Experiment No 11 :Implementing MARKET BASKET ANALYSIS

AIM: To implement MARKET BASKET ANALYSIS algorithm using any programming language.

Code:

```
#implementing market basket analysis from scratch

import itertools
import matplotlib.pyplot as plt
plt.tick_params(axis='x',labelsize=4)

def support(tranc,items):
    total_no_of_transactions=len(tranc)
    dic={}
    for item in items:
        dic[item]=0
    for item in items:
        for i in range(1,total_no_of_transactions+1):
            if item in tranc[i]:
                dic[item]+=1
    print("**************************************")
    print("calculating support for each item :")
    print("The occurences of each items in all the transactions :")
    print(dic)
    sup={}
    for item in items:
        sup[item]=0
    print("")
    print("******** SUPPORT FOR EACH ITEM IS ***************")
    for item in items:
        supp=dic[item]/total_no_of_transactions
        print("the support for {} is : {}".format(item,supp))
        sup[item]+=supp
    print("**********************************************")
    plt.bar(dic.keys(),dic.values())
    return sup,dic

def confidence_lift(tranc,items,dic,sup):
    conf={}
    comb=list(itertools.combinations(items,2))
    for combs in comb:
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        conf[combs]=0
    ll=[]
    print("*******The confidence and lift for the items are
*****************")
    for combs in comb:
        for i in range(1,6):
            if combs[0] and combs[1] in tranc[i]:
                conf[combs]+=1
        conf[combs]=conf[combs]/dic[combs[0]]
        print("The confidence of {} and {} is
{}".format(combs[0],combs[1],conf[combs]))
        lift=conf[combs]  / sup[combs[1]]
        ll.append(lift)
        print("The lift of {} and {} is
{}".format(combs[0],combs[1],lift))
        print("")
    print("*****************************************************")
    l=[]
    for combs in comb:
        l.append(combs[0]+'+'+combs[1])
    plt.bar(l,conf.values())
    plt.scatter(l,ll)

transactions={1:['milk','eggs','bread','butter'],2:['milk','eggs','cheese
'],3:['milk','eggs','bread'],4:['milk','bread','butter','eggs','cheese'],
5:['butter','eggs']}
print("The given transactions are :")

for i in range(1,6):
    print(i,transactions[i])

items=['milk','butter','eggs','bread','cheese']
#get the support for each item

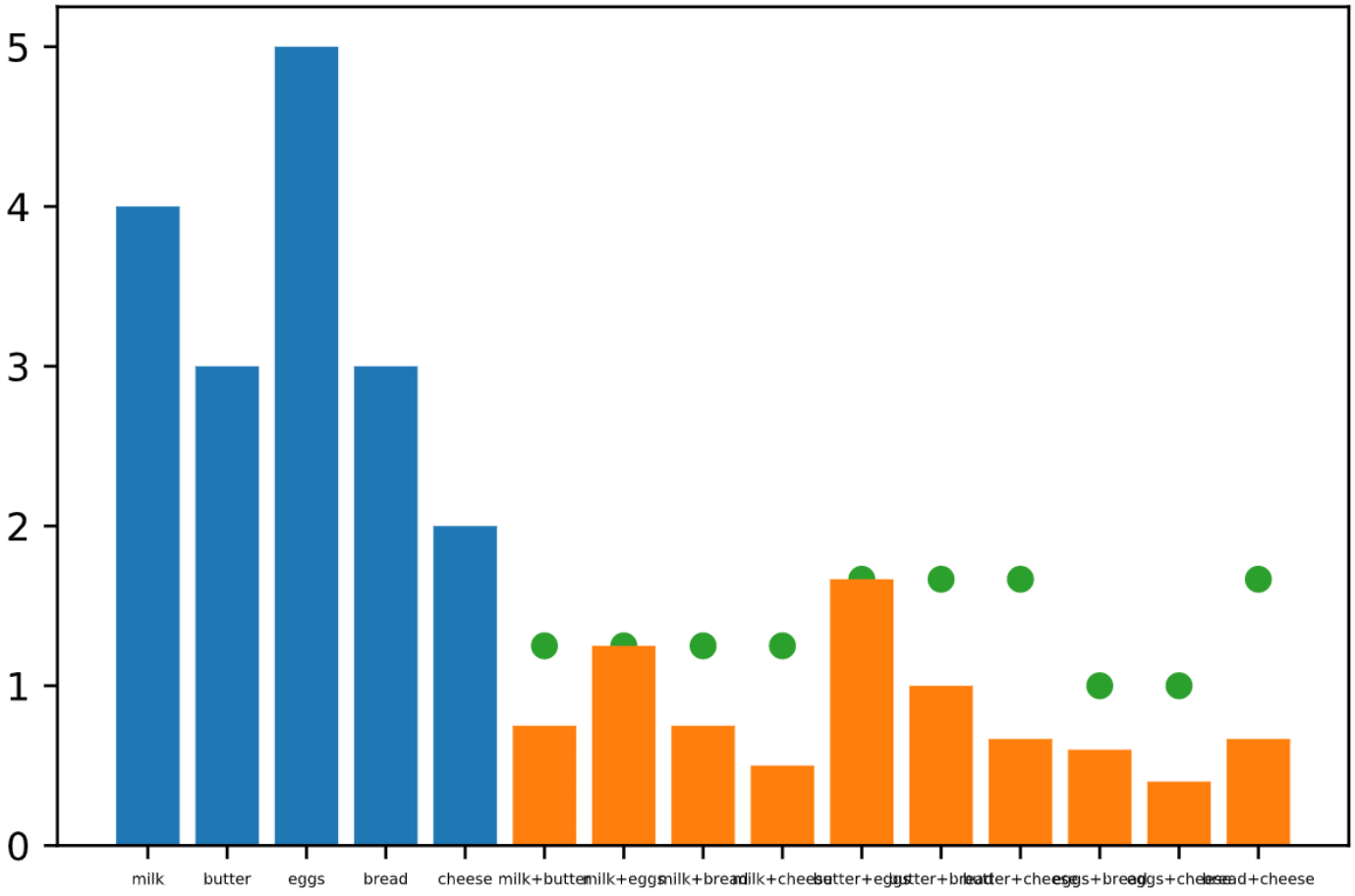
sup,dic=support(transactions,items)
#get the confidence for each pair

confidence_lift(transactions,items,dic,sup)
```

