CS 312: Algorithm Analysis

Homework Assignment #19

Question 1 (6 points): For the following 4-city TSP problems assume that the initial BSSF is infinite and that the city cost/distance matrix is

\[
\begin{array}{cccc}
\infty & 7 & 3 & 12 \\
3 & \infty & 6 & 14 \\
5 & 8 & \infty & 6 \\
9 & 3 & 5 & \infty \\
\end{array}
\]

This is the same as the previous homework and the initial state should start with the same reduced cost matrix that you did for the previous homework.

Use the include/exclude state search approach we discussed in class. This does not assume a particular start city, and at each branch chooses one edge to include/exclude from the solution. At each branch, choose the edge which maximizes bound(S_{excluded}) – bound(S_{included}).

Show the search tree that branch and bound would generate for this problem. Show each state including the reduced cost matrix and bound. Also show when BSSF is updated and use it for proper pruning, etc.

Question 2 (4 points): Question 9.3 from the book. See section 5.4 of the book for a definition of Set Cover.