Mallu Sravana Sandhya
SPARK Coding Assignment **27/12/23**

1.Implement Processing JSON and CSV data with PySpark

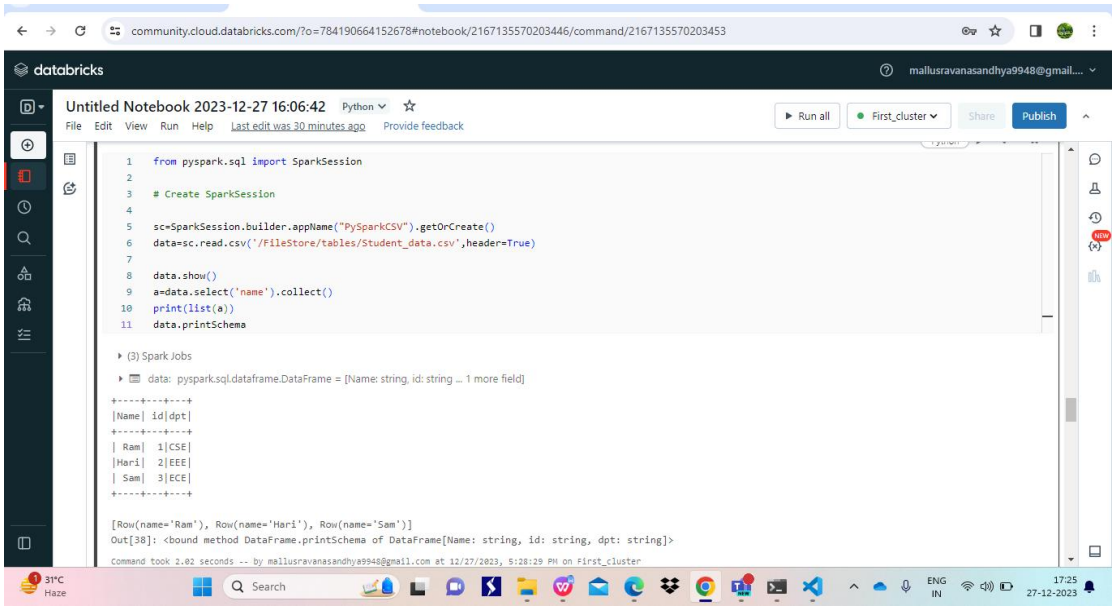
First we have to login into databricks and create a cluster then open new notebook and start the spark session using the following syntax

```
from pyspark.sql import SparkSession
sc=SparkSession.builder.appName("PySparkCSV").getOrCreate()
```

Then load the csv file from local system to databricks and copy the path and paste in the fillowing command

Sc.read.csv("path of csv file")

Now we can perform any operations on csv data which is loaded from the file



Similarly we can add json files same as csv files

2. Explain ETL (Extract, Transform, Load) with pyspark

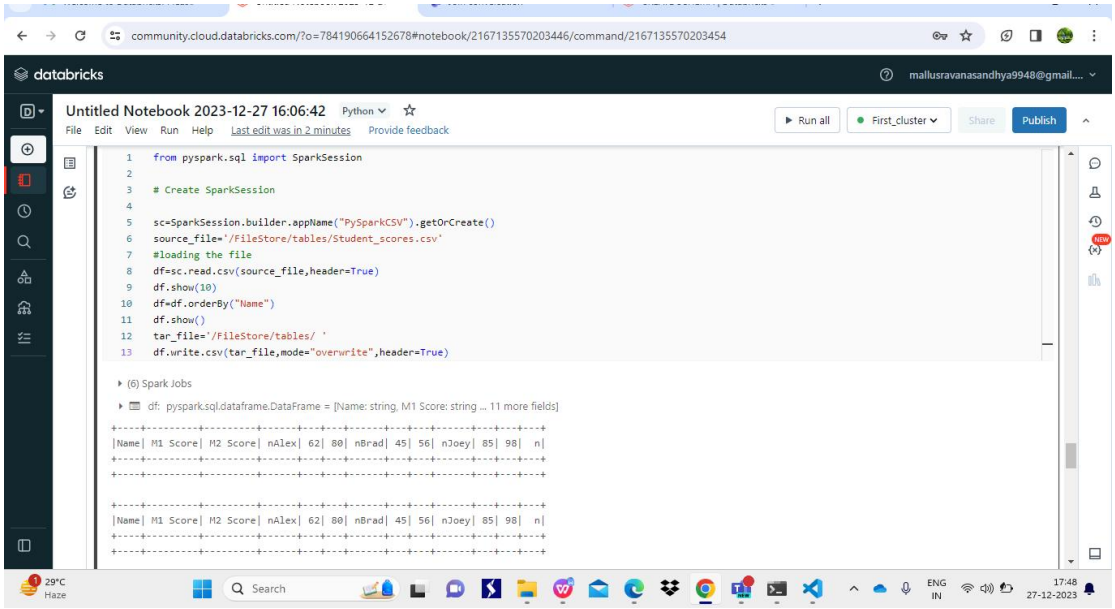
Extract : it extracts the input data from databases or local systems or APIs
Transform: It transforms the data as required by the user for analysis as per the requirement
Load: It saves the data that is transformed inorder to do analysis further

