

EconS 503 - Microeconomic Theory II
 Homework #1 - Due date: Monday, January 31st, in class.

1. **Strict dominance, IDSDS, and IDWDS.** Consider the following two-player game, adapted from Tadelis (2013).

		Player 2		
		<i>L</i>	<i>C</i>	<i>R</i>
Player 1	<i>U</i>	3, 3	5, 1	6, 2
	<i>M</i>	4, 1	8, 4	3, 6
	<i>D</i>	4, 0	9, 6	6, 8

- (a) Find the strict dominant equilibrium of this game.
 (b) Which strategy profile/s that survive IDSDS?
 (c) Which strategy profile/s survive IDWDS?
2. **NE and rationalizability.** In this exercise, we formally show the relationship between NE strategy profiles and rationalizability.
- (a) Show that if strategy profile $s^* = (s_1^*, \dots, s_N^*)$ is a Nash equilibrium of a N -player game, it must also survive rationalizability.
 (b) Show that the converse of part (a) is not necessarily true. (For this part, an example suffices.)
3. **IDSDS implies IDWDS, but the converse is not true.** Consider strategy profile $s = (s_1, s_2, \dots, s_N)$.
- (a) Show that if s survives IDWDS, it must also survive IDSDS. [*Hint*: Use contradiction, by considering a strategy profile that, despite surviving IDWDS, violates IDSDS.]
 (b) Show that if s survives IDSDS, it does not need to survive IDWDS. (An example suffices.)
4. **If a game has a NE, it must survive IDSDS.** Consider the two-player game in the following matrix, where payoffs satisfy $a \neq b \neq c \neq d$. If the game has a unique psNE, show that it must be the unique strategy profile surviving IDSDS.

		Player 2	
		<i>A</i>	<i>B</i>
Player 1	<i>A</i>	a, a	c, c
	<i>B</i>	b, b	d, d

5. **Exercises from Tadelis:**
- (a) Chapter 4: Exercise 4.3.
 (b) Chapter 5: Exercises 5.1 and 5.9.