

'NegoAgent': An Agent Submitted to The ANAC 2023 SCM League OneShot Track

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1 Introduction

In 2021, a new track called SCML-OneShot was introduced. The OneShot track is a simpler form of the SCM world in which agents do not need to consider long-term planning or production scheduling, and instead emphasize negotiations. In this track, an agent's utility (it's profits) on a given day is completely determined by the set of contracts it secures on that specific day.

The tutorial 'Developing an agent for SCML2023 (OneShot)'[1] presents a few types of agents. In this work, we based our agent on the ideas of AdaptiveAgent and LearningAgent. AdaptiveAgent's concept is to make him consider other negotiations, and LearningAgent tries to learn about different partners over the simulation time in a simplistic manner.

2 Design

We created our agent based on the winner of SCML 2022 competition, which based his work on the ideas of AdaptiveAgent and LearningAgent. AdaptiveAgent sets his behaviour based on how negotiations are going during the current day, while LearningAgent sets his behavior based on a combination of the prices it has seen on the current day and how its negotiation partner has traded in the past. Both of these agents tend to focus almost exclusively on price, between $(Pmin, Pmax)$. The price range (this year) is only two consecutive values, which makes the score of the agent almost insensitive to prices of agreements but only on the ability to match its supply and demand.

2.1 Negotiation Choices

Both agents are hard headed, means once they see a good price from a negotiator, they insists on it for future negotiations. In other words, they assume that the price will only improve over time. This year the importance was to make the score insensitive to the prices of agreements, and emphasize the match between the supply and demand. Therefore, we adapted the agent behaviour to take in account the supply and demand in the negotiation offers, and response in addition to the price.

3 Performance

In order to evaluate our agent, we compared it's performance among other agents: LearningAgent, AdaptiveAgent and PatientAgent (The winner from last year competition). We can see from Figures 1, 2 that our agent- NegoAgent has one of the highest scores, and in some simulations gets the best score.

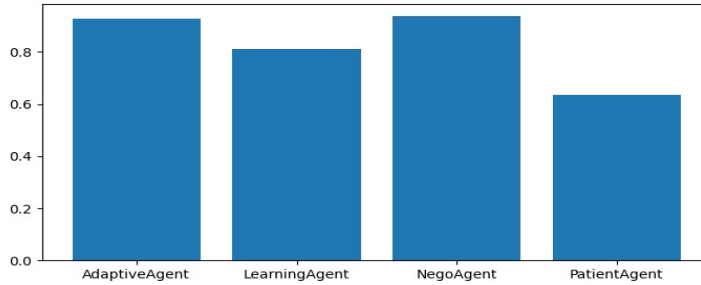


Figure 1: Results of 10 steps (days)

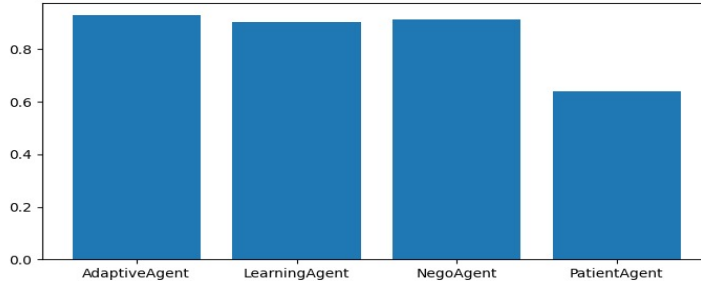


Figure 2: Results of 100 steps (days)

References

- [1] http://www.yasserm.com/scml/scml2020docs/tutorials/02.develop_2020_.html