BIA 650 A Homework#3 W&A Chapter 3, Problem 18

# Management Overview

Problem Statement:

The Objective is to analyse the sensitivity of initial inventory to the number of units produced each month and the total cost.

Data Sources:

* + The **inputs** are identified as Initial Inventory, Holding Cost, Production Cost, Production Capacity, Demand and Storage Capacity
  + The key **decision variables** are Number of units to be produced in each of the six months
  + **Constraints** are identified as
    - Units produced must be less than or equal to Production Capacity
    - Units on hand must be greater than or equal to Demand
    - Ending Inventory must be lesser than or equal to Storage capacity
  + **Output** is the Total Cost incurred.

Model Approach:

* + Separate the data into inputs, decision variables, constraints and output.
  + In order to do sensitivity analysis on initial inventory, a one-way table is created using SolverTable with initial inventory as input and Number of Units produced, Total cost as Output

Sensitivity Analysis:

* **Initial Units Vs Units Produced each month**

As the number of initial units assumed increases from 1000 to 10000, the number of units to be produced in month 1 steadily decreases. There is no change in the number of units produced in the other months.

* **Initial Units Vs Total Cost**

As the initial inventory assumed increases from 1000 to 10000, there is a steady decline in the Total Cost.

Solution:

* When we assume that we have more units in hand initially, we do not account for its cost in the model, hence the decrease in total cost. Also, the number of units in hand can be used to satisfy the demand in month 1. So lesser units are produced in month 1 to accommodate for this adjustment and clearly it shouldn’t affect the number of units produced in other months.