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PySpark Tutorial

PySpark (https://sparkbyexamples.com/pyspark-

PySpark Tutorial For

Beginners

(https://sparkbyexamples.com/utorial/) pyspark-tutorial/)

PySpark - Features

pyspark-tutorial/#features)

PySpark - Advantages (https://sparkbyexamples.com/ pyspark-tutorial/#advantages)

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Packages

(https://sparkbyexamples.com/ pyspark-tutorial/#modules-

packages)

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hbase-tutorial/

PySpark - Cluster Managers

pyspark-tutorial/#cluster-

manager)

(https://sparkbyexamples.com/ Kafka (https://sparkbyexamples.com/apache-(https://sparkbyexamples.com/author/admin/) -

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PySpark - Install on Windowskafka-tutorials/withkeyannines/)com/category/pyspark/) (https://sparkbyexamples.com/

pyspark-tutorial/#pyspark-

installation)

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spark/spark-web-uiunderstanding/)

sparksession/)

PySpark - SparkSession pyspark/pyspark-what-is-

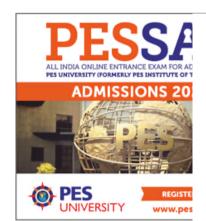
PySpark - RDD (https://sparkbyexamples.com/ pyspark-rdd)

PySpark - Parallelize (https://sparkbyexamples.com/ pyspark/pyspark-parallelizecreate-rdd/)

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PySpark - Broadcast Variables (https://sparkbyexamples.com/ pyspark/pyspark-broadcastvariables/)

FAQ's In httpsp://kprowbclessispereileble/byoarkimporting pyspark.sql.Row which is represented as a record/row in question bata Frame, one can create a Row object by using named arguments, or create a custom Row like class. In this (https://sparkbyexamples.com/ More Yartichttps://sparkbyexamples.com/) class on RDD, DataFrame and its functions.



Before we start using it on RDD & DataFrame, let's understand some basics of Row class.

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PySpark DataFrame

PySpark – Create a

DataFrame
(https://sparkbyexamples.com/
pyspark/different-ways-tocreate-dataframe-in-pyspark/)

PySpark – Create an empty
DataFrame
(https://sparkbyexamples.com/
pyspark/pyspark-create-anempty-dataframe/)

PySpark – Convert RDD to

DataFrame
(https://sparkbyexamples.com/
pyspark/convert-pyspark-rddto-dataframe/)

<u>PySpark – Convert DataFrame</u> <u>to Pandas</u> (<u>https://sparkbyexamples.com/pyspark/convert-pyspark-dataframe-to-pandas/</u>)

<u>PySpark – show()</u>
(https://sparkbyexamples.com/
<u>pyspark/pyspark-show-display-</u>
dataframe-contents-in-table/)

<u>PySpark – StructType & StructField</u>
(https://sparkbyexamples.com/
pyspark/pyspark-structtypeand-structfield/)

<u>PySpark – Row Class</u> (https://sparkbyexamples.com/ pyspark/pyspark-row-usingrdd-dataframe/)

<u>PySpark – Column Class</u> (https://sparkbyexamples.com/ <u>pyspark/pyspark-column-functions/)</u>

<u>PySpark – select()</u>
(https://sparkbyexamples.com/
pyspark/select-columns-frompyspark-dataframe/)</u>

<u>PySpark – collect()</u>
(https://sparkbyexamples.com/
pyspark/pyspark-collect/)

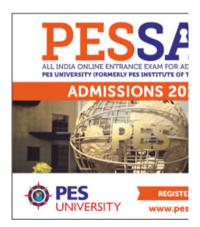
<u>PySpark – withColumn()</u> (https://sparkbyexamples.com/ pyspark/pyspark-withcolumn/) Related Article: PySpark Column Class
Usage & Functions with Examples
(https://sparkbyexamples.com/pyspark/
pyspark-column-functions/)

Key Points of Row Class:

- Earlier to Spark 3.0, when used Row class with named arguments, the fields are sorted by name.
- Since 3.0, Rows created from named arguments are not sorted alphabetically instead they will be ordered in the position entered.
- To enable sorting by names, set the environment variable
 PYSPARK_ROW_FIELD_SORTING_ENA BLED to true.
- Row class provides a way to create a struct-type column as well.

