Assignment 21.1 Spark SQL 2

Task 1

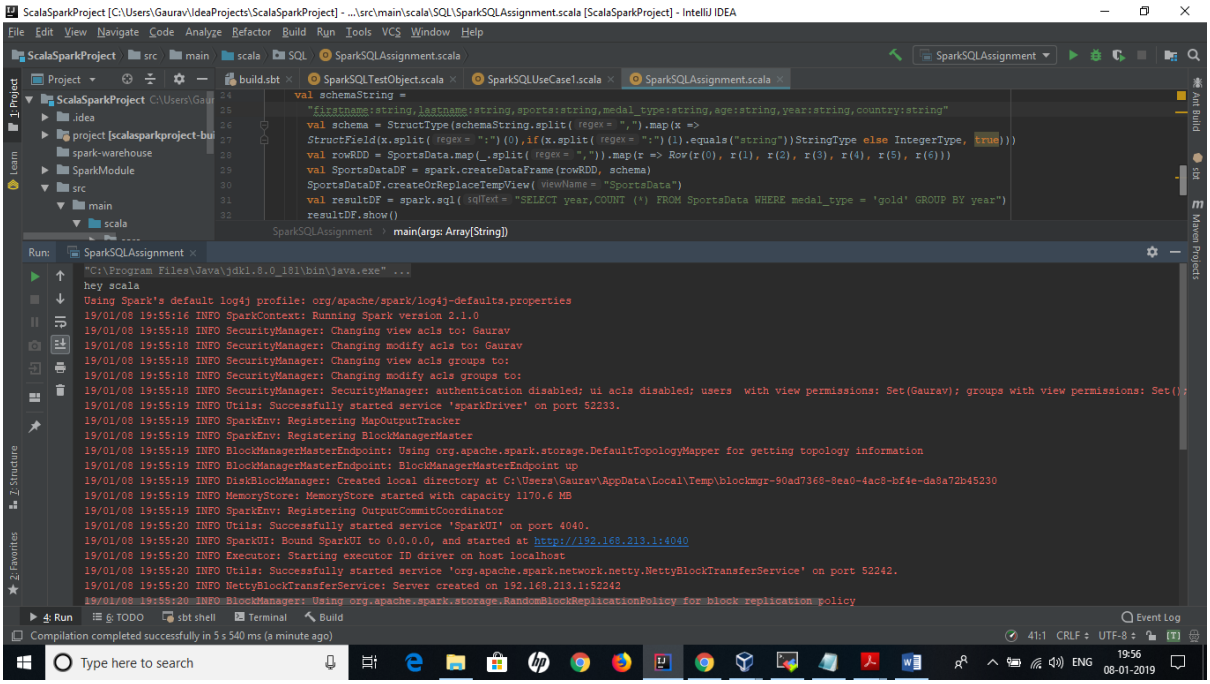
Using spark-sql, Find:

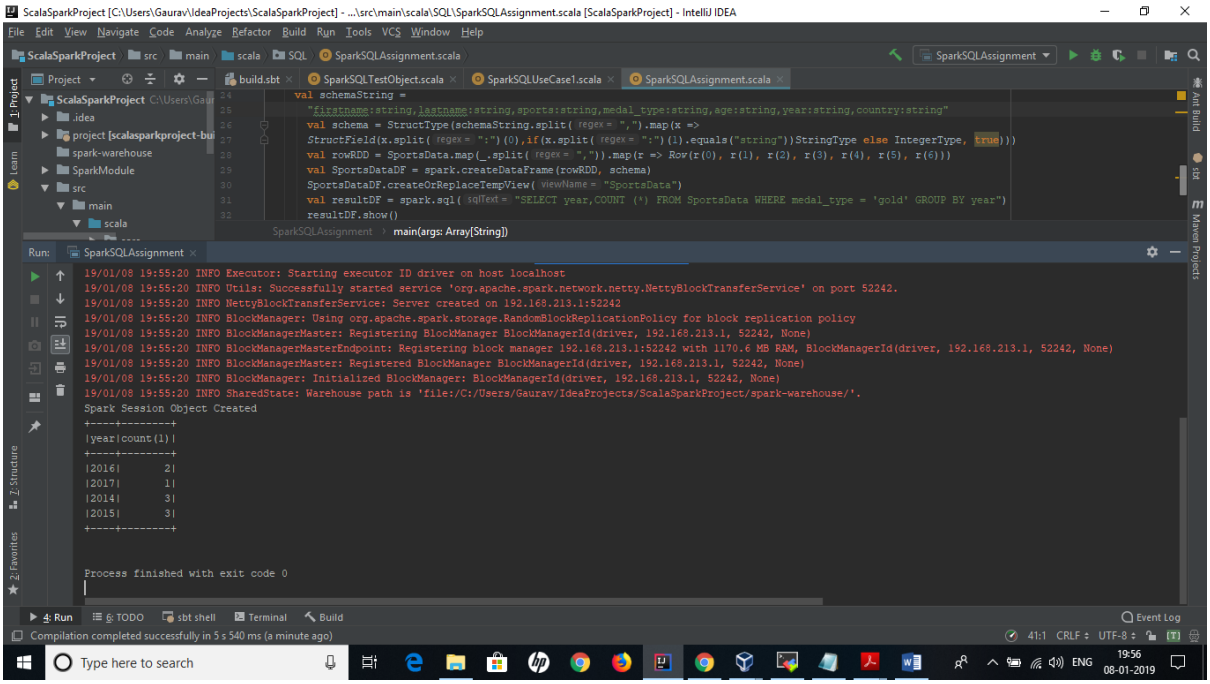
1. What are the total number of gold medal winners every year.

Solution:

```
package SQL
import org.apache.spark.sql.types.{IntegerType, StringType, StructField, StructType}
import org.apache.spark.sql.{Row, SparkSession}

object SparkSQLAssignment {

 def main(args: Array[String]): Unit = {

   println("hey scala")

   val spark = SparkSession
    .builder()
    .master(master= "local")
    .appName( name= "Spark SQL Assignment")
    .config("spark.some.config.option", "some-value")
    .getOrCreate()

   println("Spark Session Object Created")

   spark.sparkContext.setLogLevel("WARN")


   val SportsData = spark.sparkContext.textFile("C:/Users/Gaurav/Desktop/Sports_data.txt")
   val schemaString =
"firstname:string,lastname:string,sports:string,medal_type:string,age:string,year:string,coun
try:string"
    val schema = StructType(schemaString.split(",").map(x =>
    StructField(x.split(":")(0),if(x.split(":")(1).equals("string"))StringType else IntegerType,
true)))
    val rowRDD = SportsData.map(_.split(",")).map(r => Row(r(0), r(1), r(2), r(3), r(4), r(5),
r(6)))
    val SportsDataDF = spark.createDataFrame(rowRDD, schema)
    SportsDataDF.createOrReplaceTempView("SportsData")
    val resultDF = spark.sql("SELECT year,COUNT (*) FROM SportsData WHERE medal_type =
'gold' GROUP BY year")
    resultDF.show()
```

Output:



