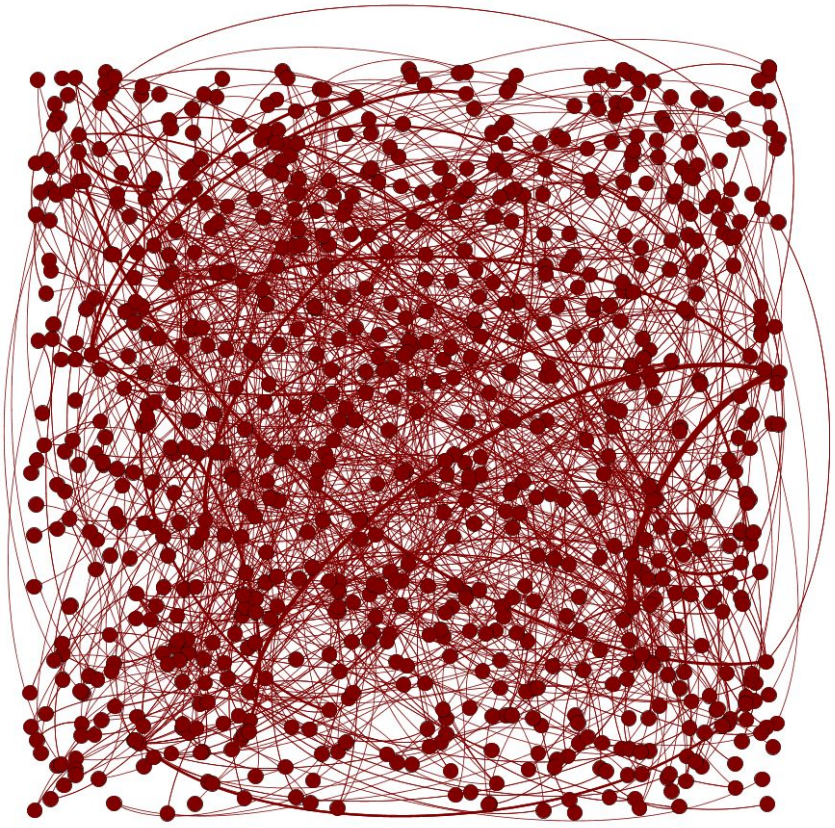
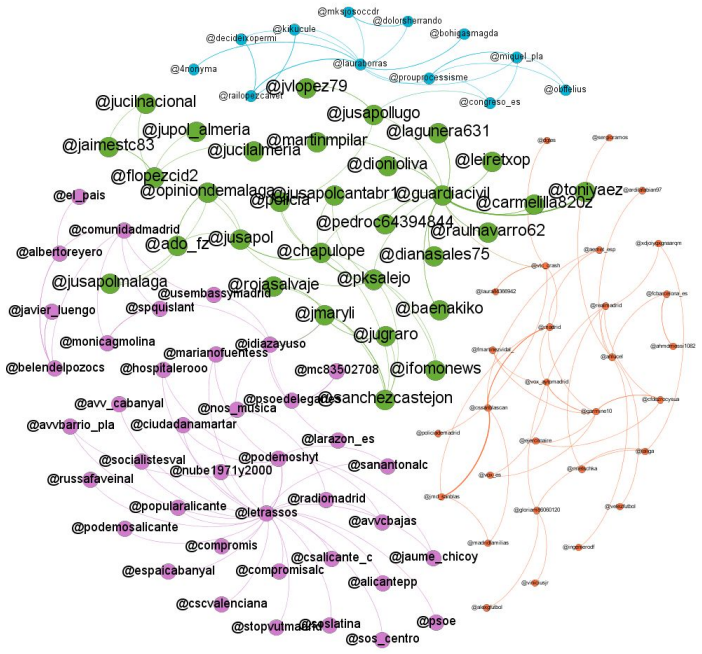
Exercises Data-Driven Social Analytics (VII)

Ana Mestre

Network of 829 nodes and 1036 edges formed with the twitter plugin of gephi by looking up to “Barça”, “FCB”, “Madrid” and “Clasico”. Once the giant component is selected we are left with a graph of 111 nodes and 182 edges.