1. Create a Row Object

Row class extends the tuple hence it takes variable number of arguments, Row() is used to create the row object. Once the row object created, we can retrieve the data from Row using index similar to tuple.



```
from pyspark.sql import Row
row=Row("James",40)
print(row[0] +","+str(row[1]))
```

This outputs James, 40. Alternatively you can also write with named arguments. Benefits with the named argument is you can access with field name row.name. Below example print "Alice".

PySpark –
withColumnRenamed()
(https://sparkbyexamples.com/
pyspark/pyspark-renamedataframe-column/)

<u>PySpark – where() & filter()</u> (https://sparkbyexamples.com/ pyspark/pyspark-where-filter/)

PySpark – drop() & dropDuplicates() (https://sparkbyexamples.com/pyspark/pyspark-distinct-to-drop-duplicates/)

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<u>PySpark – groupBy()</u>
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pyspark/pyspark-groupbyexplained-with-example/)</u>

<u>PySpark – join()</u>
(https://sparkbyexamples.com/
<u>pyspark/pyspark-join-</u>
explained-with-examples/)

<u>PySpark – union() & unionAll()</u> (https://sparkbyexamples.com/ <u>pyspark/pyspark-union-and-unionall/)</u>

<u>PySpark – unionByName()</u>
(https://sparkbyexamples.com/
spark/spark-merge-twodataframes-with-differentcolumns/)

PySpark – UDF (User Defined Function)
(https://sparkbyexamples.com/pyspark/pyspark-udf-user-defined-function/)

<u>PySpark – map()</u>
(https://sparkbyexamples.com/
<u>pyspark/pyspark-map-</u>
<u>transformation/)</u>

<u>PySpark – flatMap()</u>
(https://sparkbyexamples.com/
pyspark/pyspark-flatmaptransformation/)

pyspark – foreach() (https://sparkbyexamples.com/ pyspark/pyspark-loop-iteratethrough-rows-indataframe/#use-foreach-loopthrough-dataframe)

<u>PySpark – sample() vs</u> <u>sampleBy()</u>

```
row=Row(name="Alice", age=11)
print(row.name)
```

2. Create Custom Class

from Row

We can also create a Row like class, for example "Person" and use it similar to Row object. This would be helpful when you wanted to create real time object and refer it's properties. On below example, we have created a Person class and used similar to Row.

```
Person = Row("name", "age")
p1=Person("James", 40)
p2=Person("Alice", 35)
print(p1.name +","+p2.name)
```

This outputs James, Alice

Using Row class on PySpark RDD

We can use Row class on PySpark RDD. When you use Row to create an RDD, after collecting the data you will get the result back in Row.

This yields below output.

(https://sparkbyexamples.com/ pyspark/pyspark-samplingexample/)

PySpark – fillna() & fill() (https://sparkbyexamples.com/ pyspark/pyspark-fillna-fillreplace-null-values/)

<u>PySpark – pivot() (Row to Column)</u>
(https://sparkbyexamples.com/pyspark/pyspark-pivot-and-

unpivot-dataframe/)

<u>PySpark – partitionBy()</u>
(https://sparkbyexamples.com/
<u>pyspark/pyspark-partitionby-example/)</u>

<u>PySpark – ArrayType Column</u>
(<u>Array)</u>
(<u>https://sparkbyexamples.com/pyspark/pyspark-arraytype-column-with-examples/)</u>

PySpark — MapType
(Map/Dict)
(https://sparkbyexamples.com/
pyspark/pyspark-maptype-dictexamples/).

PySpark SQL Functions

<u>PySpark – Aggregate Functions</u> (<u>https://sparkbyexamples.com/pyspark/pyspark-aggregate-functions/</u>)

<u>PySpark – Window Functions</u> (<u>https://sparkbyexamples.com/pyspark/pyspark-window-functions/</u>)

PySpark – Date and Timestamp
Functions
(https://sparkbyexamples.com/py
spark/pyspark-sql-date-andtimestamp-functions/)

<u>PySpark – JSON Functions</u> (<u>https://sparkbyexamples.com/pyspark/pyspark-json-functions-with-examples/</u>)

PySpark Datasources

<u>PySpark – Read & Write CSV</u> <u>File</u>

(https://sparkbyexamples.com/ pyspark/pyspark-read-csv-fileinto-dataframe/)

<u>PySpark – Read & Write</u> <u>Parquet File</u> (https://sparkbyexamples.com/

```
[Row(name='James,,Smith', lang=
```

Now, let's collect the data and access the data using its properties.

```
collData=rdd.collect()
for row in collData:
    print(row.name + "," +str(r
```

This yields below output.

```
James,,Smith,['Java', 'Scala',
Michael,Rose,,['Spark', 'Java',
Robert,,Williams,['CSharp', 'VB
```

Alternatively, you can also do by creating a Row like class "Person"

```
Person=Row("name","lang","state
data = [Person("James,,Smith",[
         Person("Michael,Rose,",["Sp.
         Person("Robert,,Williams",[
```

4. Using Row class on

PySpark DataFrame

Similarly, Row class also can be used with PySpark DataFrame, By default data in DataFrame represent as Row. To demonstrate, I will use the same data that was created for RDD.

pyspark/pyspark-read-andwrite-parquet-file/)

PySpark - Read & Write JSON

(https://sparkbyexamples.com/ pyspark/pyspark-read-jsonfile-into-dataframe/)

Note that Row on DataFrame is not allowed to omit a named argument to represent that the value is None or missing. This should be explicitly set to None in this case.

df=spark.createDataFrame(data) df.printSchema() ①×F.show()

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yields below output. Note that aFrame able to take the column es from Row object.



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PySpark Built-In **Functions**

PySpark - when() (https://sparkbyexamples.com/py spark/pyspark-when-otherwise/)

PySpark - expr() (https://sparkbyexamples.com/py spark/pyspark-sql-exprexpression-function/)

PySpark - lit() (https://sparkbyexamples.com/py spark/pyspark-lit-add-literalconstant/)

PySpark - split() (https://sparkbyexamples.com/py spark/pyspark-convert-string-toarray-column/)

-- name: string (nullable = t -- lang: array (nullable = tr |-- element: string (cont state: string (nullable =

James,,Smith|[Java, Scala, Michael, Rose, | [Spark, Java, Robert, , Williams ΓCSharp

can also change the column names ising toDF() function

```
columns = ["name", "languagesAtS
df=spark.createDataFrame(data).
df.printSchema()
```

This yields below output, note the column name "languagesAtSchool" from the previous example.

```
|-- name: string (nullable = t
|-- languagesAtSchool: array (
    |-- element: string (cont
|-- currentState: string (null
```

PySpark – concat_ws()
(https://sparkbyexamples.com/py
spark/pyspark-convert-arraycolumn-to-string-column/)

<u>Pyspark – substring()</u>
(https://sparkbyexamples.com/pyspark/pyspark-substring-from-a-column/)

PySpark – translate() (https://sparkbyexamples.com/py spark/pyspark-replace-columnvalues/#translate-replacecharacter-by-character)

PySpark - regexp_replace()
(https://sparkbyexamples.com/py
spark/pyspark-replace-columnvalues/#regexp_replace-replacestring-columns)

PySpark – overlay() (https://sparkbyexamples.com/py spark/pyspark-replace-columnvalues/#overlay-function)

PySpark – to_timestamp()
(https://sparkbyexamples.com/spark/pyspark-to_timestampconvert-string-to-timestamptype/)

PySpark – to_date() (https://sparkbyexamples.com/py spark/pyspark-to_date-converttimestamp-to-date/)

PySpark – date_format() (https://sparkbyexamples.com/pyspark/pyspark-date_format-convert-date-to-string-format/)

PySpark – datediff() (https://sparkbyexamples.com/py spark/pyspark-differencebetween-two-dates-daysmonths-years/#datediff)

PySpark – months_between()
(https://sparkbyexamples.com/py
spark/pyspark-differencebetween-two-dates-daysmonthsyears/#months_between())

PySpark – explode() (https://sparkbyexamples.com/py spark/pyspark-explode-nestedarray-into-rows/)

<u>PySpark – array_contains()</u>
(https://sparkbyexamples.com/pyspark/pyspark-arraytype-columnwith-examples/#array_contains)

Create Nested StructUsing Row Class

The below example provides a way to create a struct type using the Row class. Alternatively, you can also create struct type using By Providing Schema using PySpark StructType & StructFields

(https://sparkbyexamples.com/pyspark/

(https://sparkbyexamples.com/pyspark/
pyspark-structtype-and-structfield/)