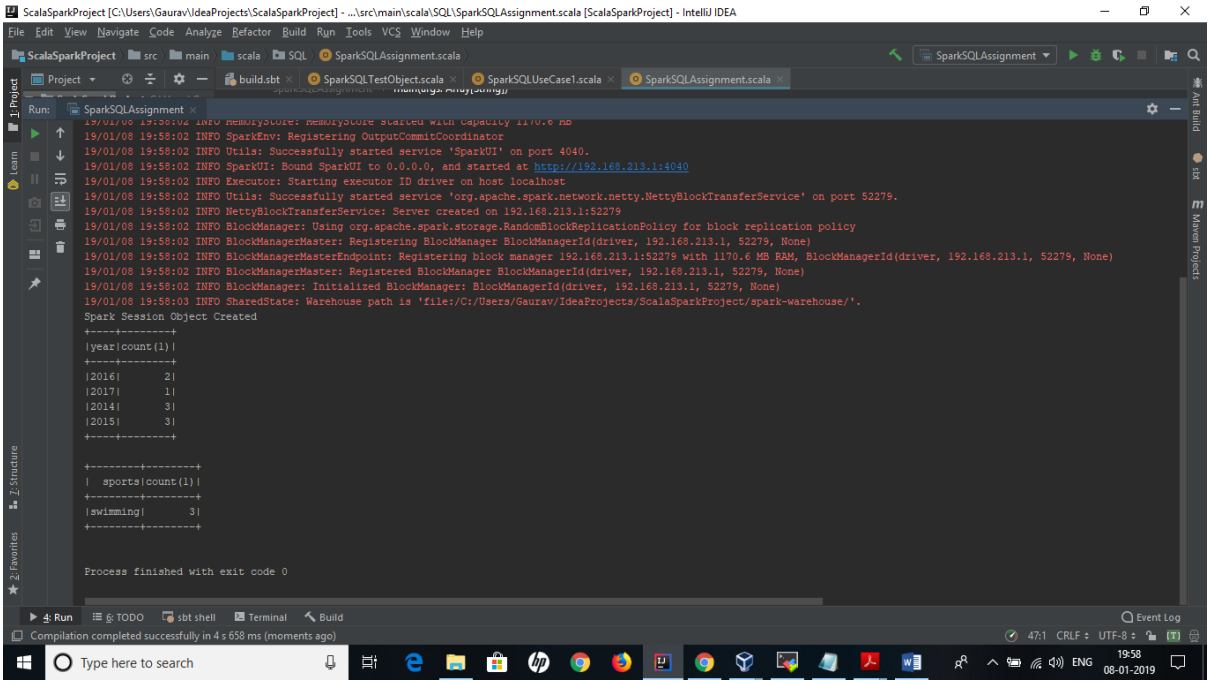


2. How many silver medals have been won by USA in each sport.

Solution:

```
val result2DF = spark.sql("SELECT sports, COUNT (*) FROM SportsData WHERE medal_type ='silver' and country ='USA' GROUP BY sports")
 result2DF.show()
```

Output:



Task 2

Using udfs on dataframe

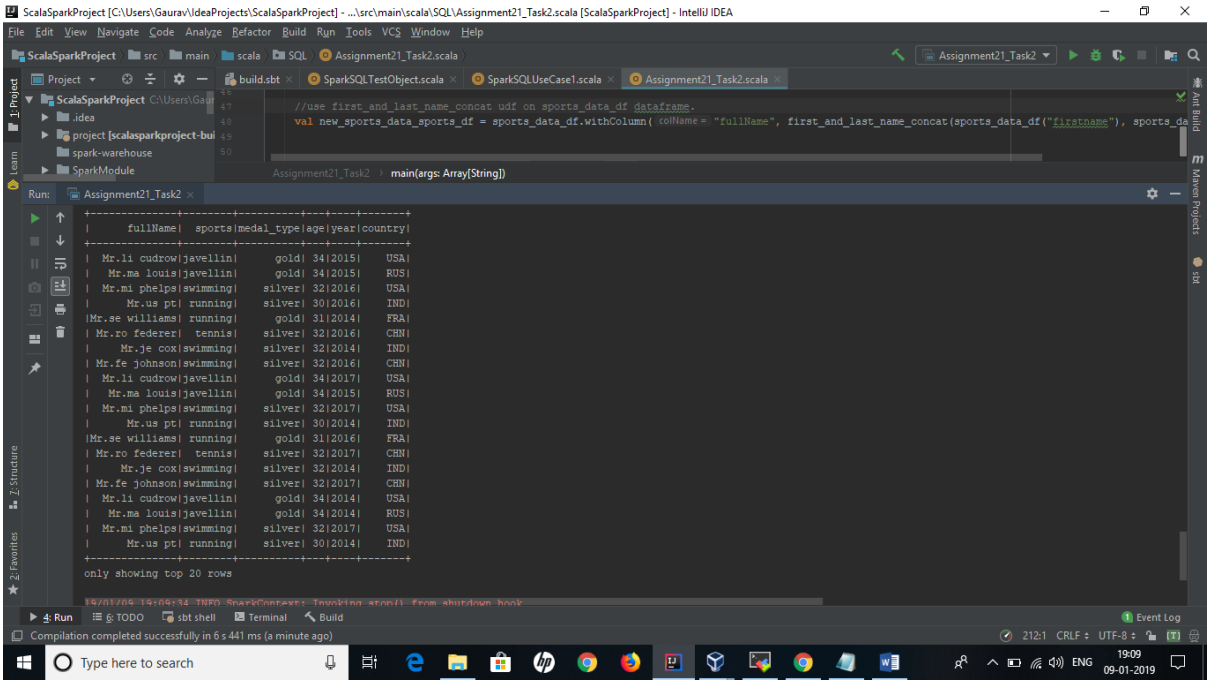
1. Change firstname, lastname columns into Mr.first_two_letters_of_firstname<space>lastname for example - michael, phelps becomes Mr.mi phelps

