1. A 2-player game is represented by the normal form below:

		Player 2	
		A	B
Player 1	A	6, 6	3, 7
	B	7, 3	5, 5

Use the normal form to circle best responses and find all the Nash equilibria. Is the strategic dynamic of this game most similar to Prisoner's Dilemma, Stag Hunt, Chicken, or Rock Paper Scissors?

2. A 2-player game is represented by the normal form below:

		Player 2	
		A	B
Player 1	A	3, 3	9, 6
	B	6, 9	7, 7

Use the normal form to circle best responses and find all the Nash equilibria. Is the strategic dynamic of this game most similar to Prisoner's Dilemma, Stag Hunt, Chicken, or Rock Paper Scissors?

3. A 2-player game is represented by the normal form below:

		Player 2	
		A	B
Player 1	A	5, -3	-3, 5
	B	-3, 5	5, -3

Use the normal form to circle best responses and find all the Nash equilibria. Is the strategic dynamic of this game most similar to Prisoner's Dilemma, Stag Hunt, Chicken, or Rock Paper Scissors?

4. A 2-player game is represented by the normal form below:

		Player 2	
		A	B
Player 1	A	2, 2	2, 1
	B	1, 2	4, 4

Use the normal form to circle best responses and find all the Nash equilibria. Is the strategic dynamic of this game most similar to Prisoner's Dilemma, Stag Hunt, Chicken, or Rock Paper Scissors?

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5. A 2-player game is represented by the normal form below:

		Player 2		
		A	B	C
	A	8, 7	7, 9	5, 4
Player 1	B	7, 2	5, 8	2, 9
	C	6, 4	10, 6	7, 0

Use the normal form to circle best responses and find all the Nash equilibria.

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6. Two firms compete by setting prices. Each firm can set either a high or a low price. If both firms set a high price, they each earn $10m in profit. If both firms set a low price, they each earn $7.5m in profit. If one firm sets a high price while the other firm sets a low price, the high-priced firm earns $0 profit while the low-priced firm earns $15m in profit.

Draw the normal form of the game and find the Nash equilibria. How would you describe the strategic dynamics of this game?

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7. During the Cuban Missile Crisis, a US ship blockaded a USSR ship supposedly carrying ballistic missiles. The US ship can either fire on the USSR ship or let it go. The USSR ship can either run the blockade or turn back.

- If the US lets the ship go and the USSR turns back, nothing happens (payoffs are zero.)

- If the US fires on the ship and the USSR turns back, the US gains prestige and the USSR loses prestige. Let the payoff of gaining prestige be 1 and let the payoff of losing prestige by -1.

- If the US lets the ship go as the USSR runs the blockade, the US loses prestige and the USSR gains prestige.

- If the US fires on the ship as the USSR runs the blockade, a nuclear war is triggered with payoffs of $-\infty$.

Draw the normal form of the game and find the Nash equilibria. How would you describe the strategic dynamics of this game?

8. Consumers in a market for commodity q have a demand curve given by:

$$Q_d = 34 - 2p$$

The market is supplied by two firms. The cost function of firm 1 is:

$$c_1(q_1) = q_1 + \frac{1}{2}q_1^2$$

The cost function of firm 2 is:

$$c_2(q_2) = 6q_2$$

The firms engage in Cournot competition (i.e. they simultaneously decide how much quantity to produce; the market price is then determined by the total quantity produced by all firms).

a. Write down the first order conditions for each firm.

b. Solve the first order conditions to find the Nash equilibrium quantities produced by each firm.

c. Calculate the Nash equilibrium market price.

d. Calculate the profits that each firm makes in the Nash equilibrium.

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9. Consumers in a market for commodity q have a demand curve given by:

$$Q_d = 14 - p$$

The market is supplied by N firms. The cost function of each firm i is:

$$c(q_i) = 2q_i$$

The firms engage in Cournot competition (i.e. they simultaneously decide how much quantity to produce; the market price is then determined by the total quantity produced by all firms).

a. What is the marginal cost of each firm? (Hint: The firms all have the same, constant marginal cost.)

b. Find the equilibrium price when $N = 1$. (Hint: This is as if the firm was a monopolist.)

c. Find the equilibrium price when $N = 2$.

d. Prove that the equilibrium price is equal to:

$$p = \frac{14}{N+1} + \left(\frac{N}{N+1}\right) \times 2$$

e. What does the equilibrium price approach when N gets very large? Comment on the relationship between monopoly, oligopoly, and perfect competition.