Homework 2 – Transportation Problem

Due: 1:30 pm, March 12, 2025

1. Starting from iteration 2, complete the remaining iterations (until finding the optimal solution) of the in-class example on the transportation problem instance (*hw_02_transportation.xlsx*).

2. Model and solve the same transportation problem instance in Problem 1 using Gurobi in Python. Compare the optimal dual variables returned by Gurobi with those you obtained in Problem 1.

   Notes:

   1) You are encouraged to design an Excel file to read the input data from and write the output solution into. Please include the Excel file in your Python package to make sure that your Python files are executable.

   2) However, you are NOT required to implement the I/O part as in 1). That is, generating the input data manually is fine.

   Hint:

   1) Follow the tutorial *Python Setup* to set up your Python environment.

   2) Follow the tutorial *I/O between Python and Excel* for the basics on I/O between Python and Excel.

   3) Follow the tutorial *Gurobi Setup* to install Gurobi, activate the academic license, and install gurobipy.

   4) Follow the tutorial *LP Modeling* to study how to formulate and optimize an LP model using Gurobi in Python.

Submission requirements:

1. For each (sub)problem, name the solution file as "*problem_x.ext*," where "*x*" represents the (sub)problem number (x = 1, 2, 3 or x = 1a, 1b, 1c) and the file extension "*ext*" depends on the file type (Word, Excel, PDF, etc.). If the solution to a (sub)problem contains multiple files (e.g., a Python package), organize the file(s) into a folder and name the folder as "*problem_x*."

2. Note that your Python files must be able to be executed directly. So use relative paths instead of absolute paths. If necessary, you may provide a short "user manual" of instructions on how to execute your codes. Warning: If the TAs have to manipulate your Python package to verify your solutions, you will be deducted points from your grade.

3. Pack all the "(sub)problem" folders in a zip file and name the zipped file "*hw_##_Chinese name.zip*," where "##" (two digits) represents the homework number, for example, "*hw_02_赵磊.zip*."