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Roll no. 41310

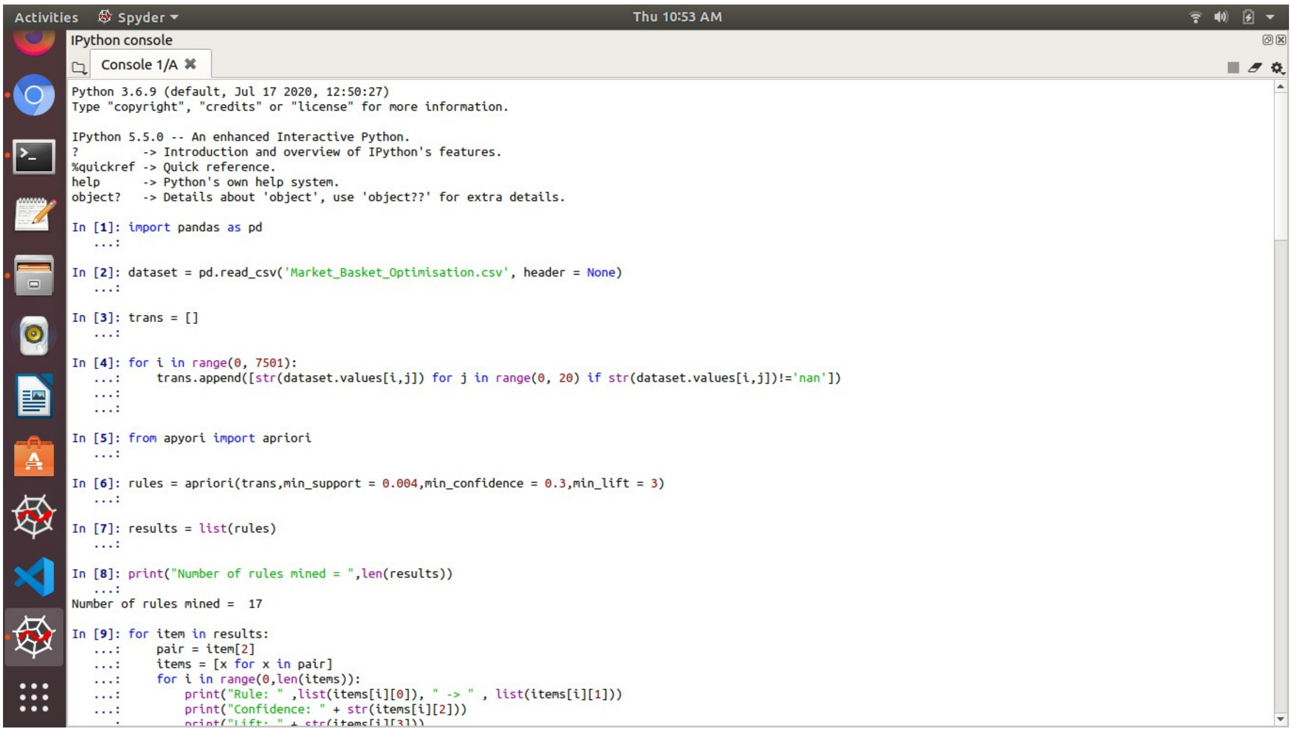
Subject : LP2

Assignment 3

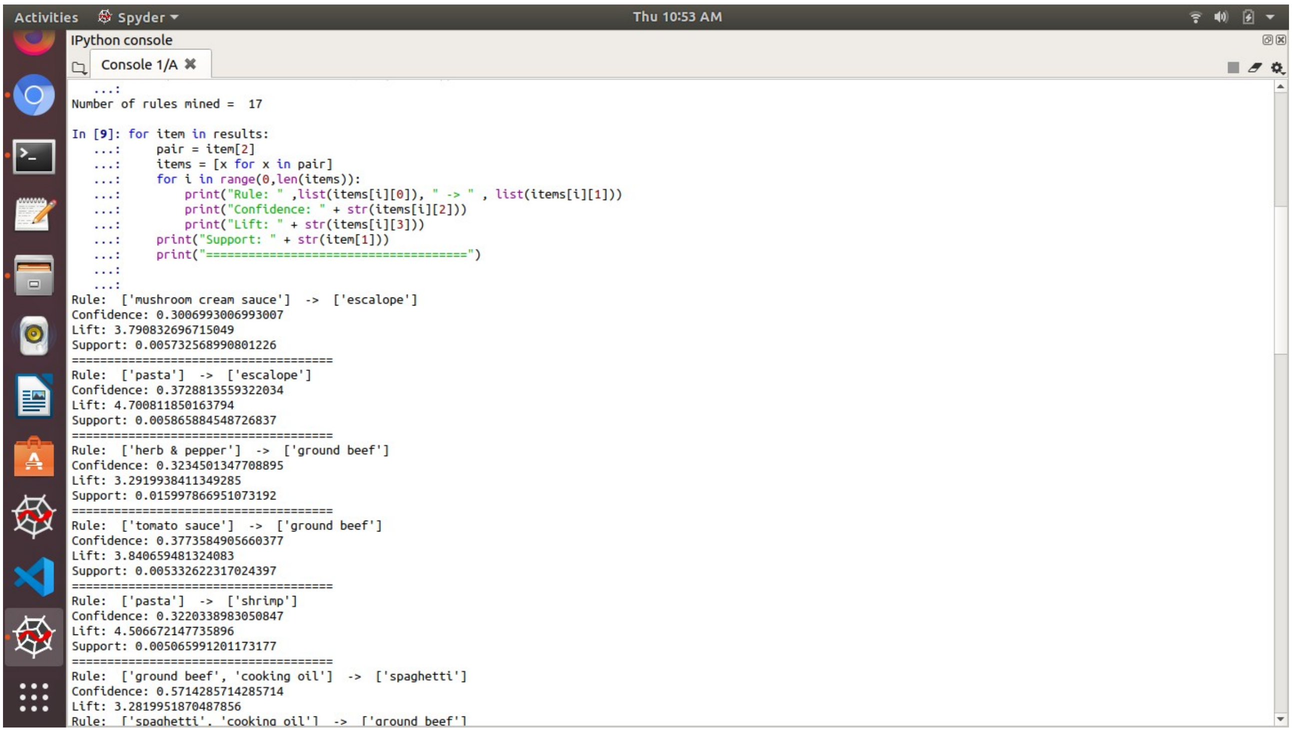
Code:

```
import pandas as pd

dataset = pd.read_csv('Market_Basket_Optimisation.csv', header = None)

trans = []

for i in range(0, 7501):
    trans.append([str(dataset.values[i,j]) for j in range(0, 20) if str(dataset.values[i,j])!='nan'])

from apyori import apriori

rules = apriori(trans,min_support = 0.004,min_confidence = 0.3,min_lift = 3)

results = list(rules)

print("Number of rules mined = ",len(results))

for item in results:
    pair = item[2]
    items = [x for x in pair]
    for i in range(0,len(items)):
        print("Rule: " ,list(items[i][0]), " -> " , list(items[i][1]))
        print("Confidence: " + str(items[i][2]))
        print("Lift: " + str(items[i][3]))
    print("Support: " + str(item[1]))
    print("=====================================")
```

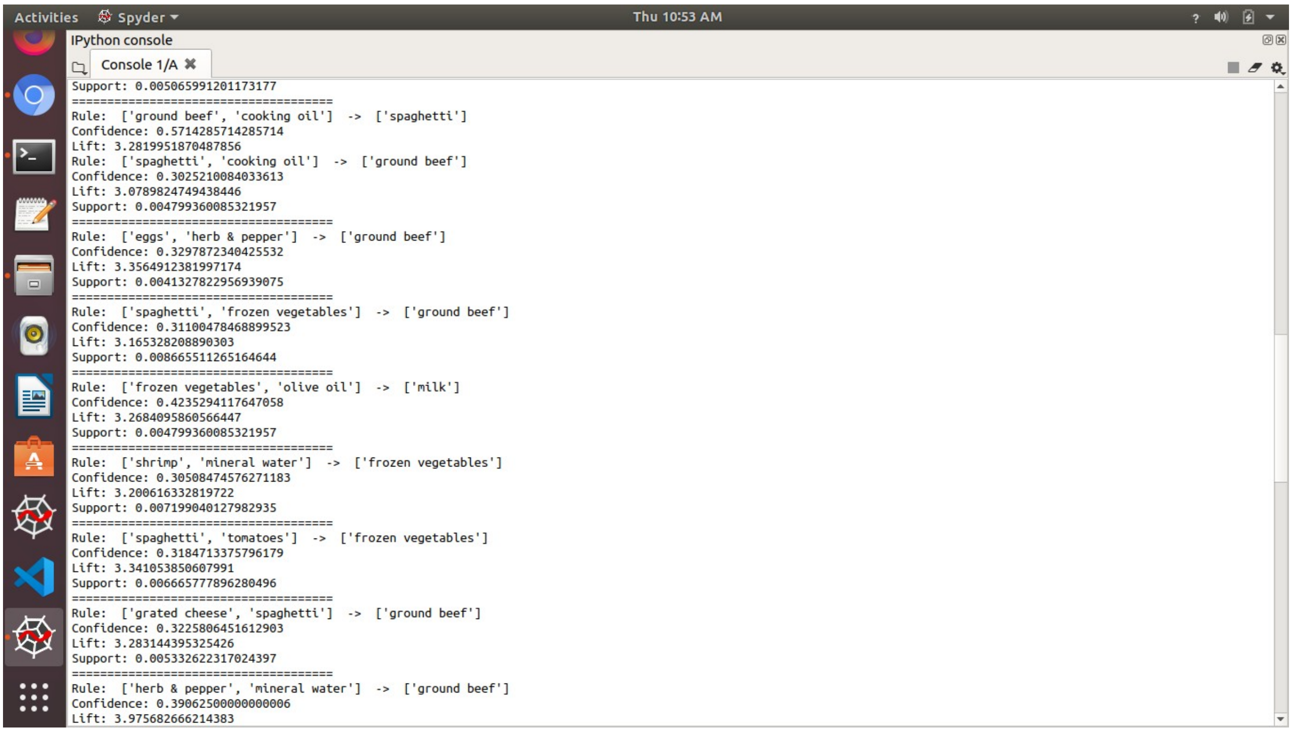
Output :



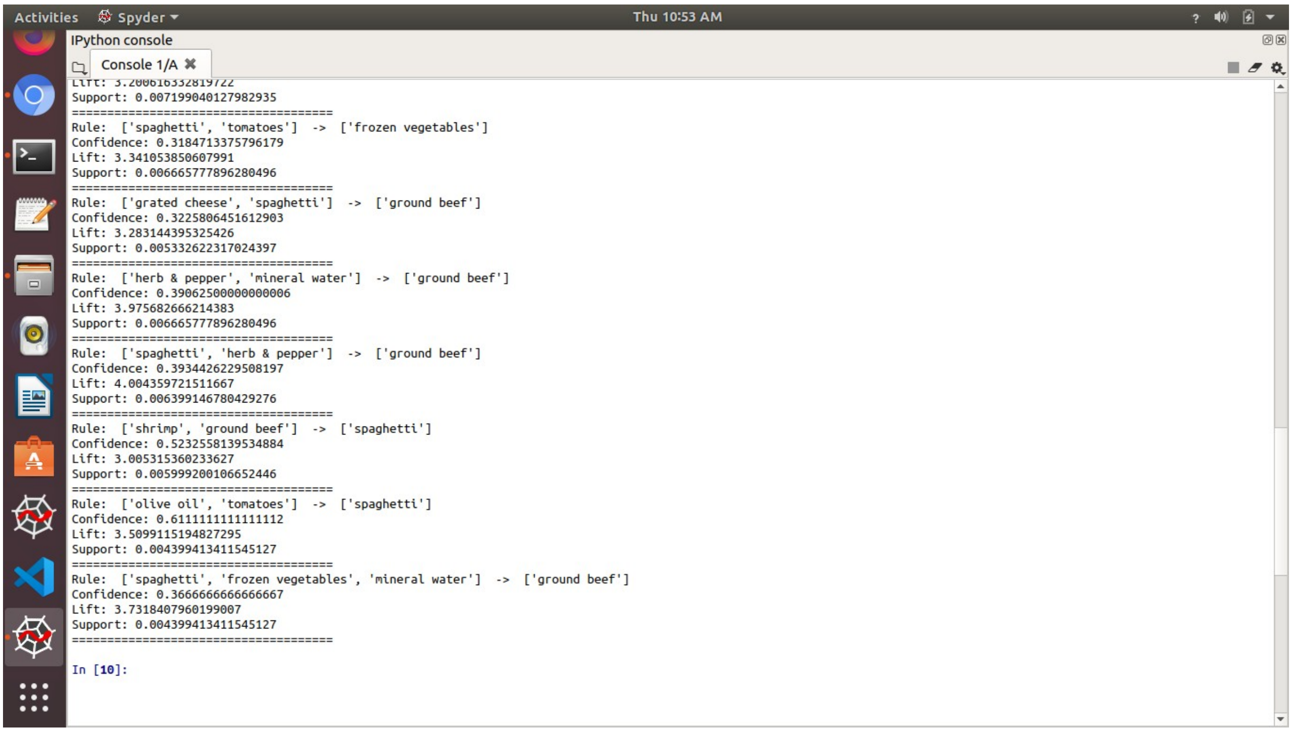
```
Python 3.6.9 (default, Jul 17 2020, 12:50:27)
Type "copyright", "credits" or "license" for more information.

IPython 5.5.0 -- An enhanced Interactive Python.
?         -> Introduction and overview of IPython's features.
%quickref -> Quick reference.
help      -> Python's own help system.
