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IE 468- Pricing and Revenue Optimization
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NETWORK MANAGEMENT FOR THAI LION AIR

Thai Lion Air is a small boutique airline that operates comfortable 30-seat Embraer ERJ 135 aircrafts for exclusive service within Thailand. The company currently operates five services: three of which are non-stop flights. The following table summarizes the data for products (origin-destination-fares)

ODF	Origin	Destination	Connection	Class	Fare (Baht)	Demand
101	Chiang Mai	Suvarnabhumi	Direct	M	750	U(8,14)
102	Chiang Mai	Suvarnabhumi	Direct	Y	500	U(26,34)
103	Chiang Mai	Koh Samui	Suvarnabhumi	M	1000	U(6,12)
104	Chiang Mai	Koh Samui	Suvarnabhumi	Y	600	U(14,18)
105	Suvarnabhumi	Koh Samui	Direct	M	650	U(6,10)
106	Suvarnabhumi	Koh Samui	Direct	Y	450	U(20,26)
107	Koh Samui	Phuket	Direct	M	700	U(6,12)
108	Koh Samui	Phuket	Direct	Y	350	U(14,28)
109	Suvarnabhumi	Phuket	Koh Samui	M	600	U(8,12)
110	Suvarnabhumi	Phuket	Koh Samui	Y	400	U(9,17)

The airline uses a network with three flights: SL 1001 (Chiang Mai-Suvarnabhumi), SL 2002 (Suvarnabhumi-Koh Samui) and SL 3003 (Koh Samui-Phuket). The notation U(a,b) corresponds to discrete uniform distribution between (including) a and b. The company's goal is to determine how many seats should be allocated for each ODF on this network.

Question 1:

A. Formulate this problem as a Deterministic Linear Program. Write down the formulation.
B. Solve the program. Show the results.
C. Suppose that there is a new customer from a partner airline who needs to go from Suvarnabhumi to Koh Samui. What should be the minimum price that you would like to charge for this new request?
D. Suppose that there is a new customer from a partner airline who needs to go from Chiang Mai to Koh Samui. What should be the minimum price that you would like to charge for this new request?

Question 2:

A. Discuss why using the results of the Deterministic Linear Programming formulation may not be a very good idea.
B. Thai Lion Air wants to use virtual nesting to determine the booking limits for this flight. For each leg of the network, using the solution of the DLP, suggest virtual nests and assign products to these nests. Discuss how you can use these nests for booking control.

Question 3:

A. Solve the problem using Randomized Linear Program (use 10 samples). Show the results.
B. Suppose that there is a new customer from a partner airline who needs to go from Suvarnabhumi to Koh Samui. What should be the minimum price that you would like to charge for this new request?
C. Suppose that there is a new customer from a partner airline who needs to go from Chiang Mai to Koh Samui. What should be the minimum price that you would like to charge for this new request?

Question 4:

A. Formulate this problem as a Probabilistic Non-Linear Program. Write down the formulation.
B. Solve the program. Show the results.
C. Suppose that there is a new customer from a partner airline who needs to go from Suvarnabhumi to Koh Samui. What should be the minimum price that you would like to charge for this new request?
D. Suppose that there is a new customer from a partner airline who needs to go from Chiang Mai to Koh Samui. What should be the minimum price that you would like to charge for this new request?