Practice Mini-Exam

1. (a) Convert between ballots and preference schedule (HW1#3)

	Dirk	Erin	Fran	Greg	Hank	Iris	John	Kurt	Lori	Mark	Nick	Olli	Phil
1st	A	A	B	B	C	C	C	B	A	B	C	A	A
2nd	B	B	A	C	A	B	B	A	B	A	B	B	B
3rd	C	C	C	A	B	A	A	C	C	C	A	C	C

	5	0	3	1	1	3
1st	A	A	B	B	C	C
2nd	B	C	A	C	A	B
3rd	C	B	C	A	B	A

(b) Count the voters and determine how many are needed to have a majority. (HW1#4)

How many voters in the previous question? 13, 5+3+1+1+3 = 13

How many needed for a majority? More than half, 7 or more

(c) Construct a preference schedule where one candidate has a majority. (See HW1part 2 #7)

	100	0	0	0	0	0
1st	A	A	B	B	C	C
2nd	B	C	A	C	A	B
3rd	C	B	C	A	B	A

A has majority of 1st place votes

2. Given a preference schedule: (HW1#5,6,7; HW1part2#4,5,6)

	6	4	3	1
1st	A	C	D	D
2nd	B	D	B	A
3rd	C	B	C	B
4th	D	A	A	C

(a) Determine who won by plurality
(most first place votes; 1 point for first, nothing for the rest)

A: 6   C: 4   A wins (6 is biggest)
B: 0   D: 3+1

(b) Determine who won by anti-plurality
(least last place votes; -1 point for last, nothing for the rest)

A: -4-3   C: -1   B wins (0 is best, others are negative)
B: 0   D: -6

(c) Determine who won by the combination
(1 point for first, -1 point for last, nothing for the rest)

A: 6-4-3 = -1   C: 4-1 = 3   C wins (3 > 0 > -1 > -2)
B: 0+0 = 0   D: 3+1-6 = -2

(d) Determine who won by Borda count
(4 points for first, 3 for second, 2 for third, 1 for last)

B wins

A: 4(6) + 1(4) + 1(3) + 3(1) = 34   C: 2(6) + 4(4) + 2(3) + 1(1) = 35
B: 3(6) + 2(4) + 3(3) + 2(1) = 37   D: 1(6) + 3(4) + 4(3) + 4(1) = 34

(e) Determine who won by Pairwise comparison
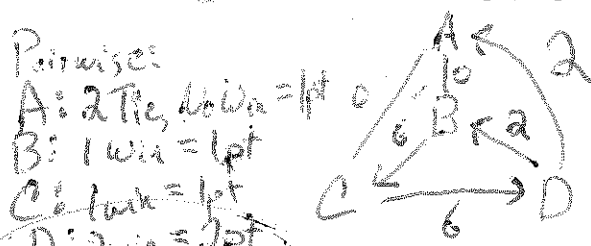(Head to head matchups; 1 pt for a win, 1/2 pt for a tie)

Pairwise:
A: 2 Ties, 1 win = 1½ 0
B: 1 win = 1pt
C: 1 win = 1pt
D: 2 win = 2pt

D wins

AvsB: 6-4-3+1 = 0, Tie
AvsC: 6-4-3+1 = 0, Tie
AvsD: 6-4-3-1 = -2, D wins
BvsC: 6-4+3+1 = 6, B wins
BvsD: 6-4-3-1 = -2, D wins
CvsD: 6+4-3-1 = 6, C wins

3. Essay questions:

(a) Given a preference schedule, pretend you are working the media for "A". How would you spin the situation? Write a short paragraph that is truthful but flattering to A. (Use the one from #2 for practice.)

A is clear favorite with 50% more support (6 vs 4, 6 vs 3+1, 6 vs 0) than the other leading candidates*. The naysayers should just give up and admit defeat (even though more people hate A than love it, 7 to 6, ssshhh!)

* as measured in 1st place votes

(b) Construct a preference schedule where two of the methods from #2 disagree (I'll choose the methods, you choose the votes) (HW1part2#7). Try Plurality and Anti-Plurality in class. Choose numbers at the top of each column (0 is ok), and then fill in the table, and circle the winner.

	3	0	0	2	0	0
1st	A	A	B	B	C	C
2nd	B	C	A	C	A	B
3rd	C	B	C	A	B	A

A win Plur
B win Anti Plur

Points:	Plurality	Anti-Plurality
A	3 win!	−3
B	2	0 win!
C	0	−2

(c) Give an example where A beats B, B beats C, and C beats A, at least in head-to-heads. Fill in the preference schedule and draw in the arrows and margins.

	1	0	0	1	1	0
1st	A Dirk	A	B	B Erin	C Fran	C
2nd	B	C	A	C	A	B
3rd	C	B	C	A	B	A

In any head to head, 2 voters agree.

Dirk,Fran vs Erin — A
Erin, Fran vs Dirk
1
1
Dirk,Erin vs Fran
B — C
1 vs Fran