object?   -> Details about 'object', use 'object??' for extra details.

In [1]: import pandas as pd
   ...:

In [2]: dataset = pd.read_csv('Market_Basket_Optimisation.csv', header = None)
   ...:

In [3]: trans = []
   ...:

In [4]: for i in range(0, 7501):
   ...:     trans.append([str(dataset.values[i,j]) for j in range(0, 20) if str(dataset.values[i,j])!='nan'])
   ...:
   ...:

In [5]: from apyori import apriori
   ...:

In [6]: rules = apriori(trans,min_support = 0.004,min_confidence = 0.3,min_lift = 3)
   ...:

In [7]: results = list(rules)
   ...:

In [8]: print("Number of rules mined = ",len(results))
   ...:
Number of rules mined =  17

In [9]: for item in results:
   ...:     pair = item[2]
   ...:     items = [x for x in pair]
   ...:     for i in range(0,len(items)):
   ...:         print("Rule: " ,list(items[i][0]), " -> " , list(items[i][1]))
   ...:         print("Confidence: " + str(items[i][2]))
   ...:         print("Lift: " + str(items[i][3]))
```



```
   ...:
Number of rules mined =  17

In [9]: for item in results:
   ...:     pair = item[2]
   ...:     items = [x for x in pair]
   ...:     for i in range(0,len(items)):
   ...:         print("Rule: " ,list(items[i][0]), " -> " , list(items[i][1]))
   ...:         print("Confidence: " + str(items[i][2]))
   ...:         print("Lift: " + str(items[i][3]))
   ...:     print("Support: " + str(item[1]))
