PROGRAMMING, PYTHON

Handle Missing Data in Pyspark

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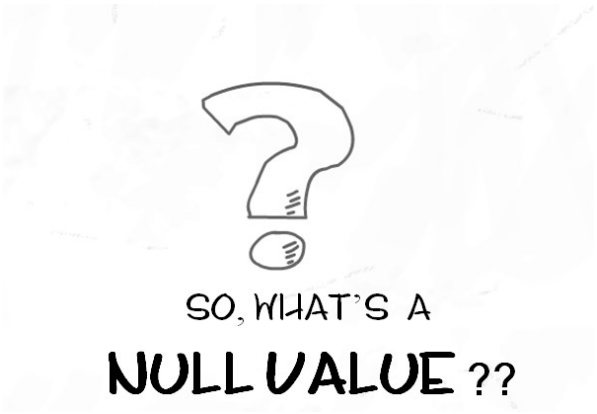
The objective of this article is to understand various ways to handle missing or null values present in the dataset. A null means an unknown or missing or irrelevant value, but with machine learning or a data science aspect, it becomes essential to deal with nulls efficiently, the reason being an ML engineer can't afford to get short on the dataset.



Nulls

Let's check out various ways to handle missing data or Nulls in Spark Dataframe.

Pyspark connection and Application creation

```
import pyspark
from pyspark.sql import SparkSession
spark= SparkSession.builder.appName('NULL_Handling').getOrCreate()
print('NULL_Handling')
```

2. Import Dataset

```
null_df=spark.read.csv(r'D:\python_coding\pyspark_tutorial\Nulls.csv',header=True,inferSchema=True)
null_df.show()
```

```
+---+-----+------+
| Id| Name| Sales|
+---+-----+------+
| e1|Vivek| 397.0|
| e2| null|  null|
| e3| null|545.68|
| e4| Jack| 448.0|
+---+-----+------+
```

Dataset

3. Dropping Null values

```
#na func to drop rows with null values
#rows having atleast a null value is dropped

null_df.na.drop().show()
```

```
+---+-----+-----+
| Id| Name|Sales|
+---+-----+-----+
| e1|Vivek|397.0|
| e4| Jack|448.0|
+---+-----+-----+
```

drop nulls

```
#rows having nulls greater than 2 are dropped

null_df.na.drop(thresh=2).show()
```

```
+---+-----+------+
| Id| Name| Sales|
+---+-----+------+
| e1|Vivek| 397.0|
| e3| null|545.68|
| e4| Jack| 448.0|
+---+-----+------+
```

drop nulls

4. Drop Nulls with ‘HOW’ argument

```
#drop rows having nulls using how parameter
#records having atleast a null wull be dropped

null_df.na.drop(how='any').show()
```

```
+---+-----+-----+
| Id| Name|Sales|
+---+-----+-----+
| e1|Vivek|397.0|
| e4| Jack|448.0|
+---+-----+-----+
```

any

```
#record having all nulls will be dropped

null_df.na.drop(how='all').show()
```

```
+---+-----+------+
| Id| Name| Sales|
+---+-----+------+
| e1|Vivek| 397.0|
| e2| null|  null|
| e3| null|545.68|
| e4| Jack| 448.0|
+---+-----+------+
```

all

5. Drop Nulls basis of a column

```
#dropping null values on basis of a column
null_df.na.drop(subset=['Sales']).show()
```

```
+---+-----+------+
| Id| Name| Sales|
+---+-----+------+
| e1|Vivek| 397.0|
| e3| null|545.68|
| e4| Jack| 448.0|
+---+-----+------+
```

subset

```
#records having both Name and Sales as Nulls are dropped

null_df.na.drop(how='all',subset=['Name','Sales']).show()
```

```
+---+-----+------+
| Id| Name| Sales|
+---+-----+------+
| e1|Vivek| 397.0|
| e3| null|545.68|
| e4| Jack| 448.0|
+---+-----+------+
```

```
#records having both Name and Sales as Nulls are dropped

null_df.na.drop(how='any',subset=['Name','Sales']).show()
```

```
+---+-----+-----+
| Id| Name|Sales|
+---+-----+-----+
| e1|Vivek|397.0|
```

```
| e4| Jack|448.0|
+---+-----+-----+
```

subset any

6. Fill the Nulls

```
#filling null values into dataset
#spark automatically detects if a column is string or numeric
null_df.na.fill('NA').show()
```

```
+---+-----+------+
| Id| Name| Sales|
+---+-----+------+
| e1|Vivek| 397.0|
| e2|   NA|  null|
| e3|   NA|545.68|
| e4| Jack| 448.0|
+---+-----+------+
```

Fill NA

```
#fill integer value column
null_df.na.fill(0).show()
```

```
+---+-----+------+
| Id| Name| Sales|
+---+-----+------+
| e1|Vivek| 397.0|
| e2| null|   0.0|
| e3| null|545.68|
| e4| Jack| 448.0|
+---+-----+------+
```

Fill 0

7. Filling Nulls on basis of column

```
#filling on basis of column name

null_df.na.fill('Name Missing',subset=['Name']).show()
```

```
+---+------------+------+
| Id|        Name| Sales|
+---+------------+------+
| e1|       Vivek| 397.0|
| e2|Name Missing|  null|
| e3|Name Missing|545.68|
| e4|        Jack| 448.0|
+---+------------+------+
```

Name Missing

```
#filling multiple column values basis of datatypes

null_df.na.fill({'Name': 'Missing Name', 'Sales': 0}).show()
```

```
+---+------------+------+
| Id|        Name| Sales|
+---+------------+------+
| e1|       Vivek| 397.0|
| e2|Missing Name|   0.0|
| e3|Missing Name|545.68|
| e4|        Jack| 448.0|
+---+------------+------+
```

8. Filling null columns with another column value

```
#fill null values in Name column with Id value

from pyspark.sql.functions import when

name_fill_df=null_df.select('ID','Name',
                            when( null_df.Name.isNull(),
null_df.Id).otherwise(null_df.Name).alias('Name_Filled'),'Sales')

name_fill_df.show()
```

```
+---+-----+-----------+
| ID| Name|Name_Filled|
+---+-----+-----------+
| e1|Vivek|      Vivek|
| e2| null|         e2|
| e3| null|         e3|
| e4| Jack|       Jack|
```

```
+---+-----+----------+
```

9. Filling nulls with mean or average

```
#filling numeric column values with the mean or average value of
that particular column

from pyspark.sql.functions import mean
mean_val=null_df.select(mean(null_df.Sales)).collect()

print(type(mean_val)) #mean_val is a list row object

print('mean value of Sales', mean_val[0][0])
mean_sales=mean_val[0][0]

#now using men_sales value to fill the nulls in sales column
null_df.na.fill(mean_sales,subset=['Sales']).show()
```

```
mean value of Sales 463.55999999999995
+---+-----+------------------+
| Id| Name|             Sales|
+---+-----+------------------+
| e1|Vivek|             397.0|
| e2| null|463.55999999999995|
| e3| null|            545.68|
| e4| Jack|             448.0|
+---+-----+------------------+
```

Summary:

· Drop null values

· Drop nulls with argument How

· Drop nulls with argument subset

· Fill the null values

· Fill the null column with another column value or with an average value

Hurray, here we have discussed several ways to deal with null values in a Spark data frame.

WRITTEN BY
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