

Principles of Optimization (Fall 2024): Homework 4

- The total points (given in parentheses) add up to 125. You will be graded for 120 points (with the possibility of getting up to 5 points as extra credit).
- You must submit your homework **by email** as follows:
 - Your main responses should be included in a **PDF file**. Include **outputs from AMPL** along with any interpretations of the same in this PDF file.
 - You must **include the model and data files** for each problem in your submission (apart from the main PDF file mentioned above).
 - You must include **all files inside a zipped folder**.
 - **Your folder name should identify you in this manner: If you are Napoleon Dynamite, say, you should name your submission folder NapoleonDynamite_Math364_Hw4.zip. Please avoid white spaces in the file name (use “_” or “-” instead).**
 - Email your submission folder to kbala@wsu.edu.
 - **Begin the SUBJECT of your email submission with the same FirstnameLastname, expression, e.g., “NapoleonDynamite Math364 Hw4 submission”.**
 - **This homework is due by 5:00 PM on Thursday, September 19.**

All problems in this homework ask you to solve LPs using AMPL. When solving any LP using AMPL, you should

- declare *parameters* for all data given, and assign their values in the data file;
 - write each group of similar constraints in one go (by repeating the constraint over an appropriate index set);
 - name the objective function and constraints so as to reflect the interpretations (which you write in parentheses); and
 - **display the optimal solution and the optimal objective function value at the `amp1:` prompt using the command `display`, and interpret the solution.**
1. (25) Solve the Gaseous Chemicals problem, which is Problem 3 in Homework 2, using AMPL.
 2. (30) Solve the NYPD Cops staffing problem seen as Problem 1 in Homework 3 using AMPL.
 3. (35) Solve the Killer Drugs’ Doozey problem, given as Problem 2 in Homework 3 using AMPL. You should try to implement the formulation in the compact form, as described in the Homework 3 solutions.
 4. (35) Solve the Spoiler Inc. problem, given as Problem 4 in Homework 3 using AMPL.