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Example 07: The News Dealer's Problem

A news dealer buys papers for 33 cents each and sells them for 50 cents each. Newspapers not sold at the end of the day are sold as scrap for 5 cents each. Newspapers can be purchased in bundles of 10. Thus, the newsstand can buy 50 or 60 or 70 papers, and so on. The order quantity, Q, is the only policy decision. Unlike some inventory problems, the order quantity Q is fixed since ending inventory is always zero due to scrapping leftover papers.

Table 16 Distribution of daily newspaper demand, by type of newsday

Demand	Distribution of Newspapers Demanded			Cumulative Probabilities		
	Good	Fair	Poor	Good	Fair	Poor
40	0.030	0.100	0.440	0.030	0.100	0.440
50	0.050	0.180	0.220	0.080	0.280	0.660
60	0.150	0.400	0.160	0.230	0.680	0.820
70	0.200	0.200	0.120	0.430	0.880	0.940
80	0.350	0.080	0.060	0.780	0.960	1.000
90	0.150	0.040	0.000	0.930	1.000	1.000
100	0.070	0.070	0.000	1.000	1.000	1.000

Table 17 Distribution of Type of Newsday

Type	Probability	Cumulative Probability
Good	0.350	0.350
Fair	0.450	0.800
Poor	0.200	1.000

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Day	Order quantity Q is Fixed	Random # 1	Type of Newsday	Random # 2	Demanded	Revenue from Sales	Lost Profit from Excess Demand	Salvage from Sale of Scrap	Daily Cost	Daily Profit
1	70	0.671	Fair	0.652	60	\$ 30.0	\$ -	\$ 3.5	\$ 23.1	\$ 10.4
2	70	0.112	Good	0.637	80	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
3	70	0.366	Fair	0.690	70	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
4	70	0.646	Fair	0.963	90	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
5	70	0.246	Good	0.574	80	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
6	70	0.877	Poor	0.134	40	\$ 20.0	\$ -	\$ 3.5	\$ 23.1	\$ 0.4
7	70	0.223	Good	0.847	90	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
8	70	0.667	Fair	0.908	80	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
9	70	0.199	Good	0.134	60	\$ 30.0	\$ -	\$ 3.5	\$ 23.1	\$ 10.4
10	70	0.021	Good	0.498	80	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
11	70	0.661	Fair	0.085	40	\$ 20.0	\$ -	\$ 3.5	\$ 23.1	\$ 0.4
12	70	0.854	Poor	0.417	40	\$ 20.0	\$ -	\$ 3.5	\$ 23.1	\$ 0.4
13	70	0.670	Fair	0.504	60	\$ 30.0	\$ -	\$ 3.5	\$ 23.1	\$ 10.4
14	70	0.598	Fair	0.250	50	\$ 25.0	\$ -	\$ 3.5	\$ 23.1	\$ 5.4
15	70	0.546	Fair	0.748	70	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
16	70	0.648	Fair	0.764	70	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
17	70	0.800	Poor	0.590	50	\$ 25.0	\$ -	\$ 3.5	\$ 23.1	\$ 5.4
18	70	0.311	Good	0.140	60	\$ 30.0	\$ -	\$ 3.5	\$ 23.1	\$ 10.4
19	70	0.672	Fair	0.915	80	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
20	70	0.590	Fair	0.433	60	\$ 30.0	\$ -	\$ 3.5	\$ 23.1	\$ 10.4
21	70	0.229	Good	0.522	80	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
22	70	0.249	Good	0.635	80	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
23	70	0.965	Poor	0.058	40	\$ 20.0	\$ -	\$ 3.5	\$ 23.1	\$ 0.4
24	70	0.306	Good	0.423	70	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
25	70	0.945	Poor	0.227	40	\$ 20.0	\$ -	\$ 3.5	\$ 23.1	\$ 0.4
26	70	0.989	Poor	0.911	70	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
27	70	0.225	Good	0.617	80	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
28	70	0.468	Fair	0.739	70	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
29	70	0.140	Good	0.702	80	\$ 35.0	\$ -	\$ 3.5	\$ 23.1	\$ 15.4
Total Profit									\$ 326.60	