```
#Importing the libraries
import numpy as np
import pandas as pd
import sklearn.preprocessing
import scipy as sp
import scipy.sparse as scp
import networkx as nx
from scipy.sparse import isspmatrix, dok_matrix, csc_matrix



# Importing the excel file
from google.colab import files
uploaded = files.upload()
```

Choose Files hw3.xlsx

- **hw3.xlsx**(application/vnd.openxmlformats-officedocument.spreadsheetml.sheet) - 14767 bytes, last modifi

100% done
Saving hw3.xlsx to hw3.xlsx

```
# Making a data frame from the xlsx file
data = pd.read_excel('hw3.xlsx')
data


#Creating 0s data frame for adjacency matrix
adj = pd.DataFrame(np.zeros(shape=(17,17)), columns=data['n1'].unique(), index=data['n1'].uni


#Feeding the 0s data frame with the edge values from the  xlsx
for x in range(42):
  # print(data.loc[x][2])
  row = data.loc[x][0]
  column = data.loc[x][1]
  adj.at[row, column] = data.loc[x][2]
  adj.at[column, row] = data.loc[x][2]
adj
```

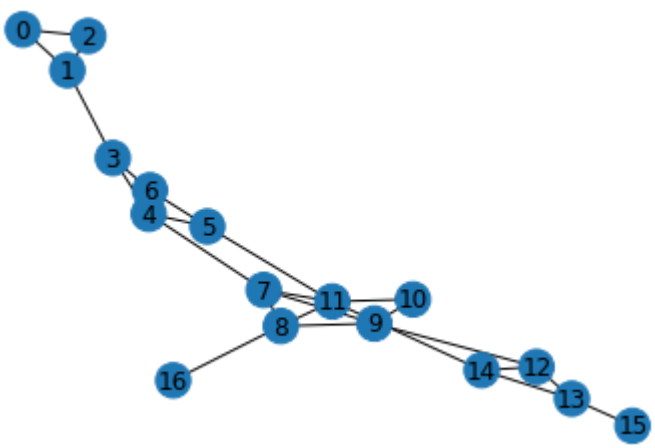
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
A	1.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B	2.0	1.0	3.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	2.0	3.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	1.0	0.0	1.0	2.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	2.0	1.0	2.0	3.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	0.0	0.0	0.0	0.0	2.0	1.0	4.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
G	0.0	0.0	0.0	4.0	3.0	4.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	3.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
J	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	1.0	3.0	0.0	4.0	0.0	0.0	0.0	0.0	1.0
K	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	3.0	1.0	4.0	0.0	1.0	0.0	0.0	0.0	0.0
L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	1.0	3.0	0.0	0.0	0.0	0.0	0.0
M	0.0	0.0	0.0	0.0	0.0	1.0	0.0	2.0	4.0	0.0	3.0	1.0	0.0	0.0	1.0	0.0	0.0
N	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	3.0	2.0	0.0	0.0
P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	1.0	3.0	4.0	0.0
Q	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.0	3.0	1.0	0.0	0.0
R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	1.0	0.0
S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0

Adjacency Matrix with added self loop

```
pip install markov_clustering
```

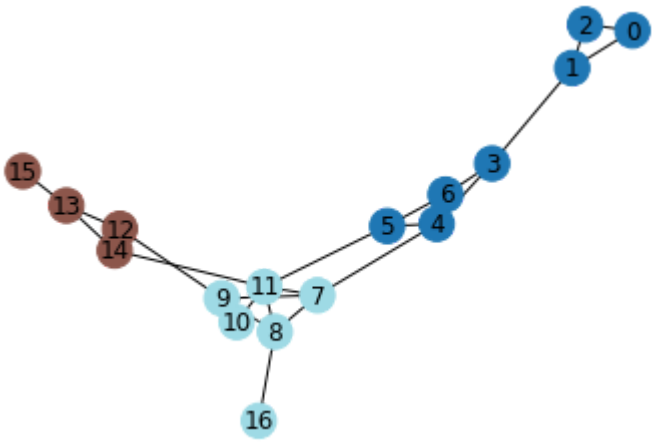
```
import markov_clustering as mc

#Convert data frame to arrays
adjarrays = adj.values
adjarrays

adjmatrix = np.asmatrix(adjarrays)

#Mapping the numbers to vertices names A-0, B-1, C-2, D-3, E-4, F-5, G-6, H-7, J-8, K-9, L-10

#Inflation with 1.1
mcla1 = mc.run_mcl(adjmatrix, inflation=1.1, iterations = 10)
result1 = mc.get_clusters(mcla1)
```

```
mc.draw_graph(adjmatrix, result1, with_labels=True, edge_color="black")
```



