**Nithin Das, CWID: 10422784, Date: 10/03/19 Assignment W&A 4th Edition, Ch 3, Q 18, Page 117**

I pledge on my honor that I have not given or received any unauthorized assistance on this

assignment/examination. I further pledge that I have not copied any material from a book, article,

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Signature: NITHIN DAS

Date: 10/03/2019

**Management Overview**

* **Problem Statement**

To develop a model to find the production schedule that meets demand on time and minimizes the total production and inventory holding costs

* **Data Sources**

The initial inventory, the holding cost, the demand forecast for 6 months, the production cost per unit for each 6 months, the production capacity of inventory, the storage capacity of inventory

* **Model Approach**
* Enter all the input data in the spreadsheet.
* Enter initial random values for ‘*Units Produced*’
* Compute ‘*On hand after production*’as the sum of initial inventory and ‘*Units Produced*’ for Month 1 and for the remaining months as the sum of ‘*Units Produced*’ and ‘*Ending Inventory*’ of the previous month.
* Compute ‘*Production Costs*’ as the product of ‘*Production Cost/Unit*’ and ‘*Units Produced*’
* Compute ‘*Holding Costs*’ as the 5% of production cost of “*Ending Inventory*”
* Compute ‘*Total Cost*’ as the sum of *Production Costs*’ and ‘*Holding Costs*’ of each 6 months
* Use Solver to compute the ‘*Units to be produced*’ for 6 months. While comouting, add the constraints on ‘*’Units on hand after production”, “Units produced” and “Ending Inventory”*
* Use SolverTable to perform Sensitivity Analysis between “*Initial inventory*” and ‘*Total Costs*’ and “*Initial inventory*” and ‘*Units to be Produced*’
* **Solution & Sensitivity Analysis**

Results:

The units to be produced for each month is as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Month 1 | Month 2 | Month 3 | Month 4 | Month 5 | Month 6 |
| 5000 | 20000 | 30000 | 30000 | 25000 | 10000 |

The total cost is$1,535,562.50

Sensitivity Analysis

1. The sensitivity analysis between “*Initial Inventory*” and “*Total Cost*” shows that as the initial inventory units increases, the total cost (production + holding) will decreases linearly.

This is because, if Initial Inventory increases, the number of units to be produced for Month1 decreases due to constraints on demand and storage facility. Therefore, the production costs for Month 1 decreases, thus affecting the total costs.

1. The sensitivity analysis between “*Initial Inventory*” and “*Units Produced*” shows that as the Units produced between Month 2 and Month 6 does not get affected by the initial inventory.