Exercise for the lecture

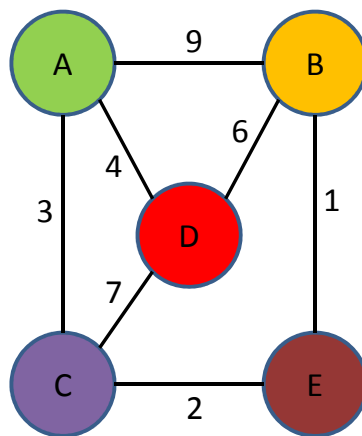# Algorithms for Radio Networks

Winter 2013/14

Sheet 3

EXERCISE 1:

1. **Distance Vector Routing Protocol**

   Consider for the Distance Vector Routing protocol the following network with four routers
   with the given distances:

   - Calculate the routing table entries for the routers?
   - What happens when router D fails? Calculate the new routing tables.

2. **Link Reversal Algorithm**

   Consider the Link Reversal algorithm for the depicted network graph. A message is sent to
   target node T.
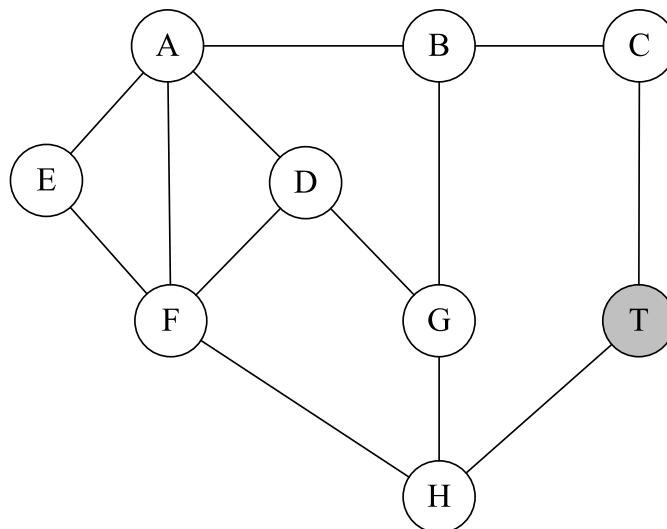
- Use Dijkstra's algorithm to orientate the directions of the edges in the given graph. Start at the target node T and direct the edges contrary to the direction of the visited nodes. Use egde weights of 1 for every edge. For equal node weights prefer the one whose id is alphabetically smaller. Direct the remaining edges in ascending lexicographic node order.

- Now the connection between the node H and T fails. Use both Full Reversal and Partial Reversal to restore the correct orientation of the edges.

- 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?

- What is the asymptotic runtime of the Full Reversal and the Partial Reversal algorithm?