Problem #1

1. Suppose you and your partner typically vote oppositely in elections so that your votes "cancel each other out." Each one of you gains 2 units of happiness from a vote for your positions (and lose two units of happiness from a vote against their positions). However, the cost of voting for each one of you is 1 unit of happiness.

Use a diagram (2X2 table) to represent a game in which you two choose whether to vote or not to vote.

2. You and your partner agreed not to vote in the coming presidential elections. Would such an agreement improve happiness? Explain your answer using the diagram from question 1.

Would such an agreement be a Nash Equilibrium? Explain your answer.

Problem #2

You and your classmate are assigned a group project on which you will receive one combined grade. You each want to receive a good grade, but you also want to avoid hard work. In particular, here is the situation:

- If both of you work hard, you both get an A, which gives each of you 40 units of happiness.
- If only one of you works hard, you both get a B, which gives each of you 30 units of happiness.
- If neither of you works hard, you both get a D, which gives each of you 10 units of happiness.
- Working hard costs 25 units of happiness.

1. Fill in the payoffs in the following decision box:

		You	
		Work	Shirk
Your classmate	Work		
	Shirk		

2. What is the likely outcome? Explain your answer.

3. If you get this classmate as your partner on a series of projects throughout the year, rather than only once, how might that change the outcome you predicted in part (2)?

4. Another classmate cares more about good grades: She gets 50 units of happiness for a B, and 80 units of happiness for an A. If this classmate were your partner (but your preferences were unchanged), how would your answers to parts (1) and (2) change? Which of the two classmates would you prefer as a partner? Would she also want you as a partner?

Problem #3

Suppose a small town has only two firms (firm A and firm B) selling the same product. Each firm can either set a high price (HP) or a low price (LP) for its product. The payoff matrix below displays the profits per day given the combination of prices for both firms. The first entry shows firm A's profits while the second entry shows firm B's profits. The information displayed in the playoff matrix are known by both firms.

		Firm B	
		High price	Low Price
Firm A	High price	$210; $220	$80; $260
	Low Price	$240; $160	$150; $140

1. Find the dominant strategy of each firm, if it exists. Explain your answer.

2. Assuming that the two firms do not cooperate to set prices, what will be the profits of each firm?

3. The local authorities of the small town are concerned about the high prices of the product. As a result, they decide to subsidize the product by giving $40 to each firm that decides to set a low price for its product. What's the new payoff matrix after subsidy?

4. Using the new payoff matrix, explain how the subsidy will affect firm A's profit in comparison to the profit it made in question 2.

5. What makes it so difficult for the two prisoners to reach a cooperative solution without confession? Explain in at least 250 words