10 Spark SQL Interview Q&As

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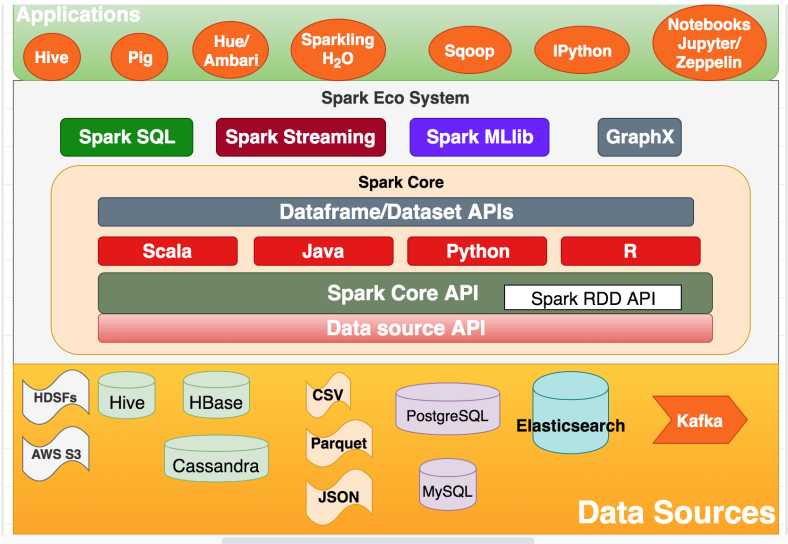
Q1. What is Spark SQL?
A1. Apache Spark SQL is a module for structured data processing in Spark. Spark SQL integrates relational processing (i.e. SQL) with Spark's functional programming using Scala, Java, etc weave SQL queries with Dataframes/Datasets based transformations. It provides support for various data sources as shown below:



Spark SQL in Spark Eco System

Q2. What libraries do Spark SQL have?
A2.

1. Data Source API

This library has built-in support for various Datasources shown above. This library can be used with various datasources for loading and storing structured data. It has built-in support for Hive, Avro, JSON, JDBC, Parquet, Elastic Search, MySQL, etc.

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2. Dataframe API

A DataFrame is a distributed collection of data organised into structured named column. It is equivalent to a relational table in SQL used for storing data into tables.

3. SQLInterpreter And Optimiser

SQL Interpreter and Optimizer are functional programming constructed in Scala for supporting **cost based** and **rules based** optimization to make the queries run faster than RDDs.

4. SQL Service

SQL Service is an entry point for working with structured data in Spark. It enables you to create DataFrame objects as well as the execution of SQL queries.

Q3. How will you go about enabling Hive support in Spark 2.0?
A3.

```
 //Spark 2.0 builder pattern to create the Spark session
val hiveLocation = "location/spark-warehouse"
val spark = SparkSession
    .builder()
    .appName("SparkSessionZipsExample")
    .config("spark.sql.warehouse.dir", hiveLocation)
    .enableHiveSupport()
    .getOrCreate()

//Once the SparkSession is instantiated, you can configure Spark’s r

//set new runtime options
spark.conf.set("spark.sql.shuffle.partitions", 6)
spark.conf.set("spark.executor.memory", "2g")
//get all settings
val configMap:Map[String, String] = spark.conf.getAll()

//access Hive catalog metadata
spark.catalog.listDatabases.show(false)
spark.catalog.listTables.show(false)

```

Q4. How will you go about using Spark SQL with Spark 2.0 SparkSession?
A4.

```
// read the csv file and create the dataframe
val csvFile = args(0)
val employeeDF = spark.read.csv(csvFile)

// Now create an SQL table and issue SQL queries against it without
// using the sqlContext but through the SparkSession object.
// Creates a temporary view of the DataFrame

mydataDF.createOrReplaceTempView("my_table")
mydataDF.cache()
val resultsDF = spark.sql("SELECT name, state, age FROM my_table")
resultsDF.show(10)

```

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You can also "printSchema" and perform transformations

```
// read the csv file and create the dataframe
val csvFile = args(0)
val mydataDF = spark.read.csv(csvFile)

df.printSchema()
df.select("city").show()

//increment age by 1
df.select($"name", $"age" + 1).show()
df.filter($"age" > 18).show()

```

Q5. How will you go about saving & reading from Hive table with SparkSession?

A5.

```
 //drop if the table already exists
spark.sql("DROP TABLE IF EXISTS my_employee_table")

//saving to a hive table
spark.table("my_employee_table").write.saveAsTable("my_hive_employee

//read from the hive table
val resultsHiveDF = spark.sql("SELECT name, state, age FROM my_hive_
resultsHiveDF.show(10)

```

If you use the Scala implicits, you do not need to prefix with "spark" as in "spark.sql("…………")"

```
import org.apache.spark.sql.Row
import org.apache.spark.sql.SparkSession
import spark.implicits._
import spark.sql
//........
sql("DROP TABLE IF EXISTS my_employee_table")

```

Q6. How will you display the number of employees at different age groups?

A6.

```
df.groupBy("age").count().show()

```

Q7. How will you create a temporary view of a DataFrame?

A7.

```
df.createOrReplaceTempView("tmp_employee")
val sqlDF = spark.sql("SELECT * FROM tmp_employee")
sqlDF.show()

```

Q8. How will you use a DataSet API with Spark SQL?

A8.

```

case class Employee(name: String, state: String, age: Long)
val caseClassDataSet = Seq(Employee("John", "NSW", 25), Employee("Pet
caseClassDS.show()

val path = arg(0)
val employeeDS = spark.read.csv(path).as[Employee]
employeeDS.show()

```

Q9. How will you be reading json & parquet files?

A9.

json

```
val path = arg(0) . //path to json file
val employeeDF = spark.read.json(path)
employeeDF.printSchema()
employeeDF.createOrReplaceTempView("tbl_employee")
val youngEmployees = spark.sql("SELECT * FROM tbl_employee WHERE age
youngsterNamesDF.show()

```

Parquet

```
val path = arg(0) . //path to parquet file
val employeeDF = spark.read.parquet(path)
employeeDF.printSchema()
employeeDF.createOrReplaceTempView("tbl_employee")
val youngEmployees = spark.sql("SELECT * FROM tbl_employee WHERE age
youngsterNamesDF.show()

```

Q10. What is a Spatk SQL's UDF?

A10. Spark SQL's User-Defined Functions (UDFs) define new Column-based functions that **extend the vocabulary of Spark SQL's DSL** for transforming Datasets.

```

val input = Seq((0, "John"),(1, "Peter")).toDF("id","name")

//uppercase function
val upper: String => String = _.toUpperCase

import org.apache.spark.sql.functions.udf
val upperUDF = udf(upper)
input.withColumn("upper", upperUDF('name')).show(false)

//you can register this function

spark.udf.register("customUpper", (input:String) => input.toUpperCas
spark.catalog.listFunctions.filter('name like "%Upper%").show(false)


```

‹ Common Table Expressions (i.e. CTE) in SQL using the "WITH" clause

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