

Transcript

Out for the Count: The Mathematics of Voting Systems

Counting: The Condorcet method

Andrew Potter: Did you manage to declare a winner? Under the Borda points system, the winner is Candidate A! If you have counted the points correctly, Candidate A won 30 points, Candidate B won 25 points, Candidate C won 26 points, and Candidate D won 29 points.

The Borda system is quite simple, even though it can be a bit laborious to count by hand! There are lots of variations on the number of points you can assign for each preference. We used an *arithmetic* weighting, but you could use a *geometric* weighting instead. Instead of assigning 1, 2, 3 and 4 points, we could assign 1, 2, 4 and 8 points. In our case, this would return a different result – I'll leave it to you to experiment with different point weightings.

Variants of Borda points systems are used in real life: in elections in Nauru and Kiribati, and perhaps most importantly, in the Eurovision Song Contest! But did you think this kind of system is fair? We certainly considered every voter's preferences. However, Borda systems can be quite sensitive to tactical voting – for example, if you tactically rank the candidate who you think is the closest rival to your preferred candidate right at the bottom, you can scupper their chances, even though it's not really a true reflection of your preferences.

Our last method of counting is probably the one that will take the longest! We'll call it the Condorcet Pairwise Counting method. I like to think of it as an attempt to try to find the "compromise candidate". We are going to consider each pair of candidates in turn, and see who is the preferred candidate between just those two. When we look at each vote, we're just interested in which of the two candidates the voter prefers.

Let's do an example where we consider who is the preferred candidate between Candidate A and Candidate B. So between candidates A and B only, Candidate A is the preferred candidate.

Now I'd like you to do the same for each other pairing of two candidates. The Condorcet method says that if any one candidate is preferred when pitted against all the other candidates, then that candidate wins! Who wins under this method? What are your thoughts about this method and its fairness? Over to you!