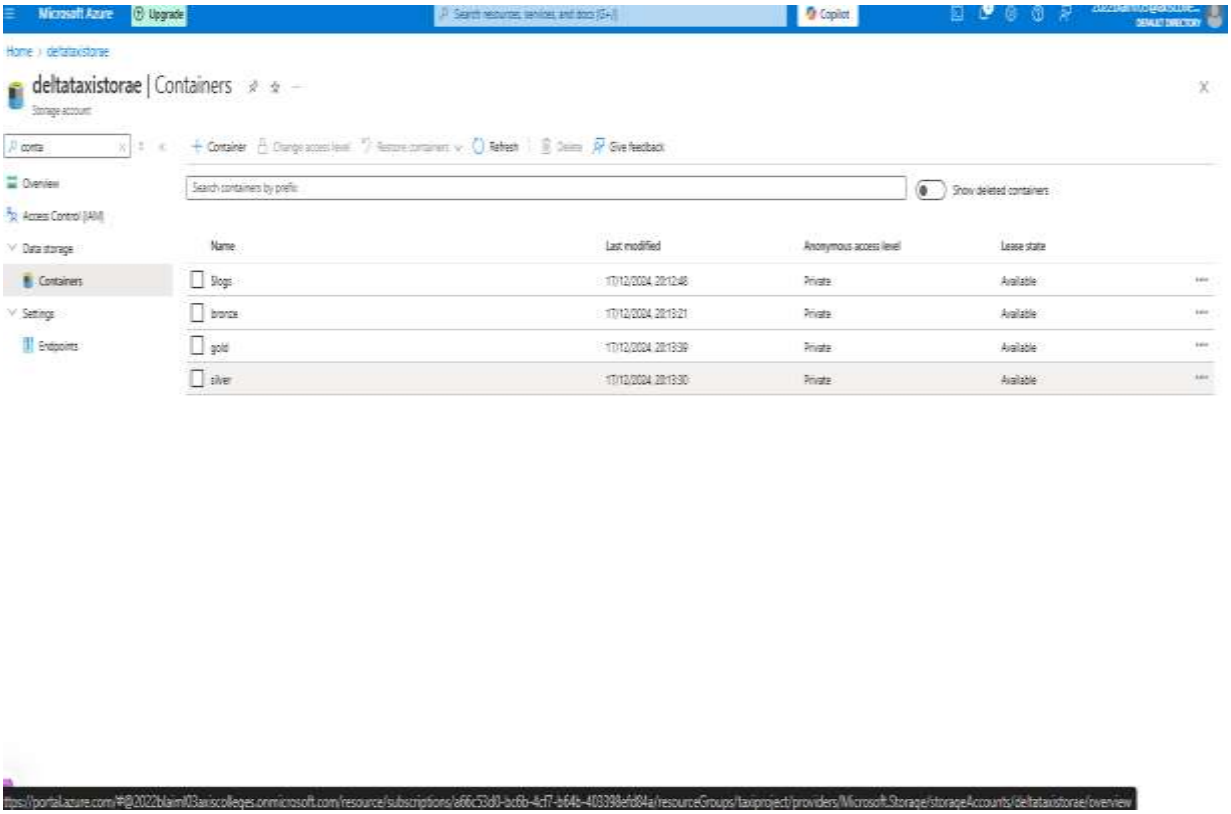
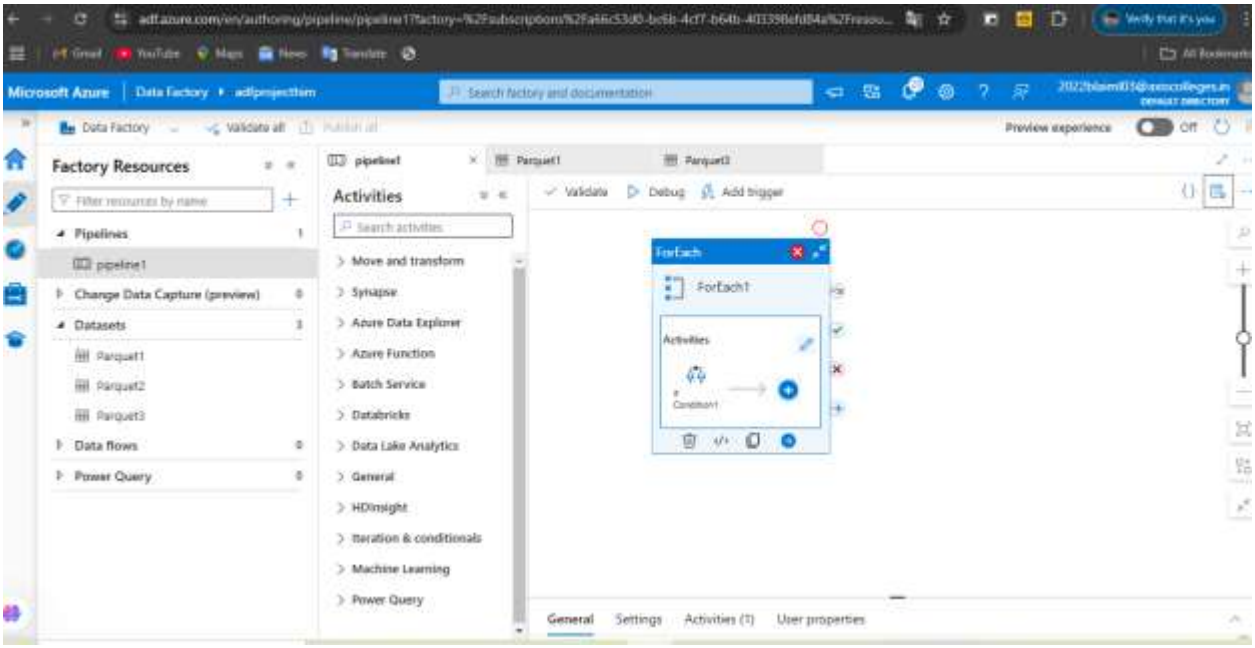
API SOURCE

