CS331: Introduction to Artificial Intelligence
Written Assignment #5

Date handed out: May 18, 2022
Date due: May 25, 2022 at 10am
Total: 25 points

This assignment is to be done individually. Please hand in a pdf on Canvas.

1. Consider the game represented in normal form below.

	B: S1	B: S2	B: S3
A: S1	A = 5, B = 9	A = 3, B = 6	A = 1, B = -4
A: S2	A = 4, B = -4	A = 2, B = 2	A = -1, B = 6
A: S3	A = 0, B = 0	A = 2, B = -2	A = 0, B = 0

a) Indicate all the pure strategy Nash equilibria in the matrix. **[2 points]**

b) Does Player A have a strictly dominant strategy? If yes, state what it is. If no, explain why not. **[2 points]**

c) Does Player B have a strictly dominant strategy? If yes, state what it is. If no, explain why not. **[2 points]**

d) What is the Pareto optimal outcome in this game? **[2 points]**

e) Is this a zero-sum game? **[2 points]**

2. Consider the game represented in normal form below.

	B: S1	B: S2
A: S1	A = 2, B = -2	A = -5, B = 5
A: S2	A = -3, B = 3	A = 4, B = -4

a) Calculate the mixed strategy Nash equilibrium for this game. Clearly indicate the probability associated with each strategy for each player. **[10 points]**

b) Calculate the expected payoffs for each player at the mixed strategy Nash equilibrium you calculated. **[5 points]**