Homework #12
Supply Chain Models: Manufacturing & Warehousing (ISyE 3104) – Spring 2002
Due April 11, 2002

Show all your steps to get partial or full credit. Total 55 points.

Question 1

A single inventory item is ordered from an outside supplier. For the next 5 weeks, the time-phased net requirements are as follows:

<table>
<thead>
<tr>
<th>Week</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>335</td>
<td>200</td>
<td>140</td>
<td>440</td>
<td>300</td>
</tr>
</tbody>
</table>

The setup cost for ordering is $200, and the holding cost is $0.30 per unit per week.

(a) (15 points) Find the optimal lot-sizing policy. (Create a graph representation of this problem and find the shortest path.)

To answer the following questions, assume that the capacity of the supplier for the next five weeks is 600, 600, 600, 400, and 200 respectively.

(b) (5 points) Determine whether the lot sizing problem with capacity constraints is feasible.

(c) (5 points) Find a feasible schedule starting with the lot-for-lot policy. (If you find the problem to be infeasible is part (b), adjust the first week’s capacity to make the problem feasible)

(d) (10 points) Check for improvements on the feasible schedule you found by considering possibilities for shifting of production. Calculate the percentage improvement in total cost compared to the solution you found in part (c)

Question 2

(10 points) In a serial production line, at which station (first, last, middle etc.) would it be best to have a bottleneck in a push system? Where in a pull system? Explain your reasoning. What can be done to avoid having a significant bottleneck at all? (Think about the pen assembly game you played in class while answering this question)

Question 3

(10 points) Find a magazine or newspaper article that discusses a successful (or unsuccessful) application of an MRP or JIT approach in a company. Explain why the chosen approach was good (or bad) for this company. Make a copy of the article, highlight the parts relevant to this question and attach it to your homework.