Complete Barkley & Motard Algorithm (B&M) for Finding the Minimum
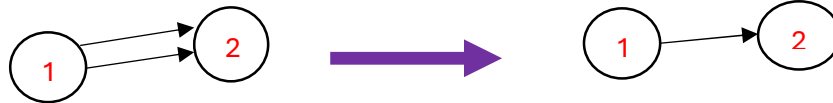
of Tear Streams and Their Locations in a Complex Flowsheet

Step 1: Graph Reduction

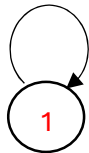   (a) Look for all nodes with a single precursor. Replace these nodes with their precursors
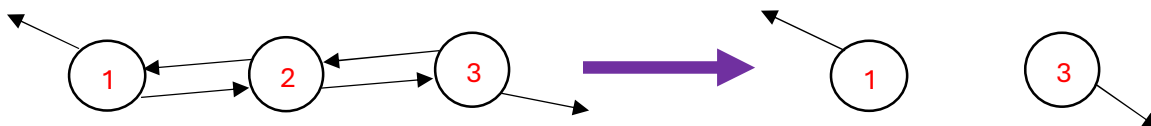

    (b) Merge parallel arcs

Note you must do all (a) and (b) before proceeding to Step 2.

Step 2: Node Elimination

    (a) Eliminate a self-loop node. Then go back to Step 1.

    (b) Process a two-way-edge-pair by eliminating the common node. Then go back to Step 1.

       If there is more than one common node, eliminate the common node with the greatest number of output arcs. In case of a tie, choose to eliminate any common node arbitrarily.

Note that you are allowed to do just one node elimination in Step 2 every time you visit it. That is, you must choose to do (a) or (b) in Step 2, after which you will go back to Step 1.

If no further progress is possible in Step 2, i.e. there are no more nodes to eliminate but there are still nodes left in the graph, proceed to Step 3.

Step 3:

Choose a node with the greatest number of arcs and eliminate it. In case of a tie, choose a node with the greatest number of arcs arbitrarily. Go back to Step 1.

The algorithm stops when all the nodes in the graph have been eliminated completely.