To initialize the spark first we have to import some modules

From pyspark.sql import SparkSession

To perform some actions or transformations we have to import some more functions from spark.sql.functions
The command to initialize spark session is
Spark=SparkSession.builder.appName("name of session").getOrCreate()

To extract data we use below command
df = spark.read.csv(source_path, header=True,schema ='col_name1 datatype,col_name2 datatype,….')
Schema is optional
Here source_path is the path of the file from where we have to extract the data
Transform:
To transform data we have many functions to transform data some among them are orderby function and got the results
Load :
the results are stored in a file path mentioned in target_file



4.Using Spark SQL - Transformations such as Filter, Join, Simple Aggregations, GroupBy

Here we created a table employee and converted into dataframes df with name,place,salary,age,bonus as column

And other datafreame edf with place and department where place is common column in both dataframes

First printed both schema and data

Then by using filter command we have filtered employees whose salary is greater than 80000 and shown name and their salary

Then by using aggregate functions we have found the sum of bonus of all employees

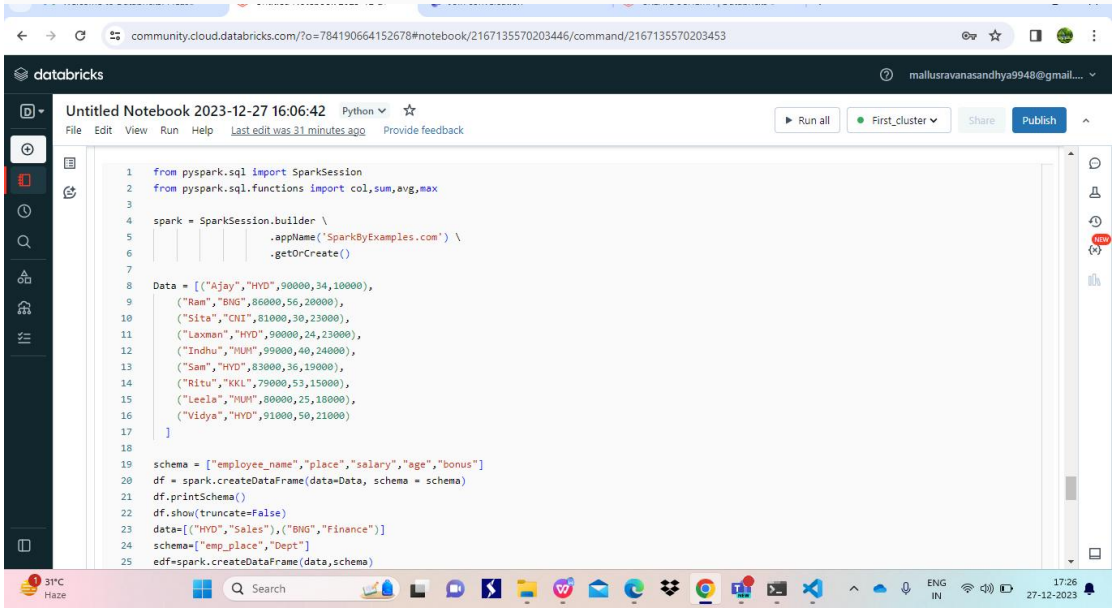
By using groupby, aggregate function we have collected the data of employees grouping by their salary and using aggregate function sum with the help of below statement and sorted by using sort method

```
dfSort=df.sort(df.place,df.salary).groupBy(df.place).agg(sum(df.salary))
```

