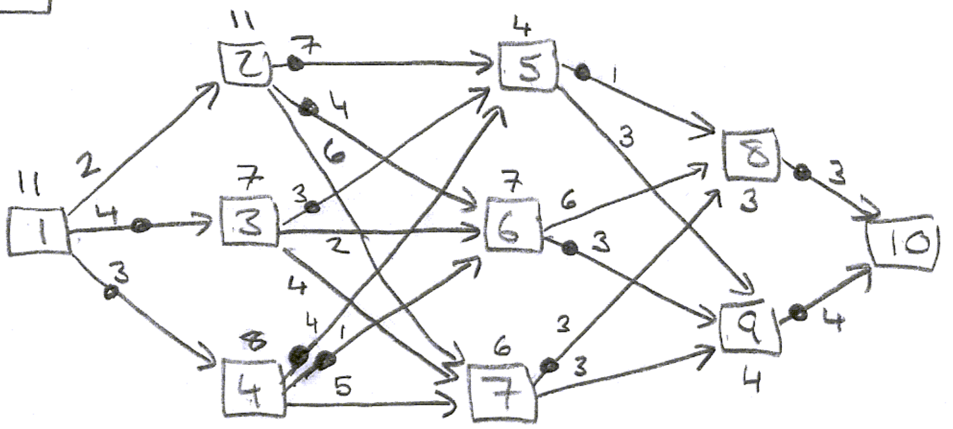
	A	B	C
1	**Homework 6, Problem 1**		
2			
3	Demand Rate (lambda or D)	600	
4	Order Cost	$ 700.00	
5	Inventory Cost/Unit Year	$ 12.00	
6	Stockout Cost	$ 40.00	
7	Lead Time	0.083333	year
8			
9	EOQ	264.5751	
10			
11	Critical Fractile	86.77%	
12			
13	Average Demand during Lead Time	50	
14			
15	Reorder point	57.88878	

	A	B	C
1	**Homework 6, Problem 1**		
2			
3	Demand Rate (lambda or D)	600	
4	Order Cost	700	
5	Inventory Cost/Unit Year	12	
6	Stockout Cost	40	
7	Lead Time	=1/12	year
8			
9	EOQ	=SQRT(2*B4*B3/B5)	
10			
11	Critical Fractile	=1 - B5*B9/(B6*B3)	
12			
13	Average Demand during Lead Time	=B3*B7	
14			
15	Reorder point	=NORMINV(B11,B13,SQRT(B13))	

	A	B	C	D	E	F
1	**Problem 2**			**Lead Time**		
2						
3	Demand Rate (lambda or D)	3600		**Days**	**Years**	**Probability**
4	Order Cost	$ 100.00		2	0.005479	10%
5	Inventory Cost/Unit Year	$ 5.00		3	0.008219	20%
6	Stockout Cost	$ 10.00		4	0.010959	30%
7				5	0.013699	20%
8	EOQ	379.4733		6	0.016438	20%
9						100%
10	Critical Fractile	94.73%				
11						
12	Average Lead Time	0.011507				
13	Average Demand during Lead Time	41.42466				
14						
15	Reorder point	64				
16						
17		**Average**	**Chance**			
18	**Scenario**	**Demand**	**X<= r**			
19	2	19.72603	100.00%			
20	3	29.58904	100.00%			
21	4	39.45205	99.99%			
22	5	49.31507	98.15%			
23	6	59.17808	75.90%			
24			94.81%			

	A	B	C	D	E	F
1	**Problem 2**			**Lead Time**		
2						
3	Demand Rate (lambda or D)	3600		**Days**	**Years**	**Probability**
4	Order Cost	100		2	=D4/365	0.1
5	Inventory Cost/Unit Year	5		3	=D5/365	0.2
6	Stockout Cost	10		4	=D6/365	0.3
7				5	=D7/365	0.2
8	EOQ	=SQRT(2*B4*B3/B5)		6	=D8/365	0.2
9						=SUM(F4:F8)
10	Critical Fractile	=1 - B5*B8/(B6*B3)				
11						
12	Average Lead Time	=SUMPRODUCT(E4:E8,F4:F8)				
13	Average Demand during Lead Time	=B3*B12				
14						
15	Reorder point	64				
16						
17		**Average**	**Chance**			
18	**Scanario**	**Demand**	**X<= r**			
19	=D4	=B$3*E4	=POISSON(B$15,B19,TRUE)			
20	=D5	=B$3*E5	=POISSON(B$15,B20,TRUE)			
21	=D6	=B$3*E6	=POISSON(B$15,B21,TRUE)			
22	=D7	=B$3*E7	=POISSON(B$15,B22,TRUE)			
23	=D8	=B$3*E8	=POISSON(B$15,B23,TRUE)			
24			=SUMPRODUCT(F4:F8,C19:C23)			