Result : You have successfully executed the market basket analysis using python

Screenshot:

GRAPHICAL REPRESENTATION



CONSOLE OUTPUT :

```
The given transactions are :
1 ['milk', 'eggs', 'bread', 'butter']
2 ['milk', 'eggs', 'cheese']
3 ['milk', 'eggs', 'bread']
4 ['milk', 'bread', 'butter', 'eggs', 'cheese']
5 ['butter', 'eggs']
****************************************
calculating support for each item :
The occurences of each items in all the transactions :
{'milk': 4, 'butter': 3, 'eggs': 5, 'bread': 3, 'cheese': 2}

******** SUPPORT FOR EACH ITEM IS ***************
the support for milk is : 0.8
the support for butter is : 0.6
the support for eggs is : 1.0
the support for bread is : 0.6
the support for cheese is : 0.4
************************************************
*******The confidence and lift for the items are *****************
The confidence of milk and butter is 0.75
The lift of milk and butter is 1.25

The confidence of milk and eggs is 1.25
The lift of milk and eggs is 1.25

The confidence of milk and bread is 0.75
The lift of milk and bread is 1.25

The confidence of milk and cheese is 0.5
The lift of milk and cheese is 1.25

The confidence of butter and eggs is 1.6666666666666667
The lift of butter and eggs is 1.6666666666666667

The confidence of butter and bread is 1.0
The lift of butter and bread is 1.6666666666666667

The confidence of butter and cheese is 0.6666666666666666
The lift of butter and cheese is 1.6666666666666665

The confidence of eggs and bread is 0.6
The lift of eggs and bread is 1.0

The confidence of eggs and cheese is 0.4
The lift of eggs and cheese is 1.0

The confidence of bread and cheese is 0.6666666666666666
The lift of bread and cheese is 1.6666666666666665

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