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**Big Data Management and Analytics**
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# Tutorial 12: Community Detection

## Assignment 12-1 *Modularity*

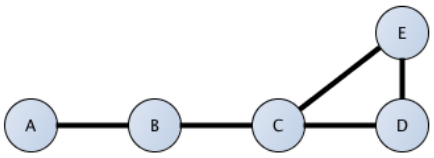


Figure 1: Example Graph

Compute the modularity Q according to the following partitionings of the graph $G(V, E)$:

1. What do you expect to be the best partitioning of the graph? Why?
2. Remove edges $(C, D)$ and $(C, E)$ and compute Q for $s_1 = \{A, B, C\}$ and $s_2 = \{D, E\}$
3. Remove edge $(B, C)$ and compute Q for $s_1 = \{A, B\}$ and $s_2 = \{C, D, E\}$
4. Compare the results with your intention from subtask 1.

## Assignment 12-2 *Betweenness*

Consider the following graph:

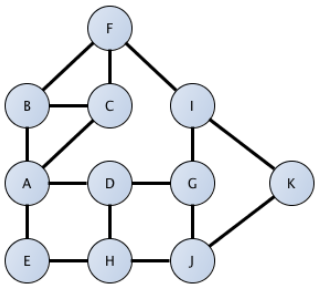


Figure 2: Example Graph

Apply the *Girvan-Newman Algorithm* and compute the betweenness of paths starting at node $A$.