MA111: Contemporary mathematics

Entrance Slip (due 5 min past the hour):

100 people are preparing a Thriller flashmob, but aren't sure where to have it. Initially they are torn between Ovid's and K-Lair, but Zombie Jared suggests Subway as an alternative. Zombies are simple creatures, and use Plurality and shambling to make decisions.

	45	35	20
1st	Ovid's	K-Lair	Subway
2nd	K-Lair	Ovid's	K-Lair
3rd	Subway	Subway	Ovid's



(a) Is Subway a reasonable alternative?

(b) What did the preference schedule look like before Subway was introduced?

- (c) Who won before Subway was introduced? After?
- (d) Is it really fair that the last place loser gets to change who wins?

Schedule:

- HW 3 is due 7am Wednesday, Sep 24th, 2014
- Exam 1 is in-class on Thursday, Sep 25th, 2014

While we are passing out the worksheet...

- Please turn in your entrance slips. We will do this every non-exam day. Please bring your own 3x5 index cards.
- Everyone's votes should count equally, and be equally good for restaurants that are equally ranked

[Anonymous, Neutral, Monotone]

• For 2 restaurants, this tells us exactly who should win!

[there is only one right answer, Majority rule]

• Adding a 3rd restaurant can change everything!

[Even if that restaurant is a majority loser.]

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)
- pairwise comparison, Condorcet candidate, bracket method, agenda/seed, shape
- Anonymous, Neutral, Monotone, May's theorem
- Majority criterion, Condorcet criterion

New words: IIA and Arrow's theorem

- IIA: If a candidate has no chance of winning, they shouldn't affect the winner!
- False for Plurality, Plurality with Elimination, Borda Count

even if "no chance of winning" means "more than half of last place votes"

• Pairwise Comparison method is unaffected by Majority Losers (or even Condorcet Losers)

but there are still spoilers (they just win at least one head-to-head)

• Can we fix the method to avoid any loser changing the winner?

Arrow (1950) No! Anonymous, neutral, monotone \implies spoilers.

Exit quiz

A group wants to decide between four restaurants



- a new seafood restaurant, Moby's, just opened up:

Alex	Blair	Charlie	Dakota	Emerson	Jared
K-Lair	K-Lair	Moby's	Moby's	Ovid's	Subway
Ovid's	Ovid's	K-Lair	K-Lair	Subway	Moby's
Subway	Subway	Ovid's	Ovid's	Moby's	K-Lair
Moby's	Moby's	Subway	Subway	K-Lair	Ovid's
	Alex K-Lair Ovid's Subway Moby's	AlexBlairK-LairK-LairOvid'sOvid'sSubwaySubwayMoby'sMoby's	AlexBlairCharlieK-LairK-LairMoby'sOvid'sOvid'sK-LairSubwaySubwayOvid'sMoby'sMoby'sSubway	AlexBlairCharlieDakotaK-LairK-LairMoby'sMoby'sOvid'sOvid'sK-LairK-LairSubwaySubwayOvid'sOvid'sMoby'sMoby'sSubwaySubway	AlexBlairCharlieDakotaEmersonK-LairK-LairMoby'sMoby'sOvid'sOvid'sOvid'sK-LairK-LairSubwaySubwaySubwayOvid'sOvid'sMoby'sMoby'sMoby'sSubwaySubwayK-Lair

(a) Write down all the head-to-head comparisons

(b) Who wins the method of pairwise comparison?

(c) Moby's and Subway are tied for most last place votes. Eliminate Subway. Who wins method of pairwise comparison?

(d) Does method of Pairwise Comparison satisfy IIA?