CSCE 475/875 Multiagent Systems

Handout 24: Game Day 3 Auction Day Analysis

November 2, 2017

Auction Rounds

Table 1 shows some of the basic information for each of the 15 rounds of auction. Git Rekt won three times, Rogue Wan A, Rogue Wan B, Dishonest Agents, Quiero MAS, and Team Cerberus each won two items, and The Whales and Winter Slayers won one item each.

Rd.	Auction	Winner (#)	Winning Bid	Payment
1	English	Rogue Wan B (1)	$300	$300
2	Japanese	Dishonest Agents (1)	$380	$380
3	Dutch	The Whales (1)	$360	$360
4	Sealed, First Price	Dishonest Agents (2)	$300	$300
5	Vickrey	Git Rekt (1)	$370	$350
6	English	Rogue Wan B (2)	$285	$285
7	Japanese	Winter Slayers (1)	$355	$355
8	Dutch	Quiero MAS (1)	$340	$340
9	Sealed, First Price	Git Rekt (2)	$200	$200
10	Vickrey	Git Rekt (3)	$330	$300
11	English	Team Cerberus (1)	$355	$355
12	Japanese	Team Cerberus (2)	$260	$260
13	Dutch	Quiero MAS (2)	$290	$290
14	Sealed, First Price	Rogue Wan A (1)	$310	$310
15	Vickrey	Rogue Wan A (2)	$340	$281
			TOTAL	**$4666**

Table 1. Winning bidders, winning bids, and payments for all rounds.

For the following, when needed to save space, we use the following acronyms for the following nine teams as listed in Table 2.

Team Cerberus	**TC**	The Whales	**TW**	Rogue Wan B	**RWB**
Rogue Wan A	**RWA**	Winter Slayers	**WS**	Git Rekt	**Git**
Quiero MAS	**QM**	Dishonest Agents	**DA**		

Table 2. Acronyms for nine of the eleven teams.

Table 3 shows the bids for the three rounds of English auctions. The amounts of the winning bids increased from Round 1 to Round 6 to Round 11.

Round 1		***Round 6***		***Round 11***	
Team	**Bid**	**Team**	**Bid**	**Team**	**Bid**
RWB	$30	RWB	$30	Git	$150
RWA	$50	WS	$50	TC	$200
GR	$100	RWA	$60	RWA	$210
TW	$130	RWB	$70	DA	$220

RWA	$150	RWA	$80	RWA	$225
TC	$160	RWB	$90	TC	$250
TW	$170	RWA	$95	DA	$251
RWB	$200	RWB	$100	RWA	$255
DA	$210	RWA	$101	TC	$260
RWB	$220	RWB	$105	DA	$261
DA	$230	WS	$120	RWA	$265
RWB	$240	RWA	$125	TC	$275
DA	$245	RWB	$130	RWA	$280
RWB	$250	RWA	$135	TC	$290
DA	$252	RWB	$140	RWA	$300
RWB	$260	WS	$150	TC	$310
DA	$270	RWB	$155	RWA	$320
RWB	$280	DA	$170	TC	$321
DA	$290	RWB	$175	RWA	$325
RWB	**$300**	WS	$190	TC	$326
		RWB	$195	RWA	$327
		WS	$200	TC	$330
		RWB	$210	RWA	$335
		WS	$230	TC	$345
		RWB	$235	RWA	$350
		WS	$240	TC	$355
		RWB	$245		
		WS	$250		
		RWB	$255		
		WS	$270		
		RWB	$275		
		WS	$280		
		RWB	**$285**		

Table 3: English auction bids (winning bid in bold).

Table 4 shows the teams participating and exiting the three rounds of Japanese auctions.

Round 2		***Round 7***		***Round 12***	
Team	**Amount Out**	**Team**	**Amount Out**	**Team**	**Amount Out**
TC	$100	DA	$180	DA	$180
TW	$280	RWA	$290	WS	$240
RWA	$305	TW	$300	RWA	$260
WS	$310	Git	$355		
RWB	$380				
Win:		**Win:**		**Win:**	
DA	$380	WS	$355	TC	$260

Table 4. Teams participating and exiting, for the three rounds of Japanese auctions.

As can be seen from Tables 3 and 4, there were more bids during the English rounds than in the Japanese rounds.

Table 5 documents the online session logs of the auction rounds (Dutch descending, Sealed Bids First Price, Sealed Bids Second Price – Vickrey).

Team	Auction Type	Round	Bid	Time Stamp
The Whales	dutch	3	360	12:55:33.1282530
Git Rekt	firstprice	4	185	12:58:35.7882070
Team Cerberus	firstprice	4	210	13:00:59.8049950
Rogue Wan A	firstprice	4	170	13:01:02.2644370
Dishonest Agents	firstprice	4	300	13:01:11.6731380
The Whales	firstprice	4	290	13:01:26.6838040
Rogue Wan B	firstprice	4	220	13:01:26.8385140
Winter Slayers	vickrey	5	340	13:05:08.2886630
Team Cerberus	vickrey	5	118	13:05:16.3553460
Quiero MAS	vickrey	5	210	13:05:17.6233230
Git Rekt	vickrey	5	340	13:05:19.9688750
Winter Slayers	vickrey	5b	350	13:07:06.4317740
Git Rekt	vickrey	5b	370	13:07:26.0055720
Quiero MAS	dutch	8	340	13:26:50.4144990
Rogue Wan A	dutch	8	340	13:26:50.8428920
Git Rekt	firstprice	9	200	13:29:45.9516120
Quiero MAS	vickrey	10	300	13:32:13.1103510
Git Rekt	vickrey	10	330	13:32:23.0240780
Winter Slayers	vickrey	10	189	13:32:23.0644930
The Whales	vickrey	10	100	13:32:44.3834430
Dishonest Agents	vickrey	10	80	13:32:49.1165940
Team Cerberus	vickrey	10	270	13:33:08.9556150
Quiero MAS	dutch	13	290	13:49:37.6168200
Rogue Wan A	firstprice	14	310	13:51:20.3067650
Git Rekt	firstprice	14	200	13:51:23.6384030
The Whales	firstprice	14	85	13:51:35.6792200
Winter Slayers	firstprice	14	88	13:51:36.8793190
Dishonest Agents	firstprice	14	120	13:51:52.9950600
Team Cerberus	vickrey	15	281	13:53:44.4915750
Rogue Wan A	vickrey	15	340	13:53:45.4204390
The Whales	vickrey	15	65	13:53:46.4904790
Git Rekt	vickrey	15	255	13:54:00.8858180
Winter Slayers	vickrey	15	89	13:54:18.9560010

Table 5. Log of online bid submissions for all rounds.

Team Statistics

Table 6 shows the private valuations of each team for 15 rounds of auctioned items. All teams followed the rules correctly. All but two teams (Dishonest Agents and Team Cerberus) assigned $300 to the remaining 4 items outside the 11 required values.

Rd	Rogue Wan A	Winter Slayers	The Whales	Dishonest Agents	Git Rekt	Rogue Wan B	Team Cerberus	Quiero MAS	Avg.
1*	$190	$130	$230	$210	$130	$300 # ^	$170	$50	$156.78
2+	$300	$300 #	$210	$230 ^	$30	$300 #	$90	$70	$170.22
3+	$90	$210 ^	$300 #	$70	$50	$300 #	$230	$300 #	$172.56
4+	$170	$30	$300 #	$300 # ^	$190	$230	$210	$170	$178.22
5+	$70	$300 #	$190	$0	$300 # ^	$70	$110	$210	$139.44
6*	$150	$230	$300 #	$170	$170	$210 ^	$70	$30	$148.44
7+	$230	$300 # ^	$300 #	$150	$300 #	$190	$30	$150	$184.11
8+	$300 #	$300 #	$170	$30	$90	$300 #	$50	$300 # ^	$172.00
9*	$50	$190	$50	$90	$300 # ^	$130	$150	$90	$117.67
10+	$30	$170	$110	$110	$300 # ^	$50	$190	$300 #	$141.11
11+	$300 #	$110	$130	$300 #	$150	$150	$300 # ^	$230	$186.78
12*	$110	$150	$30	$130	$110	$170	$260 # ^	$190	$129.11
13+	$130	$50	$150	$50	$70	$110	$300 #	$300 # ^	$130.33
14	$210 # ^	$90	$90	$190	$210 #	$90	$130	$130	$128.22
15*	$300 # ^	$70	$70	$0	$230	$30	$280	$110	$122.78
TOT	**$2,630**	**$2,630**	**$2,630**	**$2,030**	**$2,630**	**$2,630**	**$2,570**	**$2,630**	

Table 6. Private valuations of each team for 15 rounds of auctioned items. * indicates a round where there was only one team with a much higher valuation than the rest. E.g., Round 1 where Rogue Wan B has $300, $70 higher than the 2nd highest valuation. + indicates a round where there were more than one $300 valuations for the same item. # indicates the team with the highest valuation. ^ indicates the winning team.

