Single winner election demonstration

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| Programmer | James Skibinski |
| Intended language | JavaScript |
| Topic | Elections |
| Layout | Dashboard style |

# Concept

A demonstration of how first past the post, supplementary vote, full preferential voting, and approval voting deliver different electoral outcomes.

# User input

Through sliders, the users determine:

* Number of voters
* Number of candidates
* Average distance for approval/preference (individual distance Poisson distribution)

# Output

Graphs for each outcome. Candidates represented with a cross, voters represented with a dot. Voters are given the colour of the candidate they vote for. The winning candidate is opaque, and the losers are more transparent.

# Methodology

Candidates are stored in a list of (x, y) values representing their left/right wing and libertarian/authoritarian scores. Voters are also stored in a list with (x, y) values representing the same thing.

These values are randomly generated.

Voters vote for their closest candidate (i.e. lowest Euclidean distance). The rounds of voting are as follows:

* A first round is undertaken, this represents first preferences or first past the post. The results of this are saved. The candidate with the plurality is marked as the FPTP winner.
* Approval Voting
  + A random (or user given) distance is taken.
  + Every voter votes for candidates within this distance.
* Supplementary Vote
  + The two closest candidates to a voter are recorded.
  + Following that, all but the top two are eliminated.
  + If a voter’s candidates are eliminated, so is the voter.
  + The closest candidate to each voter is recorded and votes are tallied.
  + Candidate with a majority of remaining voters is the winner.
* Alternative Vote
  + In the next round, the candidate with the least votes is eliminated and votes are recounted.
  + This is repeated until there are only two candidates left. The candidate with the majority is marked as the AV winner.
* Optional Alternative Vote
  + The same as Alternative Vote but voters will only vote for a candidate if they are within a certain distance.