

IT350: Data Analytics

Lab Assignment 4

Girvan Newman Technique

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Date of Submission: 22nd March, 2021

Code Outputs

```
python girvanNewman.py
```

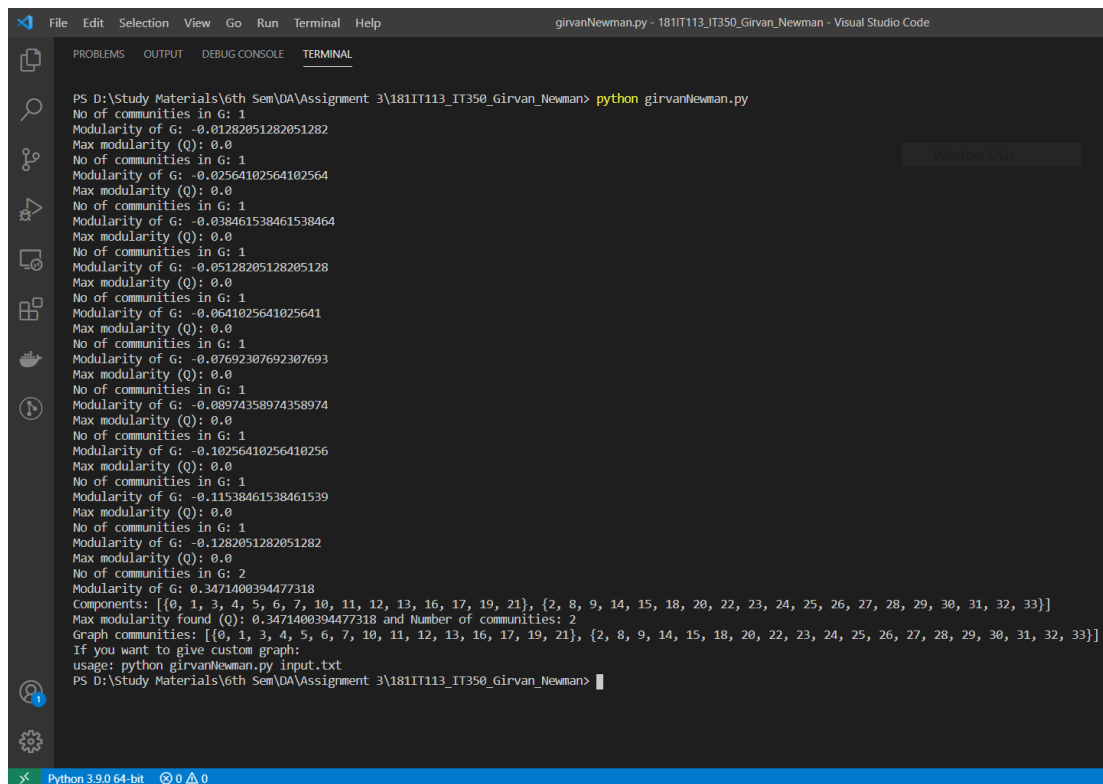
Prints communities of karate club graph(real time supervised social network).

```
python girvanNewman.py input.txt
```

Prints betweenness and communities of custom graphs.

The communities plotted are stored in components.jpg file

Screenshots of Output:



```
PS D:\Study Materials\6th Sem\DA\Assignment 3\181IT113_IT350_Girvan_Newman> python girvanNewman.py
No of communities in G: 1
Modularity of G: -0.01282051282051282
Max modularity (Q): 0.0
No of communities in G: 1
Modularity of G: -0.02564102564102564
Max modularity (Q): 0.0
No of communities in G: 1
Modularity of G: -0.038461538461538464
Max modularity (Q): 0.0
No of communities in G: 1
Modularity of G: -0.05128205128205128
Max modularity (Q): 0.0
No of communities in G: 1
Modularity of G: -0.0641025641025641
Max modularity (Q): 0.0
No of communities in G: 1
Modularity of G: -0.07692307692307693
Max modularity (Q): 0.0
No of communities in G: 1
Modularity of G: -0.08974358974358974
Max modularity (Q): 0.0
No of communities in G: 1
Modularity of G: -0.10256410256410256
Max modularity (Q): 0.0
No of communities in G: 1
Modularity of G: -0.11538461538461539
Max modularity (Q): 0.0
No of communities in G: 1
Modularity of G: -0.1282051282051282
Max modularity (Q): 0.0
No of communities in G: 2
Modularity of G: 0.3471400394477318
Components: [{0, 1, 3, 4, 5, 6, 7, 10, 11, 12, 13, 16, 17, 19, 21}, {2, 8, 9, 14, 15, 18, 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33}]
Max modularity found (Q): 0.3471400394477318 and Number of communities: 2
Graph communities: [{0, 1, 3, 4, 5, 6, 7, 10, 11, 12, 13, 16, 17, 19, 21}, {2, 8, 9, 14, 15, 18, 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33}]
If you want to give custom graph:
usage: python girvanNewman.py input.txt
PS D:\Study Materials\6th Sem\DA\Assignment 3\181IT113_IT350_Girvan_Newman>
```

Fig 1. karate_club_graph()

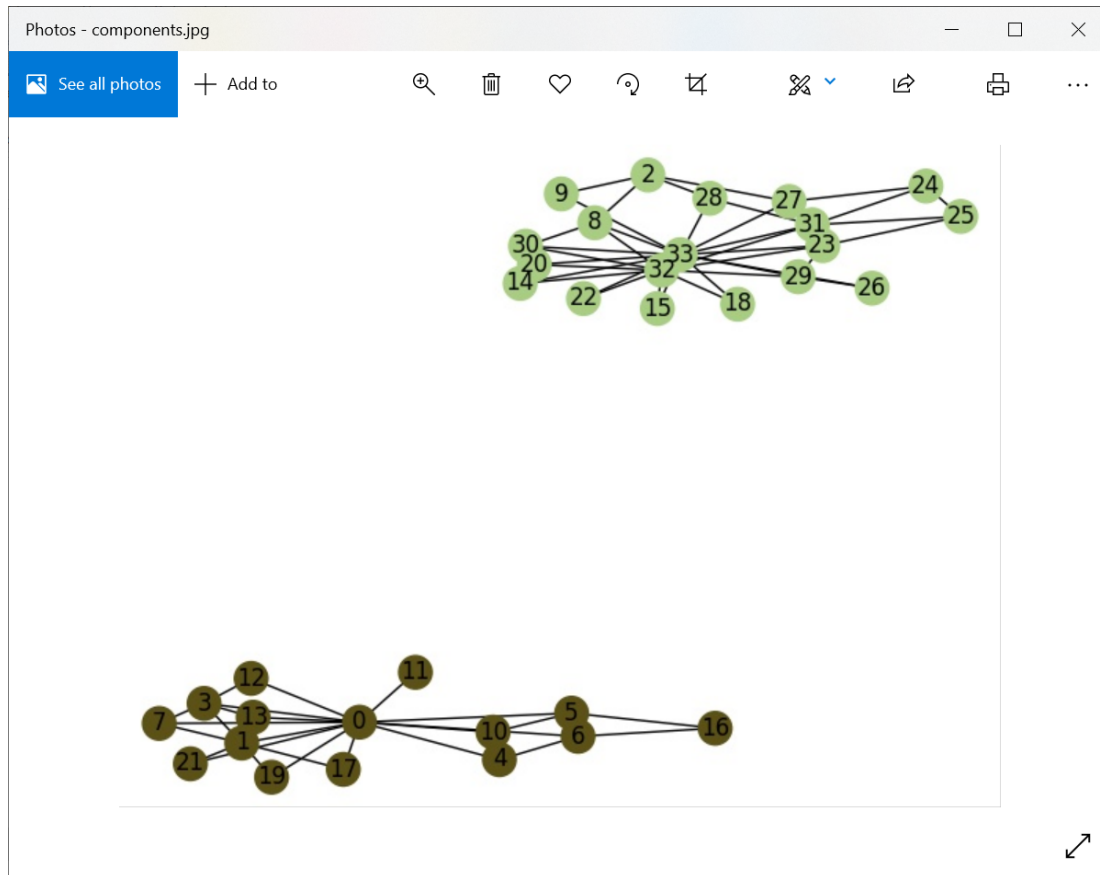


Fig 2. Karate_club_graph plotted

```
PS D:\Study Materials\6th Sem\DA\Assignment 3\181IT113_IT350_Girvan_Newman> python girvanNewman.py input.txt
No of communities in G: 1
Modularity of G: -0.07142857142857142
Max modularity (Q): 0.0
No of communities in G: 1
Modularity of G: -0.14285714285714285
Max modularity (Q): 0.0
No of communities in G: 2
Modularity of G: 0.2831632653061224
Components: [{1, 2, 3, 8, 9}, {4, 5, 6, 7, 10}]
Max modularity found (Q): 0.2831632653061224 and Number of communities: 2
Graph communities: [{1, 2, 3, 8, 9}, {4, 5, 6, 7, 10}]
PS D:\Study Materials\6th Sem\DA\Assignment 3\181IT113_IT350_Girvan_Newman> |
```

