

Exam I – OMGT3223 SS1 Online

Please state all assumptions, formulae, and definitions. Also, show all your work and explain your answers. Read all instructions carefully and answer each question asked. Calculations are important but so are explanations and dialogue.

1. You are required to submit this exam by the due date via Canvas. **MAKE SURE TO USE THE NAMING CONVENTION SET DOWN IN THE SYLLABUS WHEN SUBMITTING YOUR EXAM/FILES IN CANVAS.** Late papers will not be accepted.
2. Your work should consist of:
 - a. A cover sheet with your name and the date.
 - b. A **1-PAGE**, one-side only, Executive Summary of your work including explanations, calculations, diagrams, etc. Please feel free to include as much detail as you think necessary but remember you have limited space.
 - c. Executive summaries are expected to be typewritten (i.e., MS-Word, WordPerfect). However, calculations can be handwritten. Clarity and neatness are expected.
 - d. Please refer to the **website for further information regarding writing executive summaries.** You may use any font and spacing that is reasonable. i.e., 0.25-inch margins and font size 10 are at the low end of reasonable. Remember you are presenting this to your boss.
 - e. Please attach all calculations, spreadsheets, diagrams, graphs, etc., to the back of the executive summary and label the section Appendix A. If you are running short on space in your executive summary, you may reference pages in the Appendix. (This may come in handy for certain diagrams, graphs, etc.) It is vitally important that you link your work to the executive summary, i.e., **I will NOT go searching for answers, spell them out in your executive summary and show your work in the Appendix!!**
3. You will be graded on both your calculations and your presentation. Calculations will be weighted approximately 75% and your presentation (i.e., the executive summary) will be weighted 25%. Just a reminder, if I can't read it or find it, I can't grade it.

A typical exam will have the following parts:

- a cover page with your name and date,
- your executive summary,
- an appendix cover page, and
- your appendix pages.

You may turn in both a Word file and an Excel file (the Excel file would most likely contain your Appendix material).

NOTE: I WANT ONLY 1 (ONE) EXECUTIVE SUMMARY THAT INCLUDES ALL EXAM PROBLEMS. DO NOT CREATE MORE THAN 1 (ONE) EXECUTIVE SUMMARY!! PLEASE EMAIL ME IF THIS IS NOT CLEAR.

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Jane has been presented with the following problems. She has been asked to provide an analysis and explanation. Help Jane solve the following questions:

1. CPA Consequences

Jane's accounting department hires CPA's from three states. The head of accounting gives Jane the following information.

Three states are beginning to require that future CPA's have 150 hours of college credit, VA, NC, and HI. 15% of the future CPA's will come from HI, 25% from VA, and 60% from NC. Given that a future CPA is from VA there is a 35% probability that they will have met the 150 hrs of college credit requirement. Whereas, given a future CPA is from NC there is an 85% probability that they will have met the 150-hr college credit requirement. In the same vein, given a future CPA is from HI there is a 40% probability that they will have met the 150-hr college credit requirement. The accounting department wants to know:

- a. Create a joint probability table.
- b. What is the probability of a future CPA not having the 150-hr college credit requirement?
- c. Given that a student does not meet the 150-hr college credit requirement, what is the probability that they are from NC?
- d. Show that the state a future CPA is from and the ability to meet the 150-hr college credit requirement are dependent events (i.e., show $p(a|b) \neq p(a)$).
- e. Jane is told that the marginal probabilities for the three states have changed as follows: $p(HI) = 10\%$, $p(VA) = 22\%$, & $p(NC) = 68\%$. All other probabilities stay the same. Rework your probability table with these new #'s & compute the probability of a student being from VA given they do not meet the 150-hr college credit requirement.

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2. Investment Intentions

Alan Fang, the company's new projects development consultant has a new proposal for the company. The company can invest in one of three different real estate projects: Slaney Loop, Haiku Road II, or Meath Place IV. He knows three things can happen after they invest: the market could boom, the market could hold steady, or the market could tank. He also knows the \$ returns from Slaney Loop could be \$1137k in a boom, \$387k in a steady market, and -\$919k if the market tanks. On the other hand, Haiku Road II offers \$799k in a boom, \$203k during steady conditions, and \$238k if the market tanks. Finally, Meath Place IV offers -\$300k in a boom, \$0k if things are steady, and \$3888k if things tank. Help Jane answer the following for Alan:

- a. Create a payoff table for the real estate decision problem.
- b. What choice would Alan make using the
 - 1) Maximax criterion?
 - 2) Maximin criterion?
 - 3) Minimax Regret criterion?
 - 4) Equal likelihood criterion?
- c. If the probability of future events follows the distribution in Table 4.1, find the expected value of each of the real estate choices. Based on expected value which would you choose and why?
HINT: You need to discuss dominance, tradeoffs, and risk here.