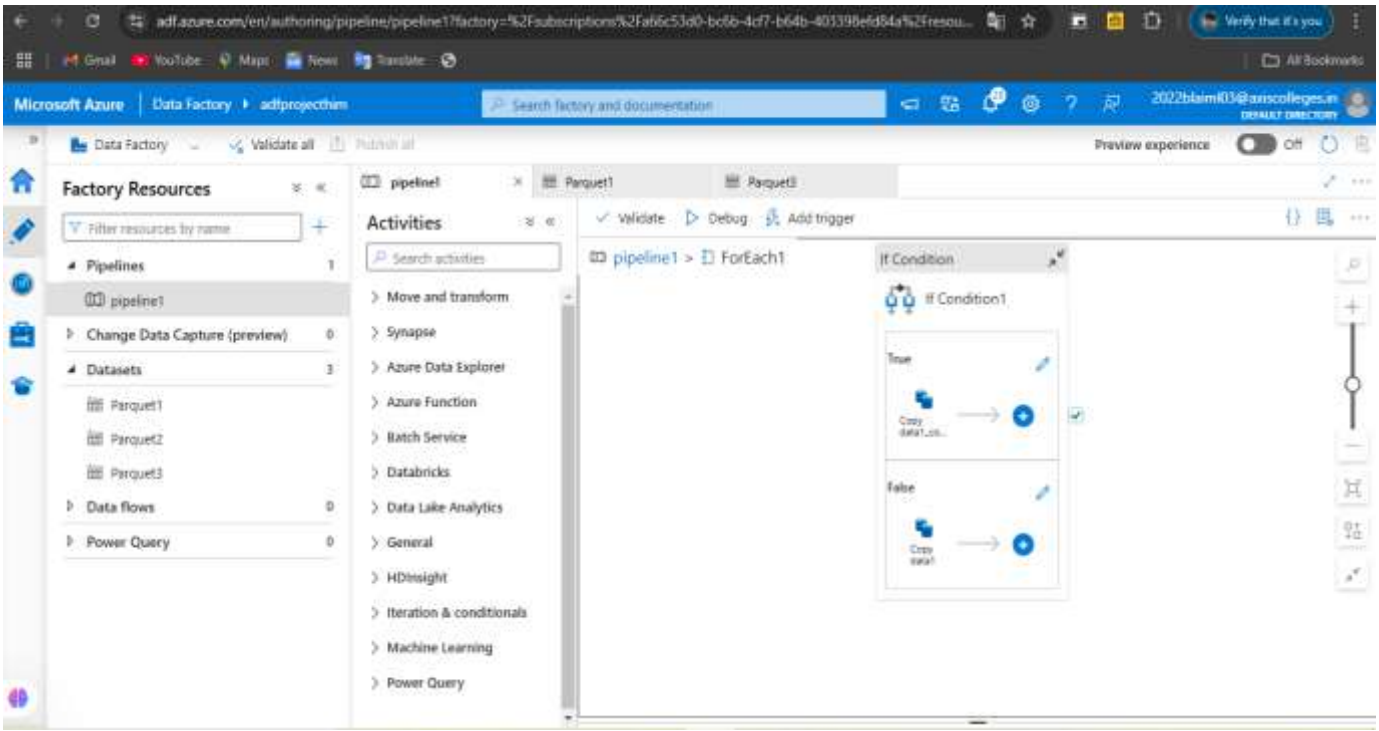
Azure Data Lake Gen 2



AZURE DATA FACTORY PIPELINE(FOR EACH ACTIVITY)

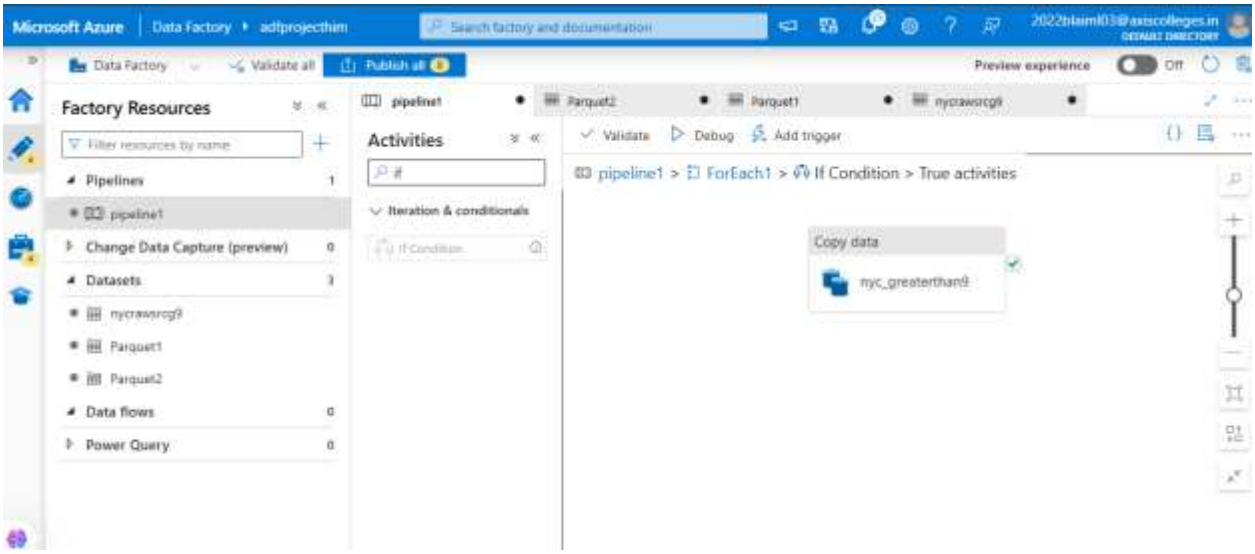


IF ELSE ACTIVITY IN FOR EACH

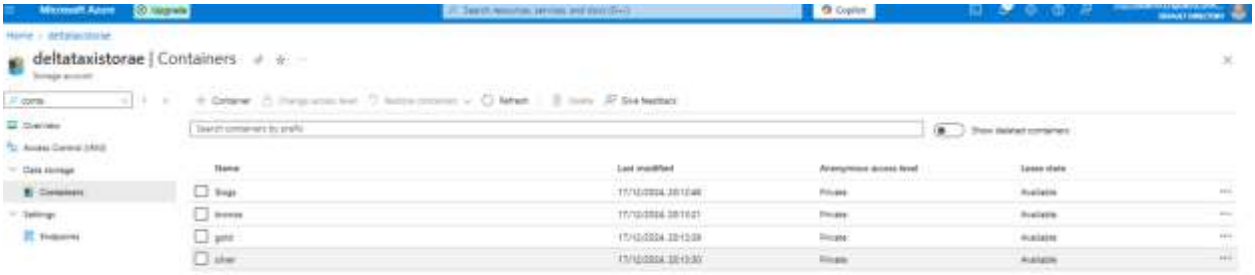


CODE - [trip-data/green_tripdata_2023-@{dataset().p_monthgreater}.parquet]

