1. **Writing the problem as a robust optimization and solve it deterministically using Pulp or Pyomo:**

|  |  |
| --- | --- |
|  |  |
| s.t. |  |

Where is the index for products, is net profit per unit of product , is the surplus quantity added to demand forecast for product , is the maximum surplus quantity allowed for product , is the adjustable macro target percentage, is the estimated demand for product , is minimum total surplus quantity required for substitutability group G.

1. **Writing the problem as a two stage stochastic programming problem**

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| --- | --- |
|  |  |
| s.t. |  |

Where is actual sales of product under scenario .