Now, we look for "opportunities" for teams to make large gains. That is, if there was only one team whose valuation for an item was maximum, then that would be an opportunity for that team to make a gain, especially if the closest valuation was much smaller. Out of 15 rounds, there were four (4) rounds where such an opportunity existed—those highlighted with an * in Table 6. Team Cerberus, Git Rekt, Rogue Wan B, Rogue Wan A, and The Whales each had such an opportunity. All but The Whales won their respective round.

Further note that out of 15 rounds, there were 11 times where the team that had the highest valuations (or tied-highest) won the item. This is fairly consistent with our expectation.

Figure 1 shows some trends of how teams value the items in each round. We see that the average valuations of items during the Vickrey rounds were in general lower than those in English. This is likely because teams were more confident about the English rounds because of its open-cry nature, as they felt they could model other teams better and react better to win an item accordingly.

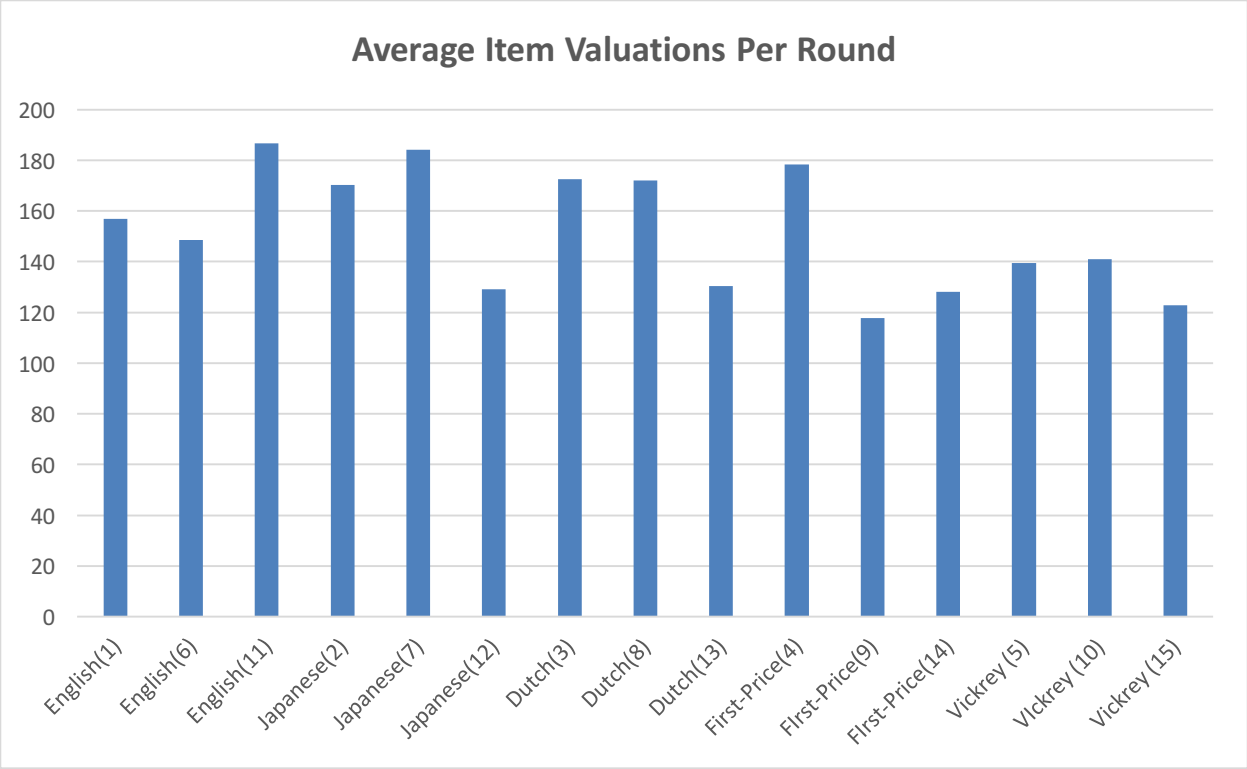

Figure 1. Average item valuations per round.

