Activity: the heuristic race, then the rolling horizon

Chapter 5, Dynamic Lot Sizing

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Work in threes. 20 minutes.

Names: _____

The item. The distributor's deck idler pulley, over the eight months from March to October. Ordering costs $k = \$150$, and carrying costs $h = \$1.00$ per pulley per month. The plan starts and ends empty, and carrying is charged on the ending balance.

t	1	2	3	4	5	6	7	8
d_t	40	150	40	30	0	10	120	80

The optimum, from the Wagner-Whitin recursion: order 40 in month 1, 230 in month 2 (covering months 2 to 6) and 200 in month 7 (covering 7 and 8), for a relevant cost of **$670**.

The three rules. Start an order in period t, extend the window one period at a time, and stop as the chapter describes. Silver-Meal watches $w(t,u)/(u-t+1)$ and stops when it rises. Least unit cost watches $w(t,u)/d[t,u]$ and stops when it rises. Part-period balancing watches the carrying $w(t,u)-k$ and, once it passes k, keeps whichever of the last two windows came closer.

Part A. Predict

Which rule will come closest to $670, and which farthest?

Part B. The race

Each member of the group runs one rule over all eight months. Report the plan (order periods and quantities), the number of orders, and the relevant cost. Then, as a group, compute each rule's penalty against $670 and rank the three.

Part C. Seeing only four months

Now the planner sees only four months at a time. At the start of each month, net the stock on hand against this month's requirement. If it covers the month, order nothing. Otherwise run Silver-Meal on the next four months (fewer at the end of the season), with this month's requirement reduced by the stock on hand, place only the first order, and move on.

Month	On hand at start	Window seen	Silver-Meal figures	Order	On hand at end
1					
2					
3					
4					
5					
6					
7					
8					

What did the eight months cost? How much did seeing less cost Silver-Meal, and how far is it now from the optimum?

Exit ticket (tear off and hand in)

Name: _____

1. Why do planning systems run a heuristic when an optimal algorithm exists?

2. True or false, and why: a longer planning window can never make a rolling plan cost more.