Machine Learning: Project
Multi-Agent Learning in Canonical Games and Knights Archers Zombies

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1 Task 1:

2 Task 2:

2.1

- A game is in Nash equilibrium when no player can improve their outcome by changing their strategy, if the other player doesn't change their's.
- A game is in Pareto Optimal when it is impossible to make a player better off without making the total payoff worse.

(a) Stag Hunt:

- Nash Equilibria: (Hare,Hare) and (Stag,Stag)
- Pareto Optimal: (Hare,Hare) and (Stag,Stag)

(b) Subsidy game:

- Nash Equilibria: (Subsidy 2,Subsidy 2)
- Pareto Optimal: (Subsidy 1,Subsidy 1) and (Subsidy 2,Subsidy 2)

(c) Matching Pennis:

- Nash Equilibria: There is no Nash Equilibria for a pure strategy. For a mixed strategy, the Nash Equilibria is picking heads or tails with probability 0.5 each.
- Pareto Optimal: Every outcome is Pareto Optimal

(d) Prisoner's Dilemma:

- Nash Equilibria: (Defect,Defect)
- Pareto Optimal: (Cooperate,Cooperate)

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3 Task 3:

4 Task 4: