CSCI-4110/6110: Computational Social Processes, 2016 Fall
Homework 3

You can either upload your solution to LMS or hand in an hard copy (please do not do both). If you have questions about the statements please post on Piazza.

Problem 1. (Normal-form games 4pts). Consider the following game.

	L	M	R
U	5, 0	1, 3	4, 0
C	2, 4	2, 4	3, 5
D	0, 1	4, 0	4, 0

1. (2pt) Remove dominated strategies iteratively. Every time a strategy is removed, you must show which strategy (which can be a mixed strategy) dominates it.

2. (2pt) Compute a mix-strategy NE.

Problem 2. (Game modeling 4pts). Suppose you are the only student in Computational Social Processes. You can choose to either pay attention or not, and the instructor can choose to prepare the class or not.

If the instructor prepares and you pay attention, then both of you will get utilities 4. If the instructor does not prepare and you do not pay attention, then both of you get utilities 0. If the instructor does not prepare but you pay attention, then you will be disappointed (-16 utility), and the instructor

will be penalized by a low course evaluation, leading to a utility of -14 (btw, this is not true in my case—giving low evaluation score does not really penalize me...) Finally, if the instructor prepares for the class but you pay no attention, then you will learn nothing (utility 0) and the instructor will be disappointed (utility -2).

1. (2pt) Model the situation as a game (identify the players, actions, and draw the game matrix).

2. (2pt) Compute all mixed strategy NE of the game.

Problem 3. (Extensive-form game 6pts) Consider the extensive-form

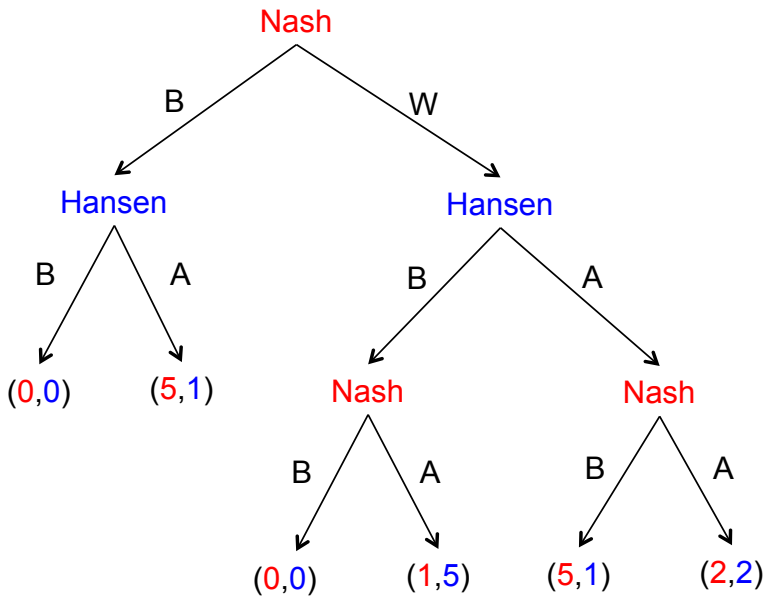

Figure 1: An extensive-form game.

game illustrated in Figure 1. In the first round Nash can either choose to go for the Blond (B) or wait for Hanson's move (W).

- **(2pt)** Find the SPNE using backward induction.
- **(2pt)** Convert the game to a normal form game.
- **(2pt)** find all pure-strategy NE of the normal form game.