# BIG DATA HADOOP AND SPARK DEVLOPMENT

# ASSIGNMENT 21

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# BIG DATA HADOOPAND SPARK DEVELOPMENT

## 1. Introduction

In this assignment, the given tasks are performed and Output of the tasks are recorded in the form of Screenshots.

## 2. Objective

This Assignment consolidates the deeper understanding of the Session – 21 SPARK SQL 2

## 3. Problem Statement

- 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

- Task 2

  Using udfs on dataframe

  1. Change firstname, lastname columns into Mr.first_two_letters_of_firstnamelastname for example - michael, phelps becomes Mr.mi phelps

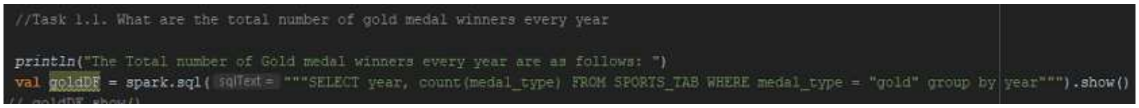
  2. Add a new column called ranking using udfs on dataframe, where : gold medalist, with age >= 32 are ranked as pro gold medalists, with age <= 31 are ranked amateur silver medalist, with age >= 32 are ranked as expert silver medalists, with age <= 31 are ranked rookie

Expected Output

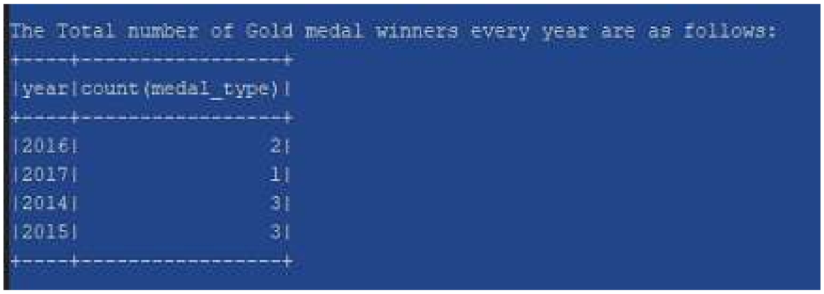
- ## Task 1

  Using spark-sql, Find:

- What are the total number of gold medal winners every year

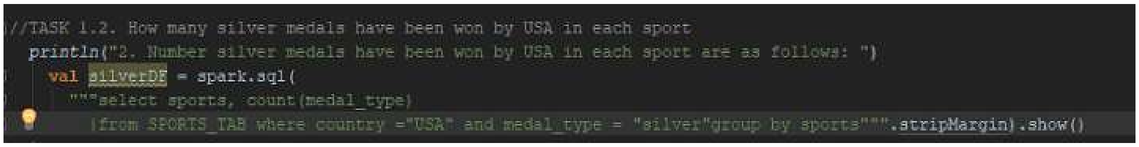


```
//Task 1.1. What are the total number of gold medal winners every year

println("The Total number of Gold medal winners every year are as follows: ")
val goldDF = spark.sql( sqlText = """SELECT year, count(medal_type) FROM SPORTS_TAB WHERE medal_type = "gold" group by year""").show()
```

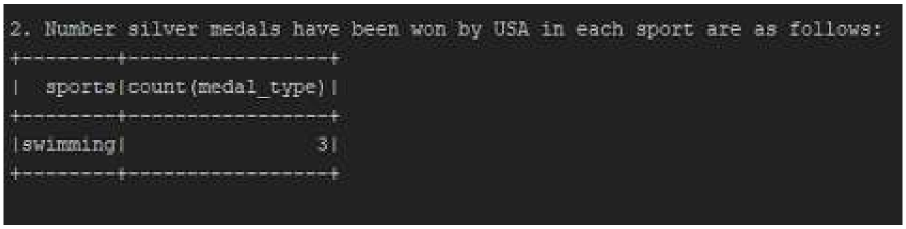


```
The Total number of Gold medal winners every year are as follows:
+----+-----------------+
|year|count(medal_type)|
+----+-----------------+
|2016|                2|
|2017|                1|
|2014|                3|
|2015|                3|
+----+-----------------+
```

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



```
//TASK 1.2. How many silver medals have been won by USA in each sport
  println("2. Number silver medals have been won by USA in each sport are as follows: ")
    val silverDF = spark.sql(
      """select sports, count(medal_type)
        |from SPORTS_TAB where country ="USA" and medal_type = "silver"group by sports""".stripMargin).show()
```