   ...:     print("=====================================")
   ...:
   ...:
Rule:  ['mushroom cream sauce']  ->  ['escalope']
Confidence: 0.3006993006993007
Lift: 3.790832696715049
Support: 0.005732568990801226
=====================================
Rule:  ['pasta']  ->  ['escalope']
Confidence: 0.3728813559322034
Lift: 4.700811850163794
Support: 0.005865884548726837
=====================================
Rule:  ['herb & pepper']  ->  ['ground beef']
Confidence: 0.3234501347708895
Lift: 3.2919938411349285
Support: 0.015997866951073192
=====================================
Rule:  ['tomato sauce']  ->  ['ground beef']
Confidence: 0.3773584905660377
Lift: 3.840659481324083
Support: 0.005332622317024397
=====================================
Rule:  ['pasta']  ->  ['shrimp']
Confidence: 0.3220338983050847
Lift: 4.506672147735896
Support: 0.005065991201173177
=====================================
Rule:  ['ground beef', 'cooking oil']  ->  ['spaghetti']
Confidence: 0.5714285714285714
Lift: 3.2819951870487856
Rule:  ['spaghetti', 'cooking oil']  ->  ['ground beef']
```



```
Support: 0.005065991201173177
=====================================
Rule:  ['ground beef', 'cooking oil']  ->  ['spaghetti']
Confidence: 0.5714285714285714
Lift: 3.2819951870487856
Rule:  ['spaghetti', 'cooking oil']  ->  ['ground beef']
Confidence: 0.3025210084033613
Lift: 3.0789824749438446
Support: 0.004799360085321957
=====================================
Rule:  ['eggs', 'herb & pepper']  ->  ['ground beef']
Confidence: 0.3297872340425532
Lift: 3.3564912381997174
Support: 0.0041327822956939075
=====================================
Rule:  ['spaghetti', 'frozen vegetables']  ->  ['ground beef']
Confidence: 0.31100478468899523
Lift: 3.165328208890303
Support: 0.008665511265164644
=====================================
Rule:  ['frozen vegetables', 'olive oil']  ->  ['milk']
Confidence: 0.4235294117647058
Lift: 3.2684095860566447
Support: 0.004799360085321957
=====================================
Rule:  ['shrimp', 'mineral water']  ->  ['frozen vegetables']
Confidence: 0.3050847457627118З
Lift: 3.200616332819722
Support: 0.007199040127982935
=====================================
Rule:  ['spaghetti', 'tomatoes']  ->  ['frozen vegetables']
Confidence: 0.3184713375796179
Lift: 3.341053850607991
Support: 0.006665777896280496
=====================================
Rule:  ['grated cheese', 'spaghetti']  ->  ['ground beef']
Confidence: 0.3225806451612903
Lift: 3.283144395325426
Support: 0.005332622317024397
=====================================
Rule:  ['herb & pepper', 'mineral water']  ->  ['ground beef']
Confidence: 0.39062500000000006
Lift: 3.975682666214383
```



```
Lift: 3.200616332819722