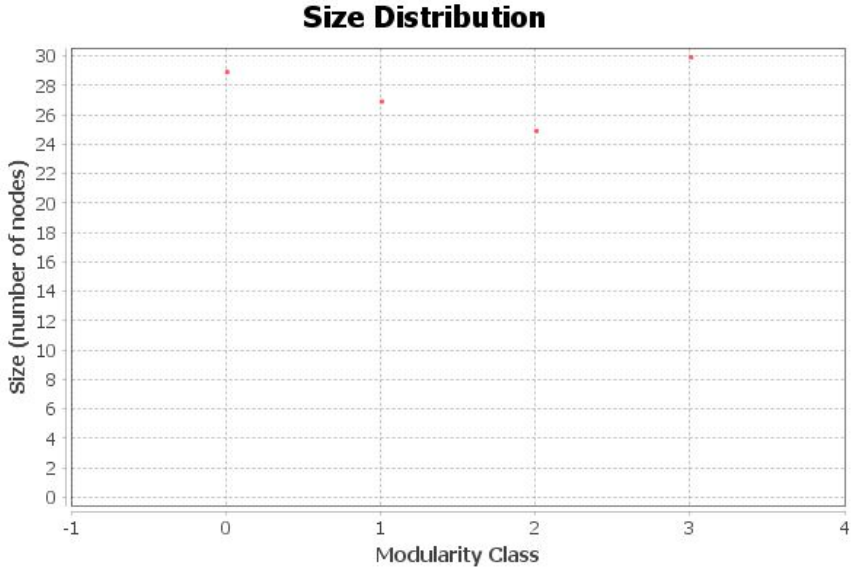


- **Graph with 4 communities** using the Fruchterman Reingold layout.



Taking a deeper look into the users of the graph we can see that the orange ones (community 0) are users related to the city of Madrid. We can see users such as @madrid and @madridfamilias.
The blue community (number 2) represents Catalan's policy. We see @lauraborras and @prouprocessisme. The green community (number 1) is basically formed by not famous accounts, probably discussing the match or any other Barcelona-Madrid related topic.

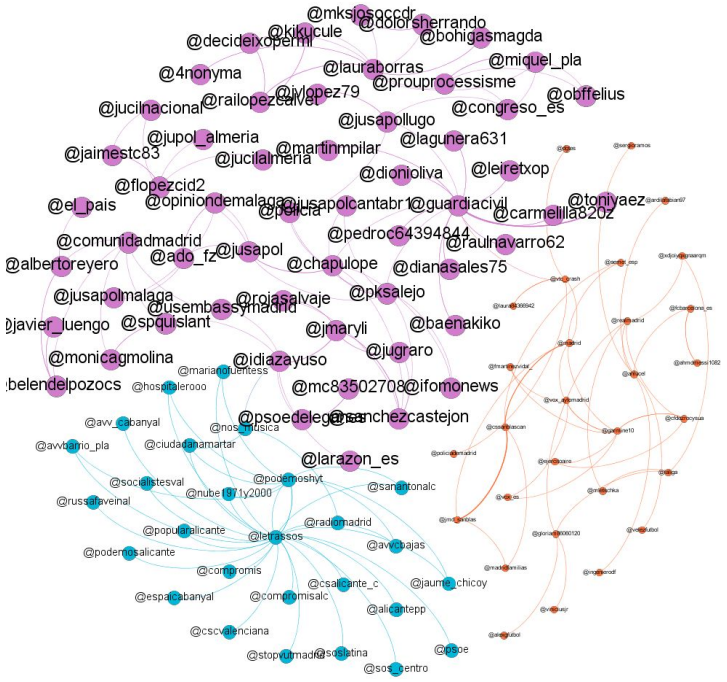
And finally, the purple community (number 3) is composed by press like @el_pais and @larazon_es but also it's formed by some policy-related accounts like @alicantepp, @compromis and @socialistesval



