Modularity clustering will end up always with a single community at the top level?

A. true
B. Only for dense graphs
C. Only for connected graphs
D. never

Answer C

If the graph is disconnected in distinct subgraphs, modularity will end up with a node representing each of those subgraphs that are not connected to each other and will therefore not be grouped to a community.

Modularity clustering will end up always with the same community structure?

A. true
B. Only for connected graphs
C. Only for cliques
D. false

Answer D

They detailed outcome of modularity clustering depends on the order of processing of the nodes. By changing the processing order different communities may result. For cliques always one community will be formed in one pass (to be shown), but other regular graph structures, e.g. a ring, may also have this property.

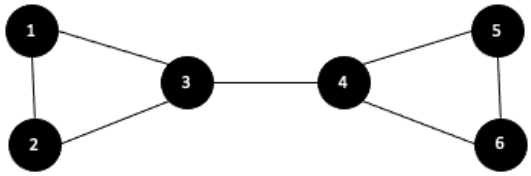
$\sigma_{xy}(v)$ of edge 3-4 is …

A. 16

B. 12

C. 9

D. 4



Answer C

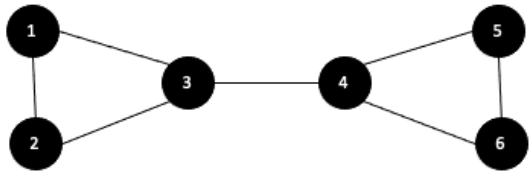
We have 4 shortest paths from {1,2} to {5, 6} passing through edge 3-4

In addition, there are 2 shortest paths from 3 to {5, 6} and from 4 to {1, 2} and the path from 3 to 4.

This gives total 9 paths.

When computing path counts for node 1 with BFS, the count at 6 is …

A. 1
B. 2
C. 3
D. 4



Answer A

BFS computes the number of shortest paths from the starting node 1 to every other node of the graph.

Since there exists only one shortest path from 1 to 6, this count is 1.