Table 4.1

Future State of Market	p(Future State of Market)
Boom	0.72
Steady	0.06
Tank	0.22

- d. Alan is given new information that **ALL** payoffs have increased by 100k (e.g., Slaney Loop in the Boom payoff is now 1237k & Meath Place in the Boom is now -200k, etc.). Find the new expected values for each alternative using the probability of future events from Table 4.1. Comment on how your new expected value compares to the expected value you calculated in part c.

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3. Shipping Shenanigans

Jane's shipping company, Pirate Logistics, has three supply locations, Wilmington, New Bern, & Lynchburg. Jane then needs goods shipped to three demand locations, Grand Island, Omaha, & Sioux Falls. Jane needs a shipping schedule that minimizes cost but yet meets the following:

- a unique shipping cost is associated with each supply locale
- limited supply amounts are provided at any supply locale
- each demand locale must meet a required demand amount
- amount supplied must equal amount demanded

Jane has given Pirate Logistics the following transshipment diagram that contains the pertinent supply and demand. The associated cost information between supply and demand locales is listed in Table 1.3.

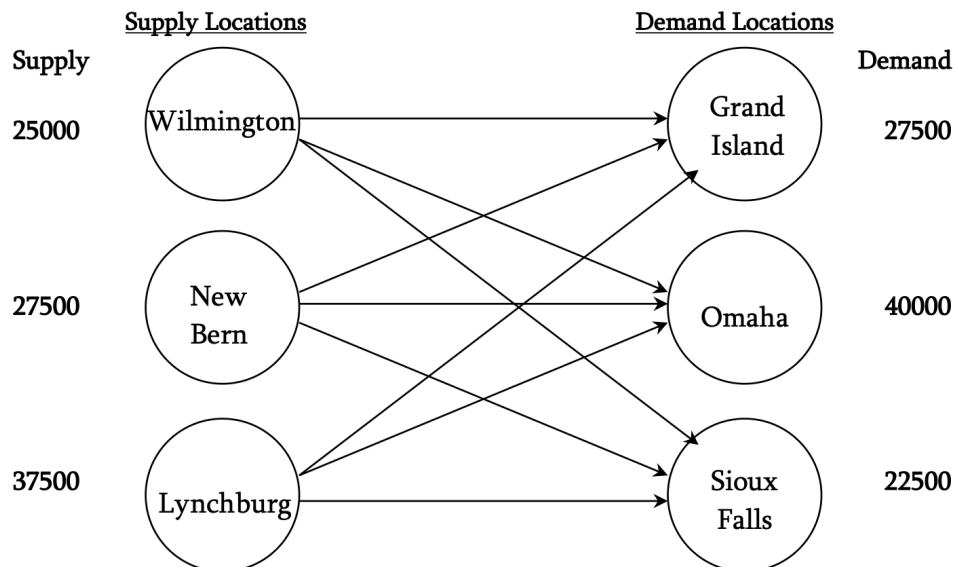


Table 1.3 Cost Structure for Pirate Logistics

	Grand Island	Omaha	Sioux Falls
Wilmington	\$17.75	\$32.50	\$22.00
New Bern	\$30.50	\$27.55	\$32.50
Lynchburg	\$31.95	\$29.00	\$17.75

(Note: for example, it costs \$17.75 to ship a unit from Wilmington to Grand Island)

Jane wonders if there is just one “best” solution. Help Jane develop a shipping schedule that minimizes total cost, meets required demand and supply constraints, comments on the idea of a “best” solution, and provides a comparison to current operations. Currently Pirate Logistics ships 14000 from Wilmington to Omaha, 11000 from Wilmington to Sioux Falls, 27500 from New Bern to Omaha, 27000 from Lynchburg to Grand Island, and 10500 from Lynchburg to Sioux Falls. Include a model (preferably in XL) showing your LP setup, a comparison of the current shipping schedule to your model's schedule, and a brief discussion of sensitivity analysis (i.e., Shadow Prices).

HINT: You can do this by hand but most likely you will set up a transportation LP in a spreadsheet and use Solver to generate a solution. Also, take a look at pages 516-528 and 536-537 in the textbook, 5th edition.