MASTER'S PROGRAM COMPUTATIONAL SCIENCE
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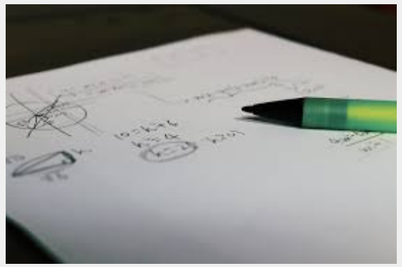
Optimization model for multi-product multi-period multi-supplier raw-material selection and composition, and order quantity problem with minimum one-year order quantity contract

Problem

A beverage company that produces a large number of powdered drinks has a problem:

- Supplier selection,
- order allocation, and
- raw-material composition

Method



Build optimization model based on rules, policies, and other supporting data.

Supporting Data

- Raw material specification per supplier,
- Raw material composition in finished goods,
- Finished good weekly demands, and
- Warehouse capacity.
- Minimum one-year order qty criteria.

Solving optimization model by creating computer codes using R language.

Findings

We derived a mixed-integer linear programming (MILP) to solve the problem. We also proposes a number of objective functions for the MILP to measure the balance of the purchase price criteria and the minimum one-year order quantity criteria.
Our numerical experimentations shows that our MILP give the desired optimal solutions.

Conclusion

the problem faced by the beverage company can be solved using our MILP model. It gives the desired optimal solution and can be used by the company as a part of decision support system in their supply chain management.