



2016 ELECTION

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DATA OVERVIEW

Key Data Points:

- **2016 Data**
- **Primary Results:** Candidate, Party, Vote Count & Pct.
- **County Demographics:** 3,144 counties (55 columns) - Pop.,
Gender, Race, Edu, Income, etc.
- **35.6% Missing Values**

MISSING VALUES

- Alaska
- Colorado
- Connecticut
- Illinois
- Kansas
- Maine

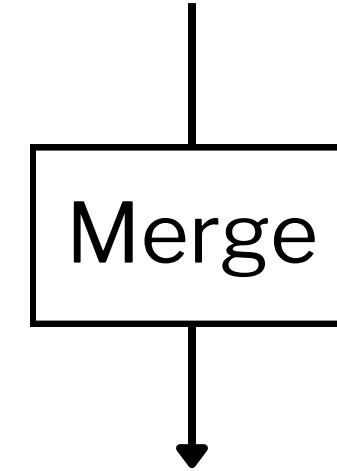
Democratic Votes	3%
Republican Votes	15%
Democratic Votes (Fraction)	3%
Republican Votes (Fraction)	15%
Fips	33.5%
...	33.5%

- Massachusetts
- North Dakota
- Rhode Island
- Vermont
- Wyoming

Primary results:

Include counties that aren't real:

- State House District 1, State House District 10, State House District 11, etc.



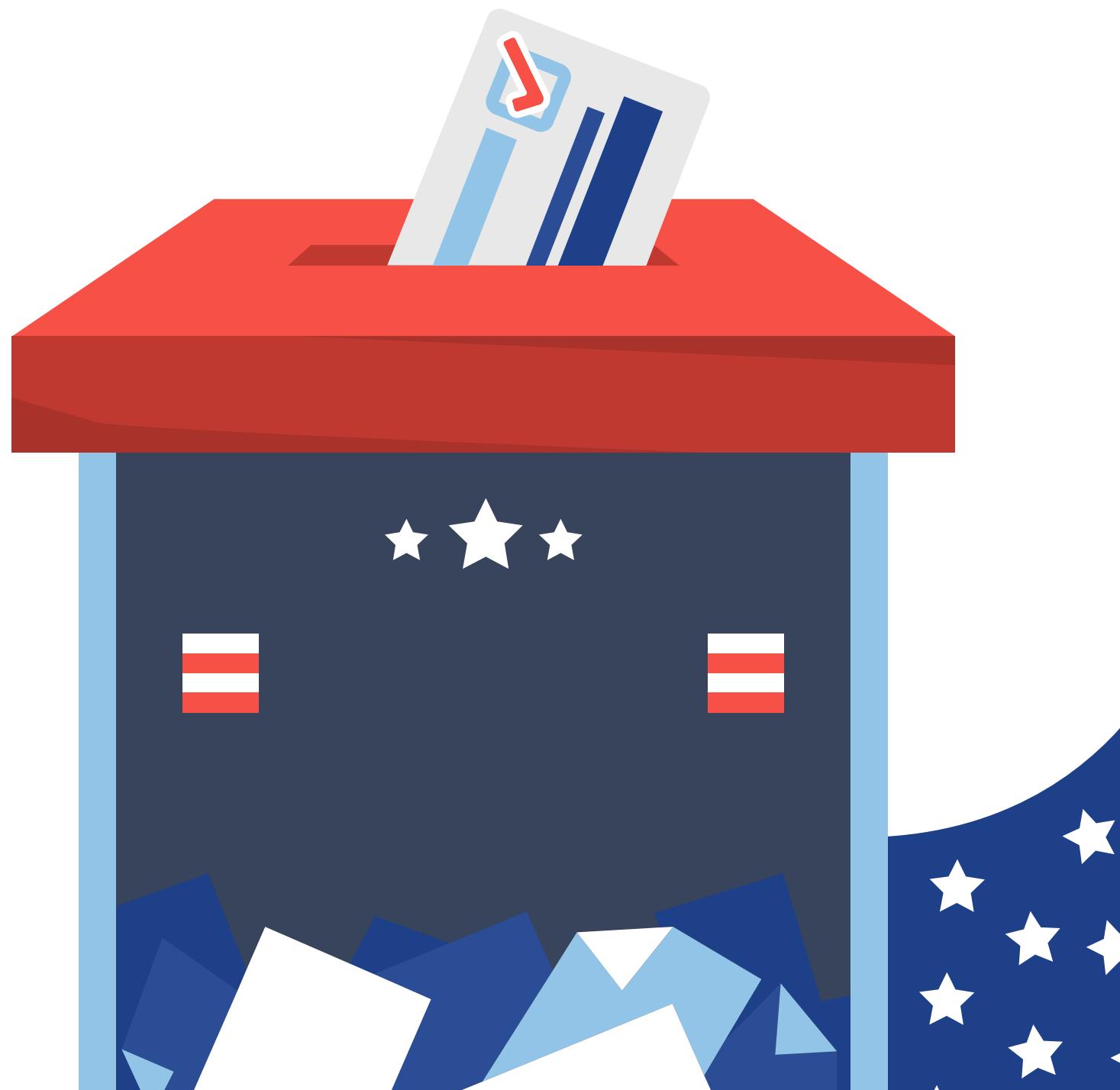
Merged df:

Counties with no demographic information



**Q: CAN WE USE DEMOGRAPHIC FACTORS TO PREDICT VOTER
TENDENCIES IN U.S. COUNTIES?**

OVERVIEW



WINNING PARTY - OVERALL VOTES

Democratic

46.9%

Republican

53.1%

Total number of votes

WINNING PARTY SHARE - COUNTY LEVEL.

Democratic

22.9%

Republican

77.1%

Percent of counties that voted Democrat or Republican

WINNING PARTY SHARE - COUNTY LEVEL.

Democratic

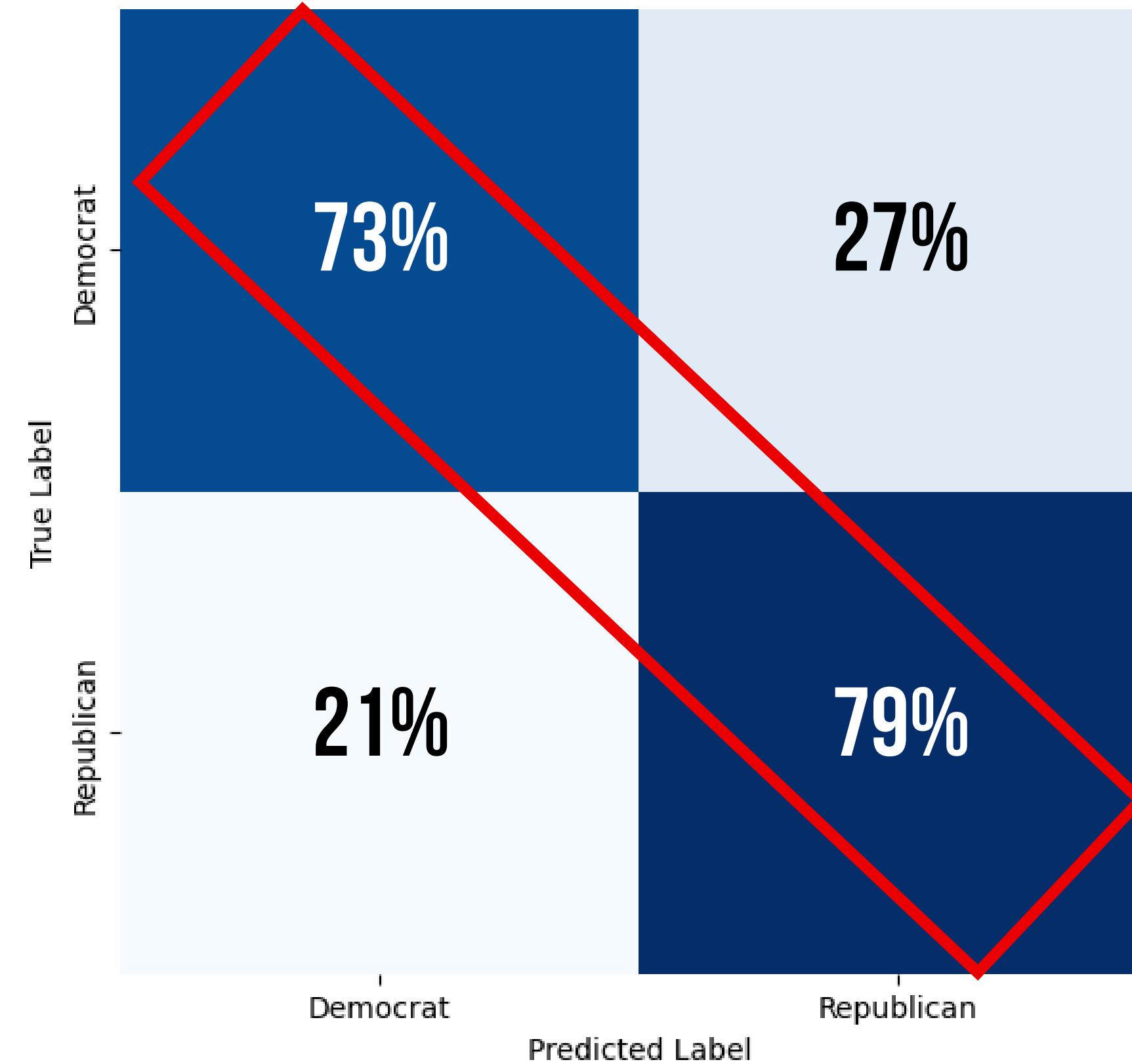
22.9%

Republican

77.1%

Percent of counties that voted Democrat or Republican

CONFUSION MATRIX NORMALIZED

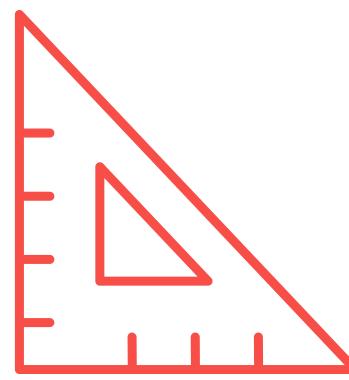


METRICS



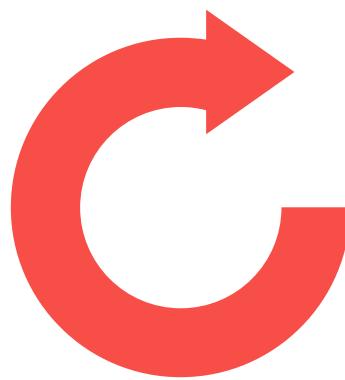
ACCURACY

77.5%



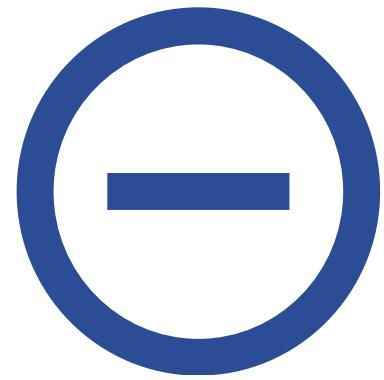
HIGH PRECISION

90% 



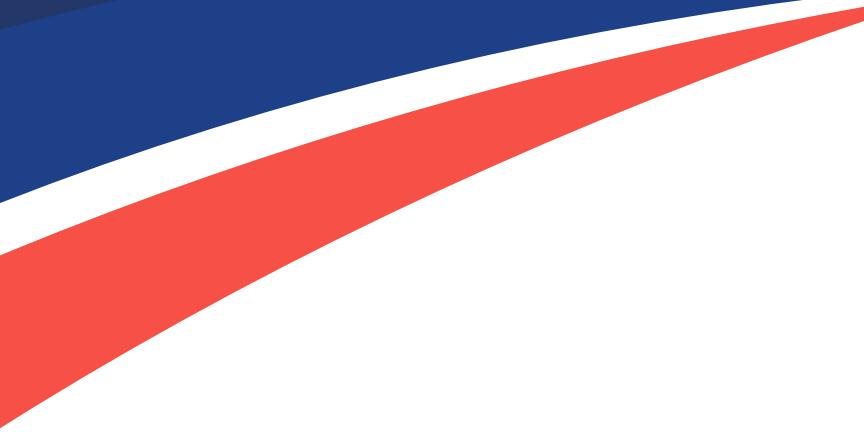
GOOD RECALL

79% 

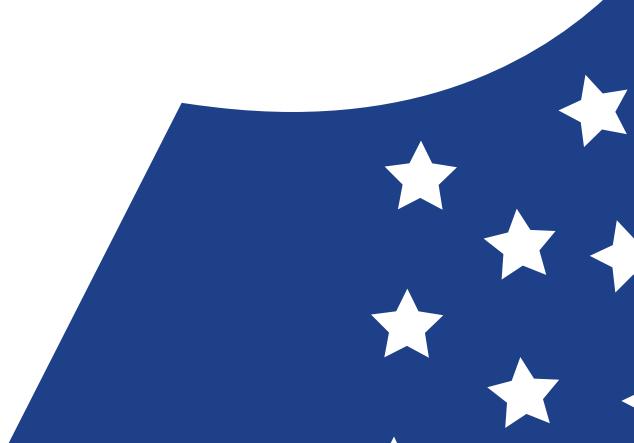
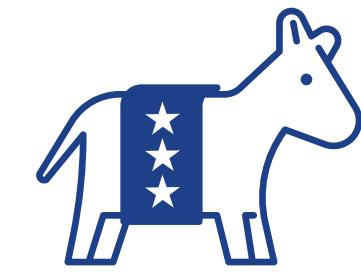


AUROC

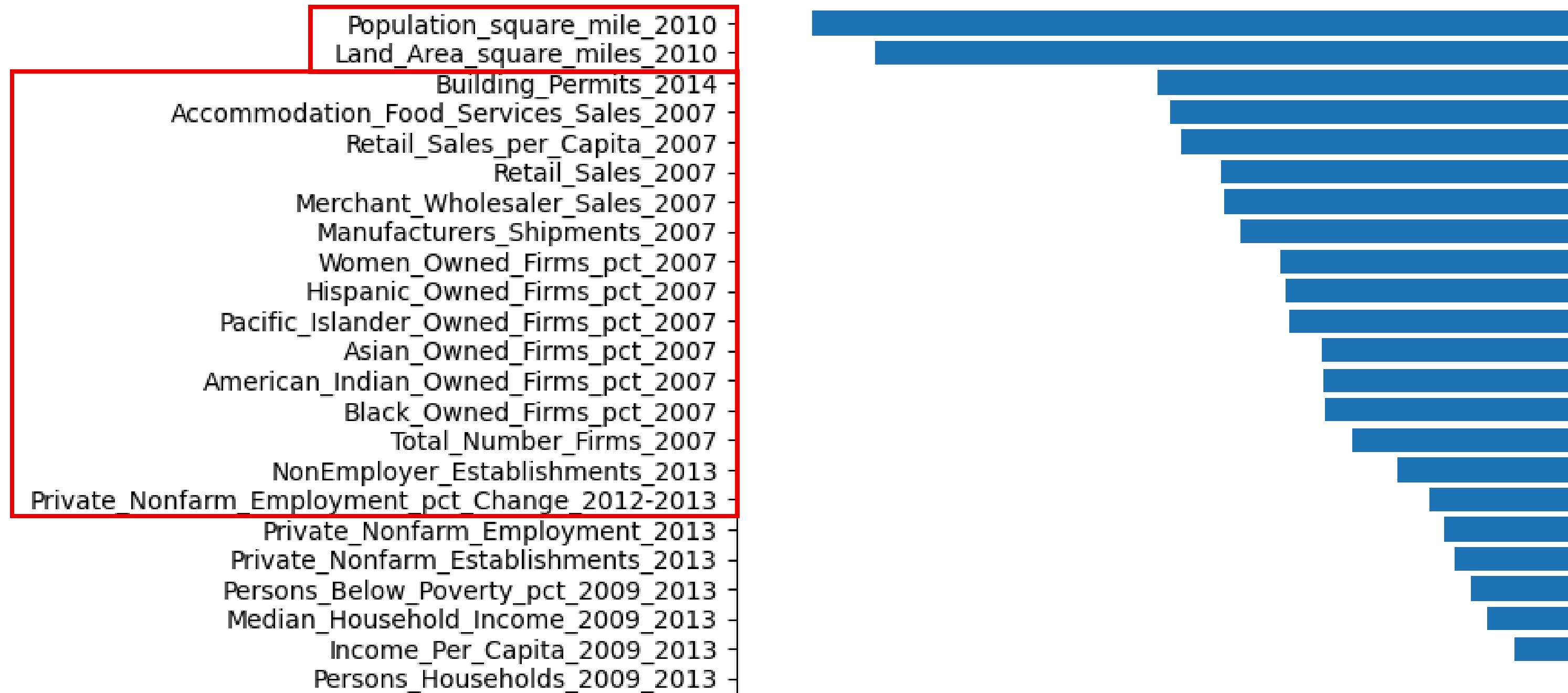
82%



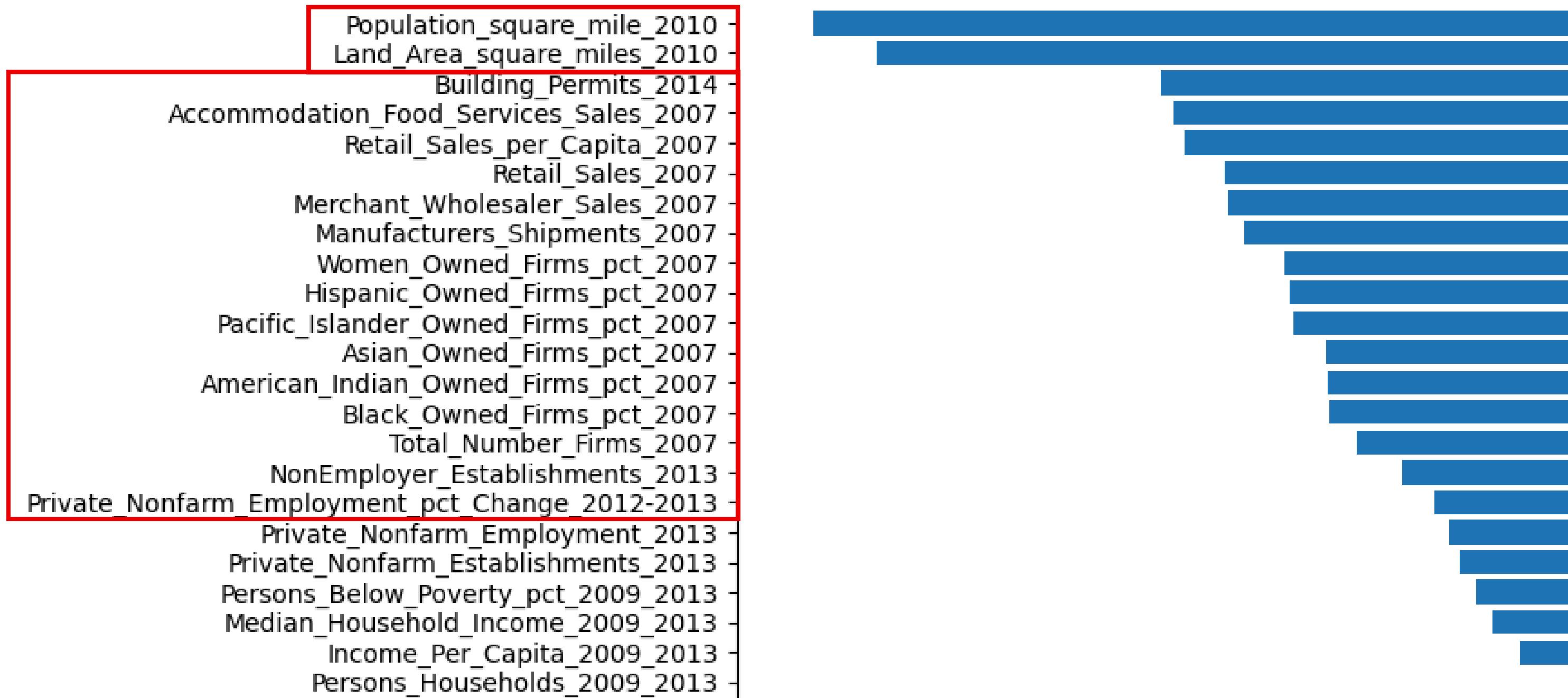
DEMOCRATIC



COEFFICIENTS - DEMOCRATIC PARTY

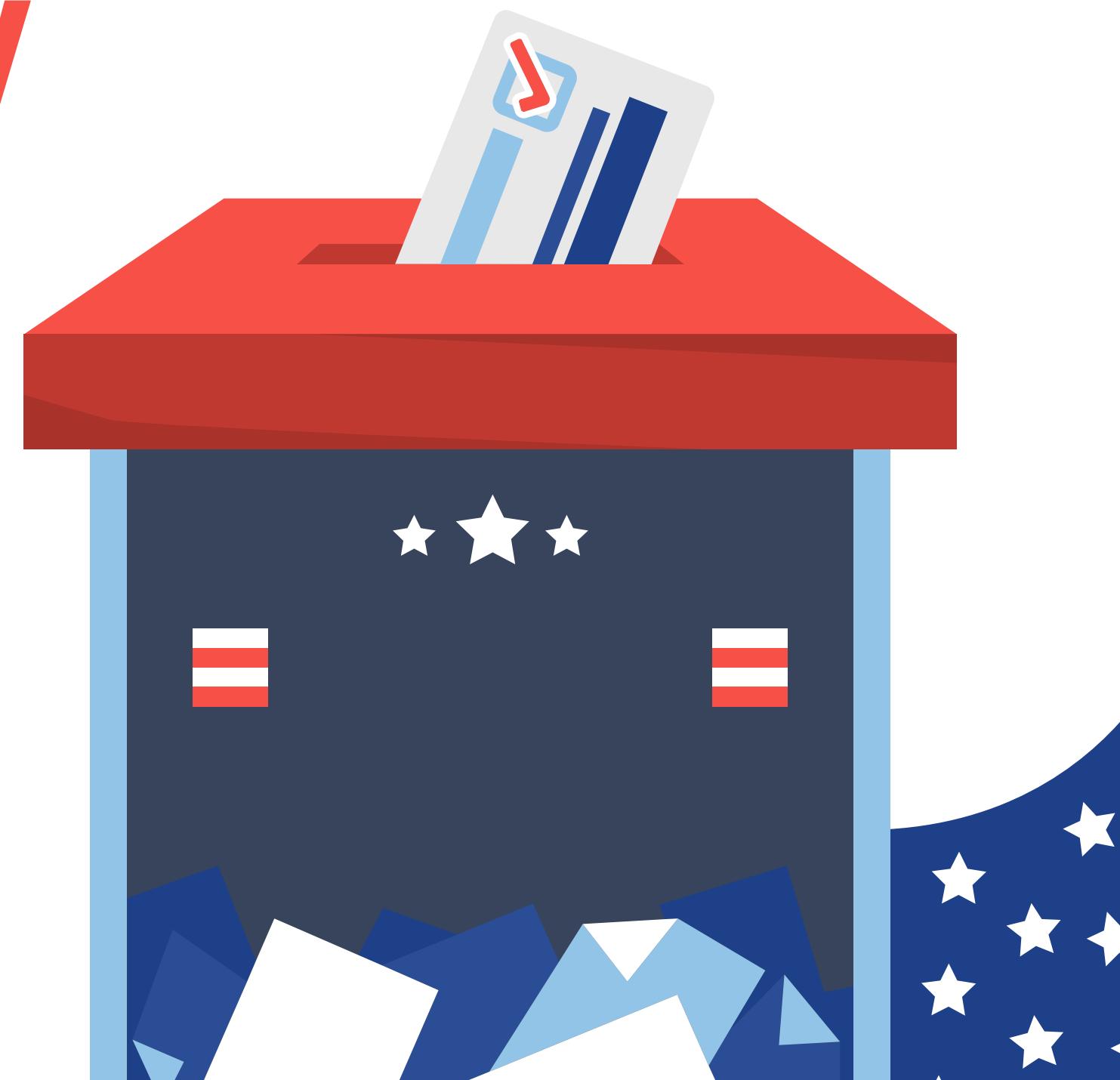


COEFFICIENTS - DEMOCRATIC PARTY

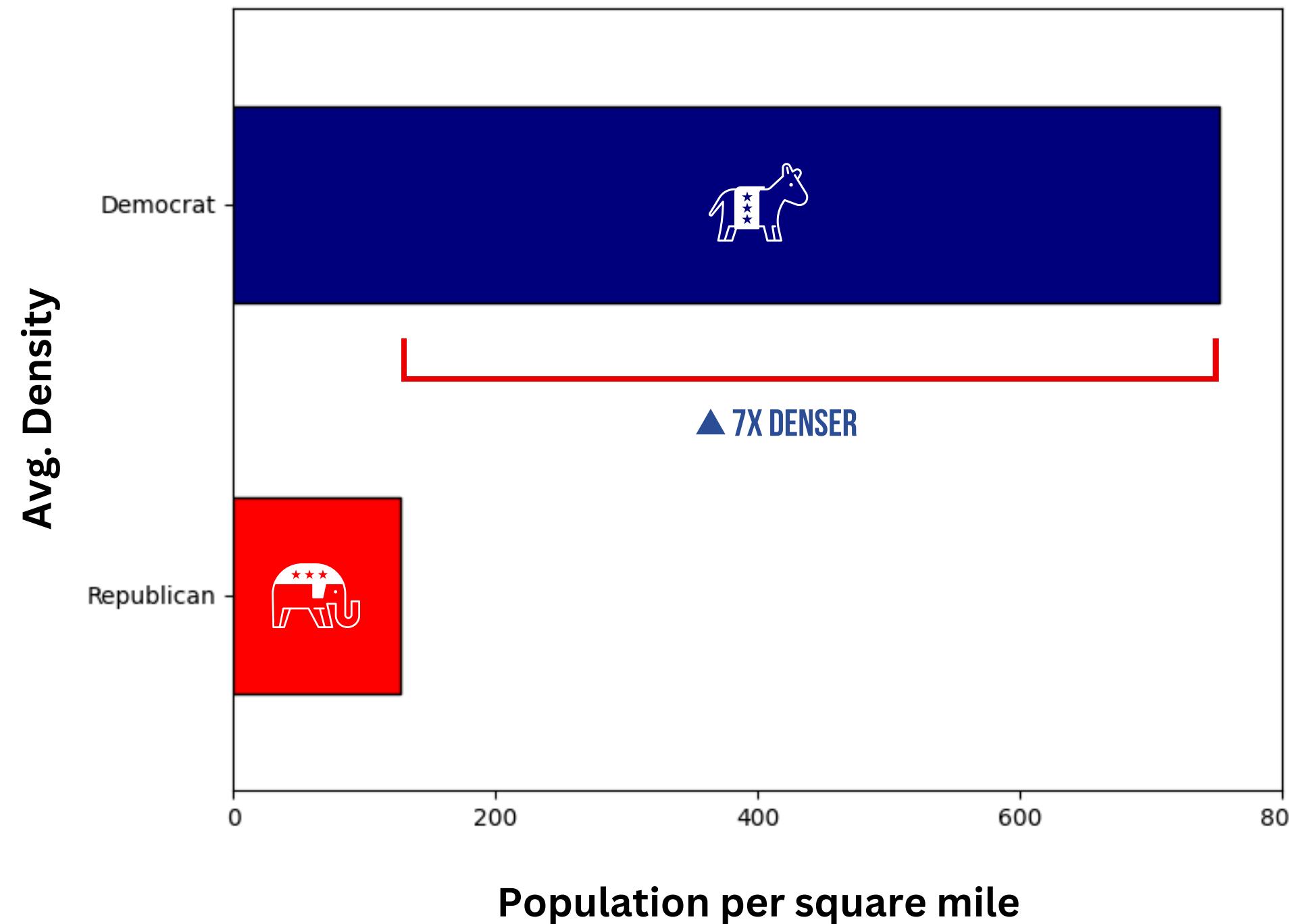


POPULATION DENSITY

How does county population density influence party vote partiality?



AVERAGE COUNTY POP. DENSITY BY WINNING PARTY

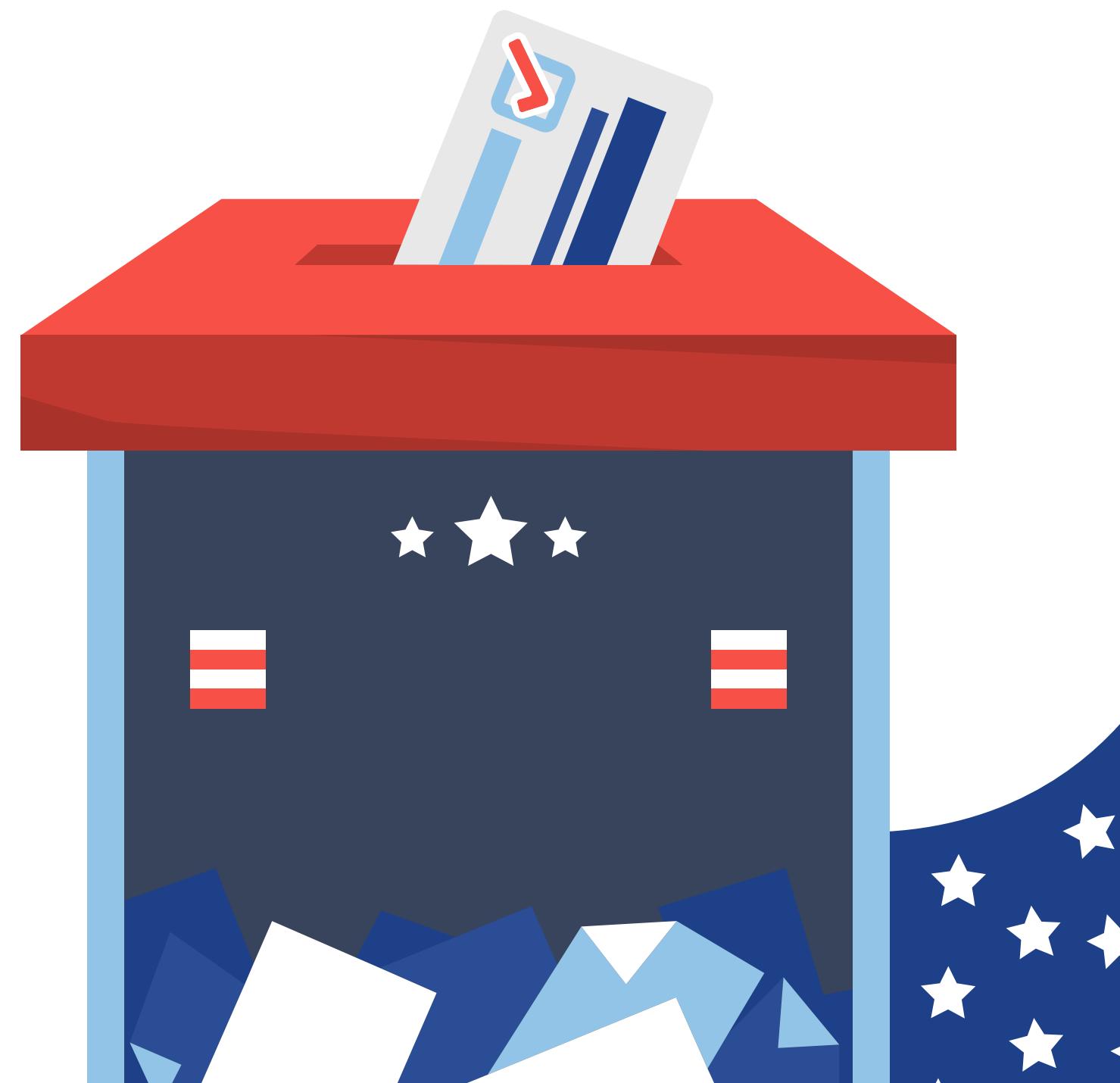


2016 Political Context:

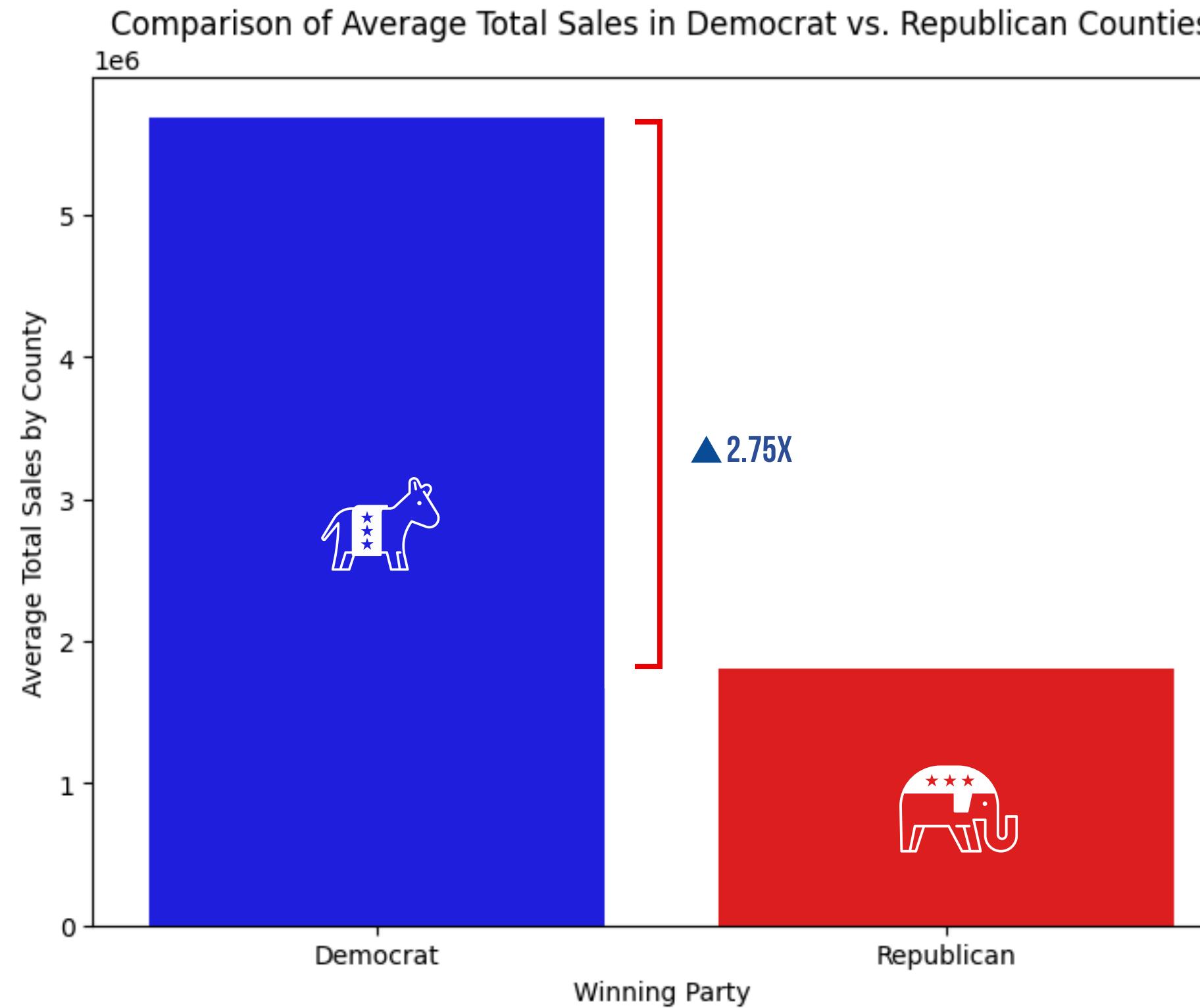
- Historical Robust Rural Support
- 2X Rep Rural Support ('10)
- Strong Urban Dem. Support (65%)
- Suburban = Divided Split

COUNTY ECONOMICS

How does a county's **total business sales** influence vote shares?



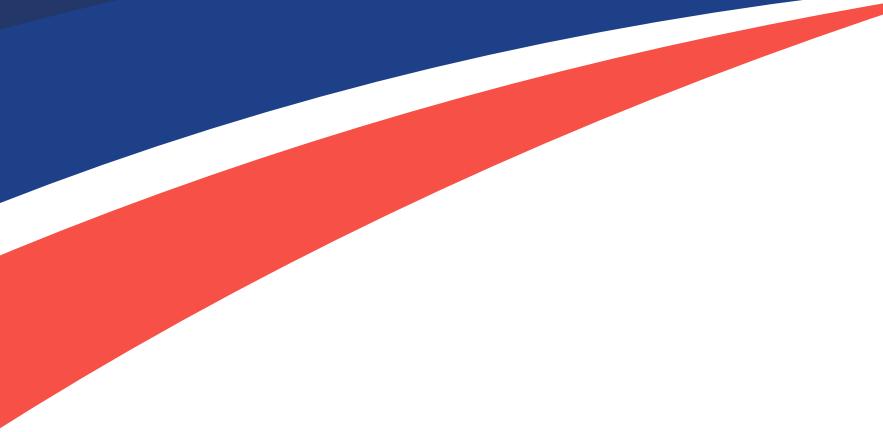
AVG. COUNTY-WIDE SALES



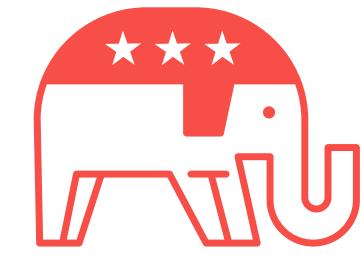
2016 Political Context:

Clinton vs. Trump (extra info.)

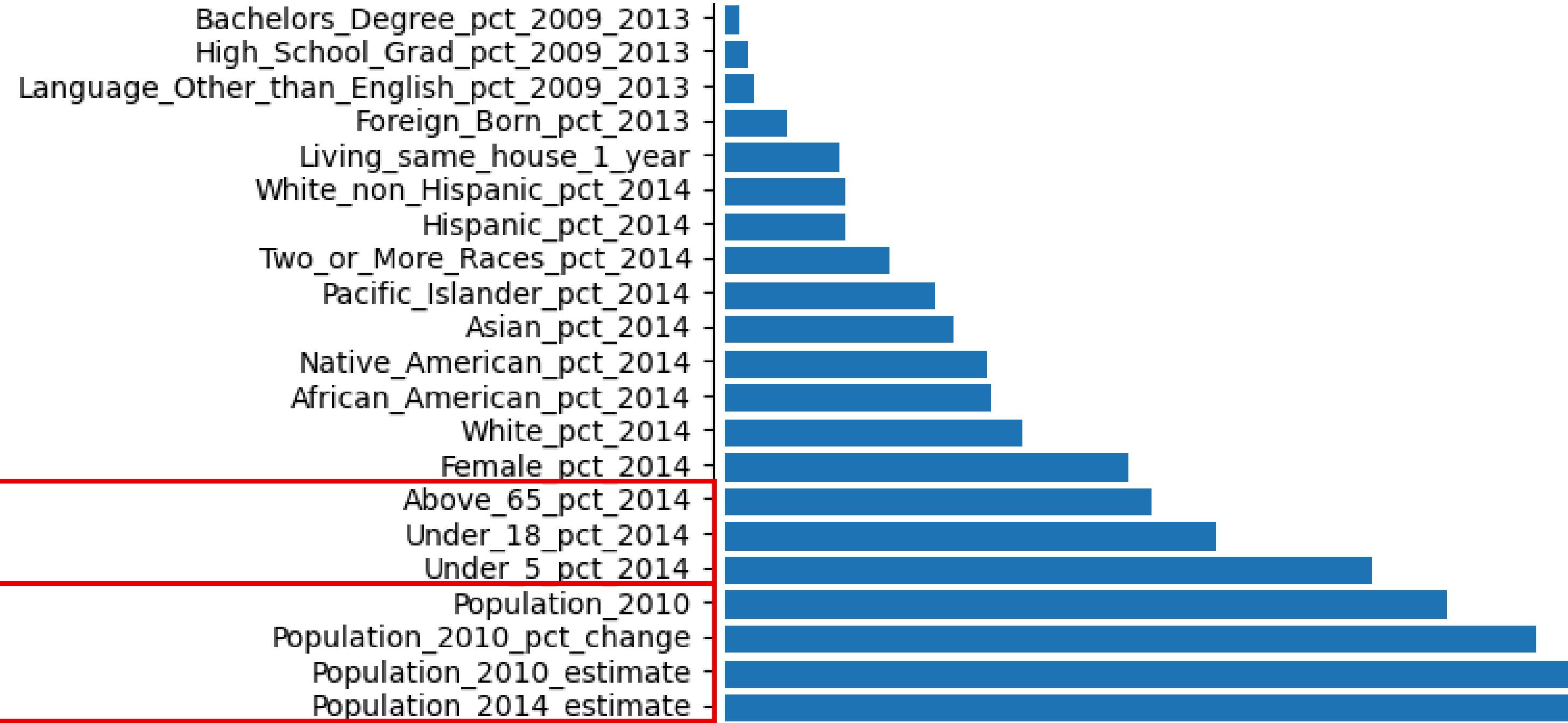
- 2584 Counties Won = 36%
- 472 Counties Won = 64%



