```
In [66]: runfile('F:/project/python/AR/
clusterData.py', wdir='F:/project/python/AR')
Reloaded modules: utils
 col  0
[[0.          1.81532366 1.58167633 ...
1.94121096 1.8659314  1.93261481]
 [1.81532366 0.          0.45265881 ...
1.26067442 0.29983329 1.35617108]
 [1.58167633 0.45265881 0.          ...
1.55711271 0.54055527 1.62089481]
 ...
 [1.94121096 1.26067442 1.55711271 ... 0.
1.20258056 0.19209373]
 [1.8659314  0.29983329 0.54055527 ...
1.20258056 0.          1.26313103]
 [1.93261481 1.35617108 1.62089481 ...
0.19209373 1.26313103 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
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 0  0 -1  0  0  0  0  0]
 col  1
[[0.          1.83469343 1.42481578 ...
1.75456547 1.72745478 1.75524927]
 [1.83469343 0.          0.73252986 ...
1.53225324 0.27202941 1.51479372]
 [1.42481578 0.73252986 0.          ... 1.8874851
0.54571055 1.8574714 ]
 ...
 [1.75456547 1.53225324 1.8874851  ... 0.
1.63162496 0.26758176]
 [1.72745478 0.27202941 0.54571055 ...
1.63162496 0.          1.58196081]
```

1

```
    [1.75524927 1.51479372 1.8574714  ...
0.26758176 1.58196081 0.        ]]
[0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0 0]
 col  2
[[0.         1.40861634 0.70950687 ...
1.70026469 0.40124805 1.87874958]
 [1.40861634 0.         0.84474848 ... 1.87502
1.08765803 1.6522409 ]
 [0.70950687 0.84474848 0.         ...
1.96277864 0.31080541 1.95762611]
 ...
 [1.70026469 1.87502    1.96277864 ... 0.
1.84621234 0.51594573]
 [0.40124805 1.08765803 0.31080541 ...
1.84621234 0.         1.9205468 ]
 [1.87874958 1.6522409  1.95762611 ...
0.51594573 1.9205468  0.        ]]
[ 0  0  0  0  1  0  1  1  1  1  0  0  1  0  0  1
 0  1  0  0  1  0  1  1
  0 -1  0  0  1  0  1  1  0  0  1  1  1  1  1  0
 0  0  1  0  1  1  0  1]
 col  3
[[0.         0.75914426 0.20639767 ...
1.56964964 0.2884441  1.75368184]
 [0.75914426 0.         0.56929781 ...
1.92429208 0.96431323 1.98174166]
 [0.20639767 0.56929781 0.         ...
1.69446157 0.4411349  1.84786363]
 ...
 [1.56964964 1.92429208 1.69446157 ... 0.
1.46253205 0.34785054]
 [0.2884441  0.96431323 0.4411349  ...
1.46253205 0.         1.67433569]
```

```
  [1.75368184 1.98174166 1.84786363 ...
0.34785054 1.67433569 0.        ]]
[0 0 0 0 1 0 1 1 1 1 0 0 1 0 0 1 0 1 0 0 1 0 1 1
0 1 0 0 1 0 1 1 1 0 1 1 1
 1 1 0 0 0 1 0 1 1 0 1]
 col  4
[[0.         0.6871681  0.42071368 ...
1.49442297 0.56115951 1.59903096]
 [0.6871681  0.         0.35298725 ...
1.85916648 0.22338308 1.91835867]
 [0.42071368 0.35298725 0.         ...
1.72473186 0.15524175 1.79652442]
 ...
 [1.49442297 1.85916648 1.72473186 ... 0.
1.81223619 0.17549929]
 [0.56115951 0.22338308 0.15524175 ...
1.81223619 0.         1.87536663]
 [1.59903096 1.91835867 1.79652442 ...
0.17549929 1.87536663 0.        ]]
[ 0  0  0  0  1  0  1  1  1  1  1  0  1  0  0  1
 0  1  0  0  0  0  1  1
  0 -1  0  0  1  0  0  1  1  0  1  1  1  1  1  0
 0  0  1  0  1  1  0  1]
 col  5
[[0.         1.04909485 1.08120303 ... 0.9106591
1.04718671 0.91235958]
 [1.04909485 0.         0.2607681  ...
