Session 21:

SPARK SQL 2

Assignment 1

Task 1

Using spark-sql, Find:

- 1. What are the total number of gold medal winners every year
- 2. How many silver medals have been won by USA in each sport

```
Solution: // Create a case class globally.

//Inferring the Schema Using Reflection. Automatically converting an RDD containing case classes to a DataFrame.

// The case class defines the schema of the table. The names of the arguments to the case class are read using reflection

// and become the names of the columns.

SOLUTION:

package SQL

//import org.apache.spark.sql.SparkSession

import org.apache.spark.sql.SparkSession

object Sports_Winner {
```

//Inferring the Schema Using Reflection. Automatically converting an RDD containing case classes to a DataFrame.

// The case class defines the schema of the table. The names of the arguments to the case class are read using reflection

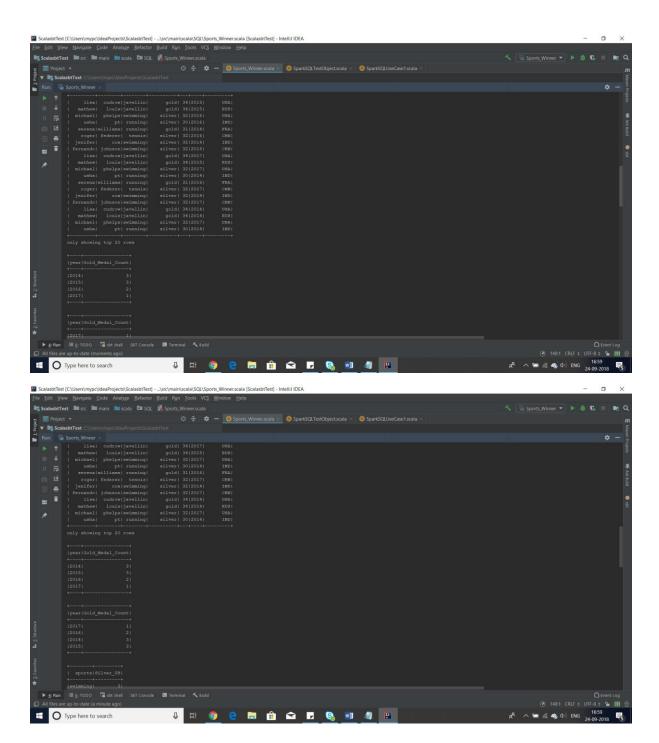
// and become the names of the columns.

// Main method - The execution entry point for the program

```
case class
Sports(firstname:String,lastname:String,sports:String,medal_type:String,age:Int,year:Long,country
id:String)
 def main(args: Array[String]): Unit = {
  val spark = SparkSession
   .builder()
   .master("local")
   .appName("Sports_data")
   .config("spark.some.config.option", "some-value")
   .getOrCreate()
  println("spark session object created")
  spark.sparkContext.setLogLevel("WARN")
  //println("spark session object created")
  import spark.implicits._
  val data = spark.sparkContext.textFile("C:/Users/mypc/Desktop/Sports_data.txt")
  val header = data.first()
  val header1 = data.filter(row => row != header)
  val sports_data = header1.map(x => x.split(",")).map(x => Sports(x(0), x(1), x(2), x(3), x(4).toInt,
x(5).toLong, x(6))).toDF()
  sports_data.show()
  //Converting the above created schema into an SQL view named sport
  sports_data.createOrReplaceTempView("sport")
  // 1. What are the total number of gold medal winners every
vear?
  // Selecting year & couting the occurance of each year by filtering medal_type condition as gold.
  // grouping by year & ordering the result based upon the year.
  val a1=spark.sql("Select year, count(year)as Gold_Medal_Count from sport where medal_type
='gold' group by year order by year ASC")
  val a2=spark.sql("Select year, count(year)as Gold_Medal_Count from sport where medal_type
='gold' group by year order by Gold_Medal_Count ASC")
  a1.show()
```

a2.show()

Screenshot:



```
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```

//2. How many silver medals have been won by USA in each sport?

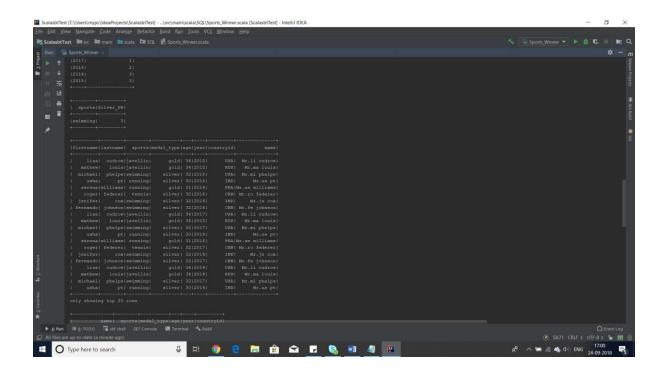
```
// Selecting sports & count of sports as Silver_US from sports view. Provided the filter as medal_type = 'silver' &
```

// coutry as USA, grouping by count & ordering the result based upon count of medals won.

val a3 = spark.sql("select sports, count(sports) as Silver_US from sport where (medal_type = 'silver' AND countryid = 'USA') group by sports order by Silver_US ASC")

a3.show()

}}



Task 2

Using udfs on dataframe

Change firstname, lastname columns into
 Mr.first_two_letters_of_firstname<space>lastname
 for example - michael, phelps becomes Mr.mi phelps

2. Add a new column called ranking using udfs on dataframe, where :

gold medalist, with age >= 32 are ranked as pro gold medalists, with age <= 31 are ranked amateur silver medalist, with age >= 32 are ranked as expert silver medalists, with age <= 31 are ranked rookie

Solution:

/*Using udfs on dataframe

1. Change firstname, lastname columns into
Mr.first_two_letters_of_firstname<space>lastname
for example - michael, phelps becomes Mr.mi phelps*/

```
import org.apache.spark.sql.functions.udf
  def udf_change_columns = udf((firstname:String,lastname:String)=>{
  val twochars Firstname=firstname.substring(0,2)
   val name ="Mr."+twochars Firstname+" "+lastname
   name})
 val df
=sports data.withColumn("name",udf change columns($"firstname",$"last
name"))
  df.show()
 val df1=df.select("name","sports","medal_type","age","year","countryid")
 // val df2 = df.drop("firstname","lastname")
 df1.show()
  val udf_add_columns = udf((medal_type:String,age:Int)=>{
  val ranking= if (medal_type.equals("gold") && age >= 32 ) "pro"
  else if(medal_type.equals("gold") && age <= 31 ) "amateur"
  else if(medal type.equals("silver") && age >= 32) "expert"
  else if(medal_type.equals("silver") && age <= 31 ) "rookie"
  else "NA"
   ranking
 })
val added column
=df1.withColumn("ranking",udf add columns($"medal type", $"age"))
  added_column.show()
```

```
val added_column1=
sports_data.withColumn("ranking",udf_add_columns($"medal_type",$"age"
))
   added_column1.show()
}}
```

Screenshot:

