

## Recommended problems 2

- (2.1) Let  $G$  be the graph whose vertex set is the set of  $k$ -tuples with elements in  $\{0,1\}$ , with  $x$  adjacent to  $y$  if  $x$  and  $y$  differ in exactly two positions. Determine the number of components of  $G$ .
- (2.2) Prove or disprove: The complement of a simple disconnected graph must be connected.
- (2.3) Let  $P$  and  $Q$  be paths of maximum length in a connected graph  $G$ . Prove that  $P$  and  $Q$  have a common vertex.
- (2.4) Prove that a bipartite graph has a unique bipartition (except for interchanging the two partite sets) if and only if it is connected.