Code:

```
package SQL

import org.apache.spark.sql.SparkSession
import org.apache.spark.sql.functions.udf


object Assignment21_Task2 {

 //declare a case class SPORTS holding the dataset description of the sports_data.
 case class SPORTS(firstname: String, lastname: String, sports: String, medal_type: String,
age: String, year: String, country: String)


 def main(args: Array[String]): Unit = {
  println("Assignment Number 21 Task 2 !!!")


  // Use new SparkSession interface in Spark
  val spark = SparkSession
   .builder()
   .master("local[*]")
   .appName("Assignment21")
   .config("spark.some.config.option", "some-value")
```

```
    .getOrCreate()


  // load the dataset using the textFile method.
  val sports_data_with_header =
spark.sparkContext.textFile("C:/Users/Gaurav/Desktop/Sports_data.txt")
  //creating a variable header, which holds the first line of the dataset, in our data set
Sports_data.txt the first line is a header line.
  val header = sports_data_with_header.first()

  //filter the header line from the dataset using the filter RDD
  val sports_data = sports_data_with_header.filter(row => row != header)

  //For implicit conversions like converting RDDs and sequences to DataFrames
  import spark.implicits._

  //preparing a structure for the data, mapping it to the case class structure, and finally
converting it to a data frame.
  val sports_data_df = sports_data.map(_.split(",")).map(x => SPORTS(x(0), x(1), x(2), x(3),
x(4), x(5), x(6))).toDF


  sports_data_df.show()


  //Use udf method to define first_and_last_name_concat udf to concat Mr.first 2 letter of
firstname and lastname
  val first_and_last_name_concat = udf((first_name: String, last_name: String) =>
"Mr.".concat(first_name.substring(0, 2)).concat(" ").concat(last_name))

  //use first_and_last_name_concat udf on sports_data_df dataframe.
  val new_sports_data_sports_df = sports_data_df.withColumn("fullName",
first_and_last_name_concat(sports_data_df("firstname"), sports_data_df("lastname")))



new_sports_data_sports_df.select("fullName","sports","medal_type","age","year","country
").show()

 }
}
```

Output:



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

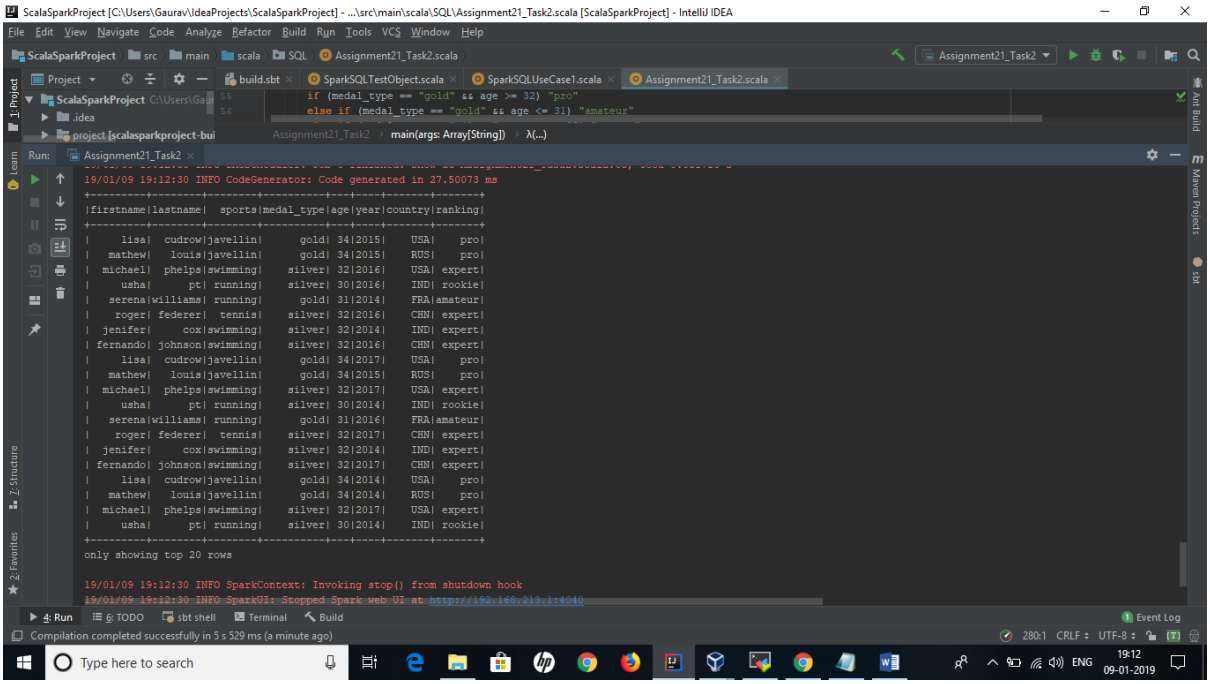
   silver medalist, with age >= 32 are ranked as expert

