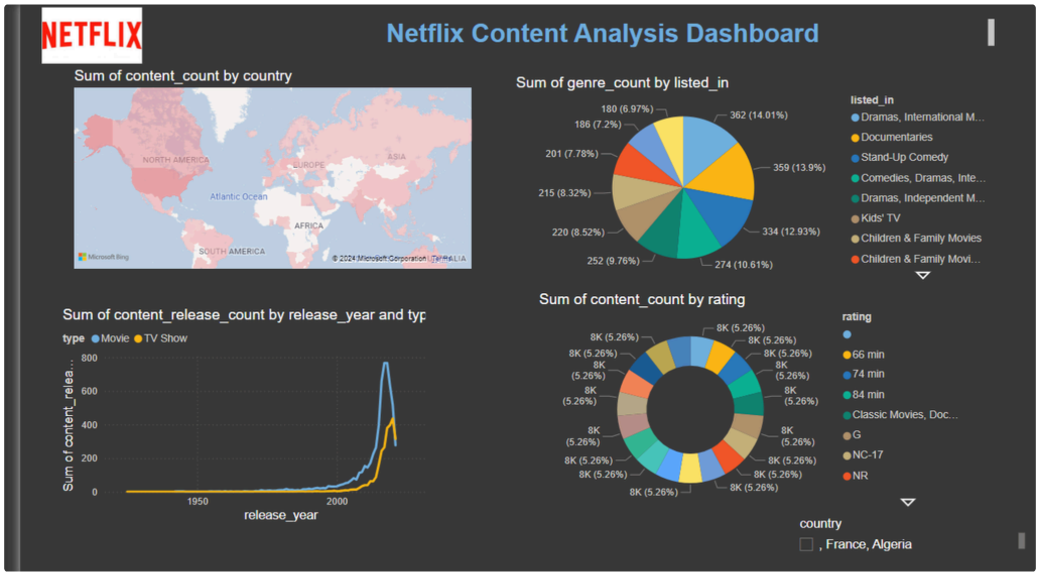
With data in the Gold layer and accessible through Synapse SQL Pool, you can connect Power BI to Synapse and create visualizations.

Power BI Report Examples:

1. **Genre Distribution**:
    - Use a bar or pie chart to show the distribution of content across genres.
2. **Titles by Release Year**:
    - A line chart showing the number of titles released each year, highlighting growth trends.
3. **Monthly Additions**:
    - A line or bar chart showing titles added monthly, useful for observing seasonal patterns.

Power BI Connection Steps:

1. Open Power BI Desktop and choose "Get Data."
2. Select "Azure Synapse Analytics" as the data source.
3. Connect to the Synapse SQL Pool and select the external tables created.



Why Choose the Netflix Dataset for Business Analysis?

- **Consumer Insights**: The dataset provides detailed information on content type, genres, and release years, helping to understand viewer preferences and popular genres.
- **Global Content Distribution**: With data on content availability across countries, this dataset allows analysis of geographical content distribution, supporting market expansion strategies.
- **Trend Analysis**: The release year and date added fields enable insights into content release patterns and trends, aiding in decisions about content production and licensing.

Key Findings from the Netflix Dataset

- **Top Genres and Content Type**: Identifies the most popular genres and distinguishes between movies and TV shows, supporting strategic content curation.
- **Country-Specific Preferences**: Shows the diversity of content by country, which helps in targeting and localizing content offerings.
- **Content Growth Over Time**: Reveals trends in content additions by year, reflecting Netflix's expansion and investment in original content and licensing.

Common errors while working on this Project:

- **Integration Runtime Issues**: Failure to correctly configure the self-hosted integration runtime could disrupt data movement.
- **Data Format Mismatches**: Inconsistent or incorrect CSV file formats might cause data parsing errors.
- **Data Path Errors**: Incorrect file paths in code might result in failures during data reading/writing operations.
- **SQL Server Connectivity**: Connectivity issues between SQL Server Management Studio and Azure Data Factory could halt the pipeline.
- **Transformation Errors**: Errors in SQL transformations or PySpark code could lead to inaccurate or incomplete data.
- **Performance Issues**: Large datasets may cause performance bottlenecks in data processing or transformation steps.
- **Security Concerns**: Inadequate security configurations may expose data to unauthorized access or breaches.
- **Visualization Inconsistencies**: Incorrect data loading into Power BI could lead to misleading visualizations or reports.

Conclusion

This project successfully demonstrates the construction of a robust end-to-end data engineering pipeline using the Netflix Titles dataset. By leveraging a combination of powerful tools and services—Azure Blob Storage, SQL Server Management Studio, Azure Data Factory, Azure

Synapse Analytics, and Power BI—the pipeline achieves efficient data ingestion, transformation, and visualization.

Key Achievements:

1. **Data Ingestion and Storage**: The pipeline effectively integrates SQL Server for hosting and Azure Blob Storage for scalable data storage, ensuring smooth data transfer and storage.
2. **Data Transformation**: Utilizing Azure Synapse Analytics and Spark, the project converts raw data into clean, structured formats like Delta and Parquet, enhancing data processing efficiency and performance.
3. **Automation and Scalability**: By incorporating Azure Data Factory, the project automates data movement and transformation processes, supporting scalability and flexibility in handling large datasets.
4. **Visualization**: The final integration with Power BI enables meaningful data visualization, facilitating insightful analysis and reporting.

Future Enhancements:

To further enhance the project, consider adding:

- Detailed data quality checks and validation processes to ensure accuracy and consistency.
- Specifics on the types of visualizations and dashboards in Power BI to better illustrate the insights derived from the data.
- Performance optimization strategies such as query optimization and resource scaling and error handling mechanisms to address potential issues and improve pipeline efficiency.

Overall, this project showcases a well-rounded approach to building a data engineering pipeline, with clear steps and effective use of Azure services, positioning it as a solid foundation for advanced data analytics and reporting Using Azure tools.