

Prisoner's Dilemma

	Tit-for-tat	Bully	Fictitious Play	Maximin	Random	My Algorithm	Average
Tit-for-tat	3	0.99	0.99	3	2.23	0.99	1.86666667
Bully	1.04	1	1	5	3.2	1	2.04
Fictitious Play	1.04	1	4.95	5	2.88	0.01	2.48
Maximin	3	0	0	3	1.5	0	1.25
Random	2.23	0.45	0.53	4	2.36	0.56	1.68833333
My Algorithm	1.04	1	4.96	5	2.76	1	2.62666667

Chicken

	Tit-for-tat	Bully	Fictitious Play	Maximin	Random	My Algorithm	Average
Tit-for-tat	3	0.01	1.81	0.01	1.82	0.01	1.11
Bully	0.04	0	3.96	0	2.28	0	1.04666667
Fictitious Play	1.81	0.99	3.96	1	2.12	1	1.81333333
Maximin	0.04	0	4	0	2.16	0	1.03333333
Random	1.85	0.57	1.52	0.54	1.81	0.47	1.12666667
My Algorithm	0.04	0	4	0	1.88	0	0.98666667

Stag Hunt

	Tit-for-tat	Bully	Fictitious Play	Maximin	Random	My Algorithm	Average
Tit-for-tat	4	1.95	1.91	4	1.47	1.95	2.54666667
Bully	2.01	2	2	3	2.57	2	2.26333333
Fictitious Play	1.97	2	3.93	4	2.43	-3	1.88833333
Maximin	4	-3	4	4	0.08	-3	1.01333333
Random	1.53	-0.85	-0.15	3.44	1.2	-0.85	0.72
My Algorithm	2.01	2	3	3	2.57	2	2.43

My Algorithm

I chose to use a mixed strategy of 50% for each item, but not in a random fashion. I use the same consecutive 6 moves over and over again, d d c d c c. I thought this would be effective against tit for tat because when I switched moves, my Algorithm would get a better payoff for at least one turn every time. It did not fare as well against bully, but it either tied or won in each game. Fictitious Play was not as effective because of the even spread of each choice from my algorithm, so it had a difficult time determining what the best response would be. Against maximin, my algorithm was able to exploit the turns where it did not try to minimize its opponent in 2 of the 3 games. Random is unpredictable, so it would not do as well against the consistency of my algorithm, even though they would end up having about the same distribution of choices over time. Against itself, it would always tie because, no matter what, it did the same moves without fail.

Results

In Prisoner's Dilemma, my algorithm was the most successful. This is because of some of the reasons I described when I was saying why I believed initially that my algorithm would be successful. It either won or tied against each algorithm, and won by the highest margins because it exploited the maximin and the fictitious play strategies. For Chicken, Fictitious play was the most successful. Although my algorithm was geared to play well against fictitious play and even defeated it handily in this game, fictitious play beat the other algorithms by a higher margin. This is due to the fact that it was able to recognize the repetitive algorithms easily and take advantage of them. Stag Hunt's victor was Tit for Tat. Due to the formulation of the board, when tit for tat played against itself, it received the highest overall payoff (4) of any other round played and therefore skewed the results of the round robin. Although, once again, my algorithm defeated tit for tat in a head to head contest, the margin of victory against the other opponents was not high enough to account for the 4 that tit for tat received when playing against itself.

Overall, my Algorithm was ideal in all three games against Fictitious Play, due to the reasons discussed earlier. In fact, my algorithm did not have the highest margins of defeat in each game, but in each individual round it either won or tied every time. It never lost. Bully was ideal against maximin because, since both players played the same choice every time and the formation of the boards, bully either beat or tied maximin every time. Random seemed to be dominated by every other algorithm, except for tit for tat and maximin.