ID2209 – Distributed Artificial Intelligence and Intelligent Agents

Assignment Y – Agents & stuff

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Agent Negotiation and Communication

In this assignment, we were tasked to create an auction scenario where we are able to communicate and negotiate within the agents by message passing and FIPA protocol. We also get to familiarize with the new agent called auctioneer who communicates with all the participants in the auction and decides the winner depending on the type of auction used. The participants in the auction have the preference of what they want to buy and accordingly, they will choose the auction.

How to run

Run GAMA 1.7/1.8 and import filename DAIIA_Group_21_2 as a new project. Press main to run the simulation. Unzip DAIIA_Group_21_2.zip and import the resulting directory in GAMA 1.7/1.8 as a new project.

Navigate to creativity Model.gaml and press on the experiment button above (guests assignment) to run a simulation of the basic assignment, of the challenges. There are many parameters that can be tweaked to modify the behaviour of the simulation, and that will be explained in the next sections. Some examples are the budget of the participants, a maximum value of starting bid (in Dutch auction), lowest value to below which the auction gets cancelled etc.

Species

Initiator

This agent was responsible for initiating the auction. It first makes an announcement when starting an auction and based on the bids received it will declare the winner. If the received bids are below the threshold value of the initiator the auction is then cancelled.

Participators

This agent was responsible for taking part in the auction based on the interest i.e the product offered by the auction. The budget is allocated to the participant in the beginning and it bids accordingly in the auction of its choice. If the bid is accepted by the initiator that participant is declared as the winner.

Selling Place

This the agent which serves as a location for the auction.

Implementation

We started with creating the auctioneer which has a skills FIPA and it starts moving once the simulation is started. We created the fixed place for the auction called selling place and tried implementing dutch auction. The initiator starts with the highest possible bid which can be changed by the user and as soon as participants give bid within the range of initiator the winner is declared. However, if any of the participants fails to bid above the minimum threshold budget of auctioneer then the auction is cancelled and agent leaves the selling place.

We then started with the implementation of English auction in which the bidding starts with the lowest price and the winner is declared based on who has the highest bid. We simply created the list and assigned random budgets to the different participants.

Results

As you can see in the following image the winner of the Dutch and English auction is being printed in the log window. Both the auctions are taking place at the same time. The auctioneers start moving towards the respective selling place and participants attend the auction based on the product they are interested in. The winners are declared by the auctioneers and then they are free to leave the selling place.

In the following image, we can see the log where the winners are declared in auctions

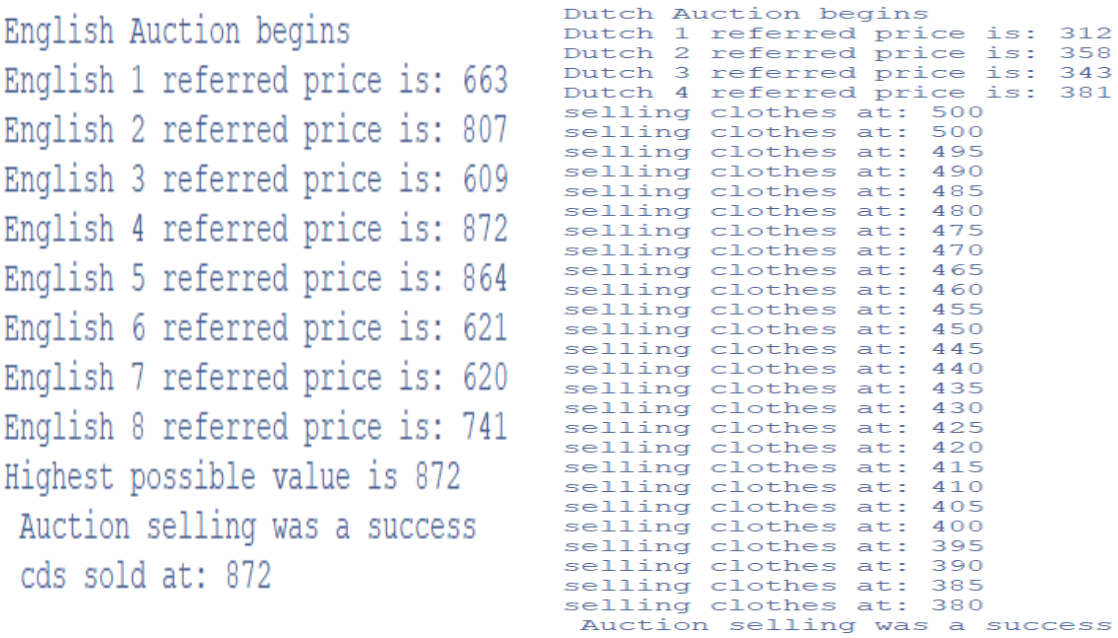

Figure 1: A screenshot of the final solution.

Challenge 1

To complete the first challenge, we created initiator who sets the highest price for the dutch auction. Once the initiator announces the start of auction participants start bidding and auctioneer decreases the bid every time until it can find an agent with the bid as per the set budget of an initiator. If no agent is able to make a bid as per the minimum value of an auctioneer then the auction is cancelled and initiator leaves the selling place.

Challenge 2

In challenge 2 we implemented multiple auctions at the same time where the agents are divided into different selling places based on their interest. The auction starts as soon as all the participants are present in the selling location and the winner is declared based on the bids made by the participants.

Creative implementation

For our creative solutions, we created the auction in which the base price is not declared by the initiator. Whichever agent comes first and puts the bid acceptable for initiator it accepts the bid staight away. If the bid is not good enough for the initiator it will reject the agent and wait for the next agent. Until the requirement meets the agents will be allowed to visit the selling place and once the proper bid is made above any base price the bid is accepted straight away.

Qualitative/Quantitative questions	*Answer*
Time spent on finding and developing the creative part	*2 hrs*
In what area is your idea mostly related to…	*Similar to first come first serve basis*
On the scale of 1-5, how much did the extra feature add to the assignment?	*2*
On the scale of 1-5, how much did you learn from implementing your feature?	*2*

Discussion / Conclusion

Creating simple Dutch auction was easy to implement but simultaneously running multiple auctions was a bit time consuming as there has to be communication between all the agents. Creating the creative part can be done in the separate file as it complicates the program which is running the multiple auctions at the same time and the user might get confused after observing the log as it declares the information for all the auctions at the same time. Overall the assignment was very good to implement.