**Project II - The Newspapers Seller**

**Reporting:**

**Formulation:**

The newspapers seller can buy a newspapers and each one by 0.5 $ and sell her by 0.7 $ , he cannot buy less than 40 newspaper . and found a Newsday 🡪 (excellent,good,fair,poor) and probability for them is (0.18,0.42,0.32,0.08).if he not sell all the newspapers , he will sell the remaining newspapers by 0.15 $.

**Components :**

Entity 🡪 Newspapers

Attribute 🡪 salary , type of news

Activity 🡪 content (news)

State 🡪 number of pages , from where you get on her

Event 🡪 change in salary

**Objectives** :

**##1-Which questions should be answered?**

* Determine the optimal number of papers the seller should purchase to increase his profit.
* How does the price of selling the newspaper and of selling the unsold newspapers as a scrap affect your answer (the optimal number to purchase) in the previous question (1)?
* How does the size of bundle used to purchase newspapers affect your answer (the optimal number to purchase) in the previous question (1)?

**##2-Is simulation appropriate?**

**##3-Costs?**

**Experimental Design Parameters and Justification of experiment parameters values:**

**probabilistic**: this is the inputs which change through a probability distribution.(newsday type)

**Controllable**: this is the inputs which change through a manager.(bundles)

**Table to refer to a type of Newsday**

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of Newsday** | **probability** | **Cumulative** | **Digit Random** |
| Excellent | .18 | .18 | 1-18 |
| Good | .42 | .6 | 19-60 |
| Fair | .32 | .92 | 61-92 |
| Poor | .08 | 1 | 93-00 |

**Table to determine number of demand**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Demand** | **prob** | **dis** |  | **cumulative** | **prob** |  | **dis** | | **random** | **digit** |  |  |
| **Demand** | **Excellent** | **Good** | **Fair** | **Poor** | **Excellent** | **Good** | **Fair** | | **Poor** | **Excellent** | **Good** | **Fair** | **Poor** |
| **40** | **0.00** | **0.06** | **0.15** | **0.42** | **0.00** | **0.06** | **0.15** | | **0.42** | **0** | **1-6** | **1-15** | **1-42** |
| **50** | **0.07** | **0.09** | **0.22** | **0.28** | **0.07** | **0.15** | **0.37** | | **0.70** | **1-7** | **7-15** | **16-37** | **43-70** |
| **60** | **0.08** | **0.16** | **0.28** | **0.14** | **0.15** | **0.31** | **0.65** | | **0.84** | **8-15** | **16-31** | **38-65** | **71-84** |
| **70** | **0.12** | **0.19** | **0.18** | **0.10** | **0.27** | **0.5** | **0.83** | | **0.94** | **16-27** | **32-50** | **66-83** | **85-94** |
| **80** | **0.13** | **0.28** | **0.10** | **0.05** | **0.4** | **0.78** | **0.93** | | **0.99** | **28-40** | **51-78** | **84-93** | **95-99** |
| **90** | **0.22** | **0.12** | **0.05** | **0.01** | **0.62** | **0.9** | **0.98** | | **1** | **41-62** | **79-90** | **94-98** | **100-00** |
| **100** | **0.23** | **0.07** | **0.02** | **0.00** | **0.85** | **0.97** | **1** | | **1** | **63-85** | **91-97** | **99-00** |  |
| **110** | **0.08** | **0.03** | **0.00** | **0.00** | **0.93** | **1** | **1** | | **1** | **86-93** | **98-00** |  |  |
| **120** | **0.07** | **0.00** | **0.00** | **0.00** | **1** | **1** | **1** | | **1** | **94-00** |  |  |  |

**Newspaper :**

**Buy 🡪 50**

**Sell 🡪 70**

**And he bought 80 newspaper.**

**Revenue =demand \* 0.7**

**Lost profit = [0.2\*(demand - 80)]$.**

**Salvage from sale = [0.15\*(80-demand)]$.**

**Daily profit = revenue from sale - cost – lost + salvage.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Day** | **Random number for types of Newsday** | **Type of Newsday** | **Random number for demand** | **demand** | **Revenue from sales ($)** | **Cost of newspaper**  **[About (80)**  **Newspaper]**  **($)** | **Lost profit from excess demand** | **Salvage from sale ($)** | **Daily profit($)** |
| **1** | **66** | **Fair** | **3** | **40** | **28** | **40** | **0** | **6** | **-6** |
| **2** | **25** | **Good** | **30** | **60** | **42** | **40** | **0** | **3** | **5** |
| **3** | **40** | **Good** | **0** | **110** | **56** | **40** | **6** | **0** | **10** |
| **4** | **75** | **Fair** | **50** | **60** | **42** | **40** | **0** | **3** | **5** |
| **5** | **86** | **Fair** | **23** | **50** | **35** | **40** | **0** | **4.5** | **-0.5** |
| **6** | **79** | **Fair** | **83** | **70** | **49** | **40** | **0** | **1.5** | **10.5** |
| **7** | **94** | **Poor** | **0** | **90** | **56** | **40** | **2** | **0** | **14** |
| **8** | **31** | **Good** | **29** | **60** | **42** | **40** | **0** | **3** | **5** |
| **9** | **44** | **Good** | **2** | **40** | **28** | **40** | **0** | **6** | **-6** |
| **10** | **26** | **Good** | **87** | **90** | **56** | **40** | **2** | **0** | **14** |

**Total = 434 400 10 27 51**

**Notes:**

* **At day(1) he bought 80 and sell 40 so he has a salvage = 6$ and not has a lost profit , at the same day he lost in daily profit because he sold less than who bought so remained a quantity was sold (0.15).**
* **at day(3) he bought 80 and sell 110 so he has a lost = 6$ and not has a salvage, at the same day he earn in daily profit , he sold greater than who bought.**
* **If at any day he was had a demand (80) , he will have the best gain.**
* **So this (80) is not the optimal solution.**
* **For this, we can knew the optimal number of papers == average of demand==67 per day.**
* **And the average of total profit ==(5.1)$**

**Total profit = 434 – 400 – 10 + 27 = 51 $**

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