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PySpark – Create an Empty DataFrame & RDD



While working with files, sometimes we may not receive a file for processing, however, we still need to create a DataFrame manually with the same schema we expect. If we don't create with the same schema, our

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[PySpark – Convert DataFrame to Pandas
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[PySpark – collect\(\)
\(https://sparkbyexamples.com/pyspark/pyspark-collect/\)](https://sparkbyexamples.com/pyspark/pyspark-collect/)

[PySpark – withColumn\(\)
\(https://sparkbyexamples.com/pyspark/pyspark-withcolumn/\)](https://sparkbyexamples.com/pyspark/pyspark-withcolumn/)

operations/transformations (like union's) on DataFrame fail as we refer to the columns that may not present.

To handle situations similar to these, we always need to create a DataFrame with the same schema, which means the same column names and datatypes regardless of the file exists or empty file processing.

1. Create Empty RDD in PySpark

Create an empty RDD by using `emptyRDD()` of `SparkContext` for example
`spark.sparkContext.emptyRDD()`.

```
from pyspark.sql import SparkSession
spark = SparkSession.builder.appName('Empty RDD').getOrCreate()

#Creates Empty RDD
emptyRDD = spark.sparkContext.emptyRDD()
print(emptyRDD)

#Displays
#EmptyRDD[188] at emptyRDD
```

Alternatively you can also get empty RDD by using
`spark.sparkContext.parallelize([])`.

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

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(<https://sparkbyexamples.com/pyspark/pyspark-loop-iterate-through-rows-in-dataframe/#use-foreach-loop-through-dataframe>).

[PySpark – sample\(\) vs sampleBy\(\).](#)

```
#Creates Empty RDD using parallelize()
rdd2= spark.sparkContext.parallelize(1000)
print(rdd2)
```

```
#EmptyRDD[205] at emptyRDD at Native.scala:105
#ParallelCollectionRDD[206] at ParallelCollectionRDD at Native.scala:105
```

Note: If you try to perform operations on empty RDD you going to get `ValueError("RDD is empty")`.

2. Create Empty DataFrame with Schema (StructType)

In order to create an empty PySpark DataFrame manually with schema (column names & data types) first, [Create a schema using StructType and StructField](#) (<https://sparkbyexamples.com/pyspark/pyspark-structtype-and-structfield/>).

```
#Create Schema
from pyspark.sql.types import StructType, StructField
schema = StructType([
    StructField('firstname', StringType, True),
    StructField('middlename', StringType, True),
    StructField('lastname', StringType, True)
])
```

Now use the empty RDD created above and pass it to `createDataFrame()` of [SparkSession](#) (<https://sparkbyexamples.com/pyspark/pyspark-what-is-sparksession/>) along with the schema for column names & data types.

```
#Create empty DataFrame from empty RDD
df = spark.createDataFrame(emptyRDD, schema)
df.printSchema()
```

This yields below ^{with it} schema of the empty DataFrame. Accept

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[PySpark – pivot\(\)_\(Row to Column\). \(https://sparkbyexamples.com/pyspark/pyspark-pivot-and-unpivot-dataframe/\)](https://sparkbyexamples.com/pyspark/pyspark-pivot-and-unpivot-dataframe/).

[PySpark – partitionBy\(\). \(https://sparkbyexamples.com/pyspark/pyspark-partitionby-example/\)](https://sparkbyexamples.com/pyspark/pyspark-partitionby-example/).

[PySpark – ArrayType Column \(Array\). \(https://sparkbyexamples.com/pyspark/pyspark-arraytype-column-with-examples/\)](https://sparkbyexamples.com/pyspark/pyspark-arraytype-column-with-examples/).

[PySpark – MapType \(Map/Dict\). \(https://sparkbyexamples.com/pyspark/pyspark-maptype-dict-examples/\)](https://sparkbyexamples.com/pyspark/pyspark-maptype-dict-examples/).

PySpark SQL Functions

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PySpark Datasources

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[PySpark – Read & Write Parquet File \(https://sparkbyexamples.com/pyspark/pyspark-read-write-parquet-file/\)](https://sparkbyexamples.com/pyspark/pyspark-read-write-parquet-file/).

```
root
|-- firstname: string (nullable=true)
|-- middlename: string (nullable=true)
|-- lastname: string (nullable=true)
```

3. Convert Empty RDD to DataFrame

You can also create empty DataFrame by converting empty RDD to DataFrame using `toDF()`.



```
#Convert empty RDD to Dataframe
df1 = emptyRDD.toDF(schema)
df1.printSchema()
```

4. Create Empty DataFrame with Schema.

So far I have covered creating an empty DataFrame from RDD, but here will create it manually with schema and without RDD.

```
#Create empty DataFrame directly
df2 = spark.createDataFrame([], schema)
df2.printSchema()
```

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[PySpark – lit\(\)](#)
(<https://sparkbyexamples.com/pyspark/pyspark-lit-add-literal-constant/>)

[PySpark – split\(\)](#)
(<https://sparkbyexamples.com/pyspark/pyspark-convert-string-to-array-column/>)

[PySpark – concat_ws\(\)](#)
(<https://sparkbyexamples.com/pyspark/pyspark-convert-array-column-to-string-column/>)

[Pyspark – substring\(\)](#)
(<https://sparkbyexamples.com/pyspark/pyspark-substring-from-a-column/>)

[PySpark – translate\(\)](#)
(<https://sparkbyexamples.com/pyspark/pyspark-replace-column-values/#translate-replace-character-by-character>)

[PySpark – regexp_replace\(\)](#)
(<https://sparkbyexamples.com/pyspark/pyspark-replace-column->

5. Create Empty

DataFrame without

Schema (no columns)

To create empty DataFrame with out schema (no columns) just create a empty schema and use it while creating spark DataFrame.

```
Create empty DataFrame with no schema  
f3 = spark.createDataFrame([],  
                             schema=StructType([]))  
f3.printSchema()
```

```
Print below empty schema  
#root
```

Happy Learning !!

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

[PySpark – datediff\(\)](#).
(<https://sparkbyexamples.com/pyspark/pyspark-difference-between-two-dates-days-months-years/#datediff>)

[PySpark – months_between\(\)](#).
([https://sparkbyexamples.com/pyspark/pyspark-difference-between-two-dates-days-months-years/#months_between\(\)](https://sparkbyexamples.com/pyspark/pyspark-difference-between-two-dates-days-months-years/#months_between()))

[PySpark – explode\(\)](#).
(<https://sparkbyexamples.com/pyspark/pyspark-explode-nested-array-into-rows/>)

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

[PySpark – array\(\)](#).
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[PySpark – collect_set\(\)](#).
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[PySpark – struct\(\).
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[PySpark – countDistinct\(\).
\(https://sparkbyexamples.com/py-spark/pyspark-count-distinct-from-dataframe/\)](https://sparkbyexamples.com/py-spark/pyspark-count-distinct-from-dataframe/)

[PySpark – sum\(\). avg\(\).
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[PySpark – row_number\(\).
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[PySpark – typedLit\(\).
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