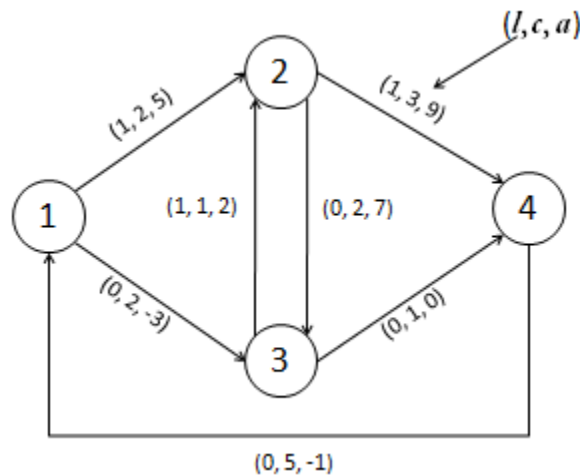


Reading Assignment:

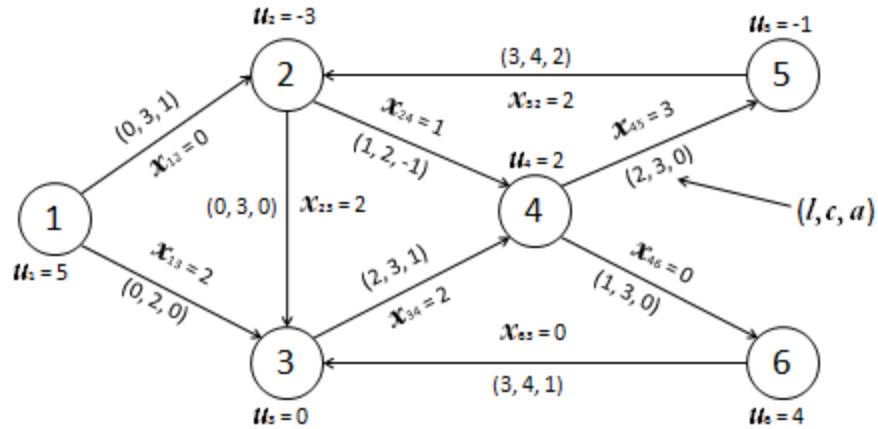
Lawler's Book – Chapter 4, Sections 10 and 12

Exercises:

1. Consider the minimum cost circulation problem using the following network:



- a. Formulate the problem in an explicit linear programming model.
 - b. Derive the dual linear program of part-a explicitly.
 - c. Write down the optimality condition of this problem, explicitly.
 - d. Draw the Kilter diagram for each arc at $x = (0)$ and $u = (0)$.
 - e. Apply the out-of-kilter algorithm step by step to find an optimal solution.
2. Consider the minimum cost circulation problem using the following network:



- Formulate the problem in a linear programming model.
- Derive the dual linear program of part-a explicitly.
- Write down the optimality condition of this problem, explicitly.
- Calculate the total kilter number of the current solution with x and u shown in the graph.
- Use the out-of-kilter algorithm to find an optimal solution.

