DATA INGESTION

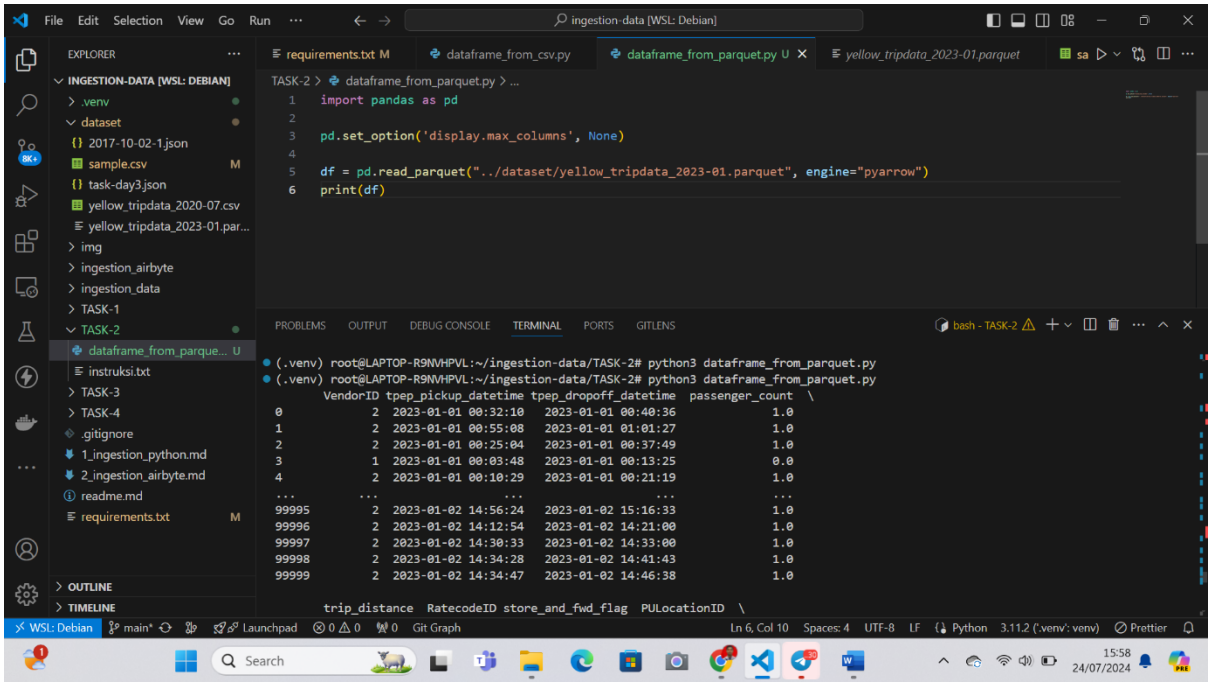
TASK-2

1. **We are going to create a DataFrame from a [parquet file](#) on our [datasets](#).**

   Jawaban :

```
import pandas as pd

pd.set_option('display.max_columns', None)

df = pd.read_parquet("../dataset/yellow_tripdata_2023-01.parquet",
engine="pyarrow")
print(df)
```

   Screenshot:

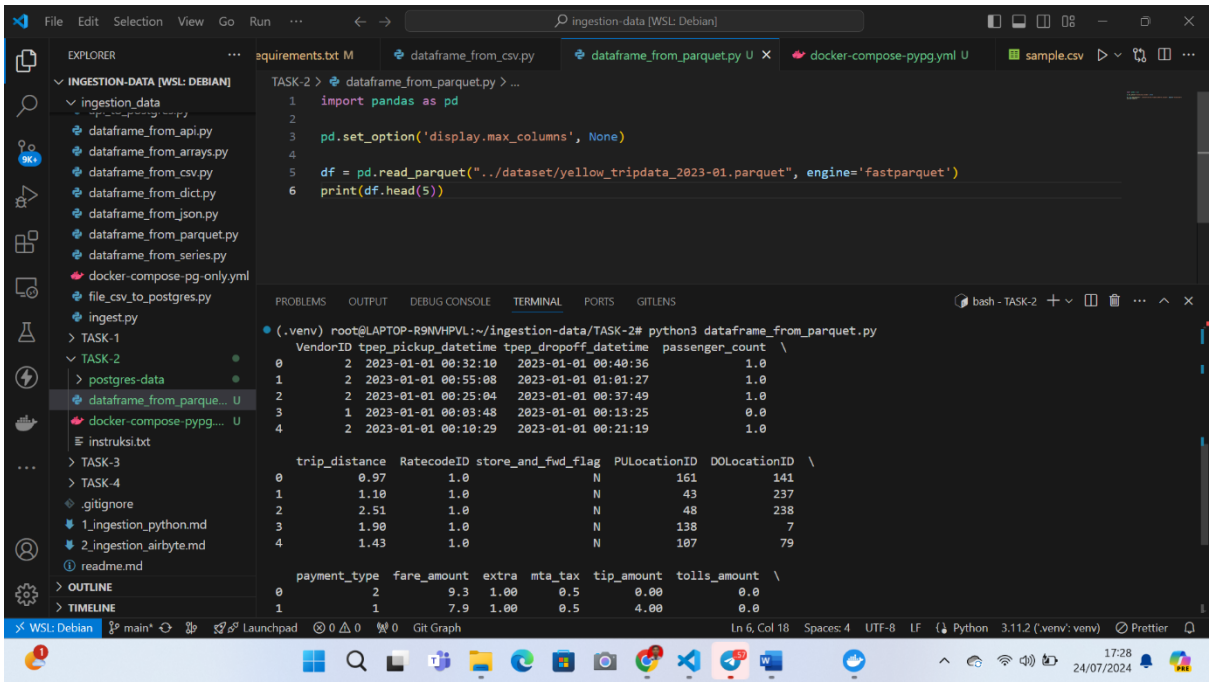


2. **Load the parquet file to a DataFrame with `fastparquet` library.**

   Jawaban :

```
import pandas as pd

pd.set_option('display.max_columns', None)

df = pd.read_parquet("../dataset/yellow_tripdata_2023-01.parquet",
engine='fastparquet')
print(df.head(5))
```

Screenshot :

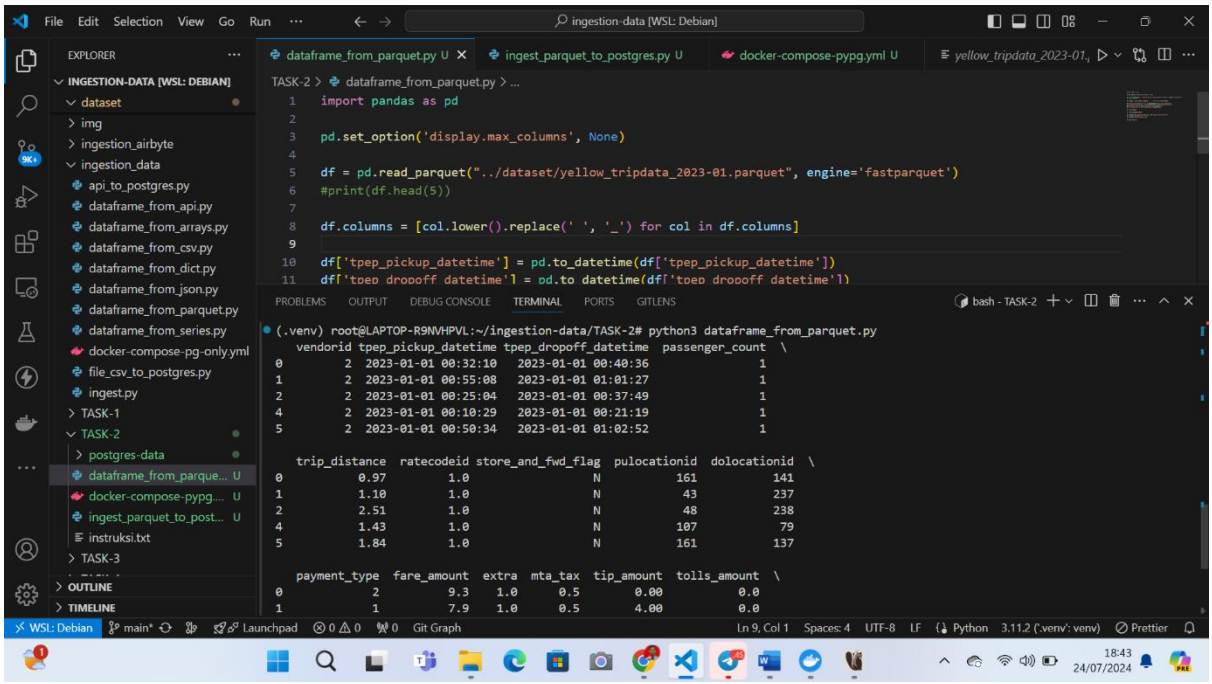


3. **Clean the Yellow Trip dataset.**

   Jawaban :

```python
import pandas as pd

pd.set_option('display.max_columns', None)

df = pd.read_parquet("../dataset/yellow_tripdata_2023-01.parquet",
engine='fastparquet')
#print(df.head(5))

df.columns = [col.lower().replace(' ', '_') for col in df.columns]

df['tpep_pickup_datetime'] = pd.to_datetime(df['tpep_pickup_datetime'])
df['tpep_dropoff_datetime'] = pd.to_datetime(df['tpep_dropoff_datetime'])
df['passenger_count'] = df['passenger_count'].astype(int)
df['trip_distance'] = df['trip_distance'].astype(float)

df = df.dropna()

df = df.drop_duplicates()

df = df[df['tpep_dropoff_datetime'] > df['tpep_pickup_datetime']]
df = df[df['passenger_count'] > 0]
df = df[df['trip_distance'] > 0]

print(df.head(5))
```

Screenshot :



4. Define the data type schema when using `to_sql` method.
   Jawaban :

```
    def to_postgres(self, db_name: str, data: pd.DataFrame):
        from sqlalchemy.types import BigInteger, String, JSON, DateTime,
Boolean, Float, Integer
        from sqlalchemy.exc import SQLAlchemyError

        self.db_name = db_name
        self.__create_connection()

        try:
            df_schema = {
                "VendorID": BigInteger,
                "tpep_pickup_datetime": DateTime,
                "tpep_dropoff_datetime": DateTime,
                "passenger_count": BigInteger,
                "trip_distance": Float,
                "RatecodeID": Float,
                "store_and_fwd_flag": Boolean,
                "PULocationID": Integer,
                "DOLocationID": Integer,
                "payment_type": Integer,
                "fare_amount": Float,
                "extra": Float,
                "mta_tax": Float,
                "tip_amount": Float,
                "tolls_amount": Float,
```

```
                "improvement_surcharge": Float,
                "total_amount": Float,
                "congestion_surcharge": Float,
                "airport_fee": Float
            }

            data.to_sql(name=self.db_name, con=self.engine,
if_exists="replace", index=False, schema="public", dtype=df_schema,
method=None, chunksize=5000)
        except SQLAlchemyError as err:
            print("error >> ", err.__cause__)
```

