Final Project: Applying Voting Methods to a Homemade Survey

1 Description of the project

Summary

For this project, you will conduct a survey with four choices for survey-takers to rank. You will calculate the winner using the voting methods we have learned in this class and write a short essay explaining which method you think is best for your survey.

Creating a survey and compiling results

- 1. Create a survey of your own with 4 choices. This can be an online survey using a platform like LimeSurvey or Survey Monkey, or you can make a paper ballot. The instructions on your survey should be clear, and you need to ask voters to rank the 4 options from best to worst. (In other words, this is a preference ballot.)
- 2. Collect results for your survey from at least 25 people.
- 3. Make a preference schedule using your survey results.

Determining the winners

- 1. Determine the winner using the Plurality method. Also determine who finished second, third, and fourth.
- 2. Determine the winner using Instant Runoff Voting. Use the fewest number of last place votes to break any ties.
- 3. *Determine the winner using Borda Count.* Also determine who finished second, third, and fourth. Use the fewest number of last place votes to break any ties.
- 4. Determine the winner using Copeland's method. Also determine who finished second, third, and fourth. Use the fewest number of last place votes to break any ties.
- 5. Determine the winner using your own original method. For example, you could decide a winner using fewest last place methods, or an instant runoff voting system where the candidate with the most last place votes is eliminated. Clearly explain your method and show all your work.

Further Analysis

Based on the objective of your survey, which of the voting methods you used do think is most fair overall? Which is the least fair? Write a short answer (1-2 paragraphs with at least 10 sentences total) explaining your answer. This is not an explanation of how the methods work, but why your chosen method seems most/least fair to you. Mention all methods that you used, including your own made up method.

2 Project Deliverables

How to submit

- Your project must have a **Title Page**, containing your name and which project you are completing.
- Your final project must be submitted in class during the final exam period. (Note that you can print out materials at the Student Success Center!)
- Your final project must be typed.
- You should use sentences to describe what each piece of your project is doing and what you are computing: one of your classmates should be able to read your project and understand what you are doing.
- Your final project must be stapled together.

What to submit

Your final project will have three sections. Each section should start on a separate page.

- 1. A section titled **Winners** containing:
 - Your preference schedule
 - Your results using the Plurality method, with supporting work
 - Your results using Instant Runoff Voting, with supporting work
 - Your results using Borda Count, with supporting work
 - Your results using Copeland's Method, with supporting work
 - Your explanation of your own method along with your results and supporting work

Each subsection above should be indicated with a clear heading.

2. A section titled **Best Method** containing your answer, with justification, to the following question:

"Which of the voting methods you used do you think is most fair overall? Which is the least fair?"

3. A section titled **Survey Results** with each voter's preference ballot. You may present these raw results using a table or spreadsheet, or include the actual ballots.

3 Grading

Your project will be graded out of 100 points using the following rubric:

- 1. Survey Results (10 points)
 - Your survey should have at least 25 ballots.

- You should include the raw data as part of your project submission
- 2. Preference Schedule (10 points)
 - The numbers corresponding to each preference should sum to the total number of voters
 - You must correctly identify how many people chose each preference
- 3. Plurality Method (10 pts)
 - Correct identification of the plurality winner
 - Correct identification of the 2nd place, 3rd place, and 4th place winner
 - Supporting computations
- 4. Instant Runoff Voting (10 pts)
 - Clear description of what happens in each round (including redistribution of votes)
 - Clear communication about who gets eliminated in each round
 - Correct determination of the IRV winner
 - Supporting computations
- 5. Borda Count (10 points)
 - Clear description of comptuations
 - Correct determination of the Borda Count winner and 2nd place, 3rd place, and 4th place
 - Supporting computations
- 6. Copeland's Method (10 points)
 - List all head-to-head comparisons
 - Correctly determine the winner of all head-to-head comparisons
 - Provide computations supporting the determination of the winner using Copeland's method
 - correct determination of the winner and 2nd place, 3rd place, and 4th place
- 7. Your own made up method (10 pts)
 - Provide a clear explanation of what your method is and how to implement it
 - Explain how your method is clearly different from the other four methods
 - Apply your method to determine the winner, and 2nd place, 3rd place, and 4th place
 - Supporting computations
- 8. Paragraph on most fair and least fair method (20 pts)
 - Clearly describe the objective of your survey
 - Describe the results of each voting method and how the results are similar or different

- Decide which method is most fair and least fair
- Provide justification on why you made those determinations
- Include mathematical analysis to support that justification

9. Grammar, mechanics, and following directions (10 points)

- Use sufficient words and complete sentences in your discussions
- Use correct grammar and mechanics in your writing
- Use words and headings to make it clear what you are answering where
- Computations should be presented clearly and legibly
- Follow the directions