Then we performed joins on two dataframes whose place is in common by using below command

```
df.join(edf,df.place ==  edf.emp_place,"inner").show(truncate=False)
```

We can perform different joins by simply replacing inner with other joins like outer,full,fullouter,left,leftouter,
etc



community.cloud.databricks.com/?o=784190664152678#notebook/2167135570203446/command/2167135570203455

databricks

Untitled Notebook 2023-12-27 16:06:42 Python

File Edit View Run Help Last edit was 31 minutes ago Provide feedback

Run all | First_cluster | Share | Publish

```python
df = spark.createDataFrame(data=Data, schema = schema)
df.printSchema()
df.show(truncate=False)
data=[("HYD","Sales"),("BNG","Finance")]
schema=["emp_place","Dept"]
edf=spark.createDataFrame(data,schema)
edf.printSchema()
edf.show()
dffilter=df.filter(df.salary>80000)
dffilter.show()
agg=df.agg(sum(df.bonus))
agg.show()
dfSort=df.sort(df.place,df.salary).groupBy(df.place).agg(sum(df.salary))
dfSort.show()
df.join(edf,df.place ==  edf.emp_place,"inner") \
     .show(truncate=False)

df.join(edf,df.place ==  edf.emp_place,"outer") \
     .show(truncate=False)
```

(19) Spark Jobs

- df: pyspark.sql.dataframe.DataFrame = [employee_name: string, place: string ... 3 more fields]
- edf: pyspark.sql.dataframe.DataFrame = [emp_place: string, Dept: string]
- dffilter: pyspark.sql.dataframe.DataFrame = [employee_name: string, place: string ... 3 more fields]
- agg: pyspark.sql.dataframe.DataFrame = [sum(bonus): long]

31°C Haze | Search | ENG IN | 17:27 27-12-2023

community.cloud.databricks.com/?o=784190664152678#notebook/2167135570203446/command/2167135570203455

databricks

Untitled Notebook 2023-12-27 16:06:42 Python

File Edit View Run Help Last edit was 32 minutes ago Provide feedback

Run all | First_cluster | Share | Publish

(19) Spark Jobs

- df: pyspark.sql.dataframe.DataFrame = [employee_name: string, place: string ... 3 more fields]
- edf: pyspark.sql.dataframe.DataFrame = [emp_place: string, Dept: string]
- dffilter: pyspark.sql.dataframe.DataFrame = [employee_name: string, place: string ... 3 more fields]
- agg: pyspark.sql.dataframe.DataFrame = [sum(bonus): long]
- dfSort: pyspark.sql.dataframe.DataFrame = [place: string, sum(salary): long]

```
root
 |-- employee_name: string (nullable = true)
 |-- place: string (nullable = true)
 |-- salary: long (nullable = true)
 |-- age: long (nullable = true)
 |-- bonus: long (nullable = true)

+-------------+-----+------+---+-----+
|employee_name|place|salary|age|bonus|
+-------------+-----+------+---+-----+
|Ajay         |HYD  |90000 |34 |10000|
|Ram          |BNG  |86000 |56 |20000|
|Sita         |CNI  |81000 |30 |23000|
|Laxman       |HYD  |90000 |24 |23000|
|Indhu        |MUM  |99000 |40 |24000|
|Sam          |HYD  |83000 |36 |19000|
|Ritu         |KKL  |79000 |53 |15000|
|Leela        |MUM  |80000 |25 |18000|
```