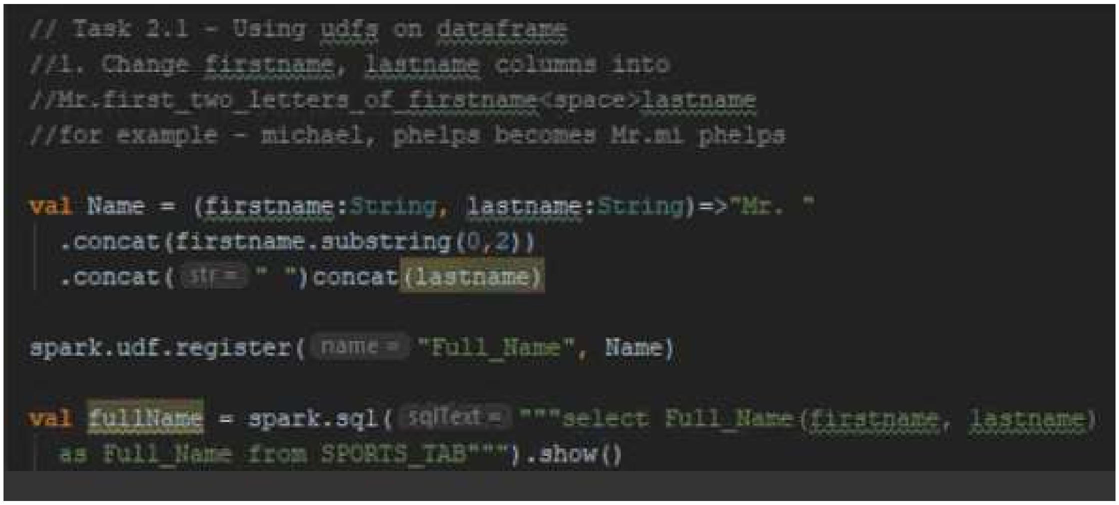


```
2. Number silver medals have been won by USA in each sport are as follows:
+--------+-----------------+
|  sports|count(medal_type)|
+--------+-----------------+
|swimming|                3|
+--------+-----------------+
```

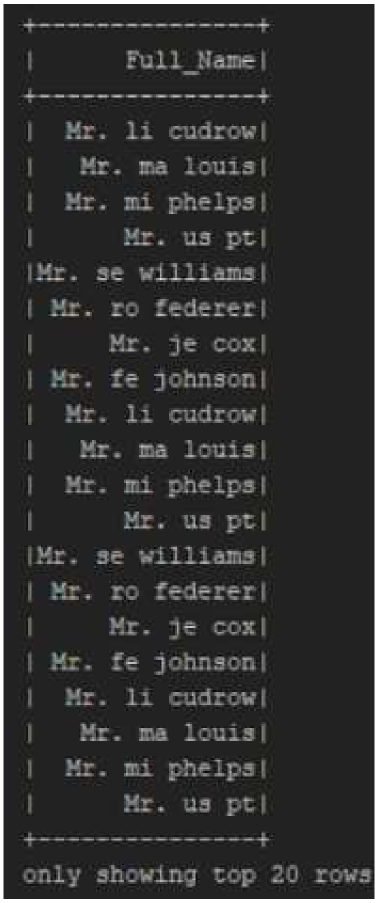
- ## Task 2

Using udfs on dataframe

Change firstname, lastname columns into Mr.first_two_letters_of_firstnamelastname for example - michael, phelps becomes Mr.mi phelps

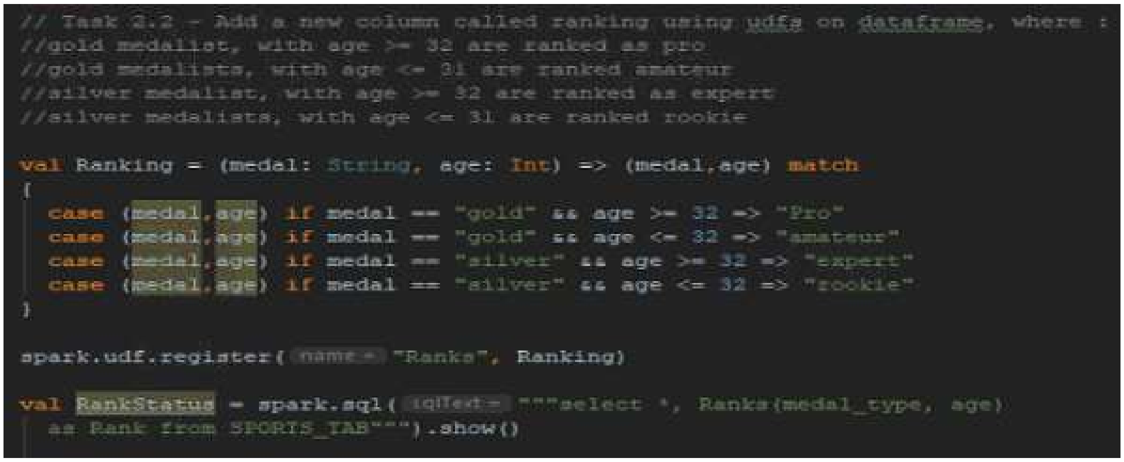


```
// Task 2.1 - Using udfs on dataframe
//1. Change firstname, lastname columns into
//Mr.first_two_letters_of_firstname<space>lastname
//for example - michael, phelps becomes Mr.mi phelps

val Name = (firstname:String, lastname:String)=>"Mr. "
  .concat(firstname.substring(0,2))
  .concat( str = " ")concat(lastname)

spark.udf.register( name = "Full_Name", Name)

val fullName = spark.sql( sqlText = """select Full_Name(firstname, lastname)
  as Full_Name from SPORTS_TAB""").show()
```

