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PySpark Tutorial

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



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

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variables/)

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

FAQ's P(/Stipask/ASDD/Data=Frampleolcoents(p)ark-

is an action operation that is used to retrieve all the elements of the dataset

question@m all nodes) to the driver node. We

should use the collect() on smaller

dataset usually after filter()

Yhtthetips: Harbarkayanamblaspramilik

pyspark-where-filter/), group()

(https://sparkbyexamples.com/pyspark/

pyspark-groupby-explained-with-

example/) e.t.c. Retrieving larger

datasets results in OutOfMemory error.

In this PySpark article, I will explain the usage of collect() with DataFrame example, when to avoid it, and the difference between collect() and select().

Related Articles:

 How to Iterate PySpark DataFrame through Loop (https://sparkbyexamples.com/pyspar <u>PySpark – Accumulator</u> (https://sparkbyexamples.com/ <u>pyspark/pyspark-accumulator-with-example/)</u>

PySpark DataFrame

<u>PySpark – Create a</u> <u>DataFrame</u>

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

<u>PySpark – Create an empty</u> DataFrame

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<u>PySpark – Convert RDD to</u> <u>DataFrame</u>

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

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dataframe-contents-in-table/)

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

<u>PySpark – select()</u>
(https://sparkbyexamples.com/
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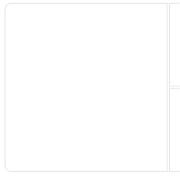
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- k/pyspark-loop-iterate-through-rows-in-dataframe/)
- How to Convert PySpark DataFrame
 Column to Python List
 (https://sparkbyexamples.com/pyspark/convert-pyspark-dataframe-column-to-python-list/)

In order to explain with example, first, let's <u>create a DataFrame</u> (https://sparkbyexamples.com/pyspark/different-ways-to-create-dataframe-in-pyspark/).

show() function on DataFrame prints
the result of DataFrame in a table
format

(https://sparkbyexamples.com/pyspark/pyspark-show-display-dataframe-contents-in-table/). By default, it shows only 20 rows. The above snippet returns the data in a table.



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<u>PySpark –</u>
<u>withColumnRenamed()</u>
(<u>https://sparkbyexamples.com/pyspark/pyspark-rename-dataframe-column/)</u>

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(https://sparkbyexamples.com/
pyspark/pyspark-groupbyexplained-with-example/)</u>

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(https://sparkbyexamples.com/spark/spark-merge-two-dataframes-with-different-columns/)

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(https://sparkbyexamples.com/
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<u>transformation/)</u>

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

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

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

Now, let's use the collect() to retrieve the data.

```
dataCollect = deptDF.collect()
print(dataCollect)
```

deptDF.collect() retrieves all
elements in a DataFrame as an Array of
Row type

(https://sparkbyexamples.com/pyspark/pyspark-row-using-rdd-dataframe/) to the driver node. printing a resultant array yields the below output.

```
[Row(dept_name='Finance', dept_
Row(dept_name='Marketing', dept_
Row(dept_name='Sales', dept_id=
Row(dept_name='IT', dept_id=40)
```

Note that collect() is an action hence it does not return a DataFrame instead, it returns data in an Array to the driver. Once the data is in an array, you can use python for loop to process it further.

```
for row in dataCollect:
    print(row['dept_name'] + ",
```

If you wanted to get first row and first column from a DataFrame.

```
#Returns value of First Row, Fi
deptDF.collect()[0][0]
```

(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>

<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> (https://sparkbyexamples.com/py spark/pyspark-windowfunctions/)

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

PySpark – Read & Write CSV File (https://sparkbyexamples.com/ pyspark/pyspark-read-csv-fileinto-dataframe/)

<u>PySpark – Read & Write</u> <u>Parquet File</u> (https://sparkbyexamples.com/ Let's understand what's happening on above statement.

- deptDF.collect() returns Array of Row type.
- deptDF.collect()[0] returns the first element in an array (1st row).
- deptDF.collect[0][0] returns the value of the first row & first column.

In case you want to just return certain elements of a DataFrame, you should call PySpark select() transformation (https://sparkbyexamples.com/pyspark/select-columns-from-pyspark-dataframe/) first.

dataCollect = deptDF.select("de

When to avoid Collect()

Usually, collect() is used to retrieve the action output when you have very small result set and calling collect() on an RDD/DataFrame with a bigger result set causes out of memory as it returns the entire dataset (from all workers) to the driver hence we should avoid calling collect() on a larger dataset.

collect () vs select ()

select() is a transformation that returns a new DataFrame and holds the columns that are selected whereas collect() is an action that returns the entire data set in an Array to the driver. <u>pyspark/pyspark-read-and-write-parquet-file/)</u>

<u>PySpark – Read & Write JSON</u> file

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

PySpark Built-In Functions

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

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

PySpark – lit() (https://sparkbyexamples.com/pyspark/pyspark-lit-add-literal-constant/)

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spark/pyspark-convert-string-toarray-column/)</u>

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

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

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<u>PySpark - regexp_replace()</u>
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<u>PySpark – overlay()</u>
(https://sparkbyexamples.com/pyspark/pyspark-replace-column-values/#overlay-function)</u>

<u>PySpark - to_timestamp()</u>
(https://sparkbyexamples.com/spark/pyspark-to_timestamp-

Complete Example of PySpark collect()

Below is complete PySpark example of using collect() on DataFrame, similarly you can also create a program using collect() with RDD.

```
import pyspark
from pyspark.sql import SparkSe
spark = SparkSession.builder.ap
dept = [("Finance",10), \
    ("Marketing",20), \
    ("Sales",30), \
    ("IT",40) \
deptColumns = ["dept name", "dep
deptDF = spark.createDataFrame(
deptDF.printSchema()
deptDF.show(truncate=False)
dataCollect = deptDF.collect()
print(dataCollect)
dataCollect2 = deptDF.select("defeated)
print(dataCollect2)
for row in dataCollect:
    print(row['dept_name'] +
```

This example is also available at PySpark Github
(https://github.com/sparkexamples/pysparkexamples/blob/master/pysparkcollect.py) project.

Conclusion

In this PySpark article, you have learned the collect() function of the RDD/DataFrame is an action operation that returns all elements of the DataFrame to spark driver program and also learned it's not a good practice to use it on the bigger dataset.

Happy Learning !!

<u>convert-string-to-timestamp-type/)</u>

<u>PySpark - to_date()</u>
(https://sparkbyexamples.com/pyspark/pyspark-to_date-convert-timestamp-to-date/)</u>

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())

<u>PySpark - explode()</u>
(https://sparkbyexamples.com/pyspark/pyspark-explode-nested-array-into-rows/)</u>

PySpark – array_contains() (https://sparkbyexamples.com/pyspark/pyspark-arraytype-column-with-examples/#array_contains)

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

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

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

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Anonymous

8 APR 2021 REPLY

Thank you ① Much appreciated for your quick response



Anonymous

6 APR 2021 REPLY

Pls explain how collect() [0][0] works

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(https://sparkbyexamples.com/py
spark/pyspark-structtype-andstructfield/#update-structfunction)

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PySpark – schema of json() (https://sparkbyexamples.com/py spark/pyspark-json-functionswithexamples/#schema_of_json)



NNK 6 APR 2021 REPLY

collect() returns Array of Row type. collect() [0] means first element in a array (1st row) and collect[0][0] means first column of first row.

On above DataFrame, if you run print(deptDF.collect() [0][0]), it prints "Finance" and print(deptDF.collect() [0][1]) print 10.

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