Due: ~~Wednesday, November 4th~~ Thursday, November 5th (noon)

Problems for Math 408 and Math 708

1. Returning to your *team warm-up problem*, show the matrices B and N corresponding to the basic and non-basic variables at the (non-integer) optimal solution x_0^* to the LP relaxation. Use this information to construct a Gomory cut for the problem.

Then reoptimize the relaxed system with the added Gomory cut. If your solution x_1^* is integer, then you are done. Otherwise proceed to find a new Gomory cut, which removes x_1^*. List the known optimal solution from question 1 c. of the Stage 1 along with the objective values of x_0^* and x_1^*.

2. You have read Chapter 2 of Applegate, Bixby, Chvátal and Cook, which describes a few applications of the TSP. In Section 2.7, there are 14 references given to papers that describe additional applications of the TSP. Choose one of these papers and read it. You do not need to understand all the details. Briefly describe the application, and why it can be modelled as a TSP. Your answer should be less than a page.

3. Apply the *2-opt* heuristic to the tour that you generated from the nearest neighbour heuristic in Stage 2. Repeat for the tour generated from the Christofides heuristic in Stage 2.

4. Make a table showing the cost of the four tours that you found in Stage 2 (the previous homework), along with the two new tours from question 2 of this homework. Which of these tours is the shortest? Can you find a way to improve it?

This assignment will be submitted directly to the instructor by e-mail. Please submit a single file named `team_hw3_name.pdf` containing all your written work, with your group identifier substituted in place of `name`.