



Homework Set 6

This assignment is worth 20 points, and is due NLT 1700 the day of Lesson 22. **Late submissions will be penalized 1 point (5% of the assignment) for each 24-hour period late after the due time - with assignments turned in more than 7 days late receiving 0 points.**

- **Documentation.** This deliverable is an individual assignment. Any assistance received must be documented in detail. Document all sources in accordance with the Office of the Dean Pamphlet "Documentation of Academic Work," (June 2015), Appendix E, and course guidance. e-Acknowledge documentation must be turned in through CIS at the time of submission. The deliverable is considered late until all portions of the assignment and the documentation are submitted.
- **Turn-In Requirement:** You will turn in **two files** to microsoft Teams: **One PDF file** (this assignment with your responses filled in the blanks), and **one Excel file** (extension .xlsx) with your model, with the following naming convention:

Section_LastName_FirstName_EM384_Homework_6

Remember that engineering management is about communicating. You will be graded on the clarity and structure of your work.

- **Acknowledgement Statement:** This assignment must be accompanied by a signed e-Acknowledgement Statement (DAW) to be eligible for graded credit. If you submit your files(s) but fail to sign the e-Acknowledgement Statement, your assignment will be considered late until the e-Acknowledgement Statement is signed.
- **Guidelines for Documenting Assistance:** For this assignment, individual work is highly encouraged, but collaboration between individuals is allowed. **ALL collaboration must be documented.** Any discussion of this problem set with anyone other than an EM384 instructor requires documentation. Documentation must be specific and detail the topics discussed and actions taken.
- You must be very specific (which problem, what assistance, etc.) when explaining any assistance used in your documentation or you will be deducted at a higher penalty. Assistance *may* result in a deduction of points in accordance with a holistic assessment by your instructor.
- Sharing of electronic files via email or any other electronic means is **strongly discouraged**. **Using, copying, or being dictated someone else's work will result in a greater point deduction.**

1. **Transportation Problem.** You are the manager of Galloping Stables, an equestrian equipment wholesaler. You have three warehouses in Newark, Albany and Buffalo, with a supply of 50, 30, and 80 pallets, respectively. You need to ship pallets of supplies from your warehouses to 4 retail locations in Troy, Albany, Philadelphia and Baltimore. Each retail location has a demand of 50 pallets. The cost to ship one pallet from warehouse to retail location is outlined below:

From / To	Troy	Albany	Philadelphia	Baltimore
Newark	\$120	\$100	\$120	\$100
Albany	\$200	\$75	\$205	\$150
Buffalo	\$110	\$125	\$200	\$350

In addition, truck capacity limits the number of pallets that can go from an Albany warehouse to each retail store to 10 pallets. All other routes are uncapacitated.

- (a) **(5 Points)** Draw a complete Network Flow Diagram to represent this problem (be sure to indicate the supply and demand amounts, costs and capacities on your diagram):

(b) **(5 Points)** Write a complete algebraic formulation for this problem using DOC.

(c) **(10 Points)** Model and solve your linear program and report the optimal decision variable values below, in addition to the optimal objective function value.

- Number of Pallets shipped from the Albany warehouse to the Albany retail location:
- Number of pallets shipped from the Newark warehouse to the Baltimore retail location:
- Number of pallets shipped from the Buffalo warehouse to the Philadelphia retail location:
- Minimum Total Cost for this problem: