## How take a random row from a PySpark DataFrame?

Asked 7 years, 1 month ago Modified 11 months ago Viewed 86k times



How can I get a random row from a PySpark DataFrame? I only see the method <code>sample()</code> which takes a fraction as parameter. Setting this fraction to <code>l/numberofRows</code> leads to random results, where sometimes I won't get any row.



On RDD there is a method takesample() that takes as a parameter the number of elements you want the sample to contain. I understand that this might be slow, as you have to count each partition, but is there a way to get something like this on a DataFrame?

**(**)

python apache-spark dataframe pyspark apache-spark-sql

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edited Mar 8, 2021 at 11:00 mck 39.6k 13 34 49

asked Nov 30, 2015 at 16:29

DanT 3.800

**3,800** 5 28 33

3 Answers

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You can simply call takesample on a RDD:



```
df = sqlContext.createDataFrame(
    [(1, "a"), (2, "b"), (3, "c"), (4, "d")], ("k", "v"))
df.rdd.takeSample(False, 1, seed=0)
## [Row(k=3, v='c')]
```





If you don't want to collect you can simply take a higher fraction and limit:



```
df.sample(False, 0.1, seed=0).limit(1)
```

Don't pass a seed, and you should get a different DataFrame each time.

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edited Feb 18, 2022 at 7:03



Jacek Laskowski
71.1k 26 235 411

answered Dec 1, 2015 at 2:06



zero323 316k 97 948 930

- Is there a way of getting random values. In the above case the same dataframe in produced each time I run the query.

   Nikhil Baby Dec 20, 2017 at 9:50
- Nice tip, @LateCoder! (On Spark 2.3.1, keeping seed=None only seems to work for df.rdd.takeSample, not df.sample.)
   Quentin Pradet Jul 17, 2018 at 11:00
- 1 Why might one not want to collect ? ijoseph Jan 14, 2020 at 0:41

- Oh because collect <u>returns it to the driver program</u> and it might not fit in the driver's memory. ijoseph Jan 14, 2020 at 0:47
- 1 I don't think the second sample -> limit solution is quite random. The sample() part is good and random, but then the results seem to be somewhat sorted before the limit is taken. This is especially obvious if you do limit(10) instead of 1 and your fraction is too big. the results may look similar. Paul Fornia Dec 10, 2020 at 21:58



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## **Different Types of Sample**

Randomly sample % of the data with and without replacement





```
import pyspark.sql.functions as F
#Randomly sample 50% of the data without replacement
sample1 = df.sample(False, 0.5, seed=0)
#Randomly sample 50% of the data with replacement
sample1 = df.sample(True, 0.5, seed=0)
#Take another sample exlcuding records from previous sample using Anti Join
sample2 = df.join(sample1, on='ID', how='left_anti').sample(False, 0.5, seed=0)
#Take another sample exlcuding records from previous sample using Where
sample1_ids = [row['ID'] for row in sample1.ID]
sample2 = df.where(~F.col('ID').isin(sample1_ids)).sample(False, 0.5, seed=0)
#Generate a startfied sample of the data across column(s)
#Sampling is probabilistic and thus cannot guarantee an exact number of rows
fractions = {
       'NJ': 0.5, #Take about 50% of records where state = NJ
    'NY': 0.25, #Take about 25% of records where state = NY
    'VA': 0.1, #Take about 10% of records where state = VA
stratified_sample = df.sampleBy(F.col('state'), fractions, seed=0)
```

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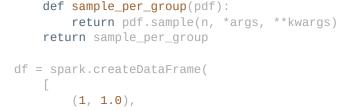


Here's an alternative using Pandas <u>DataFrame.Sample</u> method. This uses the spark applyInPandas method to distribute the groups, available from Spark 3.0.0. This allows you to select an exact number of rows per group.



I've added args and kwargs to the function so you can access the other arguments of DataFrame.Sample.





def sample\_n\_per\_group(n, \*args, \*\*kwargs):

```
(1, 1.0),
(1, 2.0),
```

(2, 3.0), (2, 5.0),

(2, 10.0)

```
[],
    ("id", "v")
)

(df.groupBy("id")
    .applyInPandas(
        sample_n_per_group(1, random_state=2),
        schema=df.schema
    )
)
```

To be aware of the limitations for very large groups, from the <u>documentation</u>:

This function requires a full shuffle. All the data of a group will be loaded into memory, so the user should be aware of the potential OOM risk if data is skewed and certain groups are too large to fit in memory.

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edited Oct 12, 2021 at 11:59

answered Oct 12, 2021 at 11:38

