Network Optimization (Fall 2024): Homework 1

- AMO stands for the text (Ahuja, Magnanti, Orlin). Exercises and page numbers are listed from AMO.
- Exercises marked with a **[G]** target the graduate students (Math 566), but undergrads (Math 466) can attempt them for extra credit.
- The total points (given in parentheses) add up to 140. Math 566 students will be graded for 135 points, and Math 466 students for 110 points.
- **You must email your submission as a PDF file to kbala@wsu.edu**. You are welcome to write answers by hand, and scan the writings (or take pictures of your writings) **into a PDF file**.
- **Your file name should identify you in the following manner. If you are Beatrice McGullicutty, you should name your submission BeatriceMcGullicutty_Hw1.pdf. If you want to add more bits to the title, e.g., Math466, you could name it BeatriceMcGullicutty_Math466_Hw1.pdf, for instance. But you should start the file name with BeatriceMcGullicutty. And please avoid white spaces in the file name.**
- **Begin the SUBJECT of your email submission with the same `FirstnameLastname`, expression, e.g., "BeatriceMcGullicutty Hw1 submission".**
- **This homework is due by 11:59 PM on Thursday, August 29**.

0. (15) Meet with me briefly (on Zoom or in person). Do so even if you've taken a class from me in the past.
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).