1.83065562 0.25690465 1.8202747 ]
 [1.08120303 0.2607681  0.         ...
1.88172793 0.29189039 1.86145105]
 ...
 [0.9106591  1.83065562 1.88172793 ... 0.
1.75467946 0.09      ]
 [1.04718671 0.25690465 0.29189039 ...
1.75467946 0.         1.73360895]
```

```
  [0.91235958 1.8202747  1.86145105 ... 0.09
1.73360895 0.        ]]
[ 0  0  0 -1  1  0  1  1  1  1  1  0  1  0 -1  1
0  1  0  0  0  0  1  1
  0 -1  0  0  1  0  0  1  1  0  1  1  1  1  1  0
0  0  0  0  1  1  0  1]
 col  6
[[0.         0.81351091 1.44267113 ...
0.09219544 1.06522298 0.15652476]
 [0.81351091 0.         0.71854019 ...
0.82030482 0.61652251 0.77595103]
 [1.44267113 0.71854019 0.         ...
1.43895796 0.54863467 1.35904378]
 ...
 [0.09219544 0.82030482 1.43895796 ... 0.
1.07228727 0.11661904]
 [1.06522298 0.61652251 0.54863467 ...
1.07228727 0.         0.97334475]
 [0.15652476 0.77595103 1.35904378 ...
0.11661904 0.97334475 0.        ]]
[ 0  0  0  0  0  0  0 -1  0  0  1  0  0  1  0  0
1  0  0  0  0 -1  0  0
  1  0  0  0  0  1  0  0  0  1  0  0  0  0  0  0
1  1  0  0  0  0  0  0]
 col  7
[[0.         0.55217751 0.26476405 ...
0.16431677 0.143527   0.09643651]
 [0.55217751 0.         0.29799329 ...
0.43370497 0.41725292 0.6406247 ]
 [0.26476405 0.29799329 0.         ...
0.14866069 0.13601471 0.3544009 ]
 ...
 [0.16431677 0.43370497 0.14866069 ... 0.
0.12806248 0.23345235]
 [0.143527   0.41725292 0.13601471 ...
```

0.12806248 0.   0.23937418]
 [0.09643651 0.6406247 0.3544009 ...
0.23345235 0.23937418 0.   ]]
[0 0 0 0 0 0 0 0 0 0 -1 0 0 1 0 0
-1 0 0 0 0 0 0 0
  0 0 0 0 0 1 0 0 0 1 0 0 0 0 0 0
1 1 0 0 0 0 0 0]
 col 8
[[0.   0.1584298 0.38807216 ...
0.11789826 0.13601471 0.14456832]
 [0.1584298 0.   0.35735137 ...
0.27495454 0.03162278 0.29223278]
 [0.38807216 0.35735137 0.   ...
0.43370497 0.33778692 0.50606324]
 ...
 [0.11789826 0.27495454 0.43370497 ... 0.
0.25099801 0.083666]
 [0.13601471 0.03162278 0.33778692 ...
0.25099801 0.   0.275318]
 [0.14456832 0.29223278 0.50606324 ... 0.083666
0.275318   0.   ]]
[0 0 0 0 0 0 0 0 0 0 -1 0 0 -1 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 -1 0 0 0 0 0 0]
 col 9
[[0.   0.1396424 0.24372115 ...
0.34249088 0.04582576 0.18894444]
 [0.1396424 0.   0.3176476 ...
0.29832868 0.09486833 0.275318]
 [0.24372115 0.3176476 0.   ...
0.25942244 0.25475478 0.39509493]
 ...
 [0.34249088 0.29832868 0.25942244 ... 0.
0.31496031 0.52440442]

```
  [0.04582576 0.09486833 0.25475478 ...
0.31496031 0.         0.21679483]
 [0.18894444 0.275318   0.39509493 ...
0.52440442 0.21679483 0.         ]]
[ 0  0  0 -1  0  0 -1  0  0  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 -1  0  0  0  0  0  0]
 col  10
[[0.         0.1034408  0.08124038 ...
0.73545904 0.29171904 0.19313208]
 [0.1034408  0.         0.03605551 ...
0.78472925 0.37576588 0.29017236]
 [0.08124038 0.03605551 0.         ...
0.75106591 0.3407345  0.25865034]
 ...
 [0.73545904 0.78472925 0.75106591 ... 0.
0.49254441 0.60464866]
 [0.29171904 0.37576588 0.3407345  ...
0.49254441 0.         0.11916375]
 [0.19313208 0.29017236 0.25865034 ...
0.60464866 0.11916375 0.         ]]
[ 0  0  0  0  0  0 -1  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  0
0 -1  0  0 -1  0  0  0]
 col  11
[[0.         0.43886217 0.15297059 ...
1.77104489 0.1926136  0.11789826]
 [0.43886217 0.         0.28982753 ...
1.73908022 0.42485292 0.47759816]
 [0.15297059 0.28982753 0.         ...
1.77302002 0.20808652 0.21283797]
 ...
 [1.77104489 1.73908022 1.77302002 ... 0.
```

```
1.85064853 1.81738824]
 [0.1926136  0.42485292 0.20808652 ...
1.85064853 0.         0.1077033 ]
 [0.11789826 0.47759816 0.21283797 ...
1.81738824 0.1077033  0.        ]]
[ 0  0  0  0  0  0 -1  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0 -1
  0  0  0  0  0  0  0 -1  0  0 -1  0  0  0  0  0
 0 -1  0  0  0 -1  0  0]
 col  12
[[0.         0.64226163 0.61229078 ...
1.81176709 0.74141756 0.62128898]
 [0.64226163 0.         0.04898979 ...
1.95146099 0.14071247 0.28442925]
 [0.61229078 0.04898979 0.         ...
1.94149427 0.14491377 0.3138471 ]
 ...
 [1.81176709 1.95146099 1.94149427 ... 0.
1.94139125 1.96400102]
 [0.74141756 0.14071247 0.14491377 ...
1.94139125 0.         0.41097445]
 [0.62128898 0.28442925 0.3138471  ...
1.96400102 0.41097445 0.        ]]
[ 0  0  0  0  0  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 -1  0  0 -1  0  0  0  0  0
 0 -1  0  0  0 -1  0  0]
 col  13
[[0.         0.42178193 0.5192302  ...
1.85315946 0.92676858 0.5416641 ]
 [0.42178193 0.         0.23388031 ...
1.92273243 0.5240229  0.4796874 ]
 [0.5192302  0.23388031 0.         ...
1.98156504 0.50368641 0.29427878]
 ...
```

```
 [1.85315946 1.92273243 1.98156504 ... 0.
1.95184528 1.96443376]
 [0.92676858 0.5240229  0.50368641 ...
1.95184528 0.         0.74155243]
 [0.5416641  0.4796874  0.29427878 ...
1.96443376 0.74155243 0.         ]]
[ 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
 0  0  0 -1  1  0  0  0
  0  0  0  0  0  0  0  1  1  0  0  0  0  0  0  0
 0  1  0  0  0  1  0  0]
 col  14
[[0.         0.75438717 1.0066777  ...
1.93199379 0.4580393  0.36674242]
 [0.75438717 0.         1.49723078 ...
1.96186136 0.33       0.81865744]
 [1.0066777  1.49723078 0.         ...
1.61015527 1.26023807 0.82686154]
 ...
 [1.93199379 1.96186136 1.61015527 ... 0.
1.98670582 1.95696193]
 [0.4580393  0.33       1.26023807 ...
1.98670582 0.         0.51176166]
 [0.36674242 0.81865744 0.82686154 ...
1.95696193 0.51176166 0.         ]]
[ 0  0  1  0  0  0  0  0 -1  1  0  1  0  0  0  0
 0  0  0  1  1  0  0  0
  0  0  0  1  0  0  0  1  1  0  0  0  0  0  0  0
 0  1  0  1  0  1  0  0]
 col  15
[[0.         0.66174013 1.84921605 ...
1.91230228 0.40024992 0.33852622]
 [0.66174013 0.         1.93749839 ...
1.94797331 0.91656969 0.8579627 ]
 [1.84921605 1.93749839 0.         ...