31°C Haze | Search | ENG IN | 17:27 27-12-2023

community.cloud.databricks.com/?o=784190664152678#notebook/2167135570203446/command/2167135570203455

databricks

Untitled Notebook 2023-12-27 16:06:42 Python

File Edit View Run Help Last edit was 32 minutes ago Provide feedback

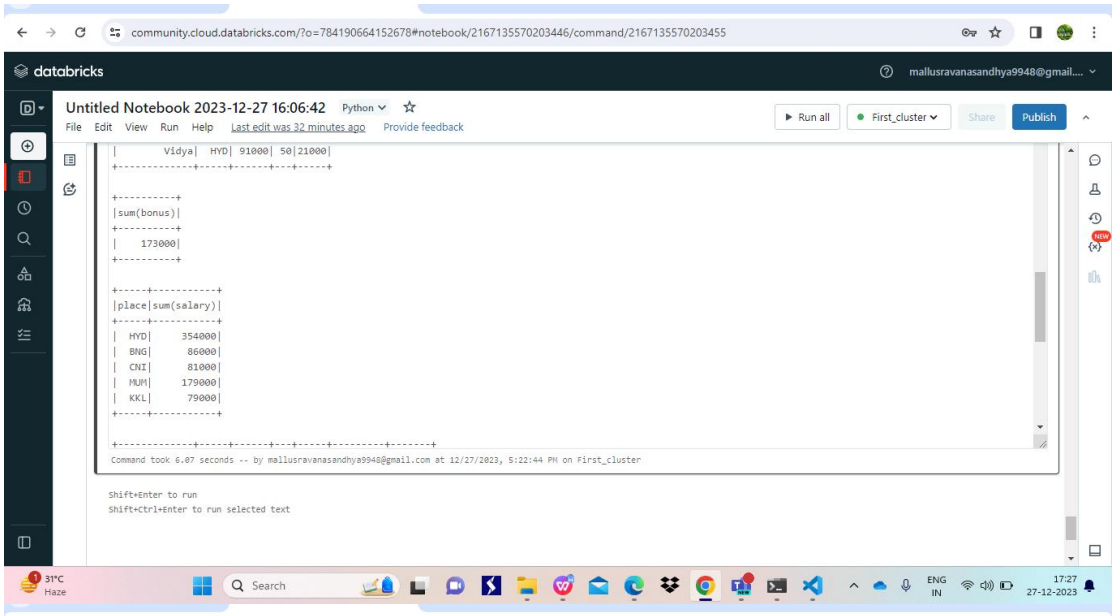
Run all | First_cluster | Share | Publish

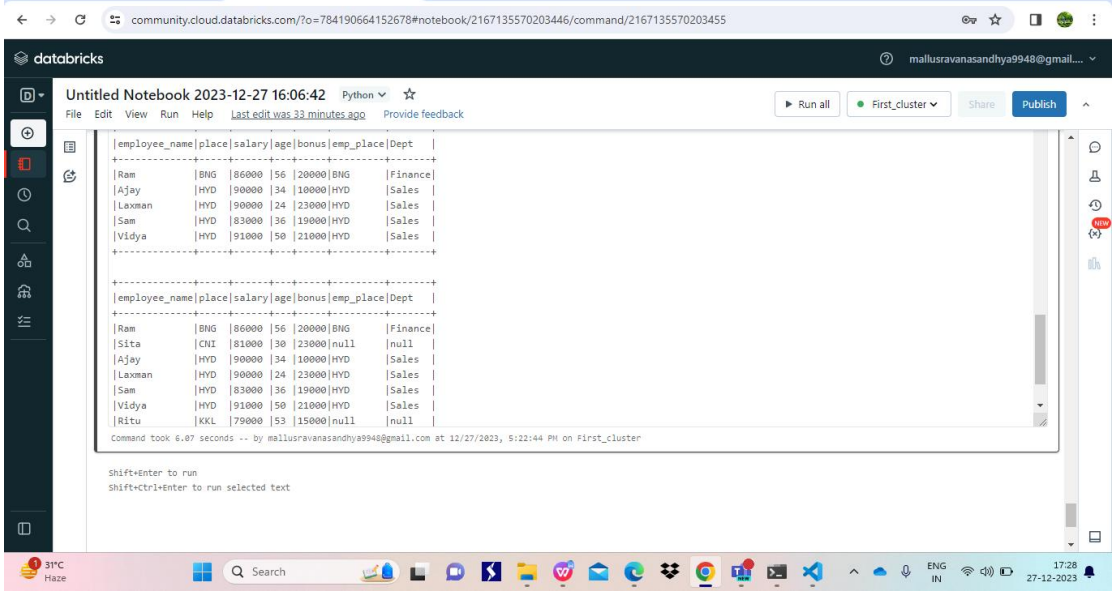
```
root
 |-- emp_place: string (nullable = true)
 |-- Dept: string (nullable = true)

+---------+-------+
|emp_place|   Dept|
+---------+-------+
|      HYD|  Sales|
|      BNG|Finance|
+---------+-------+

+-------------+-----+------+---+-----+
|employee_name|place|salary|age|bonus|
+-------------+-----+------+---+-----+
|         Ajay|  HYD| 90000| 34|10000|
|          Ram|  BNG| 86000| 56|20000|
|         Sita|  CNI| 81000| 30|23000|
|       Laxman|  HYD| 90000| 24|23000|
|        Indhu|  MUM| 99000| 40|24000|
|          Sam|  HYD| 83000| 36|19000|
```