Table 7 showed the auction rounds that each team participated. Further, the table shows that all teams participated in the rounds where they knew they at least shared the maximum valuation—i.e., $300—of the auctioned item. There were also teams that participated in rounds that they knew they were unlikely to win the auction because of their low valuation of the item being auctioned (as low as $30). That means, these teams were willing to lose $2 for each such round for nothing. No team participated in all 15 rounds. IMPORTANT NOTE: During the Game Day, we announced that Round 1's opt-in fees would not be collected. After discussions between the TA and myself, we decided to include them as 7 out of 8 teams participated, and we were able to decide that Quiero MAS did not participate.

Team	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOT
Dishonest Agents	√	√	√	√		√	√	√		√	√	√		√		11
Git Rekt	√			√	√		√		√	√	√			√	√	9
Quiero MAS			√		√			√		√	√		√			6
Rogue Wan A	√	√		√		√	√	√			√	√	√	√	√	11
Rogue Wan B	√	√	√	√		√		√			√	√				8
Team Cerberus	√	√	√	√	√					√	√	√	√		√	10
The Whales	√	√	√	√			√			√	√		√	√	√	10
Winter Slayers	√	√	√		√	√	√	√		√	√	√	√	√	√	13
TOT	**7**	**6**	**6**	**6**	**4**	**4**	**5**	**5**	**1**	**6**	**8**	**5**	**5**	**5**	**5**	**78**

Table 7. The number of teams "in" (√) for each round of auctions. Shaded cells indicate winning teams.

Table 8 shows the final utility tally for each team. Per this table, **Git Rekt won the Game Day**. They are the only team that made a positive gain (TOTAL > $2,600). The final rankings are provided in the table at the end of this handout. Git Rekt made a large gain in Round 9 as the only team that participated in that round.

Team	Original Money	Utility Gained from Items Won (#)	Payment	Participation Fee	TOTAL
Git Rekt	$2,600	$900 (3)	$850	$18	**$2,632**
Quiero MAS		$600 (2)	$630	$12	$2,558
Team Cerberus		$560 (2)	$615	$20	$2,525
The Whales		$300 (1)	$360	$20	$2,520
Winter Slayers		$300 (1)	$355	$24	$2,519
Rogue Wan B		$510 (2)	$585	$16	$2,499
Rogue Wan A		$510 (2)	$591	$22	$2,497
Dishonest Agents		$530 (2)	$680	$22	$2,428

Table 8. Total utility for each team. Total Utility = Original Money + Utility Gained from Items Won – Payment – Participation Fee.

Individual Team Analysis

Table 9 documents my comments on each team's worksheet and reports. Almost all teams adapted their strategies after observing the auction rounds, showing good agent behavior: observe, reason, and act. Different teams also had different "feels" for different auction protocols. Some teams were more comfortable with English auctions, some were more comfortable with sealed bids, and so forth. Some teams did not feel confident with First-price Sealed-bid auctions.

Team	Pre-Game	Tracking	Mid-Game/Post-Game
Quiero MAS	Had a detailed pre-game strategy, for each auction protocol, for each round; also had a contingency plan; also had a strategy to get at least one item. Thoughtful and careful.	Tracked well; modeled other agents well.	This team stuck to their strategy very well. They also observed the other teams very well with detailed tracking and modeling. In Round 13, they pulled off a very timely move to make positive utility, and they did it very well. They also participated in only 6 rounds of auctions. "*The beginning rounds were very competitive and expensive. We think this is because teams were desperate to win an item, since we were required to win at least one item. The later rounds, which we expected to be more competitive for this reason, were actually less competitive since most teams won an item early on. It seems that the teams that waited until the end may have made the best overall utility.*" *"For us, the Dutch auctions proved easiest to win since it only takes one bid and the price can't be driven up any higher. We were able to obtain 2 items from Dutch auction rounds, and though we made negative utility on one of them, we were then able to shift to a risk-neutral strategy and make positive utility on the other."* *"There was a fair amount of luck involved; teams randomly choose their valuations beforehand and could not adjust them once they observed what other teams were bidding. This meant that if a team happened to highly value an item that none of the other teams valued highly, they could obtain it at a low price and make positive utility, like the team that happened to be the only one participating in one of the rounds. However, if a team's valuations mostly match that of other*

