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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	Demand Proabilities			Distribution of Newspapers Demanded Cumulative Proabilities		
	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

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	0.103	Good	0.030	40	$ 20.0	$ -	$ 3.5	$ 23.1	$ 0.4
2	70	0.818	Poor	0.982	80	$ 35.0	$ -	$ 3.5	$ 23.1	$ 15.4
3	70	0.016	Good	0.702	80	$ 35.0	$ -	$ 3.5	$ 23.1	$ 15.4
4	70	0.042	Good	0.998	100	$ 35.0	$ -	$ 3.5	$ 23.1	$ 15.4
5	70	0.838	Poor	0.468	50	$ 25.0	$ -	$ 3.5	$ 23.1	$ 5.4
6	70	0.424	Fair	0.015	40	$ 20.0	$ -	$ 3.5	$ 23.1	$ 0.4
7	70	0.685	Fair	0.570	60	$ 30.0	$ -	$ 3.5	$ 23.1	$ 10.4
8	70	0.600	Fair	0.436	60	$ 30.0	$ -	$ 3.5	$ 23.1	$ 10.4
9	70	0.368	Fair	0.251	50	$ 25.0	$ -	$ 3.5	$ 23.1	$ 5.4
10	70	0.067	Good	0.313	70	$ 35.0	$ -	$ 3.5	$ 23.1	$ 15.4
11	70	0.506	Fair	0.971	90	$ 35.0	$ -	$ 3.5	$ 23.1	$ 15.4
12	70	0.782	Fair	0.287	60	$ 30.0	$ -	$ 3.5	$ 23.1	$ 10.4
13	70	0.421	Fair	0.285	60	$ 30.0	$ -	$ 3.5	$ 23.1	$ 10.4
14	70	0.488	Fair	0.666	60	$ 30.0	$ -	$ 3.5	$ 23.1	$ 10.4
15	70	0.232	Good	0.765	80	$ 35.0	$ -	$ 3.5	$ 23.1	$ 15.4
16	70	0.787	Fair	0.479	60	$ 30.0	$ -	$ 3.5	$ 23.1	$ 10.4
17	70	0.865	Poor	0.091	40	$ 20.0	$ -	$ 3.5	$ 23.1	$ 0.4
18	70	0.964	Poor	0.055	40	$ 20.0	$ -	$ 3.5	$ 23.1	$ 0.4
19	70	0.245	Good	0.404	70	$ 35.0	$ -	$ 3.5	$ 23.1	$ 15.4
20	70	0.731	Fair	0.534	60	$ 30.0	$ -	$ 3.5	$ 23.1	$ 10.4
21	70	0.289	Good	0.416	70	$ 35.0	$ -	$ 3.5	$ 23.1	$ 15.4
22	70	0.260	Good	0.654	80	$ 35.0	$ -	$ 3.5	$ 23.1	$ 15.4
23	70	0.537	Fair	0.371	60	$ 30.0	$ -	$ 3.5	$ 23.1	$ 10.4
24	70	0.272	Good	0.436	80	$ 35.0	$ -	$ 3.5	$ 23.1	$ 15.4
25	70	0.754	Fair	0.111	50	$ 25.0	$ -	$ 3.5	$ 23.1	$ 5.4
26	70	0.404	Fair	0.085	40	$ 20.0	$ -	$ 3.5	$ 23.1	$ 0.4
27	70	0.374	Fair	0.575	60	$ 30.0	$ -	$ 3.5	$ 23.1	$ 10.4
28	70	0.901	Poor	0.095	40	$ 20.0	$ -	$ 3.5	$ 23.1	$ 0.4
29	70	0.043	Good	0.658	80	$ 35.0	$ -	$ 3.5	$ 23.1	$ 15.4
									Total Profit	$ 281.60