

PS 274—Political Choice and Strategy
Problem Set 2

Due Friday, October 22, 5:00 pm (please note this extension from the date given on the syllabus). The short essay is worth one-third of the grade, the problems two-thirds.

Short essay: You are sitting around the holiday table, enjoying your dinner, when the subject turns (inexplicably) to movies starring Russell Crowe. After a tedious and exhausting conversation about whether ancient Rome really looked like the computer-generated images in *Gladiator*, the conversation settles on *A Beautiful Mind*, in which Russell Crowe plays John Nash. What is Nash equilibrium, your relatives ask, and what does it tell us about the world? Answer their question in 250 words or less, and in terms they can understand. (We assume that few or none of your relatives are political scientists, economists, or mathematicians.)

Problems:

- (6 points) How many Nash equilibria are there of each of the following games? What are they? Please identify equilibria by the strategies chosen by the players, not by the payoffs from those strategies.

(a)

	<i>A</i>	<i>B</i>
<i>A</i>	−1, 1	1, −1
<i>B</i>	1, −1	−1, 1

(b)

	<i>Five Guys</i>	<i>Dotty's</i>
<i>Five Guys</i>	1, 1	0, 0
<i>Dotty's</i>	0, 0	3, 3

(c)

	<i>Wall</i>	<i>Street</i>	<i>Journal</i>
<i>New York Times</i>	8, 6	6, 8	0, 0
<i>York Times</i>	6, 8	8, 6	0, 0
<i>Times</i>	0, 0	0, 0	5, 5

2. (2 points) Consider the following simultaneous-move game:

- There are two players, 1 and 2.
- Player 1 chooses either *Up* or *Down*, and player 2 chooses either *Left* or *Right*.
- Player 1 has strict preferences over the four possible outcomes as follows:

$$(Down, Left) P_1 (Up, Left) P_1 (Up, Right) P_1 (Down, Right)$$

whereas player 2 has strict preferences over the four possible outcomes as follows:

$$(Up, Right) P_2 (Up, Left) P_2 (Down, Left) P_2 (Down, Right).$$

Express this game as a 2×2 game table and find all Nash equilibria.

3. (2 points) Recall Downs' model of electoral competition, but now assume that there are three candidates rather than two.
- (a) Is it a Nash equilibrium for all three candidates to adopt the median ideal point? Why or why not? (No points without justification.)
 - (b) How would your answer change, if at all, if there were more than three candidates? Please justify your answer.