

Homework 1: Chapter 1

Reading: Chapter 1, pgs 3-9

Exercises:

(1.1) In an election involving five voters and three candidates, the preference schedule is

| | | |
|----------|----------|----------|
| 2 | 2 | 1 |
| <i>A</i> | <i>B</i> | <i>C</i> |
| <i>B</i> | <i>C</i> | <i>A</i> |
| <i>C</i> | <i>A</i> | <i>B</i> |

Determine the winners using (a) the plurality method, (b) the runoff method, (c) the elimination method, ~~(d) Borda count~~, and (e) the method of pairwise comparison. Is there a Condorcet candidate?

(1.2) In an election involving seven voters and four candidates, the preference schedule is

| | | | |
|----------|----------|----------|----------|
| 1 | 2 | 3 | 1 |
| <i>A</i> | <i>B</i> | <i>D</i> | <i>A</i> |
| <i>B</i> | <i>C</i> | <i>A</i> | <i>C</i> |
| <i>C</i> | <i>A</i> | <i>C</i> | <i>B</i> |
| <i>D</i> | <i>D</i> | <i>B</i> | <i>D</i> |

Prove:

- (a) *A* wins against every other candidate in a head-to-head competition. That is, *A* is the Condorcet candidate.
- (b) *D* loses against every other candidate in head-to-head competition.
- (c) *D* is the winner when the plurality method is used.

(1.6) Explain why there can only be at most one Condorcet candidate in an election.

After completing the exercises, check your answers with the [solutions](#) online.