**ETL Using Data Factory**

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(1). To develop a ETL (Extract Transform Loading) Assignment, we need some prerequisites for performing the following operation.

Create a Resource Group so that I can perform my task inside the resource. Create a resource Group named **ETLAssignment**

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Create a data factory workspace, using the workspace I can perform my data flow and pipeline activityA screenshot of a computer

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Create Azure Data Lake Storage Account and place the input as below

**In Azure 🡪Go To Storage Account🡪Create🡪Select Resource Group (ETLAssignment)🡪give Storage Account name🡪select Redundancy as LRS🡪In Advanced tab Enable hierarchical namespace🡪Review and Create**

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Create a Storage Container to store the data inside Storage account and place the input movies.csv file there

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To store the output of CountMoviesBasedOnGenre data Stream ,we need Azure Data Lake Storage Gen 1

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The output of JoinMovieCountWithCleanData should be stored in SQL Database, so need to create new SQL db and server

Creating SQL DB named **ETLDB** and creating new server for this resource group.

Server name – etladmin

Pass – Kullay@137

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After deployment gets completed, adding client IP in Firewall settings for connecting with Studio

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Connecting server with studio for opening Database in studio and to create table

Below Query is used for creating table Movie\_Clean\_Data.

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For Using in Linked Service, need to give YES in Allow Azure service and resource to access server

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**Task 1: Create a dataflow with the following requirement:**

1.Create a data stream named CleaningGenreRomance and perform data cleansing on the Genre column using Derived Column and case expression. (While collecting data it was observed that some genres have spelling mistakes like romance, Romence for Romance, comedy, Comdy for Comedy.)

**Steps:**

Create a data flow and add source by creating new dataset ADLS gen2 with delimited text format and using linked service to connect with etladlsgen2 storage account for input data

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Connecting with new linked service with below information

The input data location is selected in wildcard path under source option

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The datatype and format of each column should be mentioned accurately in projection

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The input data can be viewed from Data Preview if needed.

Adding derived Column from sourceMovie named **derivedColumn1**

The below condition is used in settings for getting cleansed data

Case(Genre ==’romance’, ‘Romance’, Genre == ‘Romence’, ‘Romance’, Genre == ‘Comdy’ , ‘Comedy’)

The output of derivedColumn1 will be cleansed data with 8 column. It can be viewed in datapreview

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2. Create a data stream named CountMoviesBasedOnGenre that can calculate number of films for each genre and store it as a separate dataset in ADLS under folder name “solution/genreCount”

Cloning derivedColumn1 from previous one and considering that cleansed data as a input for counting number of films

Adding pipeline named Aggregate1 which will calculate the number of films for each genre.

Under group by => genre is selected

Under Aggregate => column name is filmCount and expression is count(film).

And the Output is shown as Below with Film Count.

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And Now to store the output in adls gen 1

Create a sink with new linked service with storage account name etladlsgen1

To mention the destination path for gen1 account Dataset > ADLSGen1 > under connection mention file path as shown below

Creating a sink with outputStream name **CountMovieBasedonGenre**

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Selecting a destination dataset ADLSgen1

Under settings, filename options is Output to single file and the name given as MovieCount

Now the Output with two column is stored in Adls Gen1 Folder

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Now the Output of join operation Contains 10 Column(2 genre column) ,So using **RemoveColumn** remove the duplicate Column and now there is 8 column

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And the output of removecolumn is passed in map drifted where in derived column settings, the output stream name is MapDrifted1, incoming stream is RemoveColumn1

Condition is represented as **toString(byName(‘Genre’)) ,**using map Drifted add the Genre Column ,now including FilmCount there is total 9 column

Create a sink with output stream name JoinMovieCountWithCleanData, incoming is mapdrifted

Using the created server information in linked service and mentioning Database name

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Under sink dataset, add a destination sql table name

Using Mapping map the input with the Table column name properly

And Now To execute the data Flow and the data flow in the pipeline with proper settings

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Now Validate and Publish ,once published with out error ,then trigger now .

Once the Data Flow is triggered, will see the below

As per requirement output of CountMoviesBasedOnGenre is stored under adls gen1 under folder name “solution/genreCount”

And the output of JoinMovieCountWithCleanData as per required we can see the data stored in e Azure SQL Database under table name Movie\_clean\_data

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**Task 2.**

Create a Azure Data Bricks Workspace.

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Launch the data brick Workspace and Create a new Cluster .

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And the cluster created and shown as below.

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Create a notebook with the created cluster

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Create a Synapse Workspace to store the output of task 2 in Sql Pool

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Create a new Sql Pool with the following configuration

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Once Created ,Connect the Sql Pool via SSM using dedicated sql endpoint.Create a Table in the Sql pool as follows

Create a pipeline CopyDataFromSqlToADLSGen2 and configure as belows,To copy data from input of task 1 from SQL database to the ALDS GEN2 Account folder.

And Also configure the output path to store the data in adls gen2 to store sql dab data.

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Link CopyDataFromSqlToADLSGen2 with new pipeline CopyDataFromSqlToGen1,Only After this activity Rank Operation must be performed in data bricks as per requirement

Configure Sink to store the data in adls gen1

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Before Linking Databricks with CopyDataFromSqlToGen1 .Login with DataBricksand open the created notebook and perform the rank operation and store the output in adls gen1 folder and save the notebook with name EtlProjectNotebook

**NOTEBOOK:** **EtlProjectNotebook**

from pyspark.sql import SparkSession

from pyspark.sql.types import \*

from pyspark.sql.window import Window

from pyspark.sql.functions import rank

from pyspark.sql.functions import row\_number

account\_name = "etladlsgen2"

container\_name = "task2output"

relative\_path = "rankoutput"

adls\_path = 'abfss://%s@%s.dfs.core.windows.net/%s' % (container\_name, account\_name, relative\_path)

spark.conf.set("fs.azure.account.auth.type.%s.dfs.core.windows.net" %account\_name, "SharedKey")

spark.conf.set("fs.azure.account.key.%s.dfs.core.windows.net" %account\_name ,"6IuB2nl5g7+x6syTpT2DLKPB2c5uSPRKfFGqQdKcwTrU/NFL1v9pmarTJWAN1KjwTImZnb4LOzet+AStCXG0+w==")

df1 = spark.read.option('header', 'true') \

.option('delimiter', ',').option('inferSchema', 'true')\

.csv(adls\_path)

Window\_Spec = Window.partitionBy("Genre").orderBy("Rotten\_Tomatoes\_in\_pcent")

Result=df1.withColumn("rank",rank().over(Window\_Spec))

spark.conf.set("fs.azure.account.key.etladlsgen1.blob.core.windows.net","yqcUoV0fdn88gifc5ANMhA/bRUq+m5JRv9EGslFoIQDoj7vz6f3fb0fcxQRt8MmGlZvdMZ+q1Qj2+AStkHUSKA==")

Result.write.csv("wasbs://countmovies@etladlsgen1.blob.core.windows.net/Fold/AzureCostAnalysis.csv", header="true")

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Link DataBricks with the CopyDataFromSqlToGen1,Once the above activity is performed,run the configured databricks by using linked service add databricks notebook **EtlProjectNotebook with ETLCLuster**

When the above data bricks executed the output will be stored under adls gen1

Now link the databricks pipeline with copydata pipeline wich transfer data from adlsgen1 to synapse created SQLPOOL :**ETLSYNAPSESQLPOOL**

Under Source tab configure the adlsgen1 path where the output of databricks stored

Under the sink Tabe Configure the synapse database and the sqlpool table name

Under mapping map the input of adls gen1 with the synapse table name

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Under Settings enable staging with linked service name configured as below

And now validate and publish the task 2 .once published trigger now the pipeline

And now the output of CopyDataFromSqlToADLSGen2 ,which is copied from sql database from task1 to adls gen2

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And now the output of CopyDataFromSqlToADLSGen1 ,which is copied from sql database from task1 to adls gen1 ,once this activity done then only the databricks must be performed

And the output of rank operation of data bricks is stored under adls gen1 as mentioned

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