# GPBR Exercise 4

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Matriculation Number: 22-132-245

Based on the computed metrics, we can argue that the clustering method that should be favored is the second one, . This is because it has the highest intra-cluster density of all three clusterings, , indicating that nodes within each cluster are more densely connected. Additionally, the cut size between the two clusters, , is the smallest among the three clusterings, indicating that there are fewer edges connecting nodes from different clusters. This leads to a higher inter-cluster density, , than the other two clusterings, indicating that nodes in different clusters are less connected than nodes within the same cluster.

As a result, is the best solution which reduce the cut size from 5 to 1.

[[ 4 -1 -1 -1 -1 0 0 0 0 0 0 0 0 0]

[-1 3 -1 -1 0 0 0 0 0 0 0 0 0 0]

[-1 -1 4 0 -1 0 -1 0 0 0 0 0 0 0]

[-1 -1 0 3 -1 0 0 0 0 0 0 0 0 0]

[-1 0 -1 -1 4 0 0 0 -1 0 0 0 0 0]

[ 0 0 0 0 0 3 -1 -1 -1 0 0 0 0 0]

[ 0 0 -1 0 0 -1 4 -1 -1 0 0 0 0 0]

[ 0 0 0 0 0 -1 -1 3 -1 0 0 0 0 0]

[ 0 0 0 0 -1 -1 -1 -1 5 0 -1 0 0 0]

[ 0 0 0 0 0 0 0 0 0 3 -1 0 -1 -1]

[ 0 0 0 0 0 0 0 0 -1 -1 5 -1 -1 -1]

[ 0 0 0 0 0 0 0 0 0 0 -1 2 -1 0]

[ 0 0 0 0 0 0 0 0 0 -1 -1 -1 3 0]

[ 0 0 0 0 0 0 0 0 0 -1 -1 0 0 2]]

First partition:

Second partition:

Three clusters obtained: