ParallelApriori-ad (1)

September 5, 2022

1 Advanced Tutorial on Implementing parallel Apriori Algorithm

In this tutorial, we will discuss two approaches to find frequent patterns in big data using parallelApriori algorithm. 1. Advanced approach: Here, we generalize the basic approach by presenting the steps to discover frequent patterns using multiple minimum support values.

In this tutorial, we explain how the parallelApriori algorithm can be implemented by varying the minimum support values

Step 1: Import the parallelApriori algorithm and pandas data frame

[1]:
```
from PAMI.frequentPattern.pyspark import parallelApriori  as alg
import pandas as pd
```

Step 2: Specify the following input parameters

[2]:
```
inputFile = 'transactional_T10I4D100K.csv'
seperator='\t'
mumberWorkersCount=4
minimumSupportCountList = [1000, 1500, 2000, 2500, 3000]
#minimumSupport can also specified between 0 to 1. E.g., minSupList = [0.005, 0.
 ↪006, 0.007, 0.008, 0.009]

result = pd.DataFrame(columns=['algorithm', 'minSup', 'patterns', 'runtime',␣
 ↪'memory'])
#initialize a data frame to store the results of parallelApriori algorithm
```

Step 3: Execute the parallelApriori algorithm using a for loop

[3]:
```
algorithm = 'parallelApriori'  #specify the algorithm name
for minSupCount in minimumSupportCountList:
    obj = alg.parallelApriori('transactional_T10I4D100K.csv',␣
 ↪minSup=minSupCount,numWorkers=mumberWorkersCount, sep=seperator)
    obj.startMine()
    #store the results in the data frame
    result.loc[result.shape[0]] = [algorithm, minSupCount, len(obj.
 ↪getPatterns()), obj.getRuntime(), obj.getMemoryRSS()]
```

```
Setting default log level to "WARN".
To adjust logging level use sc.setLogLevel(newLevel). For SparkR, use
setLogLevel(newLevel).

22/08/22 15:10:45 WARN NativeCodeLoader: Unable to load native-hadoop library
for your platform… using builtin-java classes where applicable


Frequent patterns were generated successfully using Parallel Apriori algorithm


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```

