

Unit 1: The Politics Exam
[In-class Portion]

- 1) **Political Issues** (adapted from Morton Davis): It is an election year, and the two major political parties are in the process of writing their platforms. There is a dispute between Los Angeles and San Francisco concerning water rights. Each candidate for US president must decide whether to favor LA or SF. The candidates plan to announce their platforms simultaneously. The California voting totals will depend on which way each candidate goes, and in an excellent shift, the country has decided to go with the popular vote, rather than the Electoral College, this year.

The candidates calculate what will happen in each circumstance and come up with the matrix shown below. The entries in the matrix are the percentage of California votes the Democrats will get if each party follows the indicated strategy.

		Republican Party		
		Favor SF	Favor LA	Dodge Issue
Democratic Party	Favor SF	52%	48%	45%
	Favor LA	61%	49%	51%
	Dodge Issue	45%	60%	40%

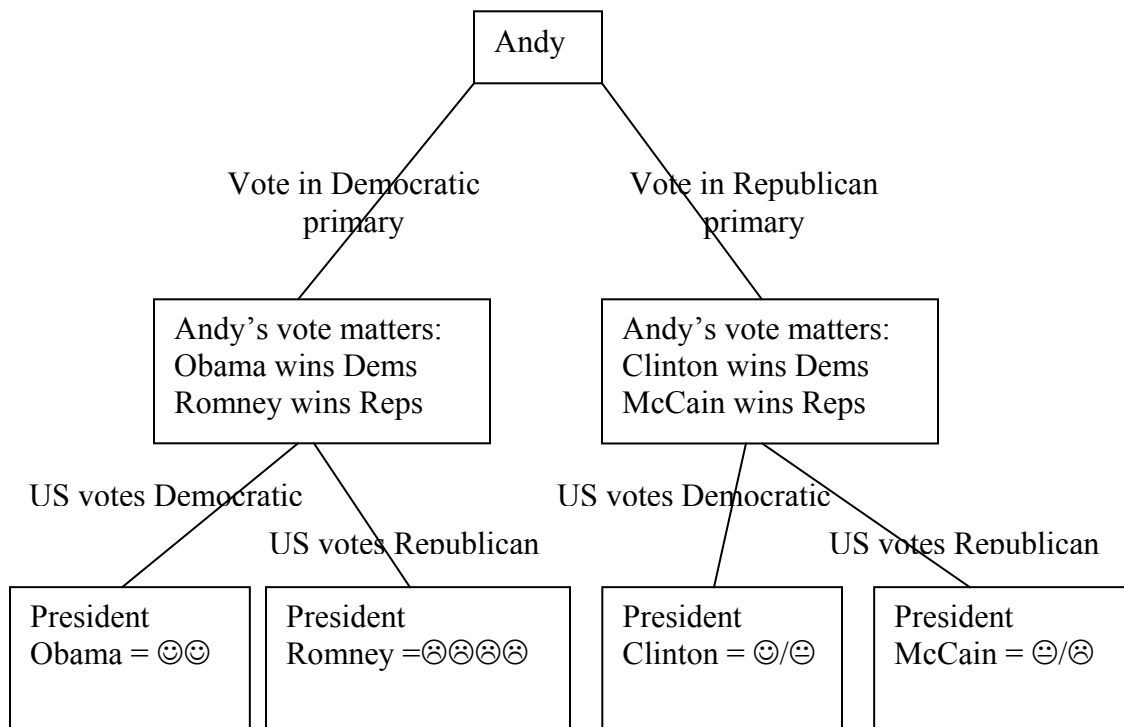
For example, if the Democrats favor LA and the Republicans favor SF, then the Democrats will get 61% of the California votes. Assume that there are no 3rd parties in this election, meaning that the Republicans will, in this example, get 39% of the California votes.

- The given matrix implies that this is a zero-sum game. Is that implication correct or incorrect? Justify your answer.
- What role, if any, does dominance play in this game? Justify your answer.
- Which strategy for each party will provide the most security against a rational but unpredictable opponent? Justify your answer.
- Which strategy for each party will have the highest expected value against a rational but unpredictable opponent? Justify your answer, and show your expected value calculations.
- Which strategy do you suggest for each party in this case? Explain and justify your answer.

2) Suppose that Andy made the following argument this past spring, prior to the California primary elections, when it was down to two candidates on each side. (Please excuse any factual inaccuracies in the following scenario.)

- “I am a Democrat. I would really like Obama to be president, but I wouldn’t be unhappy if Clinton gets elected. I’ll be disappointed but ok if McCain is our next president, but I’ll be absolutely hopping mad if Romney becomes president.”
- “It’s a pretty close race here in California between Clinton and Obama and between McCain and Romney.”
- “As a believer in the democratic process, I am going to assume that my primary vote makes the difference one way or the other, in whichever party’s primary I vote: that means that if I vote for a candidate, he/she will probably win their primary. If I cast my vote in one party’s election, the candidate I like in the other party will probably lose, having not gotten my support.”
- “My choices in the primary election are to vote for my preferred candidate in the Democratic primary or for my preferred candidate in the Republican primary.”
- “I’m pretty sure that my vote won’t matter in the general election, as California almost always votes Democratic. In other words, I have no control over the nation’s choice in the general election. The nation’s choices are to vote Democratic or to vote Republican.”

So, he decided that the game could be represented using the following tree:



- a. Represent the game described above using a matrix. Explain how you constructed the matrix and what the entries in it represent.
- b. Is this a zero-sum or nonzero-sum game?
- c. What role, if any, does utility play in this game? Justify your answer.
- d. What strategy would you have advised Andy to pursue? Explain and justify your answer using game-theoretic analysis.
- e. Does the game Andy has set up to represent the election make sense, or are there holes in his logic? [No credit for this question].

Unit 1: The Politics Exam
[take-home portion]

- 3) **Invent your own game:** Come up with some real-world scenario we have not used or discussed in class. You will construct a game-theoretic model for this scenario. Your scenario can come from your own life experience, newspaper articles, fictional or mythological writing, or from your imagination, but it must be a scenario that makes sense and is somehow interesting to society at large.
- a. Describe your game scenario briefly, in layman's terms. If you got the idea for your game from an article, website, etc., make sure to include an attribution here.
 - b. Represent your scenario using a game matrix. Explain how you constructed the matrix and what the entries in it represent.
 - c. Consider the list of the following 6 terms. Explain the significance of 4 of those terms, with respect to this game. Each phrase must be used in a meaningful way, and you must justify your use of the phrases. For example, if you say that your game is a zero-sum game, you must explain how you know this is so.
 - Zero-sum or non-zero sum
 - Dominated strategy
 - Utility
 - Principle of rationality
 - Best-worst case strategy
 - Expected value