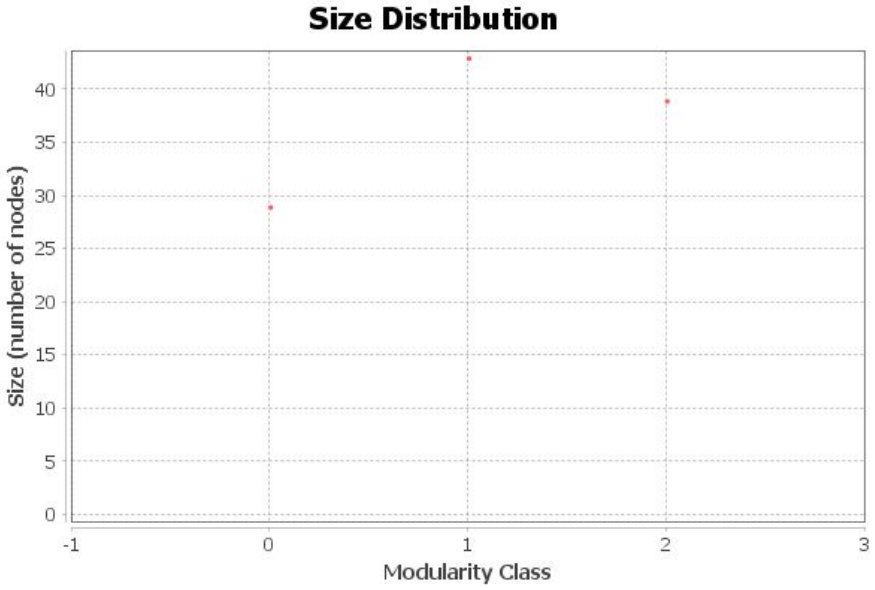
As we can see, these communities are distributed like follows:

- Community 0: 29 nodes / 111 = 26.12%
- Community 1: 27 nodes / 111 = 24.32%
- Community 2: 25 nodes / 111 = 22.52%
- Community 3: 30 nodes / 111 = 27.03%

- **Graph with 3 communities** using the Fruchterman Reingold layout.



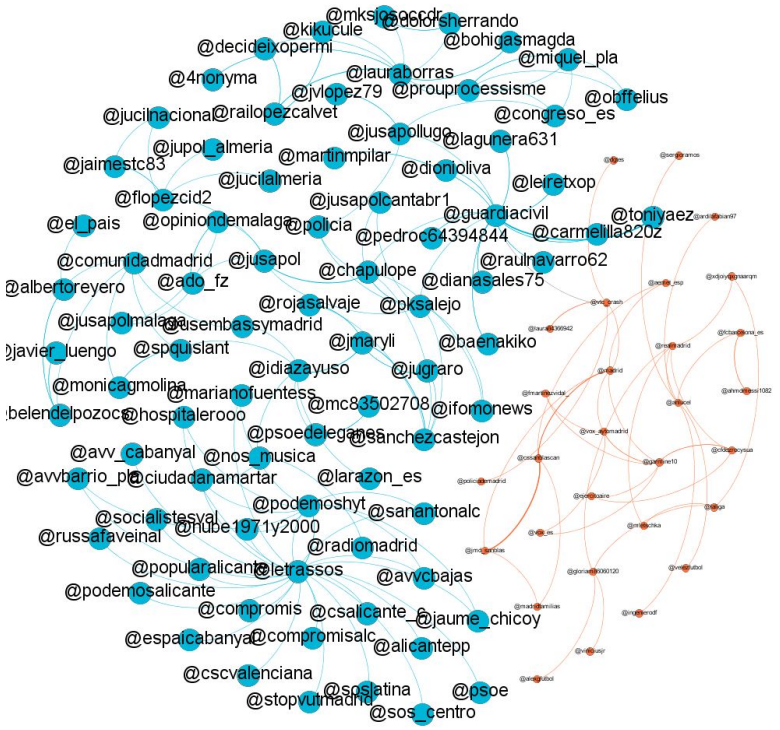
In this case, the two previous blue and green communities have merged while the other two remain the same.