			teams, it becomes harder for them to win an item at a reasonable price."
Team Cerberus	Thought about winning the game days league; based their valuations on desirability of the dinosaurs; game-playing as they indicated that they would try to prevent teams without items from getting them; did not assign $300 to the remaining four items (puzzling).	Several mistakes in terms of recording the winning bids.	Made changes mid-game to their strategy: decided to opt out in Rounds 6-9 because they valued the items quite low, in face of the aggressive and over-spending behaviors of agents; and changed to become more aggressive starting Round 11 in order to win an item. "*Teams were much more aggressive in the early rounds and paid well over the max assigned utility value for an item. Teams also became more desperate towards the end and bid higher to ensure they did not get the penalty of not obtaining an item … Many rounds the winning bid was above 300 which didn't seem like a good strategy but with all teams being so aggressive that might have been necessary to win an item ... Overall, we learned the aggressive nature of our classmates on bidding amounts. Certain rounds such as English auction and Dutch auctions were always high and no potential to gain significant utility was given throughout the day. As such we predict that the winners of game day three will ultimately come down to which team lost the least amount of utility. Although it is possible that some teams gained positive utility it was not the norm."*
Rogue Wan A	Had a fairly detailed strategy; game playing; broke game day into three batches, and had different expectations; had different strategies for different rounds; no contingency plan.	Tracked well; Modeled other teams.	"Teams are trying to get at least one item as soon as possible in first two 5 rounds. Unlike the expectation mentioned in class, the last 5 rounds are much less aggressive than the first two 5 rounds. Risk-averse agents are more than Risk-seeking agents in first 5 rounds. So, the auctioneer gets more money. Risk-seeking agents are more than Risk-averse agents in last 5 rounds. So, the auctioneer gets less money." They were particularly calm and collected: they won their first item at Round 14, past 1:45 PM of class time.
Git Rekt	Game playing; with goal "to minimize the utility of other agents rather than maximize our own utility"; different strategies for different rounds; learn from other teams in earlier rounds first and then take risks; no contingency plan.	Tracked well; Modeled other teams.	After the first 5 rounds, planned to capitalize as they predicted that the next 5 rounds to be weaker; After 10 rounds, decided to only enter if they saw opportunity to raise the auction stakes for other teams "We got very lucky by being the only team to participate in Round 9 giving us such a high utility. After gaining what we believe to be the high ground we adjusted our strategy to be much more defensive as to not blow our lead while keeping others from having a high utility with the highest valuation being only $300. Keeping track of the other teams was very helpful so we knew what decisions we should make in the end and which auctions would be beneficial for us to participate in. Our best auction was the Vickrey auctions which we decided our values on based on the circumstances and the other teams' standings."

Winter Slayers	Detailed and thoughtful strategy; "English auction can be used for observation purpose in which we can figure out other teams' bidding strategies …"; a set of insightful observations and sensible assumptions; based valuations on assumptions and observations; has a contingency plan; did not necessarily game play.	Tracked well; Modeled other teams.	After first five rounds, decided to take a risk up to 50 negative utility for the upcoming rounds; Missed an opportunity for Round 9; did not game play for later rounds. "*When a team does not have an item, they are motivated to bid higher, maybe if it means not following their strategies. If they have an item, they still choose to participate in the future rounds in order to spoil the game for others or to gain some utility back."*
The Whales	Strategy okay. Had different strategies for different auction protocols; risk averse from the beginning as they anticipated others to be risk-seeking at the start of Game Day 3; had a contingency plan	Tracked fairly well; modeled other teams; observed other teams well for the first 12 rounds	Some of the mid-game observations and implications were not quite fully based on evidence or valid assumptions. "In addition to the mid-game observations, we can conclude that the teams did not play as per our initial assumption that they will be risk-seeking at start of game and risk-averse at end of the game. It was in fact the opposite. Every team made sure to win at least one toy due to the game day rules. Some teams were very focused on getting as many toys as possible and even ended up getting 3. Our valuations for the items were bad towards the end because since people were determined to get toys, most of the bids were above $300."
Rogue Wan B	Definitely game-playing; willing to sacrifice utility in order to win early and cause problems for other teams; decided not to participate in any of the Vickrey rounds; no contingency plans; did not consider how other agents might play rationally or otherwise	Tracked fairly well; modeled other teams	After first 5 rounds, "… we are going to try to stall the auctions and bid slowly … should make it so that we get through fewer rounds, so more reams will have to bid over $300 to win …" "Attempting to sabotage other teams can backfire heavily, as it did for us when we tried to call another team's bluff and won … A more conservative approach after winning our first item likely would have allowed us place near the top instead of towards the bottom."
Dishonest Agents	Assigned $0 to two of the four remaining items (puzzling); Good goals: maximize utility, decrease fees to be paid, secure items. Game playing, in order to model other teams. Participated in only open cry auctions (English & Japanese) (but also indicated would play other rounds, inconsistent game plan); some contingency plan, but not clear on how it would be executed	Tracked fairly well; did not make round-by-round observations; did not model other teams; did not compute the final utility correctly	Mid-game strategies not quite consistent with bidding behaviors. Did not provide general observations or lessons learned; only observations of some specific teams.

