Exercises from lecture 8 (Non-cooperative game theory) TEK5010 Multiagent systems 2021

Question 1

The following payoff matrix (A) is for the "Prisoner's dilemma".

		j	
		Defect	Coop
i	Defect	2,2	4,1
	Coop	1,4	3,3

The following payoff matrix (B) is for the "Matching pennies".

		j	
		Heads	Tail
i	Heads	1,-1	-1,1
	Tails	-1,1	1,-1

The following payoff matrix (C) is for the "Game of chicken".

		j	
		Defect	Coop
i	Defect	1,1	4,2
	Coop	2,4	3,3

a) For each of these payoff matrices:
   i. Identify all (pure strategy) Nash equilibria
   ii. Identify all Pareto optimal outcomes
   iii. Identify all outcomes that maximize social welfare

b) "Program equilibria make cooperation possible in the one-shot Prisoner's dilemma". Explain and critically assess this statement.