

Announcement

Review (Help) sessions

Wednesday 4:00-6:00PM at Lawson 221.

The due day for homework set 16&17 are postponed. New due day will be announced after exam 3.

- The Third Hour Exam:**
April. 4, Friday in class.

Please show up in time. There will be no make-up exam.

March 28, 2008

Methods of Voting

Condorcet Winner Criterion (CWC)

A winner who beats all other candidates when they meet one-on-one

To decide if a Condorcet winner exists:

Every candidate is matched on a one-on-one basis with every other candidate.

Drawback: there may not exist a Condorcet winner.

Condorcet winner (one-on-one)

Example: In 1980, D' Amato was opposed by two liberals: Elizabeth Holtzman and the late Jacob Javits.

22%	23%	15%	29%	7%	4%
D	D	H	H	J	J
H	J	D	J	H	D
J	H	J	D	D	H

Holtzman vs D' Amato:

Holtzman=15%+29%+7%=51% : D' Amato=22%+23%+4%=49%

Holtzman vs Javits:

Holtzman=22%+15%+29%=66% : Javits=23%+7%+4%=34%

D' Amato vs Javits:

D' Amato=22%+23%+15%=60% : Javits=29%+7%+4%=40%

Old Exam Question

Suppose that a nine-member committee needs to elect one of the four alternatives A, B, C, or D. Their preference schedule is given below. Is there a Condorcet winner?

	Number of Members			A:B=>A=4+2=6, B=3
	4	3	2	A:C=>A=4+3=7, C=2
First choice	A	B	C	A:D=>A=4, D=3+2=5
Second choice	B	D	D	B:C=>B=4+3=5, C=2
Third choice	C	A	A	B:D=>B=4+3=7, D=2
Fourth choice	D	C	B	C:D=>C=4+2=6, D=3

A) B wins B) C wins C) D wins D) **No Condorcet winner is determined**

Borda Count Method (weighted voting)

- Each place on a ballot is assigned points.
- Each voter submits a complete ranking of all the candidates
- Points tallied for each candidate separately.
- Candidate with highest total wins.

Example

100 members of the University Marching Band are trying to decide in which of 4 different bowl games they will march.

the preference schedule is given:

# of votes	49	48	3
1st	R	H	C
2nd	H	O	H
3rd	C	C	O
4th	O	R	R

R: Rose Bowl **H:** Hula Bowl
C: Cotton Bowl **O:** Orange Bowl

In which bowl will the University Band March if votes are counted by the Borda Count method? (use a 4, 3, 2, 1 point distribution).

R=49(4)+48(1)+3(1)=247
H=48(4)+49(3)+3(3)=348
C=3(4)+49(2)+48(2)=206
O=48(3)+3(2)+49(1)=199

Old Exam Question

A fourteen-person committee is considering three applicants, A, B, and C, for the new Provost. The individual rankings are summarized in the table below. (No one preferred the rankings BAC or CBA.) Which applicant would be accepted if the committee used the 3-2-1 Borda count?

Number of Members	5	4	3	2	$A=5(3)+4(2)+3(1)+2(3)=32$
First choice	A	C	B	A	$B=5(1)+4(1)+3(3)+2(2)=22$
Second choice	C	A	C	B	$C=5(2)+4(3)+3(2)+2(1)=30$
Third choice	B	B	A	C	

A. A ___B. B ___C. C ___D. There is no Borda count winner

Methods of Voting

The Hare System (elimination):

Candidates are eliminated in an order based on **the number of first votes**.

Example: Using the preference schedule in the following figure, which candidate will win if the Hare System of voting is used?

# of votes	7	5	4	1
1 st	A	C	B	D
2 nd	D	A	C	A
3 rd	B	B	D	B
4 th	C	D	A	C

Step 1. D has fewest 1st place votes → D is eliminated.
Remove D from chart and move others up.

# of votes	7	5	4	1
1 st	A	C	B	A
2 nd	B	A	C	B
3 rd	C	B	A	C

Step 2. B now has the fewest 1st place votes → B is eliminated.
Remove B from lists and move others up.

# of votes	7	5	4	1
1 st	A	C	C	A
2 nd	C	A	A	C

Step 3. A now has fewest 1st place votes and is eliminated!

C wins!!

Old Exam Question

40. A group of twenty-two young people must decide whether to go to the beach (B), the mountain (M), or the zoo (Z) on a field trip. Their preference rankings are summarized in the table below. Which choice wins using the Hare system?

	Number of Voters		
	10	8	4
First choice	B	M	Z
Second choice	M	B	M
Third choice	Z	Z	B

- A) M
B) B
C) Z
D) No winner is determined.

Methods of Voting

Sequential Pairwise Voting

An agenda is given: A, B, C, D.

The first alternative on the agenda is pitted against the second, i.e. A vs B.

The loser of that contest is eliminated, and the winner is pitted against the third, C.

The winner of that contest is pitted against the fourth, D.

The alternative remaining at the end is the winner.

Sequential pairwise voting fails to satisfy the Pareto condition

Example

Given the agenda: B, C, D, A and the preference schedule in the following figure, who will win the election using sequential pairwise voting?

# of votes	5	2	4
1 st	A	B	C
2 nd	B	C	D
3 rd	D	A	A
4 th	C	D	B

By the given agenda, B competes first against C.

B vs C: B get 7 votes.

C get 4 votes

B wins; C is eliminated.

B goes on to compete with the next alternative, D

B vs D: B gets 7 votes

D gets 4 votes

B wins; D is eliminated

Winner is A!!

B vs A: B gets 2 votes

A gets 9 votes

A wins; B is eliminated.

- Instructional class meets

Monday and Friday 8:00-8:50 AM.

- Recitation sessions meet:

- section 1 Tues 8:00AM, NKRS 156
- section 2 Wed 8:00AM, AG 153
- section 4 Tues 9:00AM, NKRS 156
- section 6 Tues 10:00AM, NKRS 156