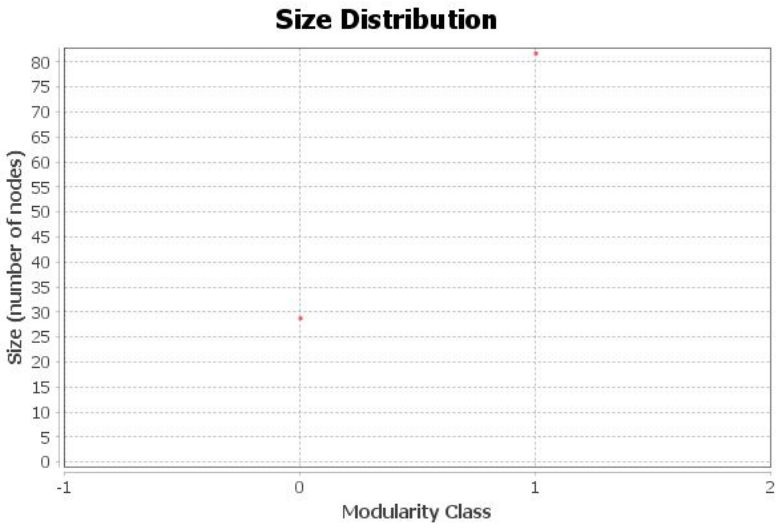
As we can see, these communities are distributed like follows:

- Community 0: 29 nodes / 111 = 26.12%
- Community 1: 43 nodes / 111 = 38.74%
- Community 2: 39 nodes / 111 = 35.13%

- **Graph with 2 communities** using the Fruchterman Reingold layout.



Finally, the only community that remains the same as in the beginning is the orange one. All the other ones have merged into a big community.



As we can see, these communities are distributed like follows:

- Community 0: 29 nodes / 111 = 26.12%
- Community 1: 82 nodes / 111 = 73.88%

Use CommunityGirvanNewman from SNAP and compare the results with the Louvain Method from Gephi.

From Gephi we obtain 201 communities with a modularity of 0,98 but for the giant component we obtain 10 communities with 0,802 modularity.
On the other hand, with Community Girvan Newman we obtain 199 communities with a modularity of 0,98. These values are pretty similar to the ones obtained with the Louvain Method.

