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Paderborn, November 10, 2016

Advanced Distributed Algorithms and Data Structures

WS 2016

Homework Assignment 3

Problem 1:
Prove the statement on slide 13: If in each round every node introduces all of its neighbors and itself to all of its neighbors, then just $O(\log n)$ communication rounds are needed (where n is the number of nodes) till the clique is reached.

Problem 2:
Prove the statement on slide 35: safe reversal preserves weak connectivity in a relay graph.

Problem 3:
Suppose there is a bind(r, s) primitive that, for a local outgoing relay r (i.e., r only has an outgoing link but no incoming links) and a local sink relay s (i.e., s has no outgoing link), moves the outgoing link of r to s and drops r. Does that primitive preserve weak or strong connectivity in the relay graph? What would be possible advantages and disadvantages of such a primitive?