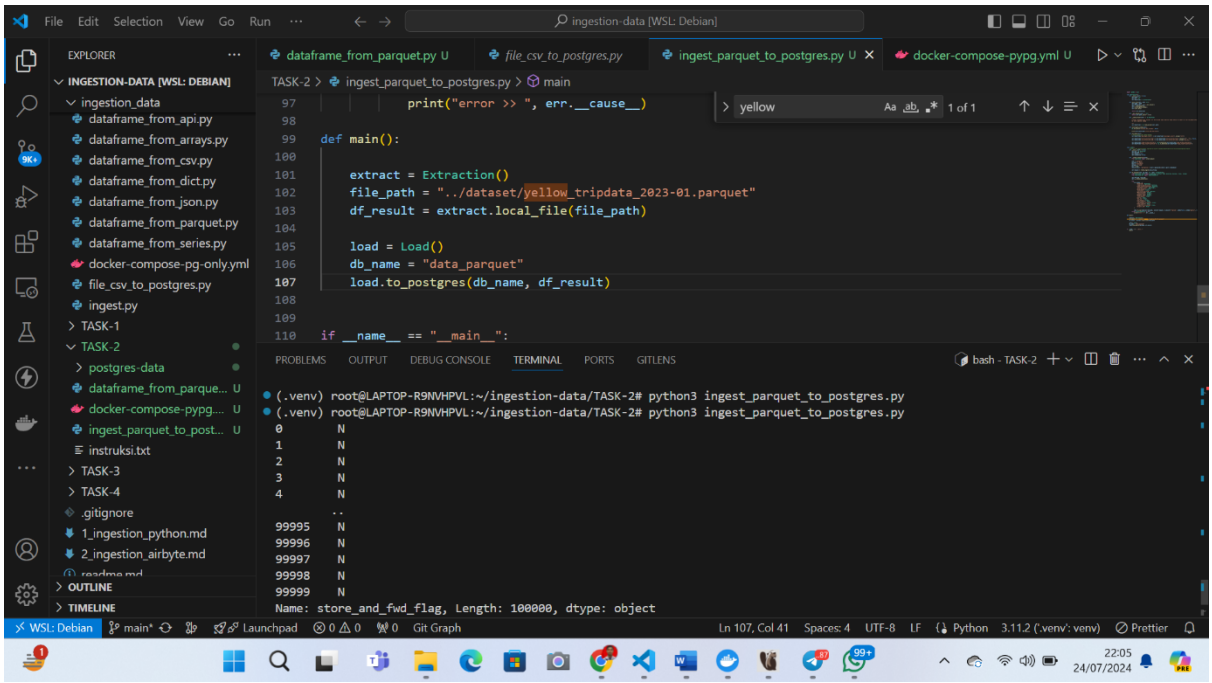
5. Ingest the Yellow Trip dataset to PostgreSQL
   Jawaban :

```
import pandas as pd

class Extraction():
    def __init__(self) -> None:
        self.path: str
        self.url: str
        self.dataframe = pd.DataFrame()

    def local_file(self, path: str):
        self.path = path
        self.extension = self.__ext_checker()
        self.__read_parquet()
        self.investigate_schema()
        self.cast_data()

        return self.dataframe

    def __ext_checker(self) -> str:
        return self.path.split(".")[-1]

    def __read_parquet(self) -> pd.DataFrame:
        """
        problem: DtypeWarning: Columns (6) have mixed types.Specify dtype
option on import or set low_memory=False.
        to solve specify schema

        """
        self.dataframe = pd.read_parquet(self.path)

    def investigate_schema(self):
        pd.set_option('display.max_columns', None)
```

```
        print(self.dataframe["store_and_fwd_flag"])

    def cast_data(self):
        # file parquet cast data handler
        self.dataframe["passenger_count"] =
self.dataframe["passenger_count"].astype("Int8")

        self.dataframe["store_and_fwd_flag"] =
self.dataframe["store_and_fwd_flag"].replace(["N", "Y"], [False, True])
        self.dataframe["store_and_fwd_flag"] =
self.dataframe["store_and_fwd_flag"].astype("boolean")

        self.dataframe["tpep_pickup_datetime"] =
pd.to_datetime(self.dataframe["tpep_pickup_datetime"])
        self.dataframe["tpep_dropoff_datetime"] =
pd.to_datetime(self.dataframe["tpep_dropoff_datetime"])


class Load():
    # https://www.geeksforgeeks.org/how-to-insert-a-pandas-dataframe-to-an-
existing-postgresql-table/
    def __init__(self) -> None:
        self.df = pd.DataFrame
        self.db_name = ""
        self.engine = None
        self.connection = None

    def __create_connection(self):
        from sqlalchemy import create_engine

        user = "postgres"
        password = "admin"
        host = "localhost"
        database = "mydb"
        port = 5432
        conn_string =
f"postgresql://{user}:{password}@{host}:{port}/{database}"

        self.engine = create_engine(conn_string)

    def to_postgres(self, db_name: str, data: pd.DataFrame):
        from sqlalchemy.types import BigInteger, String, JSON, DateTime,
Boolean, Float, Integer
        from sqlalchemy.exc import SQLAlchemyError

        self.db_name = db_name
        self.__create_connection()
```

```python
        try:
            df_schema = {
                "VendorID": BigInteger,
                "tpep_pickup_datetime": DateTime,
                "tpep_dropoff_datetime": DateTime,
                "passenger_count": BigInteger,
                "trip_distance": Float,
                "RatecodeID": Float,
                "store_and_fwd_flag": Boolean,
                "PULocationID": Integer,
                "DOLocationID": Integer,
                "payment_type": Integer,
                "fare_amount": Float,
                "extra": Float,
                "mta_tax": Float,
                "tip_amount": Float,
                "tolls_amount": Float,
                "improvement_surcharge": Float,
                "total_amount": Float,
                "congestion_surcharge": Float,
                "airport_fee": Float
            }

            data.to_sql(name=self.db_name, con=self.engine,
if_exists="replace", index=False, schema="public", dtype=df_schema,
method=None, chunksize=5000)
        except SQLAlchemyError as err:
            print("error >> ", err.__cause__)

def main():

    extract = Extraction()
    file_path = "../dataset/yellow_tripdata_2023-01.parquet"
    df_result = extract.local_file(file_path)

    load = Load()
    db_name = "data_parquet"
    load.to_postgres(db_name, df_result)


if __name__ == "__main__":
    main()
```

Screenshot :



6. **Count how many rows are ingested.**

   Jawabannya : 100.000