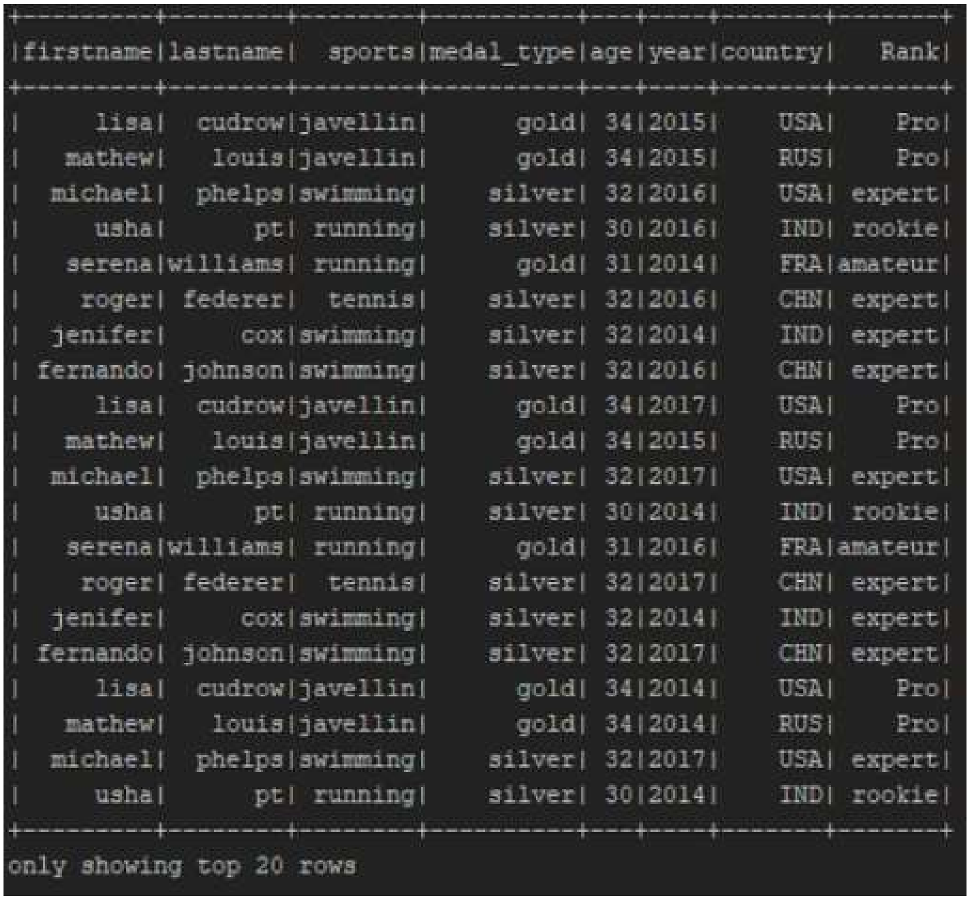


```
+---------------+
|      Full_Name|
+---------------+
|  Mr. li cudrow|
|   Mr. ma louis|
|  Mr. mi phelps|
|      Mr. us pt|
|Mr. se williams|
| Mr. ro federer|
|     Mr. je cox|
| Mr. fe johnson|
|  Mr. li cudrow|
|   Mr. ma louis|
|  Mr. mi phelps|
|      Mr. us pt|
|Mr. se williams|
| Mr. ro federer|
|     Mr. je cox|
| Mr. fe johnson|
|  Mr. li cudrow|
|   Mr. ma louis|
|  Mr. mi phelps|
|      Mr. us pt|
+---------------+
only showing top 20 rows
```

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



```
// Task 2.2 - 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

val Ranking = (medal: String, age: Int) => (medal,age) match
{
  case (medal,age) if medal == "gold" && age >= 32 => "Pro"
  case (medal,age) if medal == "gold" && age <= 32 => "amateur"
  case (medal,age) if medal == "silver" && age >= 32 => "expert"
  case (medal,age) if medal == "silver" && age <= 32 => "rookie"
}

spark.udf.register( name = "Ranks", Ranking)

val RankStatus = spark.sql( sqlText = """select *, Ranks(medal_type, age)
  as Rank from SPORTS_TAB""").show()
```



```
+---------+--------+--------+----------+---+----+-------+--------+
|firstname|lastname|  sports|medal_type|age|year|country|    Rank|
+---------+--------+--------+----------+---+----+-------+--------+
|     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
```