Fig 3. Custom graph

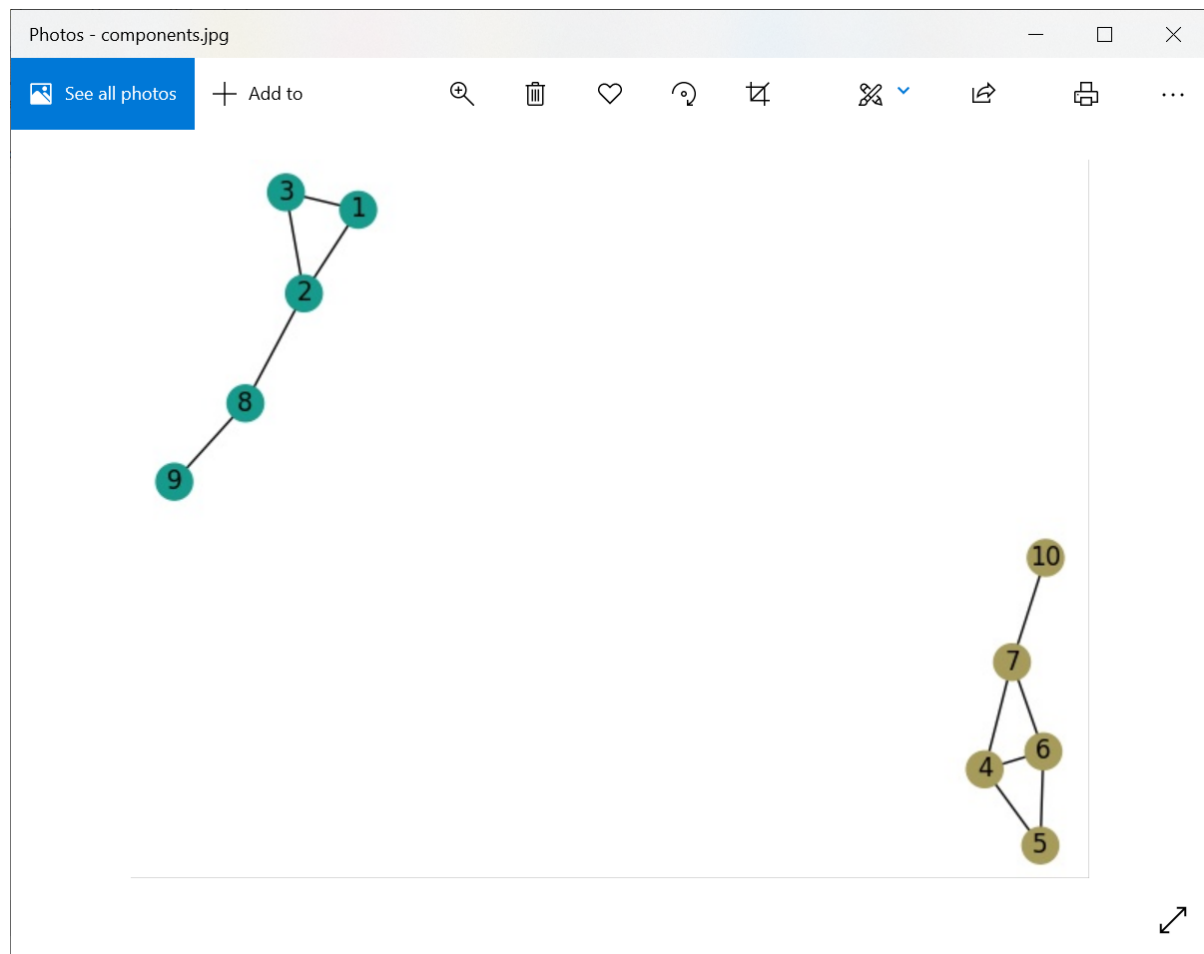


Fig 4. Custom graph plotted