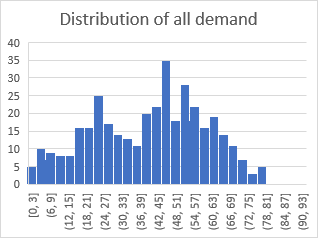
**MSBA7004 Assignment 4**

1. Dual Sourcing Game Strategy

Our group started by analyzing the historical data given and concluded:

|  |  |
| --- | --- |
| Mean of all demand | 42.81 |
| Stand Deviation of all demand | 19.32 |



Assuming the demand follows the same distribution across all time periods, we predicted the demand is generated following ~N(40,20).

Our team then adopted a Base-Surge ordering model, being conservative, we set the base order from China as 30, slightly less than the predicted mean 40, to ensure that we would yield a stable gain even in a scenario where total demand is low, while giving up the opportunity to capture greater gains. To cope with that, we also set the Mexico buy target as mean+1.5SD=40+20\*1.5=70 to respond to the market.

In summary, for every period, we would:

* Place a standing order of 30 units from China
* Order units from Mexico to ensure that we start with 70 units next period

This can be reflected in an extract of our Order History:

一張含有 文字, 螢幕擷取畫面, 數字 的圖片

自動產生的描述

After period 34, noticed the decaying demand of the market, we then ordered less from China for 2 more periods (15 per period) and stopped ordering from Mexico to allow our inventory on hand to decrease. We made a buy at period 43 as our inventory dropped to 1.

In summary I think our team’s strategy is a viable one, but we could have put in more effort in identifying the true distribution from the historical data (which is actually two sets of distribution before period 34 and after period 34), in order to decide the optimal standing order quantity.

On hindsight, after the debriefing lecture, we also understood that we can also compute the optimal base allocation level, to maximize our expected revenue (lower total cost).

1. From the question we have:

|  |  |
| --- | --- |
| Unit Cost | $5 |
| Sell Value | $10 |
| Salvage Value | $3.5 |
| Daily Demand Mean | 250 |
| Daily Demand SD | 34 |

Therefore the supermarket should purchase 276 boxes of lettuce.

If the demand is a uniform distribution from 300 to 400, the boxes to stock in:

Therefore the supermarket should purchase 377 boxes of lettuce.

1. From the question we have:

|  |  |
| --- | --- |
| Unit Cost | $10 |
| Sell Value | $30 |
| Salvage Value | $7 |

Cumulative probability of demand is as below:

|  |  |  |
| --- | --- | --- |
| Demand | Probability | Cumulative Probability |
| 300 | 0.05 | 0.05 |
| 400 | 0.10 | 0.15 |
| 500 | 0.40 | 0.55 |
| 600 | 0.30 | 0.85 |
| 700 | 0.10 | 0.95 |
| 800 | 0.05 | 1 |

Since 0.85<0.8696<0.95, according to the round-up rule, Sally should produce 700 T-shirts.

1. From the question we have:

|  |  |
| --- | --- |
| Ticket Price | $475 |
| Loss from bumped passenger | $800 |
| Seats available | 200 |
| Not show up (overbooking demand) mean | 40 |
| Not show up (overbooking demand) SD | 25 |

Optimal overbooking amount:

Therefore, the airline should accept 200+31.869 = 232 reservations.

1. From the question we have:

|  |  |
| --- | --- |
| Review Time (T) | 30 days |
| Lead Time (LT) | 4 days |
| Current inventory (I) | 45 |
| Daily demand mean (D) | 5 |
| Daily demand SD () | 2 |
| Service Level | 98% |

Target Inventory:

So the target inventory is 194 units.

Order Quantity:

If the inventory ever falls to 0, then he should order 194 units.