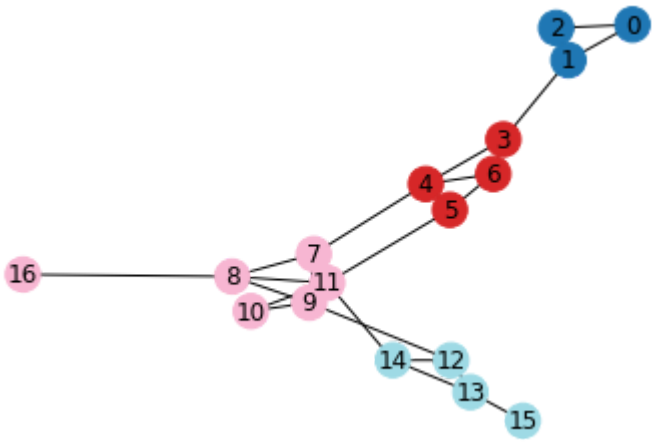
Clusters with 1.1 inflation value includes all nodes as 1 cluster

```
# Inflation with 1.3
mcla3 = mc.run_mcl(adjmatrix, inflation=1.3, iterations = 10)
result3 = mc.get_clusters(mcla3)
mc.draw_graph(adjmatrix, result3, with_labels=True, edge_color="black")
```



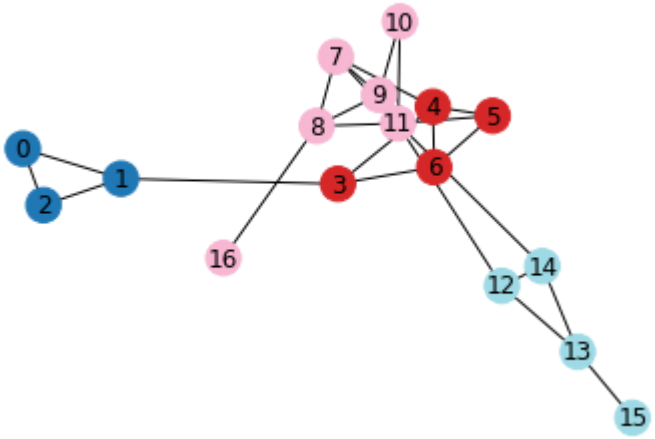
Clusters with inflation = 1.3 (12,13,14,15 ---- N,P,Q,R) (7,8,9,10,11,16 ----- H,J,K,L,M,S) (0,1,2---A,B,C) (3,4,

```
#Inflation 1.5
mcla5 = mc.run_mcl(adjmatrix, inflation=1.5, iterations = 10)
result5 = mc.get_clusters(mcla5)
mc.draw_graph(adjmatrix, result5, with_labels=True, edge_color="black")
```



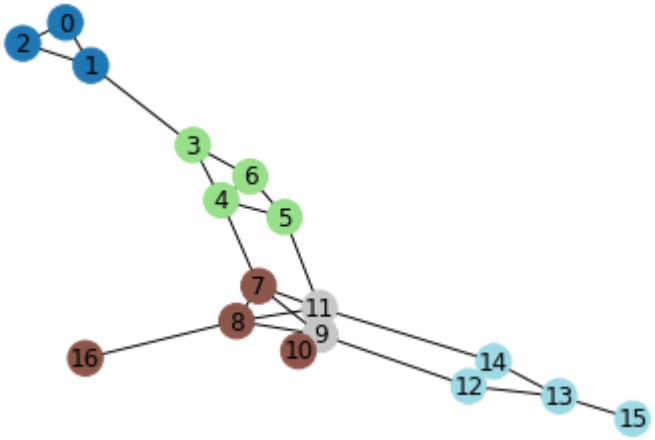
Clusters with inflation = 1.5 (12,13,14,15 ---- N,P,Q,R) (7,8,9,10,11,16 ----- H,J,K,L,M,S) (0,1,2---A,B,C) (3,4,

```
#Inflation 1.7
mcla7 = mc.run_mcl(adjmatrix, inflation=1.7, iterations = 10)
result7 = mc.get_clusters(mcla7)
mc.draw_graph(adjmatrix, result7, with_labels=True, edge_color="black")
```




```
Clusters with inflation = 1.7 (12,13,14,15 ---- N,P,Q,R) (7,8,9,10,11,16 ----- H,J,K,L,M,S) (
```

```
#Inflation 2.1
mcla21 = mc.run_mcl(adjmatrix, inflation=2.1, iterations = 10)
result21 = mc.get_clusters(mcla21)
mc.draw_graph(adjmatrix, result21, with_labels=True, edge_color="black")
```



