Master PySpark: From Zero to Big Data Hero!!

Loading Data from CSV File into a DataFrame

Loading data into DataFrames is a fundamental step in any data processing workflow in PySpark. This document outlines how to load data from CSV files into a DataFrame, including using a custom schema and the implications of using the inferSchema option.

Step-by-Step Guide

1. Import Required Libraries

Before loading the data, ensure you import the necessary modules:

```
from pyspark.sql import SparkSession
from pyspark.sql.types import StructType, StructField, IntegerType,
StringType, DoubleType
```

2. Define the Schema

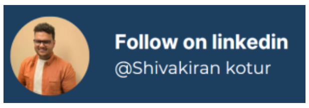
You can define a custom schema for your CSV file. This allows you to explicitly set the data types for each column.

```
# Define the schema for the CSV file
custom_schema = StructType([
    StructField("id", IntegerType(), True),
    StructField("name", StringType(), True),
    StructField("age", IntegerType(), True),
    StructField("salary", DoubleType(), True)
])
```

3. Read the CSV File

Load the CSV file into a DataFrame using the read.csv() method. Here, header=True treats the first row as headers, and inferSchema=True allows Spark to automatically assign data types to columns.

```
# Read the CSV file with the custom schema
df = spark.read.csv("your_file.csv", schema=custom_schema,
header=True)
```



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4. Load Multiple CSV Files

To read multiple CSV files into a single DataFrame, you can pass a list of file paths. Ensure that the schema is consistent across all files.

```
# List of file paths
file_paths = ["file1.csv", "file2.csv", "file3.csv"]
# Read multiple CSV files into a single DataFrame
df = spark.read.csv(file_paths, header=True, inferSchema=True)
```

5. Load a CSV from FileStore

Here is an example of loading a CSV file from Databricks FileStore:

```
df = spark.read.csv("/FileStore/tables/Order.csv", header=True,
inferSchema=True, sep=',')
```

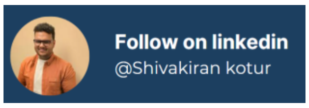
6. Display the DataFrame

Use the following commands to check the schema and display the DataFrame:

```
# Print the schema of the DataFrame
df.printSchema()

# Show the first 20 rows of the DataFrame
df.show()  # Displays only the first 20 rows

# Display the DataFrame in a tabular format
display(df)  # For Databricks notebooks
```



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Interview Question: How Does inferSchema Work?

- **Behind the Scenes:** When you use inferSchema, Spark runs a job that scans the CSV file from top to bottom to identify the best-suited data type for each column based on the values it encounters.

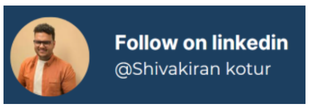
Does It Make Sense to Use inferSchema?

- **Pros**:
    - Useful when the schema of the file keeps changing, as it allows Spark to automatically detect the data types.
- **Cons**:
    - Performance Impact: Spark must scan the entire file, which can take extra time, especially for large files.
    - Loss of Control: You lose the ability to explicitly define the schema, which may lead to incorrect data types if the data is inconsistent.

Conclusion

Loading data from CSV files into a DataFrame is straightforward in PySpark. Understanding how to define a schema and the implications of using inferSchema is crucial for optimizing your data processing workflows.

This document provides a comprehensive overview of how to load CSV data into DataFrames in PySpark, along with considerations for using schema inference. Let me know if you need any more details or adjustments!



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