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Exercise for the lecture

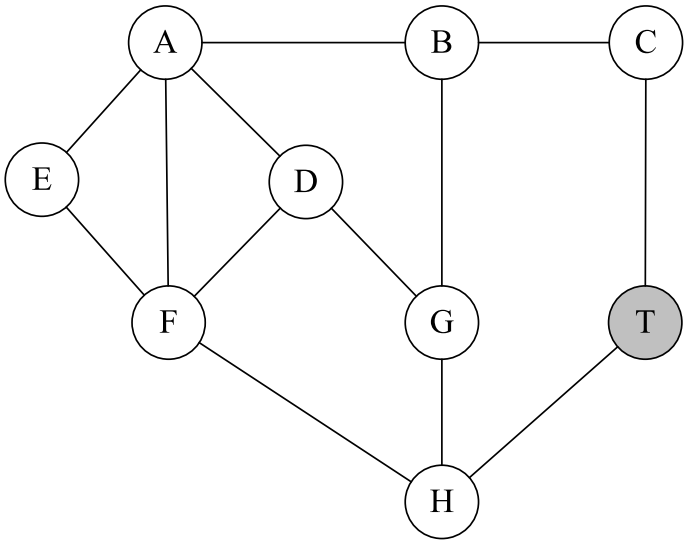
Algorithms for Radio Networks

Winter 2011/12

Sheet 6

EXERCISE 6:

Consider the Link Reversal algorithm for the depicted network graph. A message is sent to target T.



1. Use Dijkstra's algorithm to orientate the directions of the edges in the given graph. Start at the target node T and direct the edges contrary to the direction of the visited nodes. Use egde weights of 1 for every edge. For equal node weights prefer the one whose id is alphabetically smaller. Direct the remaining edges in ascending lexicographic node order.
2. Now the connection between the nodes H and T fails. Use both Full Reversal and Partial Reversal to restore the correct orientation of the edges.
3. What is the asymptotic runtime of the Full Reversal and the Partial Reversal algorithm?
4. Now remove also the edges (B, G), (A, D), (A, F) and (E, F). Use Link Reversal to repair the graph. What behavior can you observe in the remaining graph?