

CS-234

Technologies for
Democratic society

Fall 2024

Week 5

Vote counting schemes / Election methods

Properties desired? - Election systems

No double counting - fairness/equality

Transparency - ensure fairness, correctness, trustworthiness

Understandability - easy to use

Accessibility - to everyone, esp w challenges

Confidentiality of vote

Outcome represents "will" of population, common interest

Practical, feasible logistically, inexpensive

Vote-counting methods

Assuming registration is "done" (secure/correct/...)
how to

- design ballots (ask for what?)
- count ballots?

Base case: majority rule - winner has $>50\%$ of votes

Complication: ≥ 3 candidates, not always a majority

Further: multi-winner, multi-candidate

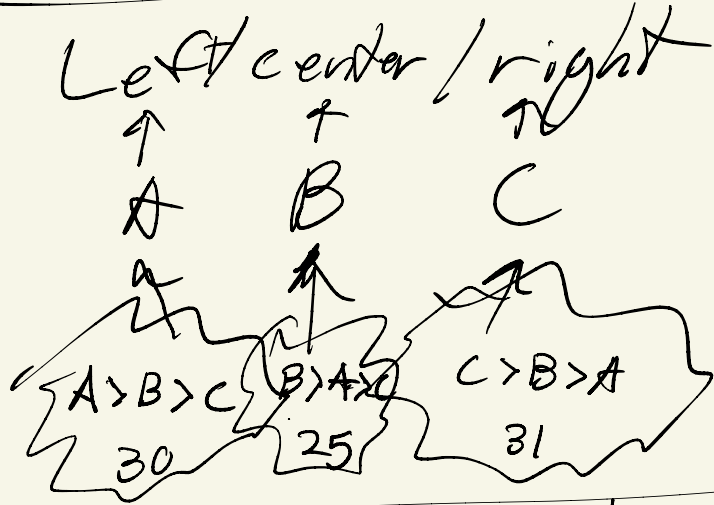
* Simple/stupid: plurality voting

widespread agreement - don't want this!

Properties desired in vote-counting?

- Should always decide
- Elect the will of the majority (problem: may be no majority)
- Elect Condorcet winner
 - wins pairwise elections against all other candidates
 - input: rankings (not just single choice)
- Condorcet cycles — no Condorcet winner
- Determinism
- Fair: no candidate has advantage
- Simplicity, understandability, accessibility
- Avoid strategic voting, incentive compatibility
 - encourage voters to express true preference

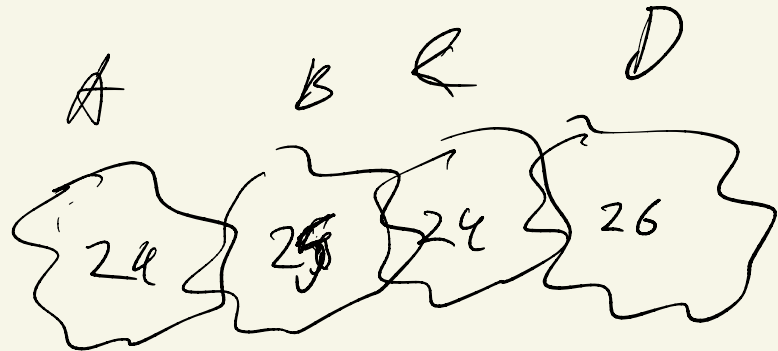
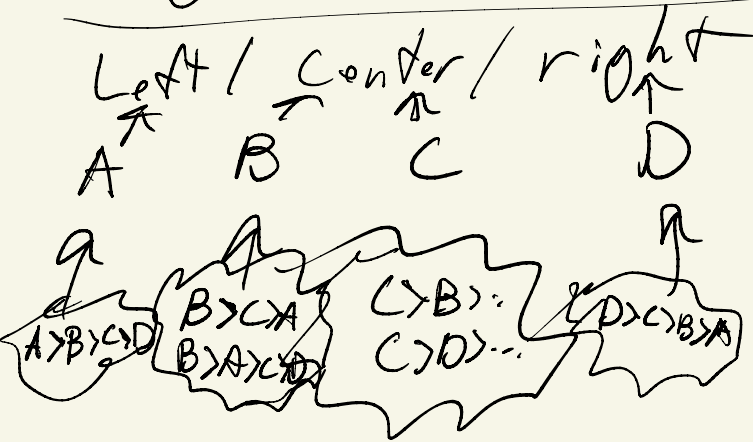
Scenarios of interest



"centrist-favoring" argument

Condorcet → Bob

IRV: non-"centrist" system



Vote-counting methods

- Majority rule (only for 2-candidate elections)
- Plurality (fails to avoid strategic voting)
- Runoff voting - can favor centrists, ...
expensive, takes time, attention of voters
- Single transferable vote (STV)
Instant runoff voting (IRV)
- Approval voting