Mod 8 - comm 4
Hierarchy of the communities

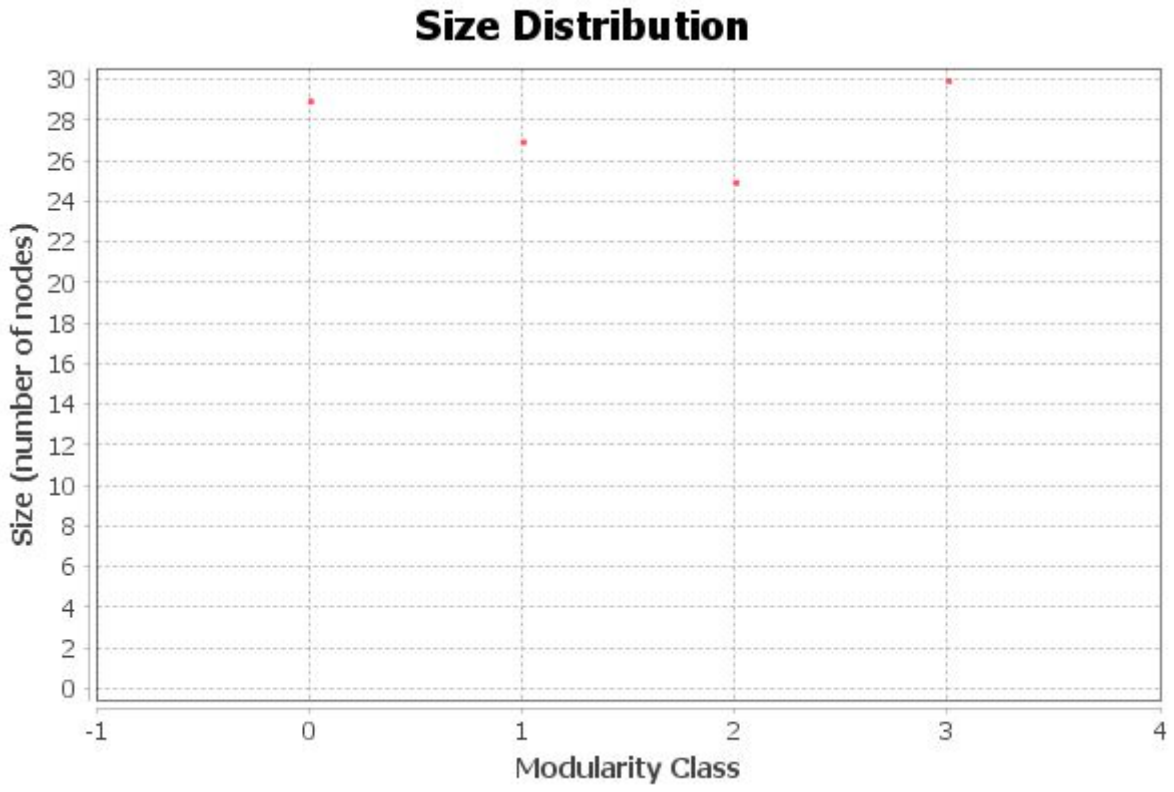
Modularity Report

Parameters:

Randomize: On
Use edge weights: On
Resolution: 8.0

Results:

Modularity: 0,713
Modularity with resolution: 7,496
Number of Communities: 4



Algorithm:

Vincent D Blondel, Jean-Loup Guillaume, Renaud Lambiotte, Etienne Lefebvre, *Fast unfolding of communities in large networks*, in Journal of Statistical Mechanics: Theory and Experiment 2008 (10), P1000

Resolution:

R. Lambiotte, J.-C. Delvenne, M. Barahona *Laplacian Dynamics and Multiscale Modular Structure in Networks 2009*

Mod 15 - comm 3

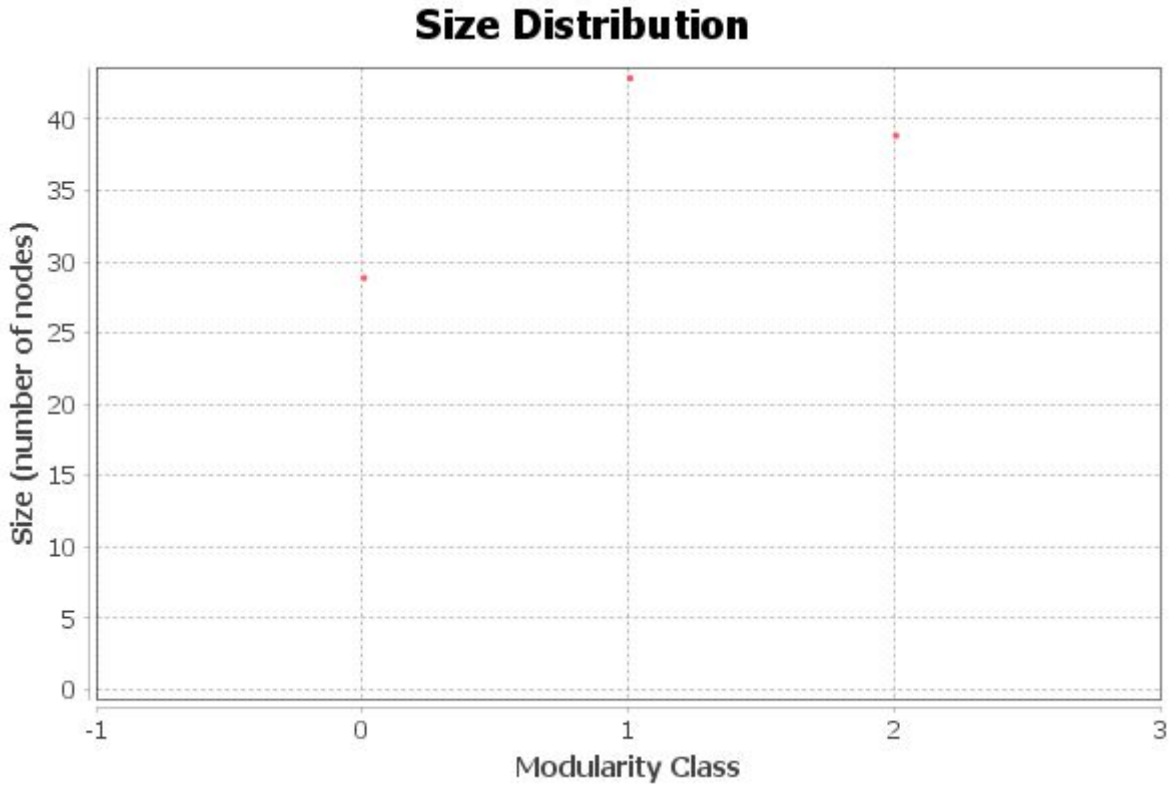
Modularity Report

Parameters:

Randomize: On
Use edge weights: On
Resolution: 15.0

Results:

Modularity: 0,632
Modularity with resolution: 14,343
Number of Communities: 3



Algorithm:

Vincent D Blondel, Jean-Loup Guillaume, Renaud Lambiotte, Etienne Lefebvre, *Fast unfolding of communities in large networks*, in Journal of Statistical Mechanics: Theory and Experiment 2008 (10), P1000

Resolution:

R. Lambiotte, J.-C. Delvenne, M. Barahona *Laplacian Dynamics and Multiscale Modular Structure in Networks 2009*

Mod 50 - comm 2
Hierarchy:

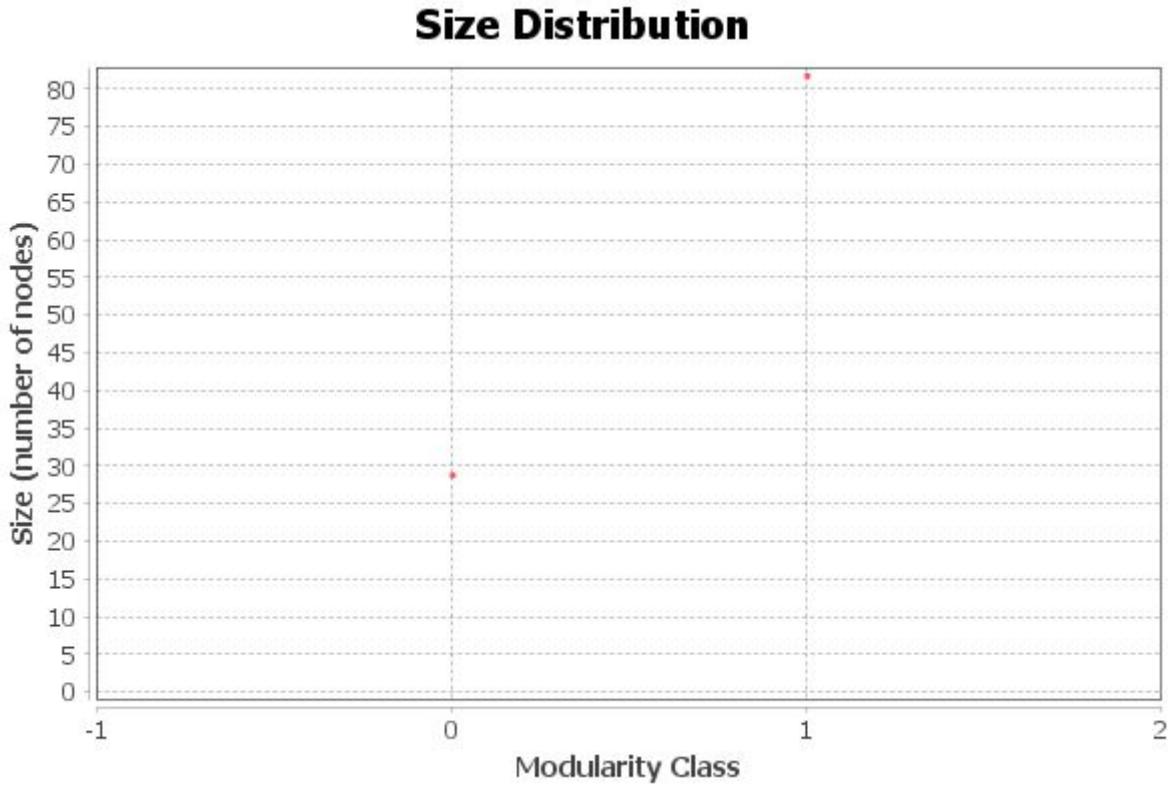
Modularity Report

Parameters:

Randomize: On
Use edge weights: On
Resolution: 50.0

Results:

Modularity: 0,359
Modularity with resolution: 48,854
Number of Communities: 2



Algorithm:

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Resolution:

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