Table 9. Our comments and observations of team strategies, worksheets, and reports.

Lessons Learned

Here are some overall lessons learned.

1. All teams except Dishonest Agents and Team Cerberus rationally assigned $300 for the four remaining items. Rationally, the four remaining items should be assigned $300.
2. Rationally, a team, without knowing or speculating on what other teams might do, should value the Vickrey round items at $300. Why? This would allow a team a chance to be aggressive and put a higher bid with the hope that it would win the item at a second price that is lower than $300. Likewise, the opponent winning bidder would also likely to pay higher than what they valued the item.
3. Participating in every round indiscriminately was unwise as the loss of $2 as fee for each round lowered the utility of a team. All-pay auctions are all-pay for a reason: to make sure that the only teams that have a chance to win an auction are the ones participating. Thus, if a team values an item lowly, then that means the team will have close to 0 chance in winning the item. Then the team should not participate.
4. On the other hand, being conservative and only participating a few rounds might not afford enough opportunities for a team to get high rewards.
5. On average, teams allocated valuations to the items in this manner: Most for Batch 1 (rounds 1-5, averaging $163.44), second for Batch 2 (Rounds 6-10, $152.67), and least for Batch 3 (Rounds 11-15, $139.44). The common reasons for Batch 3 with smallest valuations were teams feeling not sure about whether there would be time to carry out the last few rounds of auctions on Game Day, and that teams would be desperate and didn't want to get into the "battle". The common reason for Batch 1 to have a bigger average the other two batches was that teams were more concerned about not getting items first, and thus valued the items more in Batch 1 in order to win high-utility items.
6. From Table 6, we see that there were two particular types of situations:
   a. Lucky: this is where one team had a relatively much higher valuation than the rest of the teams for that round (1, 6, 9, 12, and 15). Four teams won their round correspondingly.
   b. Yucky: this is where more than two teams had the highest valuation for that round (10 rounds). The team that won the item paid more than it valued the item.
   c. Under the above typing, only five teams had lucky situations, each with one.
7. ***Did the teams with more "opportunities" fare better than teams with fewer "opportunities"?*** Table 10a and Table 10b below shows something interesting. We computed the differences between the valuation of each team and the valuation of every other team for each round. We then counted the times a difference is lower, higher, and the same. And then we averaged these numbers across all rounds. From Table 10a and 10b, we see that the teams with better opportunities to gain are those with a relatively high ">" average and a relatively low "=" average. There was one team in that position: Team Cerberus. The team had the highest ">" average and the second lowest "=" average. Yet, Team Cerberus did not finish as #1 for the Game Day. On the other hand, there were several teams in the opposite position: with low ">" average and high "=" average, such as Dishonest Agents, Winter Slayers, and Rogue Wan A. However, even under such a disadvantaged position, Winter Slayers were able to place ahead of Rogue Wan B. In short, while luck played a role, valuation strategies, bidding strategies, and participation strategies all played a role as well.

	Rogue Wan A			Winter Slayers			The Whales			Dishonest Agents			Git Rekt			Rogue Wan B		
	>	<	=	>	<	=	>	<	=	>	<	=	>	<	=	>	<	=
1	4	3	0	1	5	1	6	1	0	5	2	0	1	5	1	7	0	0
2	5	0	2	5	0	2	3	4	0	4	3	0	0	7	0	5	0	2
3	2	5	0	3	4	0	5	0	2	1	6	0	0	7	0	5	0	2
4	1	5	1	0	7	0	6	0	1	6	0	1	3	4	0	5	2	0
5	1	5	1	6	0	1	4	3	0	0	7	0	6	0	1	1	5	1
6	2	5	0	6	1	0	7	0	0	3	3	1	3	3	1	5	2	0
7	4	3	0	5	0	2	5	0	2	1	5	1	5	0	2	3	4	0
8	4	0	3	4	0	3	3	4	0	0	7	0	2	5	0	4	0	3
9	0	6	1	6	1	0	0	6	1	2	4	1	7	0	0	4	3	0
10	0	7	0	4	3	0	2	4	1	2	4	1	6	0	1	1	6	0
11	5	0	2	0	7	0	1	6	0	5	0	2	2	4	1	2	4	1
12	1	5	1	4	3	0	0	7	0	3	4	0	1	5	1	5	2	0
13	4	3	0	0	6	1	5	2	0	0	6	1	2	5	0	3	4	0
14	6	0	1	0	5	2	0	5	2	5	2	0	6	0	1	0	5	2
15	7	0	0	2	4	1	2	4	1	0	7	0	5	2	0	1	6	0
	3.06	**3.13**	**0.80**	**3.06**	**3.06**	**0.86**	**3.26**	**3.06**	**0.66**	**2.47**	**4.00**	**0.53**	**3.26**	**3.13**	**0.60**	**3.40**	**2.86**	**0.73**

Table 10a. Comparing each team's valuations to other teams' for each round. A large average #higher valuation per round (under the > columns) means a team's valuation for that round dominates quite a few other teams' and so on.

	Team Cerberus			Quiero MAS		
	>	<	=	<	>	=
1	3	4	0	0	7	0
2	2	5	0	1	6	0
3	4	3	0	5	0	2
4	4	3	0	1	5	1
5	3	4	0	5	2	0
6	1	6	0	0	7	0
7	0	7	0	1	5	1
8	1	6	0	4	0	3
9	5	2	0	2	4	1
10	5	2	0	6	0	1
11	5	0	2	4	3	0
12	7	0	0	6	1	0
13	6	0	1	6	0	1
14	3	3	1	3	3	1
15	6	1	0	4	3	0
	3.66	**3.06**	**0.27**	**3.20**	**3.06**	**0.73**

Table 10b. Comparing each team's valuations to other teams' for each round. A large average #higher valuation per round (under the > columns) means a team's valuation for that round dominates quite a few other teams' and so on.

8. Due to the large potential penalty of not winning an item, the teams practiced different types of risk attitudes. When a team was still in need of an item, it was likely to be risk averse – afraid of not winning and thus offering a higher bid; and when a team had won an item, it was likely to be risk seeking – not offering a higher bid.
9. From viewpoint of delivering the auctions, the sealed-bids were fast. Intuitively, one would think that English would be the next fastest as bids could jump. However, all our English rounds involved bidding "wars" of small increments between teams, making each round longer. Dutch descending and Japanese were thus faster.
10. The teams the observed and modeled other teams tend to do better than their individual situation afforded. For example, Quiero MAS, with its methodical approach, was able to place #2 for the Game Day even though their team situation rated only #5 out of 8 teams.

Note that it is important for agents to consider their environment as well as other agents in the environment.

11. Note also that we had the game changer in this Game Day, and also our Independent Private Values (IPVs) were neither completely Independent nor Private. Further, we had all-pay auctions. So, our results here did not reflect what theoretical works have found, as covered in our lectures. But these results showed a more real-world side of auctions and should give us a sense of how to "game" each auction round – how to strategically bid and gain information each auction.

Game Days League

Here are the new League Standings. Quiero MAS won the Game Days League, followed by Team Cerberus and Rogue Wan. The Whales and Git Rekt tied for the fourth place. Git Rekt made a valiant effort to come back from last place after the first two game days! Winter Slayers and Dishonest Agents place #6 and #7 respectively.

Team Name	Learning Day	Voting Day	Auction Day	League Standings
Quiero MAS	**2**	**3**	**2**	**7**
Team Cerberus	**6**	**1**	**3**	**10**
Rogue Wan	**4**	**2**	**6.5***	**12.5**
The Whales	**3**	**6**	**4**	**13**
Git Rekt	**7**	**5**	**1**	**13**
Winter Slayers	**5**	**4**	**5**	**14**
Dishonest Agents	**1**	**7**	**9**	**17**

* Change in team members: Rogue Wan broke into two teams: Rogue Wan A and Rogue Wan B. Rogue Wan A was placed 7th and Rogue Wan B was placed 6th. I took the average of the two and assigned it to Rogue Wan.