Clusters with inflation = 1.3 (12,13,14,15 ---- N,P,Q,R) (7,8,10,16 ----- H,J,L, S) (0,1,2---A,B,C) (3,4,5,6 ---D,E

```
#Adjacency Matrix for Inflation = 1.1
mcla1
```

```
array([[0.02168927, 0.02168926, 0.02168927, 0.02168913, 0.02168911,
        0.02168911, 0.02168912, 0.02168901, 0.021689  , 0.021689  ,
        0.021689  , 0.021689  , 0.02168895, 0.02168894, 0.02168895,
        0.02168894, 0.021689  ],
       [0.04522077, 0.04522075, 0.04522077, 0.04522049, 0.04522044,
        0.04522043, 0.04522046, 0.04522024, 0.04522023, 0.04522022,
        0.04522022, 0.04522023, 0.04522012, 0.0452201 , 0.04522012,
        0.0452201 , 0.04522022],
       [0.03436041, 0.0343604 , 0.03436041, 0.03436019, 0.03436016,
        0.03436015, 0.03436017, 0.03436   , 0.03435998, 0.03435998,
        0.03435998, 0.03435999, 0.0343599 , 0.03435989, 0.0343599 ,
        0.03435988, 0.03435998],
       [0.04352424, 0.04352423, 0.04352424, 0.04352413, 0.04352412,
        0.04352411, 0.04352412, 0.04352404, 0.04352403, 0.04352403,
        0.04352403, 0.04352404, 0.04352399, 0.04352399, 0.04352399,
        0.04352399, 0.04352403],
       [0.05721187, 0.05721186, 0.05721187, 0.05721177, 0.05721175,
        0.05721175, 0.05721175, 0.05721167, 0.05721167, 0.05721167,
        0.05721167, 0.05721167, 0.05721163, 0.05721162, 0.05721163,
        0.05721162, 0.05721167],
       [0.04182038, 0.04182037, 0.04182038, 0.04182031, 0.0418203 ,
        0.04182029, 0.0418203 , 0.04182024, 0.04182024, 0.04182024,
        0.04182024, 0.04182024, 0.04182021, 0.04182021, 0.04182021,
        0.04182021, 0.04182024],
       [0.13562483, 0.13562482, 0.13562483, 0.13562456, 0.13562451,
        0.13562451, 0.13562453, 0.13562432, 0.1356243 , 0.13562429,
        0.13562429, 0.13562431, 0.13562419, 0.13562418, 0.13562419,
        0.13562418, 0.1356243 ],
       [0.04830658, 0.04830658, 0.04830658, 0.04830663, 0.04830664,
        0.04830664, 0.04830664, 0.04830668, 0.04830668, 0.04830668,
        0.04830668, 0.04830668, 0.0483067 , 0.04830671, 0.0483067 ,
        0.04830671, 0.04830668],
       [0.11180107, 0.11180108, 0.11180107, 0.11180122, 0.11180124,
        0.11180125, 0.11180123, 0.11180135, 0.11180136, 0.11180136,
        0.11180136, 0.11180135, 0.11180141, 0.11180142, 0.11180141,
        0.11180142, 0.11180136],
       [0.09223059, 0.0922306 , 0.0922306 , 0.09223073, 0.09223075,
        0.09223076, 0.09223074, 0.09223085, 0.09223086, 0.09223086,
        0.09223086, 0.09223086, 0.09223091, 0.09223092, 0.09223091,
        0.09223092, 0.09223086],
       [0.04095825, 0.04095826, 0.04095825, 0.04095831, 0.04095832,
        0.04095832, 0.04095832, 0.04095836, 0.04095837, 0.04095837,
        0.04095837, 0.04095836, 0.04095839, 0.04095839, 0.04095839,
        0.04095839, 0.04095837],
       [0.10516584, 0.10516585, 0.10516584, 0.10516597, 0.10516599,
        0.105166  , 0.10516598, 0.10516609, 0.10516609, 0.1051661 ,
        0.1051661 , 0.10516609, 0.10516615, 0.10516615, 0.10516615,
        0.10516615, 0.1051661 ],
       [0.03293757, 0.03293758, 0.03293758, 0.03293767, 0.03293769,
        0.03293769, 0.03293768, 0.03293775, 0.03293776, 0.03293776,
        0.03293776, 0.03293776, 0.0329378 , 0.0329378 , 0.0329378 ,
        0.0329378 , 0.03293776],
       [0.13735443, 0.13735446, 0.13735443, 0.13735485, 0.13735492,
        0.13735493, 0.13735489, 0.13735522, 0.13735524, 0.13735526,
        0.13735525, 0.13735524, 0.13735541, 0.13735543, 0.13735541,
        0.13735543, 0.13735525],
       [0.03259097, 0.03259098, 0.03259097, 0.03259106, 0.03259108,
```

```
       0.03259108, 0.03259107, 0.03259115, 0.03259115, 0.03259116,
       0.03259116, 0.03259115, 0.03259119, 0.03259119, 0.03259119,
       0.0325912 , 0.03259115],
      [0.01801758, 0.01801759, 0.01801758, 0.01801764, 0.01801765,
       0.01801765, 0.01801765, 0.01801769, 0.01801769, 0.01801769,
       0.01801769, 0.01801769, 0.01801771, 0.01801772, 0.01801771,
       0.01801772, 0.01801769],
      [0.00118533, 0.00118533, 0.00118533, 0.00118533, 0.00118533,
       0.00118533, 0.00118533, 0.00118533, 0.00118534, 0.00118534,
       0.00118534, 0.00118534, 0.00118534, 0.00118534, 0.00118534,
       0.00118534, 0.00118534]])
```

```
#Adjacency Matrix for Inflation = 1.1 mcla3
mcla3
```

```
array([[0.01130327, 0.01112869, 0.01128712, 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.31878609, 0.31388017, 0.31833218, 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.12345012, 0.12154348, 0.1232737 , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.00217983, 0.00220778, 0.00218241, 0.00399169, 0.00399035,
        0.00399031, 0.00399173, 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.54330525, 0.55024882, 0.5439477 , 0.99294581, 0.99261269,
        0.99260194, 0.99295673, 0.16046767, 0.14579308, 0.13372915,
        0.1398395 , 0.14533855, 0.        , 0.        , 0.        ,
        0.        , 0.14555263],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.006273  , 0.00635784, 0.00596721,
