MA111: Contemporary mathematics

Entrance Slip (due 5 min past the hour):

Five friends are trying to decide on where to have lunch.

Avery	
1st	Ovid's
2nd	Stud. Cent. Subway
3rd	Sci. Lib. Subway
4th	Off campus Subway

Blair	
1st	Ovid's
2nd	Stud. Cent. Subway
3rd	Sci. Lib. Subway
4th	Off campus Subway

Jared	
1st	Stud. Cent. Subway
2nd	Sci. Lib. Subway
3rd	Off campus Subway
4th	Ovid's

Jared suggests they use a Borda Count to decide where to go to lunch.

1 point for 1st, 1/2 point for 2nd, lose a point for last.

Explain why Jared likes this idea.

Schedule:

- HW 1 is due 7am Tuesday, Sep 8th, 2015
- Mini-exam 1 is in-class on Thursday, Sep 10th, 2015
- HW 2 is due 7am Tuesday, Sep 15th, 2015
- HW 3 is due 7am Tuesday, Sep 22nd, 2015
- Exam 1 is in-class on Thursday, Sep 24th, 2015

Today we try some completely different rules

Schedule for today

- Please turn in your entrance slips. We will do this every non-exam day.
  Please bring your own 3x5 index cards.
- Work in groups of 3-6 (probably your table is 3, and you can combine 2 tables if you want)
- After 5 minutes will present some answers
- Next we'll get back into groups to critique the answers, and then present again
- Then I'll go over the old-ideas quickly
- Finally we have the exit quiz (last 10 minutes of class)

While we are passing out the worksheet...

- We've looked at point methods:

  reward for being ranked high

  penalty for being ranked low

- Each point method decides on the relative size of those rewards/penalties

- Tends to pick "medium" candidates if the reward and penalty are both used

- But...

  On the quiz: what are the two real candidates?

  On the quiz: why does adding more candidates help turn a loser into a medium?

Old words

- ballot, preference schedule,
- voting method, majority winner,
- plurality method, soccer rule, Borda count = Thomas's rule, Daisia's rule
- standard elimination (plurality with elimination)

New words: eliminate

- If we **eliminate** a candidate, then we get new (shorter) preference schedules

  Eliminate "off campus" from

	2	1
1st	Ovid's	Stud Cent
2nd	Stud Cent	Sci Lib
3rd	Sci Lib	Off campus
4th	Off campus	Ovid's

  to get

	2	1
1st	Ovid's	Stud Cent
2nd	Stud Cent	Sci Lib
3rd	Sci Lib	Ovid's

New words: pairwise comparison

- If we eliminate all but two candidates we get a **head-to-head matchup**
- The **pairwise-comparison method** gives 1 point for every head-to-head matchup won, 1/2 point for every tie
- A **Condorcet winner** wins every head-to-head matchup
- Borda count does not always choose the Condorcet winner
- **Condorcet's paradox** is that a group can prefer Ovid's to K-lair, K-Lair to Starbucks, and Starbucks to Ovid's (so which is best?)

  (It is like rock-scissors-paper.)

Exit quiz

- A group is trying to decide on lunch.

	6	4	4	3	2
1st	O	K	S	S	K
2nd	K	O	O	K	S
3rd	S	S	K	O	O

- Write down all the head-to-head matchups and who wins.
- Who wins pairwise comparison?
- Are there any Condorcet winners (or losers)?