

EXAM MLC QUESTIONS OF THE WEEK

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Week of April 23/07

A traveling salesman visits three separate cities, A, B and C, on an ongoing basis. He starts the year in City A, and travels at the end of April, August and December and stays in his destination city for 4 months. His December trip is always back to City A, no matter where he is. Due to the seasonal nature of business, the probabilities of traveling from one city to another depend on the time of year. He starts the year in City A, and his travel probabilities at the end of April are

Destination	Stay in City A	City B	City C
Probability	.1	.3	.6

His one-step transition probability matrix for travel at the end of August is

	A	B	C
A	0	.6	.4
B	.2	0	.8
C	.5	.5	0

Wherever he is at the end of December, he travels to City A.

His travel costs are as follows

Route:	A to B or B to A	A to C or C to A	B to C or C to B
Airfare Cost	3000	4000	5000
Accommodation:	City A	City B	City C
	0	10,000	15,000

Find the expected accommodation cost for the year.

The solution can be found below.

Week of April 23/07 - Solution

There are 6 travel itineraries with non-zero probability that can be taken

Itinerary	Airfare Cost	Accommodation Cost	Probability
A-A-B-A	6,000	10,000	(.1)(.6)
A-A-C-A	8,000	15,000	(.1)(.4)
A-B-A-A	6,000	10,000	(.3)(.2)
A-B-C-A	12,000	25,000	(.3)(.8)
A-C-B-A	12,000	25,000	(.6)(.5)
A-C-A-A	8,000	15,000	(.6)(.5)

Expected accommodation cost is

$$1000 \times [10(.06) + 15(.04) + 10(.06) + 25(.24) + 25(.3) + 15(.3)] = 19,800 .$$