

Detecting unusual behaviours in network logs is typically done by using

- A. local rule discovery
- B. predictive modelling
- C. descriptive modelling
- D. exploratory data analysis
- E. all of these methods can be applied

This question is more like a survey, and it totally depends on the tasks at hand, and therefore the last answer is correct.

Which of the following graph analysis techniques do you believe would be most appropriate to identify communities on a social graph?

- A. Cliques
- B. Random Walks
- C. Shortest Paths
- D. Association rules

Cliques are fully connected subgraphs on a social graph and can identify communities for us (although it might not detect all communities), therefore first answer is correct.

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

Modularity clustering end up with a single community if the graph is indeed connected, therefore the third answer is correct.

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

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

First answer is not correct as this greedy algorithm relies on the order of processing nodes and might give different community structures. Second answer is also not correct as it's not dependent whether the input graph is connected or not (we can basically think that it's independently applied to every connected component). Third answer is also not true, as we might have highly connected structures that are not cliques but the algorithm will always find the same community structure for them. Therefore the fourth answer is correct.

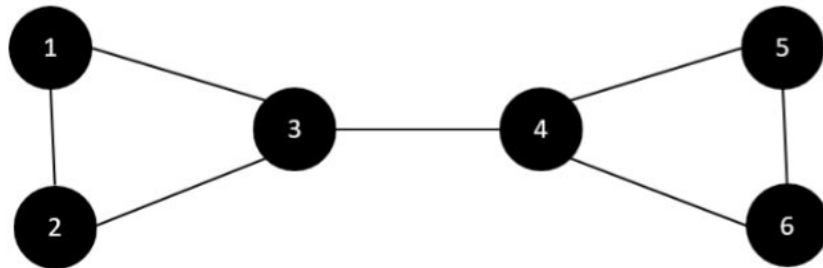
$\sigma_{xy}(v)$ of edge 3-4 is ...

A. 16

B. 12

C. 9

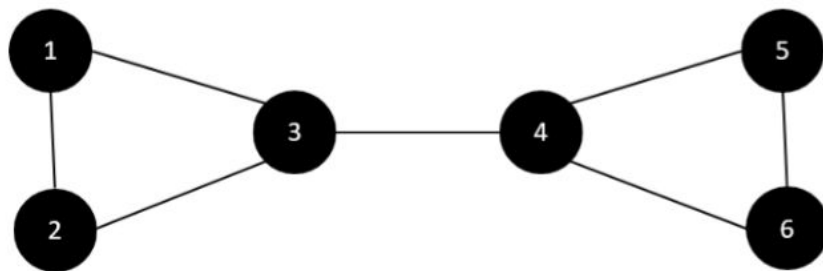
D. 4



We can count 9 shortest path that uses edge 3-4, therefore third answer is correct.

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

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



There is only one shortest path from node 1 to node 6, and therefore the first answer is correct.