ICP8 REPORT

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```
# Mount Google Drive
from google.colab import drive
drive.mount('/content/drive')
```

```
Mounted at /content/drive
```

```
# Import required libraries
from pyspark import SparkContext
from pyspark.sql import SparkSession
```

```
# Initialize Spark Context
sc = SparkContext("local", "RDD Examples")
spark = SparkSession.builder.appName("DataFrame Examples").getOrCreate()
```

```
# 1. Produce RDD with List of first 15 natural numbers
rdd_list = sc.parallelize(range(1, 16))
print("RDD with first 15 natural numbers:", rdd_list.collect())
```

```
RDD with first 15 natural numbers: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15]
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```
# 2. Show the elements and number of partitions in RDD
print("Elements in RDD:", rdd_list.collect())
print("Number of partitions:", rdd_list.getNumPartitions())
```

```
Elements in RDD: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15]
Number of partitions: 1
```

```
# 3. Return the first element in the RDD
first_element = rdd_list.first()
print("First element:", first_element)
```

```
First element: 1
```

```
# 4. Use filter transformation to create a new RDD by selecting even elements
even_rdd = rdd_list.filter(lambda x: x % 2 == 0)
print("Even elements:", even_rdd.collect())
```

```
Even elements: [2, 4, 6, 8, 10, 12, 14]
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[ ] # 5. Apply map transformation to square each element in the RDD
    squared_rdd = rdd_list.map(lambda x: x ** 2)
    print("Squared elements:", squared_rdd.collect())
```

```
Squared elements: [1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225]
```

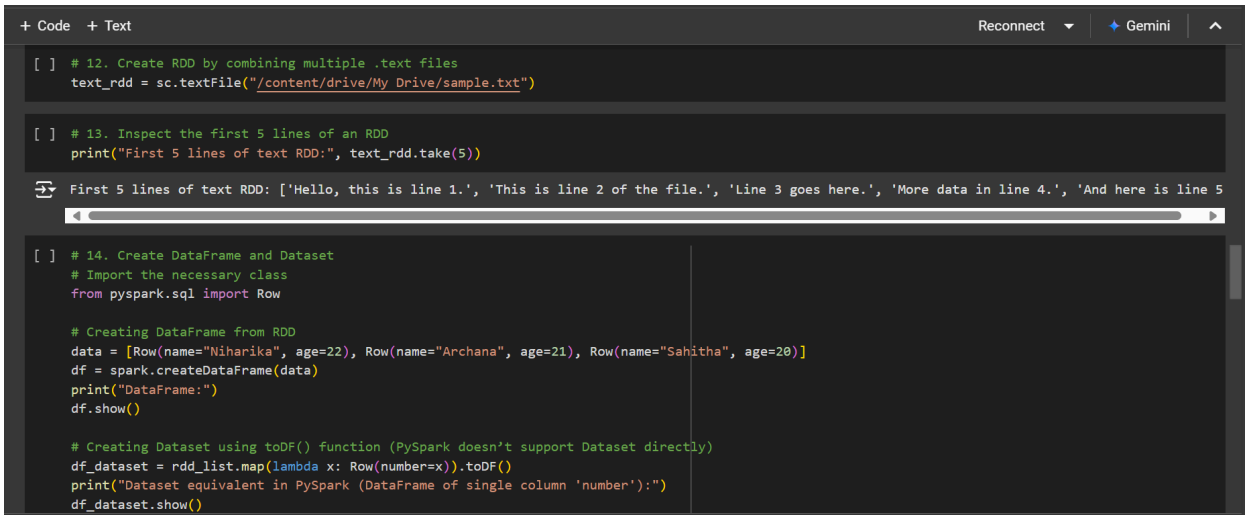
```
[ ] # 6. Aggregate all elements in the RDD using reduce action
    sum_elements = rdd_list.reduce(lambda x, y: x + y)
    print("Sum of elements in RDD:", sum_elements)
```

```
Sum of elements in RDD: 120
```

```
[ ] # 7. Save the RDD data as a text file
    rdd_list.saveAsTextFile("out_rdd_text")
```

```
[ ] # 8. Take two new list RDDs and combine them with union transformation
    rdd_list2 = sc.parallelize(range(16, 21))
    combined_rdd = rdd_list.union(rdd_list2)
    print("Combined RDD:", combined_rdd.collect())
```

