UltraSuperMiracleSoraFinalAgentZ

An agent submitted to the ANAC 2025 SCM league

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1. Introduction

- In SCML, factory size and product types are fixed
  - Main cost factors:
    - Inventory holding cost (over-purchasing)
    - Shortfall penalty (delivery failure)
  - To maximize profit:
    - Avoid excessive buying and selling
    - Trade necessary quantities at appropriate prices
- Goal: Design *UltraSuperMiracleSoraFinalAgentZ* to achieve both profit maximization and risk management

2. Design and Strategy of UltraSuperMiracleSoraFinalAgentZ

- **2.1 Basic Design Policy**

  - Reliability score = success rate × price evaluation

  - Factors considered:
    - Inventory state
    - Delivery deadlines
    - Production capacity
    - Time-dependent concession strategy

  - Priority: avoid shortfall penalties > minimize storage costs

2. Design and Strategy of UltraSuperMiracleSoraFinalAgentZ

- **2.2 Strategy as BUYER**
  - Early stage (~15% steps): actively procure raw materials
  - Later stage: restrict purchases to reduce inventory costs
  - Reject long-term delivery contracts (> 7 steps ahead)
  - Partner selection: prioritize high-trust partners
  - Flexible acceptance if inventory is insufficient

2. Design and Strategy of UltraSuperMiracleSoraFinalAgentZ

- **2.3 Strategy as SELLER**

  - Compute max safe sales today() based on inventory, supply, and production lines
  - Conservative contracts to avoid shortfall penalties
  - Dynamic concession strategy:
    - Early stage → aim for favorable prices
    - Later stage → sell-out strategy (accept lower prices)
  - Contract evaluation considers: delivery time, quantity, inventory, production, trust score

3. Experimental Result

- Settings:
  - Steps = 30, Processes = 3, Configs = 4, Repetitions = 3
- Results:
  - Profit ≥ 1.0 in all cases
  - Always outperformed baselines (SyncRandomStdAgent, RandomOneShotAgent)

3. Experimental Result

Result Table1

Experient	MyAgent	SyncRandomStdAgent	RandomOneShotAgent
1	1.004	0.792	-0.071
2	1.003	0.937	0.438
3	1.139	0.937	0.097
4	1.008	0.783	0.221
5	1.232	0.843	-0.189
Average	1.077	0.859	0.099

4. Conclusion

- Proposed agent dynamically adapts strategy based on:
  - Role (BUYER / SELLER)
  - Inventory status
  - Delivery timing
  - Partner reliability
- Consistently secured stable profits across all settings
- Outperformed baseline agents in every experiment
- Effectiveness of role-dependent and dynamic negotiation strategies confirmed