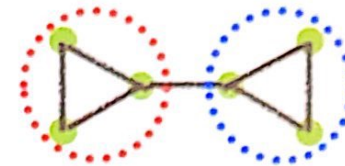# Modularity of networks

□ Definition of modularity:

$$Q = \sum_{s=1}^{N_M} \left[\frac{l_s}{L} - \left(\frac{d_s}{2L} \right)^2 \right]$$

where

- N_M: number of modules in the network
- l_s: number of intra-modular links in module s
- d_s: sum of the degrees of the nodes in module s
- L: total number of links in the network

$N_M = 2$

$l_1 = 3, l_2 = 3$

$d_1 = 7, d_2 = 7$

$L = 7$

- $Q = 0.357$

Roger Guimerà, et al.: Nature **433**, 895 (2005)