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CSC 375

Project 1

Single-Voter Implementation

Evaluating Single-Voter Systems

The following simulations of voting systems were developed using impartial culture for 2,4,8,16,32,64, and 128 alternatives and 3,5,9,17,33,65, and 129 voters. Each combination was simulated 10,000 times for each voting system. The following graphs were created in MATLAB based on data generated in Python.

**Evaluating When the Condorcet Winner Exists**

Chart, scatter chart

Description automatically generated

The image above showcases the percentage of simulations that a Condorcet winner exists as a function of the number of voters and the number of the alternatives.

**Graphs of When a Condorcet Winner Exists**

Chart, scatter chart

Description automatically generated

The image above showcases the percentage of simulations that Borda picks the Condorcet winner as a function of the number of alternatives and the number of voters. Note too that Borda is not a Condorcet-efficient voting system.

Chart, scatter chart

Description automatically generated

The above graph showcases the percentage of simulations that the Plurality voting system chooses the Condorcet winner as a function of the number of voters and the number of alternatives.

**Graphs of When a Condorcet Winner Does Not Exist**

Chart, scatter chart

Description automatically generated

Chart, scatter chart

Description automatically generated

Chart, scatter chart

Description automatically generated

Chart, scatter chart

Description automatically generated