Command took 6.07 seconds -- by mallusravanasandhya9948@gmail.com at 12/27/2023, 5:22:44 PM on First_cluster

Shift+Enter to run
Shift+Ctrl+Enter to run selected text

31°C Haze | Search | ENG IN | 17:27 27-12-2023


community.cloud.databricks.com/?o=784190664152678#notebook/2167135570203446/command/2167135570203455
databricks
mallusravanasandhya9948@gmail....
Untitled Notebook 2023-12-27 16:06:42
Python
File Edit View Run Help
Last edit was 32 minutes ago
Provide feedback
Run all
First_cluster
Share
Publish
|Vidya| HYD| 91000| 50|21000|
+----------+
|sum(bonus)|
+----------+
| 173000|
+----------+
+-----+----------+
|place|sum(salary)|
+-----+----------+
HYD	354000
BNG	86000
CNI	81000
MUM	179000
KKL	79000
+-----+----------+
Command took 6.07 seconds -- by mallusravanasandhya9948@gmail.com at 12/27/2023, 5:22:44 PM on First_cluster
Shift+Enter to run
Shift+Ctrl+Enter to run selected text
31°C
Haze
Search
ENG
IN
17:27
27-12-2023


community.cloud.databricks.com/?o=784190664152678#notebook/2167135570203446/command/2167135570203455
databricks
mallusravanasandhya9948@gmail....
Untitled Notebook 2023-12-27 16:06:42
Python
File Edit View Run Help
Last edit was 33 minutes ago
Provide feedback
Run all
First_cluster
Share
Publish
|employee_name|place|salary|age|bonus|emp_place|Dept |
+----------+
Ram	BNG	86000	56	20000	BNG	Finance
Ajay	HYD	90000	34	10000	HYD	Sales
Laxman	HYD	90000	24	23000	HYD	Sales
Sam	HYD	83000	36	19000	HYD	Sales
Vidya	HYD	91000	50	21000	HYD	Sales
+----------+
|employee_name|place|salary|age|bonus|emp_place|Dept |
+----------+
Ram	BNG	86000	56	20000	BNG	Finance
Sita	CNI	81000	30	23000	null	null
Ajay	HYD	90000	34	10000	HYD	Sales
Laxman	HYD	90000	24	23000	HYD	Sales
Sam	HYD	83000	36	19000	HYD	Sales
Vidya	HYD	91000	50	21000	HYD	Sales
Ritu	KKL	79000	53	15000	null	null
Command took 6.07 seconds -- by mallusravanasandhya9948@gmail.com at 12/27/2023, 5:22:44 PM on First_cluster
Shift+Enter to run
Shift+Ctrl+Enter to run selected text
31°C
Haze
Search
ENG
IN
17:28
27-12-2023