```
Combined RDD: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]
```



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```
DataFrame:
+--------+---+
|    name|age|
+--------+---+
|Niharika| 22|
| Archana| 21|
| Sahitha| 20|
+--------+---+

Dataset equivalent in PySpark (DataFrame of single column 'number'):
+------+
|number|
+------+
|     1|
|     2|
|     3|
|     4|
|     5|
|     6|
|     7|
|     8|
|     9|
|    10|
|    11|
|    12|
|    13|
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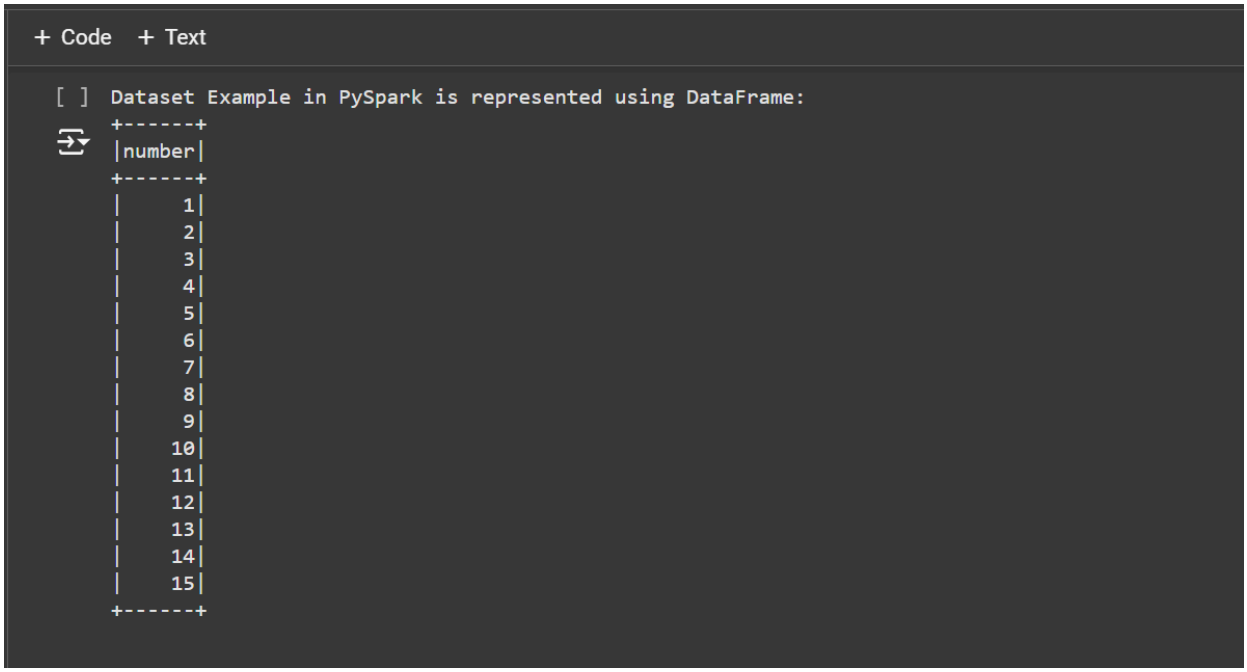
```
|    14|
|    15|
+------+
```

```python
# 15. Show difference between RDD, DataFrame, and Dataset
# RDD: Basic distributed data processing API, untyped, allows any type of data
print("RDD Example:", rdd_list.collect())

# DataFrame: Organized into named columns (structured data), similar to a table in SQL
print("DataFrame Example:")
df.show()

# Dataset: Only available in Scala and Java APIs in Spark, combines RDD and DataFrame features with compile-time safety
# In PySpark, DataFrames act as a replacement for Dataset
print("Dataset Example in PySpark is represented using DataFrame:")
df_dataset.show()
```

```
RDD Example: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15]
DataFrame Example:
+--------+---+
|    name|age|
+--------+---+
|Niharika| 22|
| Archana| 21|
| Sahitha| 20|
+--------+---+
```



My Github Repository Link:-
https://github.com/niharika0912/BDA.git