Q3 p. 225, #1



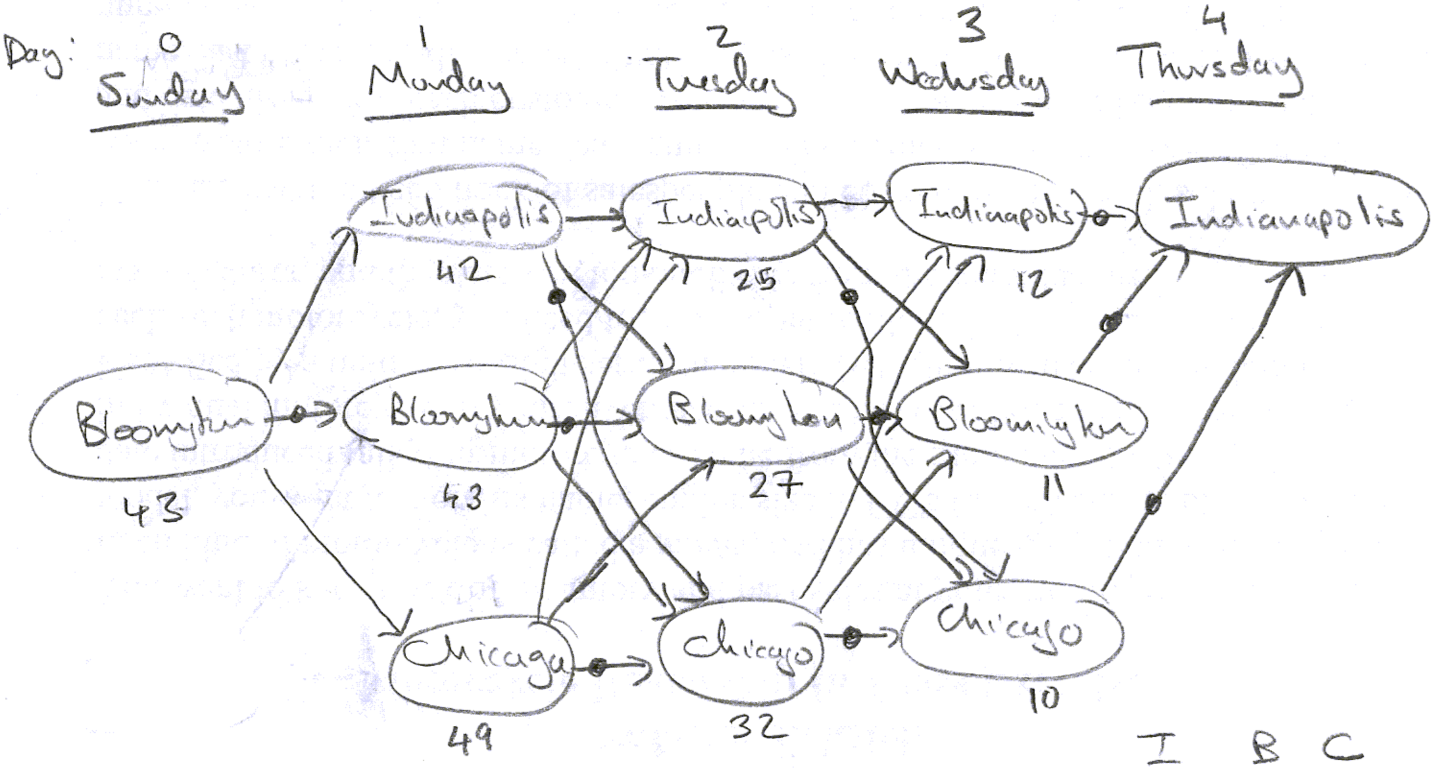
Optimal choices from each node are marked with a "●".

The optimal distance is 11.

The shortest paths are 1-3-5-8-10
1-4-5-8-10
1 4 -6-9-10

The shortest path from 3→10 must be 3-5-8-10.

Q4 p. 225 #2



Indianapolis = "I" (12)
Bloomington = "B" (16)
Chicago = "C" (17)

	I	B	C
I	–	5	2
B	5	–	7
C	2	7	–

Let $f_t(i)$ = profit if you are in city i on day t

$$f_4(I) = 0$$

$$f_3(I) = 12 - 0 + f_4(I) = 12$$

$$f_3(B) = 16 - 5 + f_4(I) = 11$$

$$f_3(C) = 17 - 2 + f_4(I) = 15$$

Note: there are variations on this depending on whether you count revenue at the start or end of the day

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$$f_2(I) = \max \begin{cases} 12 - 0 + f_3(I) = 24 & (I) \\ 12 - 5 + f_3(B) = 18 & (B) \\ 12 - 2 + f_3(C) = 25^* & (C) \end{cases}$$

$$f_2(B) = \max \begin{cases} 16 - 5 + f_3(I) = 23 & (I) \\ 16 - 0 + f_3(B) = 27^* & (B) \\ 16 - 7 + f_3(C) = 24 & (C) \end{cases}$$

$$f_2(C) = \max \begin{cases} 17 - 2 + f_3(I) = 27 & (I) \\ 17 - 7 + f_3(B) = 21 & (B) \\ 17 - 0 + f_3(C) = 32^* & (C) \end{cases}$$

$$f_1(I) = \max \begin{cases} 12 - 0 + f_2(I) = 37 & (I) \\ 12 - 5 + f_2(B) = 34 & (B) \\ 12 - 2 + f_2(C) = 42^* & (C) \end{cases}$$

$$f_1(B) = \max \begin{cases} 16 - 5 + f_2(I) = 36 & (I) \\ 16 - 0 + f_2(B) = 43^* & (B) \\ 16 - 7 + f_2(C) = 41 & (C) \end{cases}$$

$$f_1(C) = \max \begin{cases} 17 - 2 + f_2(I) = 40 & (I) \\ 17 - 7 + f_2(B) = 37 & (B) \\ 17 - 0 + f_2(C) = 49^* & \end{cases}$$

$$f_0(B) = \max \begin{cases} -5 + f_1(I) = 37 & (I) \\ 0 + f_1(B) = 43^* & (B) \\ -7 + f_1(C) = 42 & (C) \end{cases}$$

So, you should just stay in Bloomington through Wednesday, and then go to Indianapolis