1. **(8 points)** Read the article “Managing demand uncertainty: People, processes and leadership revolutionize HP media’s supply chain” by Wilkins R., Thakur-Weigold B., and Wagner S. *Industrial Engineer*. 2012 vol: 44 iss:8 pg:30. You can use Google Scholar, and then click on “Find @ GT”, or find it directly in the GT Library webpage. Answer briefly (a paragraph) the following questions:
   a. **(2 points)** Suppose that HP media operations have an inventory level of 6 weeks and a service level policy of 95%. According to Figure 1, depicted in this article, would they be operating efficiently? Why?
   b. **(2 points)** What are the benefits of a “demand-pull” system from both the buyer’s and the supplier’s perspective?
   c. **(2 points)** Why does HP manage different products (e.g. high vs. low revenue and gross margin products, new vs. current products) in a different way?
   d. **(2 points)** How did HP improve supply chain responsiveness through a lead-time reduction?

2. **(4 points)** The organizers of an annual local festival have to decide how many t-shirts with the festival logo to order this year. The cost of each t-shirt is $4 and the price to the public is $10. All the unsold t-shirts are sold to a thrift store at $1 per shirt. The organizers have kept a record of the sales during previous festivals.
   a. **(2 points)** What would be an adequate inventory model to compute the optimal order of t-shirts? Why?
   b. **(2 points)** Do the organizers have all the information needed to accurately compute the order size in a)? Why?

3. **(5 points)** Mrs. Smith has to decide how many apple pies to prepare for the monthly neighborhood cook-out. Each pie costs approximately $9 in ingredients and utilities. She sells each apple pie at $20. She donates all the unsold pies to a local soup kitchen. She has kept record of the demand of the pies for the last 15 months, including the times when people requested her pies but they were sold-out. Her data are shown in the table below. Her son, who is an Industrial Engineering student, offered to help her to find the optimum amount of pies she should make to maximize her expected profit. Based solely on this information, what is the optimal number of pies that her son should recommend her to make?

<table>
<thead>
<tr>
<th>Pies Demand Data:</th>
<th>4</th>
<th>3</th>
<th>1</th>
<th>0</th>
<th>5</th>
<th>6</th>
<th>4</th>
<th>4</th>
<th>7</th>
<th>5</th>
<th>8</th>
<th>5</th>
<th>4</th>
<th>7</th>
<th>6</th>
</tr>
</thead>
</table>

4. **(8 points)** The local farmers’ market is preparing its order of turkeys for the coming Thanksgiving Day. Each pound of turkey costs $1.5 and it is sold for $2.2 per pound. Any remaining turkeys are sold at a clearance price of $0.50 per pound. Previous years’ demand data for Thanksgiving Day are shown in the table below.
a. **(6 points)** Assume that the data above follows a normal distribution. How many pounds of turkey does the farmer market’s manager should order, such that the expected profits from this item are maximized?

b. **(2 points)** The farmer market’s manager estimates an inventory of 9,000 pounds of turkey before the Thanksgiving shipment arrives. Taking into account this inventory, what should be the order size in pounds of turkey?

5. **(5 points)** A retailer needs to calculate the number of Christmas cards to order to their supplier. Each card costs $0.35. Other costs, such as transportation and storage, are estimated to be $0.10 per card. Cards are sold for $1.5. Any unsold cards are recycled at a salvage value of $0.02 per card. The retailer estimates that the demand follows a uniform distribution with parameters 7,500 and 12,600. How many cards should the retailer order to maximize the expected profit from this item?