no other rules of the voting system swap

votes for A + votes for B = total # of votes

If you get more votes, you don't do worse

If anonymous X^{th}: A>B $n-X^{th}$: B>A

If monotone, and A wins, ~~X > n-X~~ than $X \not< n-X$

1/29/20

anonymous: a method is anonymous if for any election, if any two voters swap their ballots the results does not change

neutral: a method is neutral if for any election, when every voter switches A and B on their ballots then the results for A and B also swap

monotone: a method is monotone if for any election w/ two candidates if we add a new voter with A>B) then A cannot lose worse in the results
(respectively B>A) (respectively B)

near decisive: A and B tie IFF A and B recieve the same number of 1st place votes

decisive: no ties

Conjecture: a method for two candidates that is anonymous, neutral, monotone, and near-decisive must be plurality.

Poof: AKA baby Proof

anon means we only care about how many people vote A>B or B<A

monotone tells us that there is some "quota" over which A will always win and a quota for B for which B will win

near decisive - it's a tie at 50-50 if even .. quota is 50% because if exactly equal than its a tie

If its odd, its no longer a tie, and the candidate that gets more vote can't do worse, and can't tie, so they must win.
could also prove w/ neutral

neutral says quotas must be ~~symmetric~~ the same

The method has some quota, x, of # of voters that A needs to win and y, that B needs to win. Because its neutral, if we switch the votes, x votes that A got to B, then B should win, so B's quota is at least x, and $y \leq x$. Symmetrically, $x \leq y$. This implies $x = y$ so they have the same quota.

Do you need all four of these things to prove plurality? If the proof is an IFF it may be flawed. ~~because~~

Explicitly defining Plurality:

A system in which the ~~first~~ candidate who recieves the most first place votes win.

The candidates are ranked by number of first place votes

Monotone definition: what happens when there are more than two candidates

we say that candidates "can't do worse" if they have more votes because adding a vote may not necessarily improve their function output in the ranked system (think 30 ~~votes~~ 0, if 0 gets one vote, they're still in last place) for two candidates

Options on board:
- In recieving a 1st place vote you will not drop lower in a ranked outcome
- If a candidate is moved higher in (any number)/(one voter's) preference list, then that candidate doesn't move to a lower ranking in the outcome
- It is monotone if when a candidate recieves a vote, they move forward instead of back
- If a voter changes their vote to increase the ranking of a particular candidate, that candidate should not rank lower in the final ranking (when