

F.16

Erin Davis owns and operates one of the largest Mercedes-Benz auto dealerships in Nebraska. In the past 36 months, her sales have ranged from a low of 6 new cars to a high of 12 new cars, as reflected in the following table:

SALES OF NEW CARS/MONTH	FREQUENCY
6	3
7	4
8	6
9	12
10	9
11	1
12	1
	<u>36 months</u>

Davis believes that sales will continue during the next 24 months at about the same historical rates, and that delivery times will also continue to follow the following pace (stated in probability form):

DELIVERY TIME (MONTHS)	PROBABILITY
1	.44
2	.33
3	.16
4	.07
	<u>1.00</u>

Davis' current policy is to order 14 cars at a time (two full truckloads, with 7 autos on each truck), and to place a new order whenever the stock on hand reaches 12 autos. What are the results of this policy when simulated over the next 2 years?

F.17 Refer to Problem F.16. Davis establishes the following relevant costs: (1) carrying cost per Mercedes per month is \$600; (2) cost of a lost sale averages \$4,350; and (3) cost of placing an order is \$570. What is the total inventory cost of the policy simulated in Problem F.16?

F.18 Refer to Problems F.16 and F.17. Davis wishes to try a new simulated policy: ordering 21 cars per order, with a reorder point of 10 autos. Which policy is better, this one or the one formulated in Problems F.16 and F.17?

F.19 Johnny's Dynamo Dogs has a drive-through line. Customers arriving at this line during the busy hours (11:00 A.M. to 1:00 P.M.) either order items à la carte or on a value-meal basis. Currently 25% of meals are sold as value meals at an average contribution margin of \$2.25. The à la carte meals earn \$3.00 per meal but take longer to prepare and this slows the line. The following are the interarrival times that were recorded over the last 3 weeks of operation.

INTERARRIVAL TIMES FOR 500 OBSERVATIONS	
TIME BETWEEN ARRIVALS (MINUTES)	NUMBER OF OCCURRENCES
1	100
2	150
3	125
4	100
5	25

In addition, the following service times for à la carte and value meals were recorded:

CUSTOMER SERVICE TIMES FOR 500 ORDERS OF EACH TYPE			
SERVICE TIME (MINUTES)	À LA CARTE	SERVICE TIME (MINUTES)	VALUE MEALS
1	50	1	100
2	125	2	175
3	175	3	125
4	150	4	100

John Cottrell ("Johnny") has observed that because of street traffic the store loses all the potential customers who arrive when 4 cars are in the drive-through line (i.e., the line never exceeds four customers).