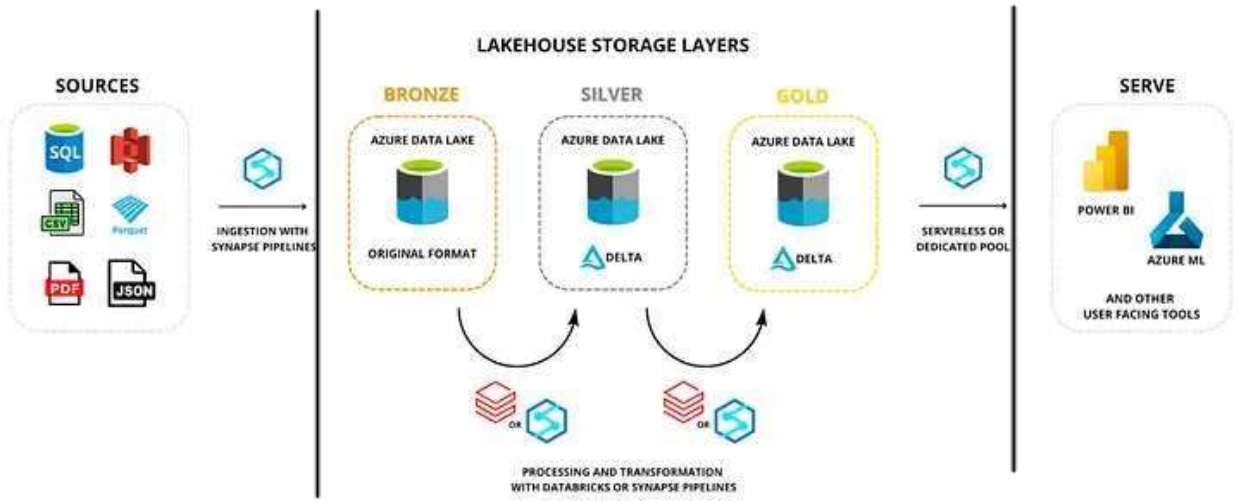
Implemented For Each Activity to iterate through monthly data (January to December), using If-Else Logic to direct data through conditional workflows, and in the "Else" condition, applied a Copy Data Activity to efficiently transfer and store the data.



CODE- trip-data/green_tripdata_2023-@{dataset().p_monthgreater}.parquet


deltataxistorae | Containers
Name
Last modified
Anonymous access level
Lease state
bronze
silver
gold


Microsoft Azure
databricks
azure data lake project
File Edit View Run Help
Run all
Schedule
Share
New
Workspace
Recents
Catalog
Workflows
Compute
SQL Editor
Queries
Dashboards
Genie
Alerts
Query History
SQL Warehouses
Job Runs
Data Ingestion
LAKEHOUSE STORAGE LAYERS
SOURCES
BRONZE
SILVER
GOLD
SERVE
DATA ACCESS



#DATA ACCESS

```
SECRET_ID = "9.d8Q~VJku6GedTf74Rwr2hqQgg3Rwsy1xZ9aau."
APP_ID  = "306b3f5c-f6ab-4ff7-9e1a-3d080ebb84f9" TENENT_ID
= "8122ffec-4fed-40ad-acb5-de53a17ae9d8"

spark.conf.set("fs.azure.account.auth.type.deltataxistorae.dfs.core.wi
ndows.net", "OAuth")
spark.conf.set("fs.azure.account.oauth.provider.type.deltataxistorae.d
fs.core.windows.net",
"org.apache.hadoop.fs.azurebfs.oauth2.ClientCredsTokenProvider")
spark.conf.set("fs.azure.account.oauth2.client.id.deltataxistorae.dfs.
core.windows.net", "306b3f5c-f6ab-4ff7-9e1a-3d080ebb84f9")
spark.conf.set("fs.azure.account.oauth2.client.secret.deltataxistorae.
dfs.core.windows.net", "9.d8Q~VJku6GedTf74Rwr2hqQgg3Rwsy1xZ9aau.")
spark.conf.set("fs.azure.account.oauth2.client.endpoint.deltataxistora
e.dfs.core.windows.net",
"https://login.microsoftonline.com/8122ffec4fed-40ad-
acb5de53a17ae9d8/oauth2/token")

dbutils.fs.ls("abfss://bronze@deltataxistorae.dfs.core.windows.net/")
[FileInfo(path='abfss://bronze@deltataxistorae.dfs.core.windows.net/
2023/', name='2023/', size=0, modificationTime=1734713530000),

 FileInfo(path='abfss://bronze@deltataxistorae.dfs.core.windows.net/
trip_type/', name='trip_type/', size=0
modificationTime=1734633483000),
```

```
 FileInfo(path='abfss://bronze@deltataxistorae.dfs.core.windows.net/
trip_zone/', name='trip_zone/', size=0
modificationTime=1734634179000)]
```

