MA111: Contemporary mathematics

No entrance quiz today!

Schedule:

- Mini-exam 1 is in-class at the beginning of class today.
- HW 2 is due 7am Tuesday, Sep 16th, 2014
- HW 3 is due 7am Tuesday, Sep 23rd, 2014
- Exam 1 is in-class on Thursday, Sep 25th, 2014

Today (after the mini-exam) we look very closely at 2 candidate elections (Ovid's vs K-Lair, no other choices)

Imaginary worksheet today

- Please pass your mini-exams to the edges
- The worksheet today will be on your own paper
- Bracket voting lets us concentrate on 2 candidates at a time
- How do we decide between two candidates?

Amari	
1st	Ovid's
2nd	K-Lair

Blair	
1st	Ovid's
2nd	K-Lair

Charlie	
1st	Ovid's
2nd	K-Lair

Dakota	
1st	K-Lair
2nd	Ovid's

Emerson	
1st	K-Lair
2nd	Ovid's

Write down our system carefully

- In groups, I want you to explain our voting method.
- Amari, Blair, Charlie, Dakota, and Emerson will all rank Ovid's vs K-Lair
- How do we decide the winner (once they've fixed their ranks)? What exactly is our method?
- What are some other (probably worse) ways of deciding it?
- Why is our way better?

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 voting, shape, agenda=seed

New words

- **Fairness criteria** are requirements we make of voting methods
- **Anonymity** is the requirement that if two voters switch ballots, the results don't change

Amari	
1st	Ovid's
2nd	K-Lair

Emerson	
1st	K-Lair
2nd	Ovid's

$\rightarrow$

Amari	
1st	K-Lair
2nd	Ovid's

Emerson	
1st	Ovid's
2nd	K-Lair

$=$ no change

- **Neutrality** is the requirement that if all the voters switch two candidates, the results change in the obvious way (they are switched too)

Amari	
1st	Ovid's
2nd	K-Lair

Blair	
1st	Ovid's
2nd	K-Lair

Charlie	
1st	Ovid's
2nd	K-Lair

Dakota	
1st	K-Lair
2nd	Ovid's

Emerson	
1st	K-Lair
2nd	Ovid's

$\rightarrow$

Amari	
1st	K-Lair
2nd	Ovid's

Blair	
1st	K-Lair
2nd	Ovid's

Charlie	
1st	K-Lair
2nd	Ovid's

Dakota	
1st	Ovid's
2nd	K-Lair

Emerson	
1st	Ovid's
2nd	K-Lair

$=$ K-Lair wins instead of Ovid's

New words

- **Monotone/No Sabotage** is the requirement that if a voter moves the winner up on their ballot, the results don't change (voting for someone does not make them lose)

Amari	
1st	Ovid's
2nd	K-Lair

Blair	
1st	Ovid's
2nd	K-Lair

Charlie	
1st	Ovid's
2nd	K-Lair

Dakota	
1st	K-Lair
2nd	Ovid's

Emerson	
1st	K-Lair
2nd	Ovid's

Amari	
1st	Ovid's
2nd	K-Lair

Blair	
1st	Ovid's
2nd	K-Lair

Charlie	
1st	Ovid's
2nd	K-Lair

Dakota	
1st	Ovid's
2nd	K-Lair

Emerson	
1st	K-Lair
2nd	Ovid's

$=$ Ovid's still wins

- **May's theorem** says the only voting method with all three is our rule, majority rule

Exit quiz

- Amari, Blair, Charlie, Dakota, and Emerson will all rank Ovid's vs K-Lair

- For each method, decide if it is anonymous, neutral, and/or monotone:

  (1) Whatever Amari decides is best

  (2) Whatever Amari decides is worst

  (3) We always go to K-Lair

  (4) We go to the one with the most last place votes