Support: 0.007199040127982935
=====================================
Rule:  ['spaghetti', 'tomatoes']  ->  ['frozen vegetables']
Confidence: 0.3184713375796179
Lift: 3.341053850607991
Support: 0.006665777896280496
=====================================
Rule:  ['grated cheese', 'spaghetti']  ->  ['ground beef']
Confidence: 0.3225806451612903
Lift: 3.283144395325426
Support: 0.005332622317024397
=====================================
Rule:  ['herb & pepper', 'mineral water']  ->  ['ground beef']
Confidence: 0.39062500000000006
Lift: 3.975682666214383
Support: 0.006665777896280496
=====================================
Rule:  ['spaghetti', 'herb & pepper']  ->  ['ground beef']
Confidence: 0.3934426229508197
Lift: 4.004359721511667
Support: 0.006399146780429276
=====================================
Rule:  ['shrimp', 'ground beef']  ->  ['spaghetti']
Confidence: 0.5232558139534884
Lift: 3.005315360233627
Support: 0.005999200106652446
=====================================
Rule:  ['olive oil', 'tomatoes']  ->  ['spaghetti']
Confidence: 0.6111111111111112
Lift: 3.5099115194827295
Support: 0.004399413411545127
=====================================
Rule:  ['spaghetti', 'frozen vegetables', 'mineral water']  ->  ['ground beef']
Confidence: 0.3666666666666667
Lift: 3.7318407960199007
Support: 0.004399413411545127
=====================================

In [10]:
```