Assignment Description

According to the data provided in this case, analyze how many shirts should be ordered for the upcoming season. Consider two different scenarios. In scenario (a), the company adopts the outsourcing strategy and only works with the manufacturer in Ukraine. The company places a single order well before the season starts. Due to its long lead time, there is no chance to place a second order if the demand turns out to be high. In scenario (b), the company adopts a more flexible strategy and uses a combination of outsourcing and near-sourcing. The company places its first order before the season starts from the manufacturer in Ukraine and then places a second order from the local manufacturer if demand turns out to be high. More specifically, conduct the following analyses.

1. Develop a linear regression model to predict the demand for the upcoming season. A season typically lasts 2-3 weeks and the company only sells a single LED in any season. You need to determine what independent variables should be included in your regression model. You need to specify the regression equation which will be used in steps 2 and 3.
2. Develop a simulation model to characterize the distribution of the net profit for the upcoming season considering scenario (a). Run 1000 replications and consider order quantity 150, 160,…, 300.
3. Develop a simulation model to characterize the distribution of the net profit for the upcoming season considering scenario (b). Run 1000 replications and consider order quantity (first order only) 150, 160, …, 300

To answer the above questions, make the following assumptions.

a. The following four periods include a major holiday, April 30 to May 20, 2013, Sep 30 to Nov 4, 2013, Nov 5 to Dec 9, 2013, and Dec 10 2014 to Jan 6 2014.
b. The salvage value is $15 per shirt. In other words, the company will only receive $15 for each unsold shirt at the end of the season.
c. The upcoming season will last 21 days and there is no holiday during this period.
d. For scenario (b), if you order from the local manufacturer, there is almost no lead time and you can order precisely what you need. For example, if you ordered 200 units from the manufacturer in Ukraine and the demand turned out to be 235. You can simply order another 35 units from the local manufacturer to meet the additional demand. However, the local manufacturer does have a capacity issue. You need to read the case to figure out its maximum production capacity for the upcoming season.

Submit a report of no more than four pages. Your report should be concise and contain all key results and findings. Feel free to add an appendix if you would like to include more detailed analysis in your report. There is no page limit on your appendix. Your report should include at least the following three sections: (1) introduction and problem description; (2) analysis; and (3) conclusion and discussion. In your analysis section, state all your assumptions as provided in the case and this document. If the two conflict, follow the information provided in this document. Make additional assumptions if necessary. When you write your report, DO NOT simply answer these questions like a homework assignment. You should treat it as a mini business consulting project when you write the report. *Be sure to submit the Excel file that contains your analysis*. Your Excel files should be structured in a way that is easy for me to follow along.

Hints:

1. What might affect the demand for a season is not immediately clear from the raw data provided. You need to think about it (and possibly reorganize the data) before you develop your regression model.
2. In developing your simulation model, you can borrow a similar modeling framework we covered in class. You can use either Excel only or @Risk.