Econ 230
Maymester 2013

Instructions: Your answers will be graded on how complete an argument you make, so use I recommend you use as many rhetorical devices as are appropriate, e.g., analogies, examples, and when useful graphs and even equations.

1 Part 1 . 40 points each (do all questions).

1. "34" and RAD are Maymester 13 fashionistas, and want to wear their tank tops to class. But being the only one wearing a tank top makes them uncomfortable. Their strategies are thus (tt, s), mnemonic for "tank top" and "sleeves," and their payoffs are

	tt	s
tt	$(3,3)$	$(1,2)$
s	$(2,1)$	$(2,2)$

   . Determine the Nash equilibria (if any) for this game. Your answer should have the form: "The Nash equilibria (equilibrium) is the pair (a, b), (or, "there is no Nash equilibria in pure strategies." Explain your reasoning.

2. Lauren and Julia, two other Maymester 13 fashionistas, like to wear their favorite tank tops-which are identical- on co-curricular activities. But they really hate it when they both are wearing the same top. Their strategies are thus (tt, s), mnemonic for "tank top" and "sleeves," and their payoffs are

	tt	s
tt	$(1,1)$	$(3,2)$
s	$(2,3)$	$(2,2)$

   . Determine the Nash equilibria (if any) for this game, and explain your reasoning.

3. "34" and RAD are "team followback" members of twitter, and can communicate before class. So are Lauren and Julia. Does this suggest anything about the Nash equilibria (if there are any) of the games in (1) and (2)?

4. The games in question (1) and (2) are famous in game theory and have applications to conflict economics. Give at least one analogy between each of these games and a relevant scenario from conflict economics.

5. Two anglers, Ray and Charley, fish from the same lake. The lake has 1000 fish in it to start. If they behave strategically, they each catch 400 fish this year, and each catch 224 the following year. If they co-operate, each catches $333\frac{1}{3}$ fish this year and each catches 289 fish the following year. Their payoff matrix associated with these strategies are given as

	Coop	Defect
Coop	$(-2.3411, -2.3411)$	$(-2.5438, -2.2561)$
Defect	$(-2.2561, -2.5438)$	$(-2.4142, -2.4142)$

   . Determine the Nash equilibria or equilibrium for this game, explain your reasoning, and give an anology between this game and at least one other relevant scenario from conflict economics.

6. The BBC ran a documentary last night about the decision of the U.S. and Britain to go to war with Iraq in 2003. What elements of bargaining failure might have contributed to this Iraq war?

2 Part 2. 60 points

Do any **one** of the following questions. Again, let me recommend you use as many rhetorical devices as are appropriate, e.g., analogies, examples, and when useful graphs and even equations.

1. Guards at the Tower of London (who had served in Iraq and Afghanistan) were dressed in bright red uniforms. French soldiers in WWI wore bright red pants. Speculate upon why might such uniforms have been useful in past wars, but not anymore. Also speculate upon why the French continued to have red pants in WWI while the Germans had moved to grey.

2. Analyze why there has been a "Kantian peace" among the democratic nations of the world.

3. Discuss the causes and conduct of WWI from the perspective of economics.

4. Consider the following scenario. Country B has to decide whether or not to fight with Country A or to negotiate. B knows that A can be of two types: type "English" (hereafter type S) or type "cheese-eating surrunder monkeys" (hereafter type CESM). If A is type "S," then if B and A fight, A gets three-fourths (3/4) of a prize worth one unit, B gets one-fourth ($\frac{1}{4}$) and both B and A have some small losses $\delta = \frac{1}{10}$ from fighting. If A is type "CESM," then if B fights A, A gets one-fourth (1/4) of the prize worth one unit, B gets $\frac{3}{4}$, and both B and A have some small losses δ from fighting.

Unfortunately for B, it cannot discern which type A is. A, though, does know if it is type "S" or type "CESM." Because A knows its type, it will insist on a negotiated settlement of 3/4 of the prize; otherwise it will fight. If it knows it is type CESM, it will also insist on a negotiated settlement of 3/4 of the prize to keep from fighting, because it knows that B cannot discern its type.

But B knows that A is type "English" with probability $\frac{4}{5}$ and type "CESM" with probability $\frac{1}{5}$. B is "risk-neutral," i.e., B cares only about the mathematical expected value of net resources. What value for δ will make B choose to settle rather than fight?

5. Coming upon a castle, the attacking force knows that the castle is "strong" with probability $\frac{5}{16}$ and weak with probability $\frac{11}{16}$. If the castle defender is strong but "folds," the attacker gets payoff 1, and the defender gets payoff -1. If the castle defender is strong and does not "fold" and the attacker goes away, the defender gets payoff 1 and the attacker gets payoff -1. If the castle defender is "strong" and does not fold, and the attacker attacks, the defender gets a payoff of 2 (capturing weapons, ransoming prisoners, etc.) and the

attacker a payoff of -2.

If the castle defender is "weak" and does not fold, and the attacker attacks, the defender gets a payoff of -2 and the attacker a payoff of 2. If the castle defender is weak and does not fold, and the attacker goes away, the defender gets a payoff of 1 and the attacker a payoff of -1. If the castle defender is weak and does fold, the defender gets a payoff of -1 and the attacker a payoff of 1.

6. Consider our standard two-country model of "fight or bargain" with the following parameter values:

$$\begin{aligned} R_A &= R_B = 100; \\ \widetilde{R} &= 200; \\ \delta &= .2 \\ Z &= 1.5 \\ p_A &= \frac{M_A}{M_A + ZM_B};\ p_B = \frac{M_B}{M_A + ZM_B}. \end{aligned}$$

Each country's Net Resources from fighting is

$$FNR_i = R_i - M_i + p_i \widetilde{R}(1 - \delta).$$

If they bargain successfully, their Net Resources are

$$SNR_i = FNR_i + \frac{1}{2}\delta \widetilde{R}.$$

Derive the equilibrium levels of military force for each country, i.e., M_i, and the equilibrium values for FNR_i and SNR_i.

3 Part three 50 points (5 points each)

Match the best answer from the second column with the entries in the first column.

1._____Hobbes/Moats autarky	a. relatively strong defense vs offense
2._____"Make the right wing strong"	b. indivisibilities
3._____British legal system	c. futility of massed infantry/cavalry attacks
4._____breech-loading rifled guns	d. Elgin marbles
5._____custody battles	e. Schlieffin plan