# Spark by {Examplesparkhttptnttps://aptarkhtyexamplescom/pm/)

# **PySpark Tutorial**

PySpark Tutorial For

**Beginners** 

(https://sparkbyexamples.com/utorial/)

pyspark-tutorial/)

PySpark - Features

pyspark-tutorial/#features)

PySpark - Advantages

(https://sparkbyexamples.com/

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PySpark - Modules &

Packages

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HBase Chttps://sparktrexamples.gom/apache-

**DataFrame to** 

hbase-tutorial/)

PySpark - Cluster Managers

pyspark-tutorial/#cluster-

manager)

(https://sparkbyexamples.com/ Kafka (https://sparkbyexamples.com/apache-

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

PySpark

PySpark - Install on Windowskafka-tutorials// With syann pes com/category/pyspark/)

(https://sparkbyexamples.com/

PySpark - Web/Application UI

pyspark-tutorial/#pyspark-

PySpark - SparkSession

pyspark/pyspark-what-is-

installation)

FAQ's (\$patrokswithplaykhoun) PaySipalets DeaterFramek-

can be converted to Python Pandas

DataFrame using a function

(https://sparkbyexamples.com/ spark/spark-web-uiquestion 60 Pandas (), In this article, I will understanding/)

explain how to create Pandas

DataFrame from PySpark (Spark)

(https://sparkbyexamples.com/ More Datattanie/Japanamples.com/)

sparksession/)

PySpark - RDD

(https://sparkbyexamples.com/

pyspark-rdd)

PySpark - Parallelize

(https://sparkbyexamples.com/

pyspark/pyspark-parallelize-

create-rdd/)

PySpark - repartition() vs coalesce()

(https://sparkbyexamples.com/

pyspark/pyspark-repartition-

vs-coalesce/)

PySpark - Broadcast

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

variables/)

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Before we start first understand the main differences between the Pandas & PySpark, operations on Pyspark run

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PySpark - Accumulator (https://sparkbyexamples.com/ pyspark/pyspark-accumulatorwith-example/)

### **PySpark DataFrame**

PvSpark - 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/)

PySpark - Convert DataFrame to Pandas (https://sparkbyexamples.com/ pyspark/convert-pysparkdataframe-to-pandas/)

PySpark - show() (https://sparkbyexamples.com/ pyspark/pyspark-show-displaydataframe-contents-in-table/)

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

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

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PySpark - select() (https://sparkbyexamples.com/ pyspark/select-columns-frompyspark-dataframe/)

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

pyspark/pyspark-withcolumn/)

In other words, pandas run operations on a single node whereas PySpark runs on multiple machines. If you are working on a Machine Learning application where you are dealing with larger datasets, PySpark processes operations many times faster than pandas.

After processing data in PySpark we would need to convert it back to Pandas DataFrame for a further procession with Machine Learning application or any Python applications.

### **Prepare PySpark**

### **DataFrame**

In order to explain with an example first let's create a PySpark DataFrame (https://sparkbyexamples.com/pyspark/ different-ways-to-create-dataframe-inpyspark/).



```
import pyspark
from pyspark.sql import SparkSe
spark = SparkSession.builder.ap
data = [("James","","Smith","36
        ("Michael", "Rose", "", "4
        ("Robert", "", "Williams"
        ("Maria", "Anne", "Jones"
        ("Jen", "Mary", "Brown", "
columns = ["first name", "middle
pysparkDF = spark.createDataFra
```

PySpark – withColumn()
We use cookies to ensure that we give you the bevious factor of the state pysparkDF.showi(httruncate=False)

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/).

<u>PySpark – orderBy() and sort()</u> (https://sparkbyexamples.com/ <u>pyspark/pyspark-orderby-and-</u> sort-explained/)

<u>PySpark – groupBy()</u>
(https://sparkbyexamples.com/
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>

PySpark – unionByName() (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/
<u>pyspark/pyspark-flatmap-</u>
transformation/)

<u>pyspark – foreach()</u>
(<u>https://sparkbyexamples.com/pyspark/pyspark-loop-iterate-through-rows-in-</u>

This yields below schema and result of the DataFrame.

```
root
 |-- first name: string (nullab
 |-- middle name: string (nulla
 |-- last name: string (nullabl
 |-- dob: string (nullable = tr
 |-- gender: string (nullable =
 |-- salary: long (nullable = t
|first name|middle name|last name
lJames
                       Smith
Michael
           Rose
Robert
                       William
Maria
           Anne
                       IJones
lJen
           Mary
                       Brown
```

# **Convert PySpark**

### **Dataframe to Pandas**

### **DataFrame**

PySpark DataFrame provides a method toPandas() to convert it Python Pandas DataFrame.

toPandas() results in the collection of all records in the PySpark DataFrame to the driver program and should be done on a small subset of the data. running on larger dataset's results in memory error and crashes the application.

```
pandasDF = pysparkDF.toPandas()
print(pandasDF)
```

This yields the below panda's dataframe. Note that pandas add a sequence number to the result.

dataframe/#use-foreach-loop: give you the best experience on our website. If you continue to use this site we withough-dataframe) with it.

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



(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-andunpivot-dataframe/)

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

<u>PySpark – ArrayType Column</u> (<u>Array)</u>

(https://sparkbyexamples.com/ pyspark/pyspark-arraytypecolumn-with-examples/)

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/)

<u>PySpark – Date and Timestamp</u> <u>Functions</u>

(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>)

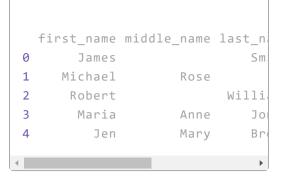
### **PySpark Datasources**

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

(https://sparkbyexamples.com/ pyspark/pyspark-read-csv-file-

PySpark – Read & Write

<u>Parquet File</u> (https://sparkbyexamples.com/



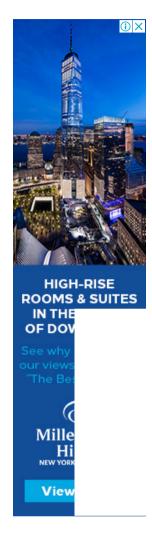
# Convert Spark Nested Struct DataFrame to Pandas

Most of the time data in PySpark
DataFrame will be in a structured
format meaning one column contains
other columns so let's see how it
convert to Pandas. Here is an example
with nested struct where we have
firstname, middlename and
lastname are part of the name
column.

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<u>pyspark/pyspark-read-and-write-parquet-file/)</u>

<u>PySpark – Read & Write JSON</u>

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

```
# Nested structure elements
 from pyspark.sql.types import S
  dataStruct = [(("James","","Smi
        (("Michael", "Rose", ""), "4
        (("Robert","","Williams")
        (("Maria", "Anne", "Jones")
        (("Jen", "Mary", "Brown"), "
   chemaStruct = StructType([
          StructField('name', Str
               StructField('first
               StructField('middl
               StructField('lastn
               ])),
            StructField('dob', St
           StructField('gender',
           StructField('salary',
(i) X
     = spark.createDataFrame(data
   .printSchema()
   andasDF2 = df.toPandas()
   rint(pandasDF2)
```



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verting structured DataFrame to das DataFrame results below out.

```
REGISTER TODAY!
```

```
name dob
(James, , Smith) 36636
(Michael, Rose, ) 40288
(Robert, , Williams) 42114
(Maria, Anne, Jones) 39192
(Jen, Mary, Brown)
```

# PES LINIVERS

### nclusion

PySpark Built-In Functions

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

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

nis simple article, you have learned onvert Spark DataFrame to pandas using toPandas() function of the Spark DataFrame. also have seen a similar example with complex nested structure elements.

toPandas() results in the collection of

toPandas() results in the collection of all records in the DataFrame to the driver program and should be done on a

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

PySpark - split()

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

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

<u>Pyspark – substring()</u>
(https://sparkbyexamples.com/py
spark/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)

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

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/py spark/pyspark-date\_formatconvert-date-to-string-format/)

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

<u>PySpark – months\_between()</u> (<u>https://sparkbyexamples.com/pyspark/pyspark-difference-</u>

years/#months between())

#### Reference:

https://docs.databricks.com/spark/latest/spark-sql/spark-pandas.html
(https://docs.databricks.com/spark/latest/spark-sql/spark-pandas.html)

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

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

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)

PySpark – map\_values() (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>
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(https://sparkbyexamples.com/py
spark/pyspark-dataframegroupby-and-sort-bydescending-order/)

PySpark - row\_number() (https://sparkbyexamples.com/py spark/pyspark-windowfunctions/#row\_number)



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

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