Network Optimization (Fall 2008) — Homework 1

- AMO stands for the text (Ahuja, Magnanti, and Orlin).
- Exercises and page numbers are listed from AMO.
- Exercises marked with a **[G]** target the graduate students (Math 566), but undergrads can attempt them for extra credit.
- The total points (given in parentheses) add up to 125. Math 566 students will be graded for 115 points, and Math 466 students for 100 points.
- **This homework is due in class on Thursday, September 4**.

1. (20) AMO 1.1 (page 20).
2. (20) AMO 1.2 (page 20).
3. (20) AMO 1.4 (page 21).
4. We have seen the min-cost flow formulation of the seat-sharing problem in class.
   (a) (10) Can you model this problem as a circulation problem? Justify your yes/no answer.
   (b) (10) We had assumed that the cars had enough capacity to hold all the members of all the families. Now, we want to minimize the total number of cars used, by filling out the cars with bigger capacities first. How will you modify the network flow model to achieve this objective?
5. (20) AMO 1.7 (page 21).
6. (25) **[G]** AMO 1.10 (page 22).