## MA111: Contemporary mathematics

#### Entrance Slip (due 5 min past the hour):

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

	Avery	Blair	Casey	Dee	Elisha
Favorite	Ovid's	Ovid's	Ovid's	K-Lair	K-Lair
Fine	K-Lair	K-Lair	K-Lair	Ovid's	Starbucks
Least	Starbucks	Starbucks	Starbucks	Starbucks	Ovid's

If they only go to one location for lunch, which location will make the group happiest? Explain why.

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 22rd, 2015
- Exam 1 is in-class on Thursday, Sep 24th, 2015

Today we try to get more specific with our 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)

## Activity: The winner depends on the rules

- Last class we had two very wise things said:
- We often want a medium candidate (not someone half-hated and half-loved)
- The majority rules (most of the time)
- On the quiz: which candidate was preferred by the majority?
- On the quiz: which was the medium candidate?

 Most of the homework will focus on old ideas (the exams will include our new ideas too)

• Sometimes the hardest part in answering a question is understanding what it is asking. What do the words mean?

• I want us all to have a common understanding of some words. You can think of them as a foreign language that only uses English words in funny ways.

# Today's words

- A **ballot** is an ordered list of possibilities.
- A **preference schedule** counts how many ballots of each type there are.

	Avery	Blair	Casey	Dee	Elisha
Favorite	Ovid's	K-Lair	Starbucks	Ovid's	Starbucks
Fine	K-Lair	Ovid's	K-Lair	K-Lair	K-Lair
Least favorite	Starbucks	Starbucks	Ovid's	Starbucks	Ovid's



• I'll use words like "favorite" and "first place vote"

- A **voting method** takes a preference schedule and returns a single ballot for the group
- The **plurality method** just counts first place votes. Whoever has the most "favorites" on the individual ballots will be the favorite on the group's summary ballot
- A majority winner is a possibility that has more than half of the first place votes.
- Groups that have a majority winner are much easier to summarize than ones that don't

## Voting methods using points

- Plurality (Halle's rule) gives 1 point for each first place vote
- No whammies (remind me of the name) takes away 1 point for each last place vote
- Simple borda count does both
- **Soccer** gives double points for first place, takes away single point for last place
- Each points method (for 3 choices) has a ratio of first to last.

How important is winning vs not-losing

Different point system for every ratio

# Exit quiz

• A group is trying to decide on lunch.

	Alex	Blake	Charlie	Dakota	Emory
1st	0	0	0	0	K
2nd	K	K	K	K	S
3rd	S	S	S	S	0

- If they use the Soccer rule, how many points does each candidate get? Label them and circle the winner.
- If they use the No Whammie's rule, how many points does each candidate get? Label them and circle the winner
- How does Emory feel about the soccer rule?