CS 6505 - Homework 7

Caitlin Beecham (Worked with James Gangavarapu)

1

1. Run Ford Fulkerson to find the residual graph after maximizing flow.
2. BFS from s and mark all vertices reachable from s. Call this set L.
3. Reverse the direction of all edges and BFS from t and mark all these vertices. Call this set R.
4. Reverse the direction of all edges.
5. For each edge in G (the original graph), check whether it is an edge from an element of L to an element of R. If so, it is a critical edge.

The runtime of this algorithm is $O(nm + 2(n+m) + m(n+n))$ time, since Ford Fulkerson runs in O(nm) time and BFS takes O(n+m) time (twice). Then for each edge we check whether its first endpoint is in L and whether its second endpoint is in R.