DATA READING

***Import Libraries**

```
from pyspark.sql.functions import * from
pyspark.sql.types import *
```

##Reading CSV DATA ###**Trip**

Type Data

```
df_trip_type = spark.read.format('csv')\
    .option('header', True)\
.option('inferSchema' , True)\
    .load
("abfss://bronze@deltataxistorae.dfs.core.windows.net/trip_type")
df_trip_type.display()
```

Read Data From Azure Blob Storage Trip Zone

```
df_trip_zone = spark.read.format('csv')\
    .option('header', True)\
.option('inferSchema' , True)\
    .load
("abfss://bronze@deltataxistorae.dfs.core.windows.net/trip_zone")
df_trip_zone.display()
```

#Trip Data Define Schema for the trip data

```
from pyspark.sql.types import StructType, StructField, LongType,
StringType, DoubleType, TimestampType

my_schema = StructType([
    StructField("VendorID", LongType(), True),
    StructField("lpep_pickup_datetime", TimestampType(), True),
    StructField("lpep_dropoff_datetime", TimestampType(), True),
    StructField("store_and_fwd_flag", StringType(), True),
    StructField("RatecodeID", LongType(), True),
    StructField("PULocationID", LongType(), True),
    StructField("DOLocationID", LongType(), True),
    StructField("passenger_count", LongType(), True),
    StructField("trip_distance", DoubleType(), True),
    StructField("fare_amount", DoubleType(), True),
StructField("extra", DoubleType(), True),
    StructField("mta_tax", DoubleType(), True),
```

```
    StructField("tip_amount", DoubleType(), True),
    StructField("tolls_amount", DoubleType(), True),
    StructField("ehail_fee", DoubleType(), True),
    StructField("improvement_surcharge", DoubleType(), True),
StructField("total_amount", DoubleType(), True),
    StructField("payment_type", LongType(), True),
    StructField("trip_type", LongType(), True),
    StructField("congestion_surcharge", DoubleType(), True)
])

df_trip = spark.read.format('parquet')\
    .option('header', 'true')\
    .schema(my_schema)\
    .option('recursiveFileLookup', 'true')\
    .load("abfss://bronze@deltataxistorae.dfs.core.windows.net/2023")
df_trip.printSchema()
```

#Data Transformation

Taxi Trip Type

```
df_trip_type.display()

df_trip_type = df_trip_type.withColumnRenamed("trip_type",
"trip_type_id") df_trip_type =
df_trip_type.withColumnRenamed( "description",
"trip_description") df_trip_type.display()

df_trip_type.write.format("parquet")\
    .mode("append")\
    .option("path"
,"abfss://silver@deltataxistorae.dfs.core.windows.net/trip_type")\
.save()
```

Trip Zone

```
df_trip_zone.display()

df_trip_zone = df_trip_zone.withColumn('zone1',split(col('Zone'),"/")
[0])\
                            .withColumn('zone2',split(col('Zone'),"/")
[1])
df_trip_zone.display()

%python df_trip_zone.write\
.format('parquet')\
    .mode('append')\
.option("path",
"abfss://silver@deltataxistorae.dfs.core.windows.net/trip_zone")\
.save()
```

