

## 1 Summary

There are seven categories. Teams will be ranked by their prediction error in each category. An overall winner will be declared on the basis of average ranking across categories. Note that teams do *not* have to submit predictions for all categories in order to participate or win in any one category. However, those who do not submit in a category will be tied for last in that category when calculating average rankings.

Category	Metric	Outcome to be predicted
President, vote share	Weighted MSE	Trump vote share
President, turnout	Normalized MSE	Votes cast for president
Senate, vote share	Weighted MSE	Trump vote share minus GOP candidate vote share
Senate, turnout	MSE	Votes cast for senate divided by votes cast for president
House, vote share	Weighted MSE	Trump vote share minus GOP candidate vote share
House, turnout	MSE	Votes cast for house divided by votes cast for president
Time state is called	Log error	Number of minutes between poll close and NBC projection

## 2 President

### 2.1 Vote share

Predict the vote share of Donald Trump (votes cast for Trump divided by the total number of votes cast for US President, including for third-party candidates) in all 50 states, plus DC and each district in Nebraska and Maine. There will be 56 units of observation in total. The weighted MSE is given by

$$WMSE = \sum_{s=1}^{56} (\text{predicted share}_s - \text{actual share}_s)^2 \times (1 - \text{margin}_s)^2 \quad (1)$$

where the margin is the difference (in percentage points divided by 100) between the first and second place candidates. Your goal is to minimize MSE.

### 2.2 Turnout

Predict the number of votes cast for US president in all 50 states, plus DC and each district in Nebraska and Maine. There will be 56 units of observation in total. The normalized MSE is given by

$$NMSE = \sum_{s=1}^{56} \left( \frac{\text{predicted number of votes}_s - \text{actual number of votes}_s}{\text{actual number of votes}_s} \right)^2 \quad (2)$$

Your goal is to minimize NMSE.

### 3 Senate

#### 3.1 Vote share

Predict the **difference in vote share** between Trump and the Republican candidate for Senate in all 34 Senate races. The vote share for Trump is calculated in the same way as in section 2.1. The vote share for the Republican Senate candidate is given by the number of votes cast for the candidate divided by the total number of votes cast for Senate, including for third-party candidates. The weighted MSE is given by

$$WMSE = \sum_{s=1}^{34} (\text{predicted difference}_s - \text{actual difference}_s)^2 \times (1 - \text{margin}_s)^2 \quad (3)$$

Your goal is to minimize WMSE.

#### 3.2 Turnout

Predict the number of votes cast for Senate in all 34 Senate races **as a fraction** of votes cast for president. This is the number of votes cast for Senate in a state divided by the number of votes cast for the presidency in that state. The normalized MSE is given by

$$MSE = \sum_{s=1}^{34} (\text{predicted fraction}_s - \text{actual fraction}_s)^2 \quad (4)$$

Your goal is to minimize MSE.

### 4 House of Representatives

#### 4.1 Vote share

Predict the **difference in vote share** between Trump and the Republican candidate for the House of Representatives in all 435 house races. The vote share for Trump (respectively, the Republican House candidate) the number of votes cast for Trump (respectively, the Republican House candidate) divided by the total number of votes cast for US president (respectively, for all House candidates) in that district, including for third-party candidates. The weighted MSE is given by

$$WMSE = \sum_{s=1}^{34} (\text{predicted difference}_s - \text{actual difference}_s)^2 \times (1 - \text{margin}_s)^2 \quad (5)$$

Your goal is to minimize WMSE.

#### 4.2 Turnout

Predict the number of votes cast for in all 435 House of Representatives races **as a fraction** of votes cast for president in that district. This is the number of votes cast for House in a district divided by the number of votes cast for the presidency in that district. The normalized MSE is

given by

$$MSE = \sum_{s=1}^{34} (\text{predicted fraction}_s - \text{actual fraction}_s)^2 \quad (6)$$

Your goal is to minimize MSE.

## 5 Time state is called

News agencies project a winner before all votes are fully counted. Predict the time it takes (in minutes) after the polls close for NBC News to project the winner of the electoral college votes in the following states: Arizona, Georgia, Michigan, Nevada, North Carolina, Pennsylvania, and Wisconsin. The log error is given by

$$\text{Log error} = \sum_{s=1}^{56} \ln (|\text{predicted number of minutes}_s - \text{actual number of minutes}_s| + 1)$$

The +1 is there to ensure error is always non-negative. We use log because some states may take several days to project a winner. Your goal is to minimize the log error.