0.36069378 1.7639161  1.78633703]
```

```
  ...
 [1.91230228 1.94797331 0.36069378 ... 0.
1.90081561 1.91230228]
 [0.40024992 0.91656969 1.7639161  ...
1.90081561 0.         0.0678233 ]
 [0.33852622 0.8579627  1.78633703 ...
1.91230228 0.0678233  0.        ]]
[ 0  0  1  0  0  0  0  0  1 -1  0  1  0  0  0  0
0  0  0  1  1  0  0  0
  0  0  0  1  0  0  0 -1  1  0  0  0  0  0  0  0
-1 -1  0  1  0  1  0  0]
 col  16
[[0.         0.32984845 1.94211225 ...
1.90845487 0.71874891 0.53347915]
 [0.32984845 0.         1.88143562 ...
1.81344975 0.40963398 0.40174619]
 [1.94211225 1.88143562 0.         ...
0.20832667 1.80371838 1.93742097]
  ...
 [1.90845487 1.81344975 0.20832667 ... 0.
1.69852878 1.86874289]
 [0.71874891 0.40963398 1.80371838 ...
1.69852878 0.         0.42591079]
 [0.53347915 0.40174619 1.93742097 ...
1.86874289 0.42591079 0.        ]]
[ 0  0  1  0  0  0  0  0  1  0  0  1  0  0  0  0
0  0  0  1  1  0  0  0
  0  0  0  1  0  0  0  0  1  0  0  0  0  0  0  0
1 -1  0  1  0  1  0  0]
 col  17
[[0.         0.50159745 1.73245491 ...
1.75456547 0.27184554 0.22022716]
 [0.50159745 0.         1.46812806 ...
1.48771637 0.31796226 0.48507731]
 [1.73245491 1.46812806 0.         ... 0.21
```

```
1.66556297 1.75376737]
 ...
 [1.75456547 1.48771637 0.21        ... 0.
1.66871208 1.7509426 ]
 [0.27184554 0.31796226 1.66556297 ...
1.66871208 0.         0.17146428]
 [0.22022716 0.48507731 1.75376737 ... 1.7509426
0.17146428 0.         ]]
[ 0  0  1  0  0 -1  0  0  1  1  0  1  0  0  0  0
0  0  0  1  1  0  0 -1
  0  0  0  1  0  0  1  0  1  0  0  0  0 -1  1  0
1 -1  0  1  1  1  0  0]
 col  18
[[0.         0.6061353  1.65559657 ...
1.69369419 0.39673669 0.17804494]
 [0.6061353  0.         1.25435242 ...
1.41576834 0.89162773 0.47549974]
 [1.65559657 1.25435242 0.         ...
0.39824616 1.81559907 1.59056594]
 ...
 [1.69369419 1.41576834 0.39824616 ... 0.
1.7853291  1.65447877]
 [0.39673669 0.89162773 1.81559907 ... 1.7853291
0.         0.45110974]
 [0.17804494 0.47549974 1.59056594 ...
1.65447877 0.45110974 0.         ]]
[ 0  0  1  0  0 -1  0  0  1  1  1  1  1  0  1  0
1  0  0  1  1  0  0  1
  0  0  1  1  0  0  1  1  1  0  1  0 -1 -1  1  0
1  1  0  1  1  1  0  0]
 col  19
[[0.         0.75485098 1.67122709 ...
1.75567651 0.76713754 0.25099801]
 [0.75485098 0.         1.1461239  ...
1.78454476 1.39674622 0.51884487]
```

```
 [1.67122709 1.1461239  0.          ...
1.47343137 1.93940713 1.52695776]
 ...
 [1.75567651 1.78454476 1.47343137 ... 0.
1.45976025 1.79872177]
 [0.76713754 1.39674622 1.93940713 ...
1.45976025 0.          0.99161484]
 [0.25099801 0.51884487 1.52695776 ...
1.79872177 0.99161484 0.        ]]
[ 0  0  1  0  0 -1  0  0  1  1  1  1  1  0  1  0
1  0  0  1  1  0  0  1
 -1  0  0  0  0  0  0  0  1  0  1  0 -1  0  1  0
1  1  0  1  1 -1  0  0]
```

In [**67**]: