

MA 125 - In-Class Assignment 1 - Spring 2008

Hello, my name is _____

1. Five hundred students at a university are voting for a new school mascot. After 300 votes have been counted, the tallies are as follows.

Purple People Eaters	106
Flying Squirrels	98
Rambling Platypi	96

- (a) What is the minimum number of the remaining votes needed to guarantee that the new mascot will be the Purple People Eaters? Explain.

- (b) What is the minimum number of the remaining votes needed to guarantee that the new mascot will be the Flying Squirrels? Explain.

- (c) What is the minimum number of the remaining votes needed to guarantee that the new mascot will be the Rambling Platypi? Explain.

2. Suppose there were 15,364 votes an election involving six candidates.

- (a) If a candidate is required to have majority of the votes cast to be considered the winner, what is the minimum number of votes needed to win? Explain.

- (b) If a candidate is needs a plurality of the votes cast to be considered the winner, what is the minimum number of votes a winning candidate can have and still win the election? Explain.

3. A university has 75 faculty members, and they need to vote for a faculty representative to the Board of Trustees. There are four candidates running for this position, and the preference rankings are as follows.

	Number of Voters							
	10	8	9	4	14	6	11	13
Adkins	1	1	3	2	2	3	2	2
Blythe	2	4	1	1	3	2	3	4
Cassidy	3	2	4	3	1	1	4	3
Dearborn	4	3	2	4	4	4	1	1

- (a) Which candidate wins a plurality election?
- (b) Which candidate wins a plurality election with a runoff between the top two finishers?
- (c) Which candidate wins a plurality election with a runoff between the top three finishers, and then a runoff between the top two finishers of the first runoff?
- (d) In a plurality election, could those who ranked Adkins as their top candidate have achieved a preferable outcome by voting strategically if the others voted as shown in the table? Explain.
- (e) In a plurality election with a runoff between the top two finishers, could those who ranked Blythe first and Dearborn second have achieved a preferable outcome by voting strategically if the others voted as shown in the table? Explain.

	Number of Voters							
	10	8	9	4	14	6	11	13
Adkins	1	1	3	2	2	3	2	2
Blythe	2	4	1	1	3	2	3	4
Cassidy	3	2	4	3	1	1	4	3
Dearborn	4	3	2	4	4	4	1	1

- (f) If the voting is sequential, with Blythe and Cassidy squaring off first, then the winner going against Dearborn, and then that winner going against Adkins, who wins?
- (g) If the voting is done tournament style, with Adkins and Cassidy competing in one election, and Blythe and Dearborn in the other, and the winners of these elections then running against each other, who wins?
- (h) If Borda's method is used, who wins?
- (i) If Borda's method is used, could the voters who ranked Blythe first and Dearborn second have achieved a preferable outcome by voting strategically if the others voted as shown in the table? Explain.