The Plurality and Borda Count Methods

Robb T. Koether

Hampden-Sydney College

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1 Assignment

2 Definitions

3 The Debate Club Election

4 The Plurality Method

5 The Borda Count Method

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Assignment

- Page 28, Exercises 11, 13, 17, 19.
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Definitions

Definition (The Candidates)
The candidates are the people running for office in an election. If we are choosing something other than people, we call them alternatives.

Definition (The Voters)
The voters are the people who have a say in the outcome of the election. All voters have equal say.
Definition (Single-choice Ballot)
In a single-choice ballot, each voter selects one candidate.

Definition (Preference Ballot)
In a preference ballot, each voter ranks all the candidates from most preferred to least preferred.

Definition (Truncated Preference Ballot)
In a truncated preference ballot, each voter ranks some, but not all, the candidates by preference.
Outline

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The Debate Club Election

Example

- There are four candidates for Debate Club president: A, B, C, and D.
- There are 37 voting members. Their preferences are shown on the next slide.
### Example

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Who won?

Example

- Who should be elected president?
- Who is more popular, A or B?
- Who is more popular, A or C?
- Who is more popular, A or D?
- Who is least popular?
Assignment

Definitions

The Debate Club Election

The Plurality Method

The Borda Count Method

Icelandic Parliamentary Elections
The Plurality Method

Definition (The Plurality Method)

By the *plurality method*, the candidate with the most *first-place* votes wins.

Example

In the Debate Club example, A wins by the plurality method.
Web Page

Run the program Voting on the web:
http://people.hsc.edu/faculty-staff/robbk/Math111/Voting
The 2010 Republican Primary

Example

- The 2010 Republican primary in Virginia’s 5th district, there were 7 candidates:
  - Robert Hurt
  - Jim McKelvey
  - Mike McPadden
  - Kenneth Boyd
  - Feda Morton
  - Laurence Verga
  - Ron Ferrin
- Robert Hurt was the “establishment” candidate.
- The other 6 were Tea Party candidates.
Example

- Robert Hurt won 48.42% of the vote.
- Was he the most popular candidate? Could he have been the least popular candidate?

(See http://www.sbe.virginia.gov/)
The 2012 Republican Primary

Example

- The 2012 Republican primary for senator, there were 4 candidates:
  - George Allen
  - Jaime Radtke
  - Bob Marshall
  - E. W. Jackson
- George Allen was the “establishment” candidate.
- The other 3 were more conservative.
- George Allen won 65.45% of the vote.
- Was he the most popular candidate? Could he have been the least popular candidate?

(See http://www.sbe.virginia.gov/)
Definition (The Borda Count Method)

By the **Borda count method**, the voters rank the candidates. Then each rank is assigned points, higher ranks receiving more points. The candidate with the *most points* wins.
Example (The Debate Club Election)

Reconsider the Debate Club election with 4 points for 1st, 3 for 2nd, 2 for 3rd, and 1 for 4th.

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Example (The Math Club Election)

- Which candidate wins?
Example (The Math Club Election)

- Which candidate wins?
- Which candidate comes in last?
The Math Club Election

Example (The Math Club Election)

- Which candidate wins?
- Which candidate comes in last?
- Would the outcome be different if the points were 3, 2, 1, 0?
Example (The Math Club Election)

- Which candidate wins?
- Which candidate comes in last?
- Would the outcome be different if the points were 3, 2, 1, 0?
- What about 20, 15, 10, 5?
Consider the Icelandic Parliamentary Elections, the method for apportionment of constituency seats.