## Election Forecasting

Predicting the Winner Before any Votes are Cast
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## United States Presidential Elections

- A president is elected every four years
- Generally, only two competitive candidates
- Republican
- Democratic


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## The Electoral College

- The United States have 50 states
- Each assigned a number of electoral votes based on population
- Most votes: 55 (California)
- Least votes: 3 (multiple states)
- Reassigned periodically based on population change
- Winner takes all: candidate with the most votes in a state gets all its electoral votes
- Candidate with most electoral votes wins election


## 2000 Election: Bush vs. Gore


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## Election Prediction

- Goal: Use polling data to predict state winners
- Then-New York Times columnist Nate Silver famously took on this task for the 2012 election

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## The Dataset

- Data from RealClearPolitics.com
- Instances represent a state in a given election
- State: Name of state
- Year: Election year $(2004,2008,2012)$
- Dependent variable
- Republican: 1 if Republican won state, 0 if Democrat won
- Independent variables
- Rasmussen, SurveyUSA: Polled R\% - Polled D\%
- DiffCount. Polls with R winner - Polls with D winner
- PropR: Polls with R winner / \# polls


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## Simple Approaches to Missing Data

- Delete the missing observations
- We would be throwing away more than $50 \%$ of the data
- We want to predict for all states
- Delete variables with missing values
- We want to retain data from Rasmussen/SurveyUSA
- Fill missing data points with average values
- The average value for a poll will be close to 0 (tie between Democrat and Republican)
- If other polls in a state favor one candidate, the missing one probably would have, too


## Multiple Imputation

- Fill in missing values based on non-missing values
- If Rasmussen is very negative, then a missing SurveyUSA value will likely be negative
- Just like sample.split, results will differ between runs unless you fix the random seed
- Although the method is complicated, we can use it easily through R's libraries
- We will use Multiple Imputation by Chained Equations (mice) package


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