   silver medalists, with age <= 31 are ranked rookie

Code:

```
val Rank = udf((medal_type: String, age: Int) => {
  if (medal_type == "gold" && age >= 32) "pro"
  else if (medal_type == "gold" && age <= 31) "amateur"
  else if (medal_type == "silver" && age >= 32) "expert"
  else if (medal_type == "silver" && age <= 32) "rookie"
  else " no-level"
})

//apply RANK udf on sports_data_df dataframe.
  sports_data_df.withColumn("ranking", Rank(sports_data_df("medal_type"),
sports_data_df("age"))).show()
```

Output:


ScalaSparkProject [C:\Users\Gaurav\IdeaProjects\ScalaSparkProject] - ...\src\main\scala\SQL\Assignment21_Task2.scala [ScalaSparkProject] - IntelliJ IDEA
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
build.sbt
SparkSQLTestObject.scala
SparkSQLUseCase1.scala
Assignment21_Task2.scala
if (medal_type == "gold" && age >= 32) "pro"
else if (medal_type == "gold" && age <= 31) "amateur"
main(args: Array[String])
19/01/09 19:12:30 INFO CodeGenerator: Code generated in 27.50073 ms
firstname	lastname	sports	medal_type	age	year	country	ranking
lisa	cudrow	javellin	gold	34	2015	USA	pro
mathew	louis	javellin	gold	34	2015	RUS	pro
michael	phelps	swimming	silver	32	2016	USA	expert
usha	pt	running	silver	30	2016	IND	rookie
serena	williams	running	gold	31	2014	FRA	amateur
roger	federer	tennis	silver	32	2016	CHN	expert
jenifer	cox	swimming	silver	32	2014	IND	expert
fernando	johnson	swimming	silver	32	2016	CHN	expert
lisa	cudrow	javellin	gold	34	2017	USA	pro
mathew	louis	javellin	gold	34	2015	RUS	pro
michael	phelps	swimming	silver	32	2017	USA	expert
usha	pt	running	silver	30	2014	IND	rookie
serena	williams	running	gold	31	2016	FRA	amateur
roger	federer	tennis	silver	32	2017	CHN	expert
jenifer	cox	swimming	silver	32	2014	IND	expert
fernando	johnson	swimming	silver	32	2017	CHN	expert
lisa	cudrow	javellin	gold	34	2014	USA	pro
mathew	louis	javellin	gold	34	2014	RUS	pro
michael	phelps	swimming	silver	32	2017	USA	expert
usha	pt	running	silver	30	2014	IND	rookie
only showing top 20 rows
19/01/09 19:12:30 INFO SparkContext: Invoking stop() from shutdown hook
19/01/09 19:12:30 INFO SparkUI: Stopped Spark web UI at http://192.168.213.1:4040
Compilation completed successfully in 5 s 529 ms (a minute ago)
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09-01-2019