```
[4]: print(result)
```

```
         algorithm  minSup  patterns     runtime     memory
0  parallelApriori    1000       385  252.870949  128946176
1  parallelApriori    1500       237  102.269674  132366336
2  parallelApriori    2000       155   44.003009  132882432
3  parallelApriori    2500       107   21.927009  133136384
4  parallelApriori    3000        60    8.072261  133136384
```

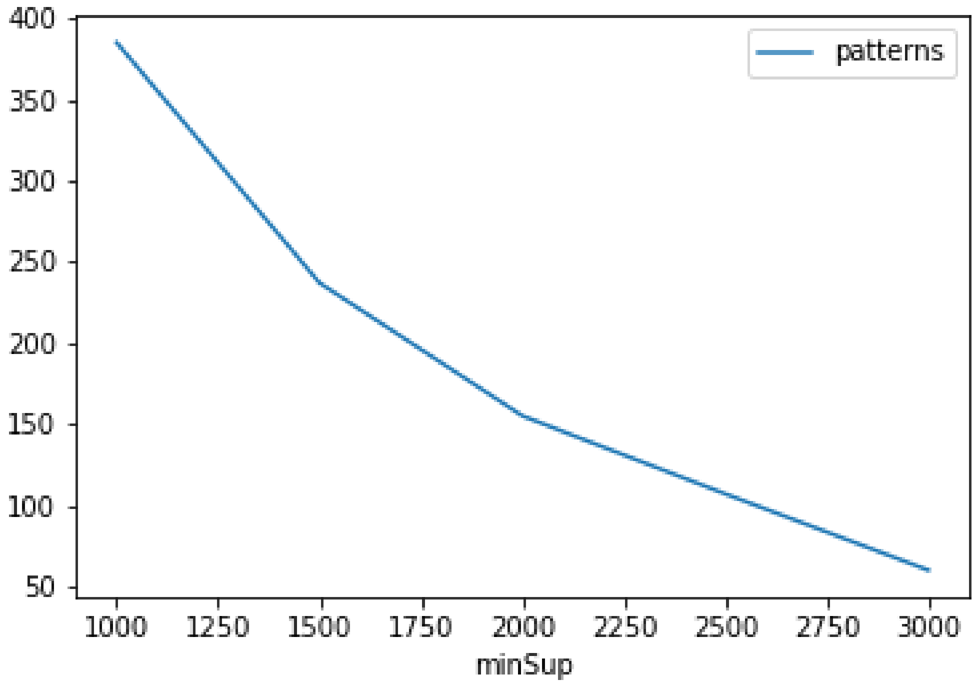
Step 5: Visualizing the results

Step 5.1 Importing the plot library

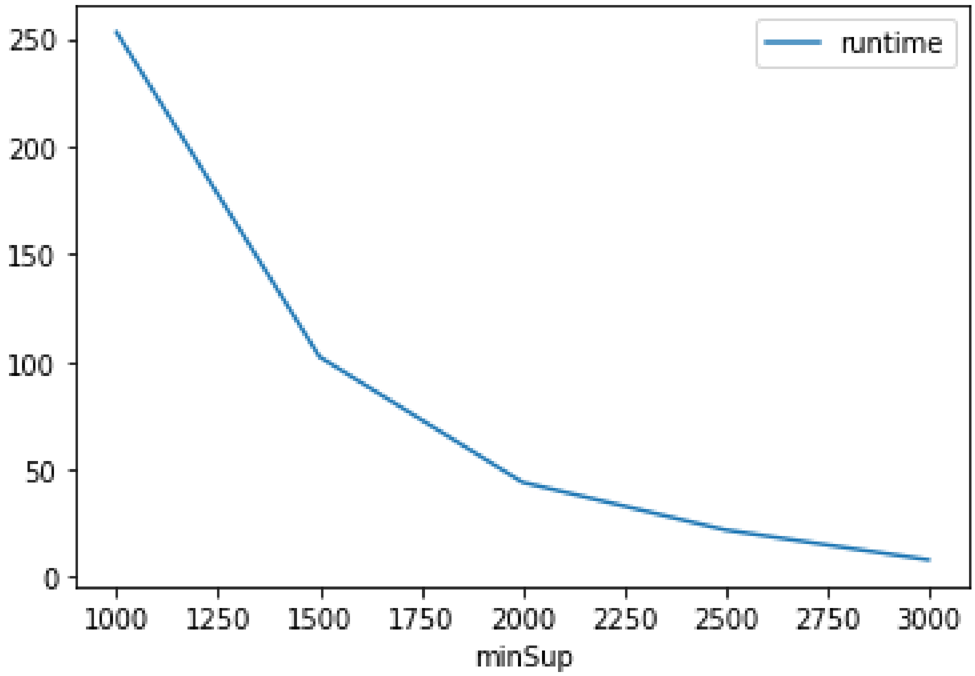
```
[5]: from PAMI.extras.graph import plotLineGraphsFromDataFrame as plt
```

Step 5.2. Plotting the number of patterns

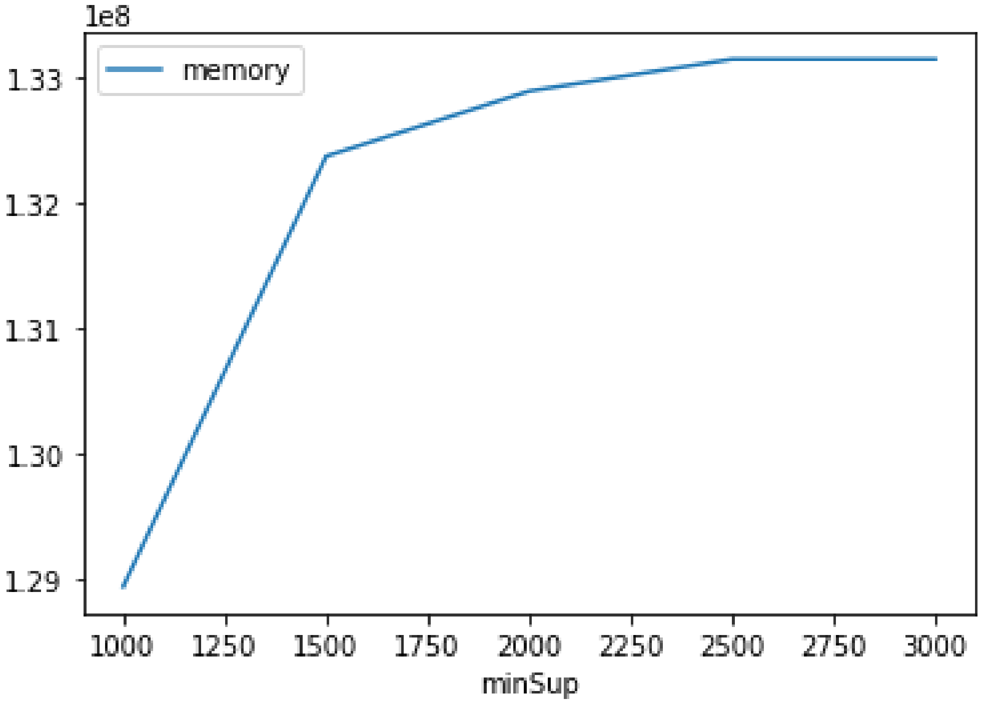
```
[6]: ab = plt.plotGraphsFromDataFrame(result)
     ab.plotGraphsFromDataFrame() #drawPlots()
```



```
Graph for No Of Patterns is successfully generated!
```



```
Graph for Runtime taken is successfully generated!
```



```
Graph for memory consumption is successfully generated!
```

1.0.1 Step 6: Saving the results as latex files

[7]:
```
from PAMI.extras.graph import generateLatexFileFromDataFrame as gdf
gdf.generateLatexCode(result)
```

```
Latex files generated successfully
```