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Now that you are familiar with the dataset and exported it into a CSV file, let's start integrating this dataset with another small dataset and analyze it in Spark.

To run PySpark in the Cloudera VM, you will first need to run the setup script: **setupWeek3.sh**

Then open PySpark in the VM with the following command: pyspark --packages com.databricks:spark-csv_2.10:1.5.0

As the Sports Analyst, you are very interested in reporting on the countries with the most popularity in Twitter. So a good way to approach this problem would be to find which countries were mentioned the most in the tweets in your dataset and to analyze what words are being used the most in these tweets.

In addition to the CSV file you just exported from MongoDB, we give you a small dataset with the codes and names of some countries. To see this additional dataset, open the following file:

- Downloads/big-data-3/final-project/country-list.csv

To get you started, we have prepared a Jupyter notebook template, and started a SparkSQL context for you. Please open the notebook in:

- Downloads/big-data-3/final-project/SoccerTweetAnalysis.ipynb.

You will use this notebook to answer the questions below. So let’s get started.

Question 1: As a Sports Analyst, you are interested in how many different countries are mentioned in the tweets. Use the Spark to calculate this number. Note that regardless of how many times a single country is mentioned, this country only contributes 1 to the total.

Question 2: Next, compute the total number of times any country is mentioned. This is different from the previous question since in this calculation, if a country is mentioned three times, then it contributes 3 to the total.

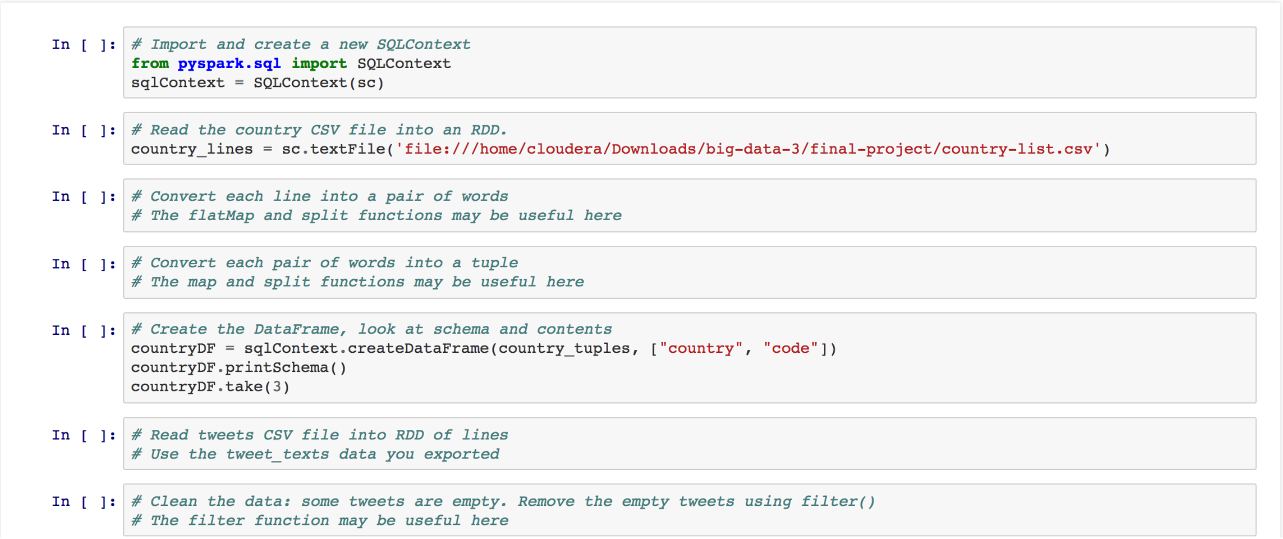
Question 3: Your next task is to determine the most popular countries. You can do this by finding the three countries mentioned the most.

Question 4: After exploring the dataset, you are now interested in how many times specific countries are mentioned. For example, how many times was France mentioned?

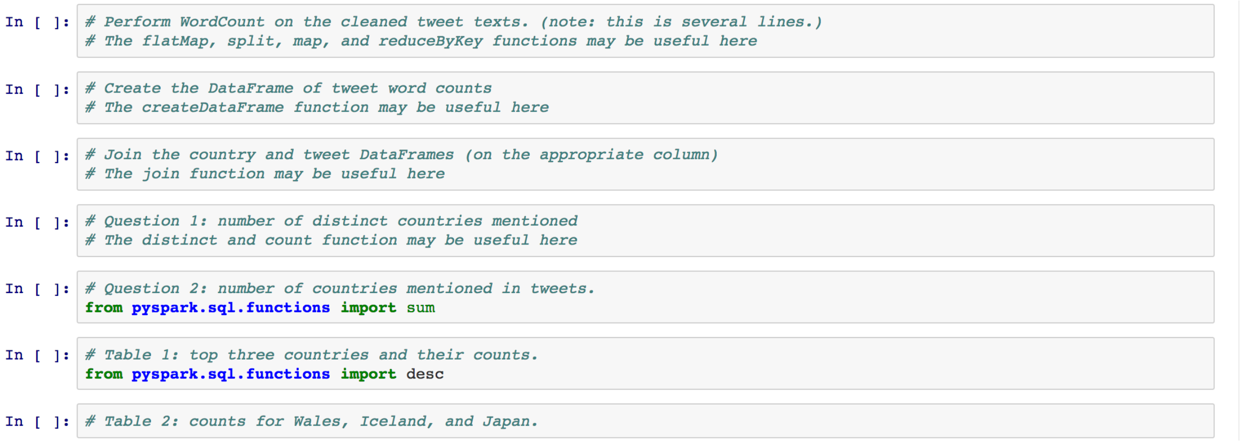
Question 5: Which country has the most mentions: Kenya, Wales, or Netherlands?

Question 6: Finally, what is the average number of times a country is mentioned?

Here is a copy of the Jupyter notebook template with added **HINTS**:



```
In [ ]: # Import and create a new SQLContext
        from pyspark.sql import SQLContext
        sqlContext = SQLContext(sc)

In [ ]: # Read the country CSV file into an RDD.
        country_lines = sc.textFile('file:///home/cloudera/Downloads/big-data-3/final-project/country-list.csv')

In [ ]: # Convert each line into a pair of words
        # The flatMap and split functions may be useful here

In [ ]: # Convert each pair of words into a tuple
        # The map and split functions may be useful here

In [ ]: # Create the DataFrame, look at schema and contents
        countryDF = sqlContext.createDataFrame(country_tuples, ["country", "code"])
        countryDF.printSchema()
        countryDF.take(3)

In [ ]: # Read tweets CSV file into RDD of lines
        # Use the tweet_texts data you exported

In [ ]: # Clean the data: some tweets are empty. Remove the empty tweets using filter()
        # The filter function may be useful here
```



```
In [ ]: # Perform WordCount on the cleaned tweet texts. (note: this is several lines.)
        # The flatMap, split, map, and reduceByKey functions may be useful here

In [ ]: # Create the DataFrame of tweet word counts
        # The createDataFrame function may be useful here

In [ ]: # Join the country and tweet DataFrames (on the appropriate column)
        # The join function may be useful here

In [ ]: # Question 1: number of distinct countries mentioned
        # The distinct and count function may be useful here

In [ ]: # Question 2: number of countries mentioned in tweets.
        from pyspark.sql.functions import sum

In [ ]: # Table 1: top three countries and their counts.
        from pyspark.sql.functions import desc

In [ ]: # Table 2: counts for Wales, Iceland, and Japan.
```

Don't forget to save the results of your analysis as you will have a quiz testing the correctness of these results following this exercise.

Mark as completed