

Things to Think About 3

UW Math Circle, Winter 2013

This week we came up with several different criteria for a “good” voting system:

- **1-1 winner:** If a candidate was at the top of everyone’s list, then this candidate should be the winner.
- **1-1 loser:** If a candidate was at the bottom of everyone’s list, then this candidate should not be the winner.
- **Not “meh”:** If a candidate was nobody’s first choice, then this candidate should not be the winner.
- **Not backwards:** Suppose that we counted up the votes (using one of the approaches we identified in the previous meeting) and we found that candidate A won. Then, suppose some voters changed their vote and ranked A higher than they had before. We want to make sure sure that in our voting system this does not hurt A - A should still be the winner after more people voted for her.
- **No ties:** we want our voting system to give a definite winner.
- **Independent of Irrelevant Voters (IIA):** Suppose that we counted up the votes and found that A won. Then suppose that a few voters changed their votes by switching candidates B and C on their ballot (but not changing B’s and C’s position relative to A). Then A should still be the winner.

For each of the [voting approaches that we came up with last week](#) determine which of the above criteria it satisfies. We started filling in the table below during class, but see if you can finish it on your own:

Vote-counting method	1-1 winner	1-1 loser	Not “meh”	Not backwards	No ties	IIA
Monarchy						
Points						
First-place method						
Elimination by least first place						
Elimination by most last place						
Brackets						

As preparation for the BAMO, write up a solution to the problem that we discussed at the beginning of class last week. The problem statement (with pictures) is [on the class website](#).