Yields below schema

6. Complete Example of PySpark Row usage on RDD & DataFrame

Below is complete example for reference.

```
<u>PySpark – array()</u>
(https://sparkbyexamples.com/py
spark/pyspark-arraytype-column-
with-examples/#array)</u>
```

<u>PySpark – collect_list()</u>
(https://sparkbyexamples.com/py
spark/pyspark-aggregatefunctions/#collect-list)

<u>PySpark – collect_set()</u>
(https://sparkbyexamples.com/pyspark/pyspark-aggregate-functions/#collect-set)</u>

PySpark – create map() (https://sparkbyexamples.com/py spark/pyspark-convertdataframe-columns-to-maptypedict/)

PySpark – map_keys()
(https://sparkbyexamples.com/py
spark/pyspark-maptype-dictexamples/#map_keys)

<u>PySpark – map_values()</u>
(https://sparkbyexamples.com/py
spark/pyspark-maptype-dictexamples/#map_values)

<u>PySpark – struct()</u>
(https://sparkbyexamples.com/pyspark/pyspark-structtype-and-structfield/#update-struct-function)

<u>PySpark - countDistinct()</u> (https://sparkbyexamples.com/py spark/pyspark-count-distinctfrom-dataframe/)

PySpark – sum(), avg() (https://sparkbyexamples.com/py spark/pyspark-dataframegroupby-and-sort-bydescending-order/)

PySpark - row_number() (https://sparkbyexamples.com/py spark/pyspark-windowfunctions/#row_number)

<u>PySpark - rank()</u>
(https://sparkbyexamples.com/py
spark/pyspark-windowfunctions/#rank)

PySpark - dense_rank()
(https://sparkbyexamples.com/py
spark/pyspark-windowfunctions/#dense_rank)

PySpark – percent_rank()
(https://sparkbyexamples.com/py
spark/pyspark-windowfunctions/#percent_rank)

```
from pyspark.sql import SparkSe
row=Row("James",40)
print(row[0] +","+str(row[1]))
row2=Row(name="Alice", age=11)
print(row2.name)
Person = Row("name", "age")
p1=Person("James", 40)
p2=Person("Alice", 35)
print(p1.name +","+p2.name)
#PySpark Example
spark = SparkSession.builder.ap
data = [Row(name="James,,Smith"
    Row(name="Michael, Rose, ", la
    Row(name="Robert,,Williams"
#RDD Example 1
rdd=spark.sparkContext.parallel
collData=rdd.collect()
print(collData)
for row in collData:
    print(row.name + "," +str(r
# RDD Example 2
Person=Row("name", "lang", "state
data = [Person("James,,Smith",[
    Person("Michael, Rose, ", ["Sp
    Person("Robert,,Williams",[
rdd=spark.sparkContext.parallel
collData=rdd.collect()
print(collData)
for person in collData:
    print(person.name + "," +st
#DataFrame Example 1
columns = ["name", "languagesAtS
df=spark.createDataFrame(data)
df.printSchema()
df.show()
collData=df.collect()
print(collData)
for row in collData:
    print(row.name + "," +str(r
#DataFrame Example 2
columns = ["name", "languagesAtS
df=spark.createDataFrame(data).
df.printSchema()
```

PySpark - typedLit()
(https://sparkbyexamples.com/py
spark/pyspark-lit-add-literalconstant/#typedlit)

PySpark – from json() (https://sparkbyexamples.com/py spark/pyspark-json-functionswith-examples/#from json)

PySpark – to_json()
(https://sparkbyexamples.com/pyspark/pyspark-json-functions-with-examples/#to_json)

PySpark – json_tuple() (https://sparkbyexamples.com/pyspark/pyspark-json-functions-with-examples/#json_tuple)

PySpark – get json object() (https://sparkbyexamples.com/pyspark/pyspark-json-functions-with-examples/#get_json_object)

<u>PySpark – schema_of_json()</u> (https://sparkbyexamples.com/py spark/pyspark-json-functionswith-

examples/#schema of json)

Conclusion

In this PySpark Row article you have learned how to use Row class with named argument and defining realtime class and using it on DataFrame & RDD. Hope you like this

Reference

 https://spark.apache.org/docs/latest/ api/python/pyspark.sql.html (https://spark.apache.org/docs/latest/ api/python/pyspark.sql.html)

Happy Learning !!

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