Report

on

Assignment 3: Trading agent competition
Connected Systems and Devices
(DA614A)

Submitted

by

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I. Intoduction

In this assignment we have to implement an agent that is capable of participating in the Supply Chain Management game for the Trading Agent Competition(TAC). We have to implement an agent that will able to compete against other agent during the game. Basically, we have to develop a strategy that is able to compete with other agent and can perform better during the game session.

II. Strategy

Our strategy is based on **probability**. The lower factory utilization for our agent, the higher chance of accepting customer RFQs(Request For Quote) are. The reason for this kind of strategy is to be somewhat adaptable to the unknown conditions of how a session of the game plays out.

We arrived to this form of strategy by observing the ExampleAgent provided with the game. It was quickly noted that the core problem of said agent is that of accepting far too many customer RFQs which ends up with the agent having a lot of late or missed delivers. Due to that being the core problem of the current agent we decided to prioritize fixing that issue, and after seeing how well it performed we would expand on the ideas for improving it with regards to the remaining time before the tournament.

After successfully implementing a system adhering to our strategy improvements were obvious compared to that of the standard ExampleAgent. Testing our agent showed that we performed similarly to that of the dummy agents populated by the server when it came to deliveries.

However, it is worth noting that while our strategy is on good way to become something effective for the task it still uses trivial ways of ordering the actual components, as well as getting the price for RFQs, both of customers and components. Due to this the agent does not perform so well at the task of achieving a high score.

To further increase the results of our agent it would be needed to develop better strategies for those parts as well. However that has not been achieved within the time before the tournament.

III. Experiences from the competition

After determining the strategy to be adopted, and following the implementation of the code, we prepared for the **Trading Agent Competition** on Thursday, December 6. On this date there will be a competition where all groups will compete against each other using their TAC SCM agents.

A. Before competition:Traning

So, the goals of the ”before TAC” are:

- See if our agent complies with all the rules of the competition
- See if our agent is competitive
- See to it that our agent performs in a way we feel to be satisfactory considering how much time we have to put into the project.

When developing the agent we tested it in two ways. One being that of playing against Dummy agents, which was done most of the time. The other being playing against itself, as in a game populated of only our agent in all six slots. The results were rather similar in both cases, which led us to believe that our agent performs in a rather steady and somewhat predictable way.

At the end of this training, we wanted to set ourselves a goal for D-Day, not to finish last in the competition and above all, to try to make sure that our agent is always close to the first place

B. During competition

In the competition, on Thursday, December 6 the tac06scm setting were used, however, the time for each day changed from 15 to 10 secondes, and the number of days will be reduced from 329, which means that the simulation took approximately 33 minutes.

For this competition, 4 groups presented their agent, ”SNSA”, ”Cat”, ”ThinAgent” and ”OurAgent”. The latter being indeed ”our agent”. After the first days of competition, the first observation: ”ThinAgent” is forced to abandon, the rest of the TAC will therefore be between 3 agents. The winning agent being the one with the most money, we followed the curve of our money throughout the 329 days. Second observation, it is only after 20 days of competition that the curve starts to rise after a long descent to 700 000 SEK on our bank account.

Unlike the other 2 remaining agents, it was very difficult for us to start, we are on it up to - 2 million, and we were therefore in 3rd place at 37 days. A few days later, in the 46th, our account turns positive and we reach second place.

The next 50 days, we were in 3rd place, but we were very close to the other 2 agents with 1 million in our bank account against 1.7 million on their side. The 100-day mark having been surpassed, we are gradually moving closer to second place. It is during the 117th that our curve rises to 3 million and allows us to be 2nd.

Our pride will remain at the halfway point, the 165th day of competition where we can make a first assessment:

- 1st: OurAgent: 2,967 million
- - 2nd: Cat: 2,925 million
- - 3rd: SNSA: 1.9 million

We are very proud to have tasted first place during this competition.

The rest of the competition was very close! We reached a peak at 3,029 million while the other 2 shared first place. It is after some big falls, bringing us back into the red that we will remain 3rd for the rest of the competition. Strong climbs followed by strong descents that will make us finish the competition with more than a million!

Congratulations to the "Cat" group who will finish first at the end of the 329th day with 4.9 million. The other agent will end up in second place with 3.5 million.

A very interesting competition to follow.

C. After competition

The agent survive until the end of the competition, we get the third position after the (SANA and CAT) groups with 1.116M in vinst Our agent managed to stay competitive during the 33 minutes of competition.

Our main goal was that our agent would not be left behind throughout the competition period and we succeeded.

IV. Output

Day: 246 Day:329

V. Experiences that we acquired

It was a great experience we gained during the whole assignment. We got a chance to build our own strategy to put and make our agent compete with other agents and not to be in negative bank balance. Though sometimes we are deteriorating by giving penalties for late delivering. At the last few days when it was deteriorating, we came to negative I thought we will not able to make it, but one of my team member said we can able to make our bank balance to positive if we are lucky. And, yes we were lucky though we came last but we able to fulfill all the request from the customer. Overall, it was a good experience.

One thing to note is that although our, in hindsight rather limited tests, seemed to indicate that our agent behaved in a somewhat predictable way this was not the case during the competition. Most likely due to the external factors of how all the other agents acted in the game, our agent started to display a peculiar pattern of first earning a lot of money and having a steady rising curve of profits. Then suddenly plummet/crash into often negative values and then repeat. This lead to the profit graph showing patterns of "hills and valleys". The interesting part of this is that the factory utilization graph followed suit by showing close to the inverse. Our belief is that this was due to our agent not being aggressive enough when it came to acquire factory RFQs, and in such a way temporarily being locked out of the competition as the others were periodically more aggressive

VI. Conclusion

Finally, we conclude that TAC is a very good way to build our strategy in such a way, so that customer can able to make request and based on the request we deliver all the products on time, and sometime due to late delivery we has to give penalties. We achieved our goal is to not to stay behind.

It is worth to keep this experience in mind that you can not count on test data to be reliable when the factors of the "real" situation are heavily different. In retrospect this might go without saying, however by experiencing it personally we, as a group, believe that it will be even better understood how crucial extensive testing is of agents, models, etc.

References