        0.00623142, 0.0059513 , 0.        , 0.        , 0.        ,
        0.        , 0.00659031],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.00298049, 0.00302096, 0.00283538,
        0.00296092, 0.0028277 , 0.        , 0.        , 0.        ,
        0.        , 0.00313147],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.00302967, 0.00307013, 0.00288139,
        0.00300898, 0.00287409, 0.        , 0.        , 0.        ,
        0.        , 0.0031822 ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.82632402, 0.84091384, 0.85381183,
        0.84714876, 0.84216897, 1.        , 1.        , 1.        ,
        1.        , 0.84069928],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
```

```
       0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        ],
      [0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        ],
      [0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        ]])
```

```
#Adjacency Matrix for Inflation = 1.5 mcla5
mcla5
```

```
array([[0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.98465914, 0.98465914, 0.98465914, 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.01534086, 0.01534086, 0.01534086, 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 1.        , 1.        ,
        1.        , 1.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.5809147 , 0.5809147 , 0.5809147 ,
        0.5809147 , 0.5809147 , 0.        , 0.        , 0.        ,
        0.        , 0.5809147 ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.26557626, 0.26557626, 0.26557626,
        0.26557626, 0.26557626, 0.        , 0.        , 0.        ,
        0.        , 0.26557626],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.15350904, 0.15350904, 0.15350904,
        0.15350904, 0.15350904, 0.        , 0.        , 0.        ,
        0.        , 0.15350904],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 1.        , 1.        , 1.        ,
        1.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
```

```
       0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        ],
      [0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        ],
      [0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        , 0.        , 0.        , 0.        ,
       0.        , 0.        ]])
```

```
#Adjacency Matrix for Inflation = 1.1 mcla7
mcla7
```

```
array([[0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [1.        , 1.        , 1.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 1.        , 1.        ,
        1.        , 1.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.13312469, 0.13440115, 0.13090624,
        0.13460723, 0.13093542, 0.        , 0.        , 0.        ,
        0.        , 0.13377499],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.8424506 , 0.84120796, 0.84461029,
        0.84100734, 0.84458188, 0.        , 0.        , 0.        ,
        0.        , 0.84181753],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.02442471, 0.02439089, 0.02448347,
        0.02438543, 0.02448269, 0.        , 0.        , 0.        ,
        0.        , 0.02440748],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 1.        , 1.        , 1.        ,
        1.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
```

```
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ],
       [0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        , 0.        , 0.        , 0.        ,
        0.        , 0.        ]])
```

```
#Adjacency Matrix for Inflation = 2.1 mcla21
mcla21
```

```
array([[0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.,
        0.],
       [1., 1., 1., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.,
        0.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.,
        0.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.,
        0.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.,
        0.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.,
        0.],
       [0., 0., 0., 1., 1., 1., 1., 0., 0., 0., 0., 0., 0., 0., 0., 0.,
        0.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.,
        0.],
       [0., 0., 0., 0., 0., 0., 0., 1., 1., 0., 1., 0., 0., 0., 0., 0.,
        1.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 1., 0., 1., 0., 0., 0., 0.,
        0.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.,
        0.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.,
        0.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.,
        0.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 1., 1., 1., 1.,
        0.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.,
        0.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.,
        0.],
       [0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0., 0.,
        0.]])
```

These algorithms are intuitive for me. As we increase the value of the inflation we get finer clusters. I of clustering graph points.Also adjacency matrix inflation 2.1 converges after 10 iteration.