Trip Data

```
%python df_trip =
df_trip.withColumn("trip_date",
to_date("lpep_pickup_datetime")) \
.withColumn("trip_year",
year("lpep_pickup_datetime")) \
                 .withColumn("trip_month",
month("lpep_pickup_datetime")) display(df_trip)

from pyspark.sql.types import StructType, StructField, LongType,
StringType, DoubleType, TimestampType

my_schema = StructType([
    StructField("VendorID", LongType(), True),
    StructField("lpep_pickup_datetime", TimestampType(), True),
    StructField("lpep_dropoff_datetime", TimestampType(), True),
    StructField("store_and_fwd_flag", StringType(), True),
    StructField("RatecodeID", LongType(), True),
    StructField("PULocationID", LongType(), True),
    StructField("DOLocationID", LongType(), True),
    StructField("passenger_count", LongType(), True),
    StructField("trip_distance", DoubleType(), True),
    StructField("fare_amount", DoubleType(), True),
    StructField("extra", DoubleType(), True),
    StructField("mta_tax", DoubleType(), True),
    StructField("tip_amount", DoubleType(), True),
    StructField("tolls_amount", DoubleType(), True),
    StructField("ehail_fee", DoubleType(), True),
    StructField("improvement_surcharge", DoubleType(), True),
    StructField("total_amount", DoubleType(), True),
    StructField("payment_type", LongType(), True),
```

```
    StructField("trip_type", LongType(), True),
    StructField("congestion_surcharge", DoubleType(), True)
]) df_tripa = df_triP.select('VendorID' ,'PULocationID' ,

'total_amount',

    'DOLocationID', 'trip_date', 'trip_distance')
```

#Save the Parquet File into Silver Layer

```
df_tripa.write\
     .format("parquet") \
    .mode('overwrite') \
    .option("path",
"abfss://silver@deltataxistorae.dfs.core.windows.net/trip2023data") \
.save()
```

storage variable

```
silver = "abfss://silver@deltataxistorae.dfs.core.windows.net" gold
= "abfss://gold@deltataxistorae.dfs.core.windows.net"
```

##Data Reading and Writing and Creating Delta Tables

```
%sql
SHOW EXTERNAL LOCATIONS;

spark.conf.set("fs.azure.account.auth.type.deltataxistorae.dfs.core.wi
ndows.net", "OAuth")
spark.conf.set("fs.azure.account.oauth.provider.type.deltataxistorae.d
fs.core.windows.net",
"org.apache.hadoop.fs.azurebfs.oauth2.ClientCredsTokenProvider")
spark.conf.set("fs.azure.account.oauth2.client.id.deltataxistorae.dfs.
core.windows.net", "306b3f5c-f6ab-4ff7-9e1a-3d080ebb84f9")
spark.conf.set("fs.azure.account.oauth2.client.secret.deltataxistorae.
dfs.core.windows.net", "9.d8Q~VJku6GedTf74Rwr2hqQgg3Rwsy1xZ9aau.")
spark.conf.set("fs.azure.account.oauth2.client.endpoint.deltataxistora
e.dfs.core.windows.net",
"https://login.microsoftonline.com/8122ffec4fed-40ad-acb5-
de53a17ae9d8/oauth2/token")

from pyspark.sql.functions import *
from pyspark.sql.types import *

silver = "abfss://silver@deltataxistorae.dfs.core.windows.net"
gold = "abfss://gold@deltataxistorae.dfs.core.windows.net"
```

#Data Zone

```
df_zone = spark.read.format("parquet")\
.option('inferSchema', True)\
                    .option('header' , True)\
.load(f'{silver}/trip_zone') df_zone.display()

%sql create database gold

df_zone = df_zone.write.format('delta')\
                       .mode('append')\
                       .option('path',f'{gold}/trip_zone')\
                       .saveAsTable('gold.trip_zone')

%sql select*from gold.trip_zone;
```

trip_type

```
df_type = spark.read.format("parquet")\
.option('inferSchema', True)\
                    .option('header' , True)\
                    .load(f'{silver}/trip_type')
df_type.display()
```

```
df_type = df_type.dropDuplicates()
df_type.display()
```

write the data into gold layer

```
df_type = df_type.write.format('delta')\
                        .mode('append')\
                        .option('path',f'{gold}/trip_type')\
.saveAsTable('gold.trip_type')
```

trip2023data

```
df_type2023 = spark.read.format("parquet")\
.option('inferSchema', True)\
                    .option('header' , True)\
.load(f'{silver}/trip2023data') df_type2023.display()
```

save the data into Gold layer

```
df_type2023 = df_type2023.write.format('delta')\
                        .mode('append')\

.option('path',f'{gold}/trip_type2023')\
                        .saveAsTable('gold.trip2023')

%sql
select*from gold.trip2023 ;
```

CONNECT TO POWER BI FOR VISUALIZATION