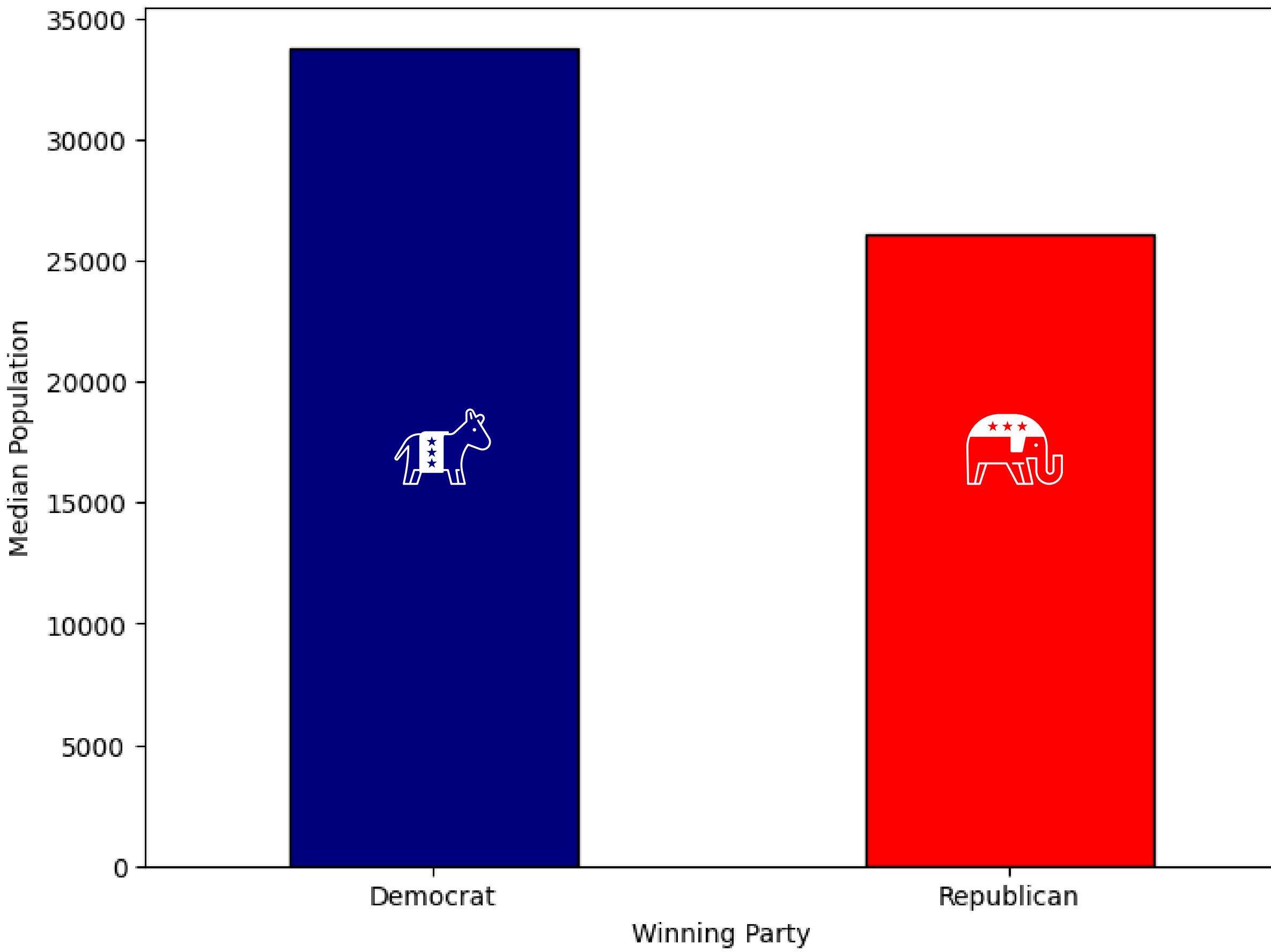
REPUBLICAN



COEFFICIENTS - REPUBLICAN PARTY



MEDIAN POPULATION BY WINNING PARTY



WHY IS THIS THE CASE?

DATA IMBALANCE

Multiple small Republican counties may **skew model** to associate pop. as (+) correlated with Republican outcomes.

OTHER VARIABLES

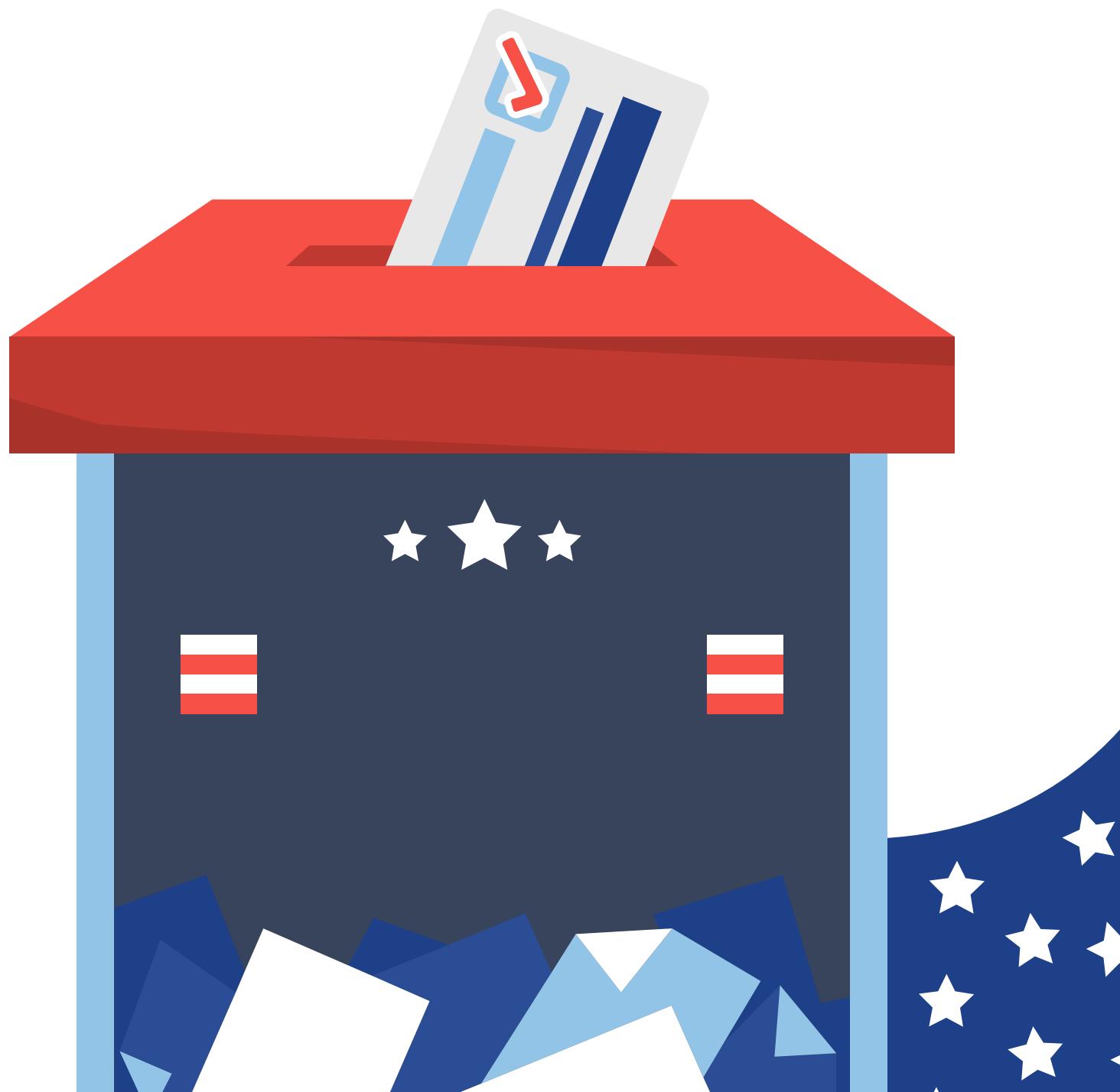
When controlling for race, poverty, age groups, etc., the **partial relationship with pop. can flip sign.**

POP. VS. DENSITY

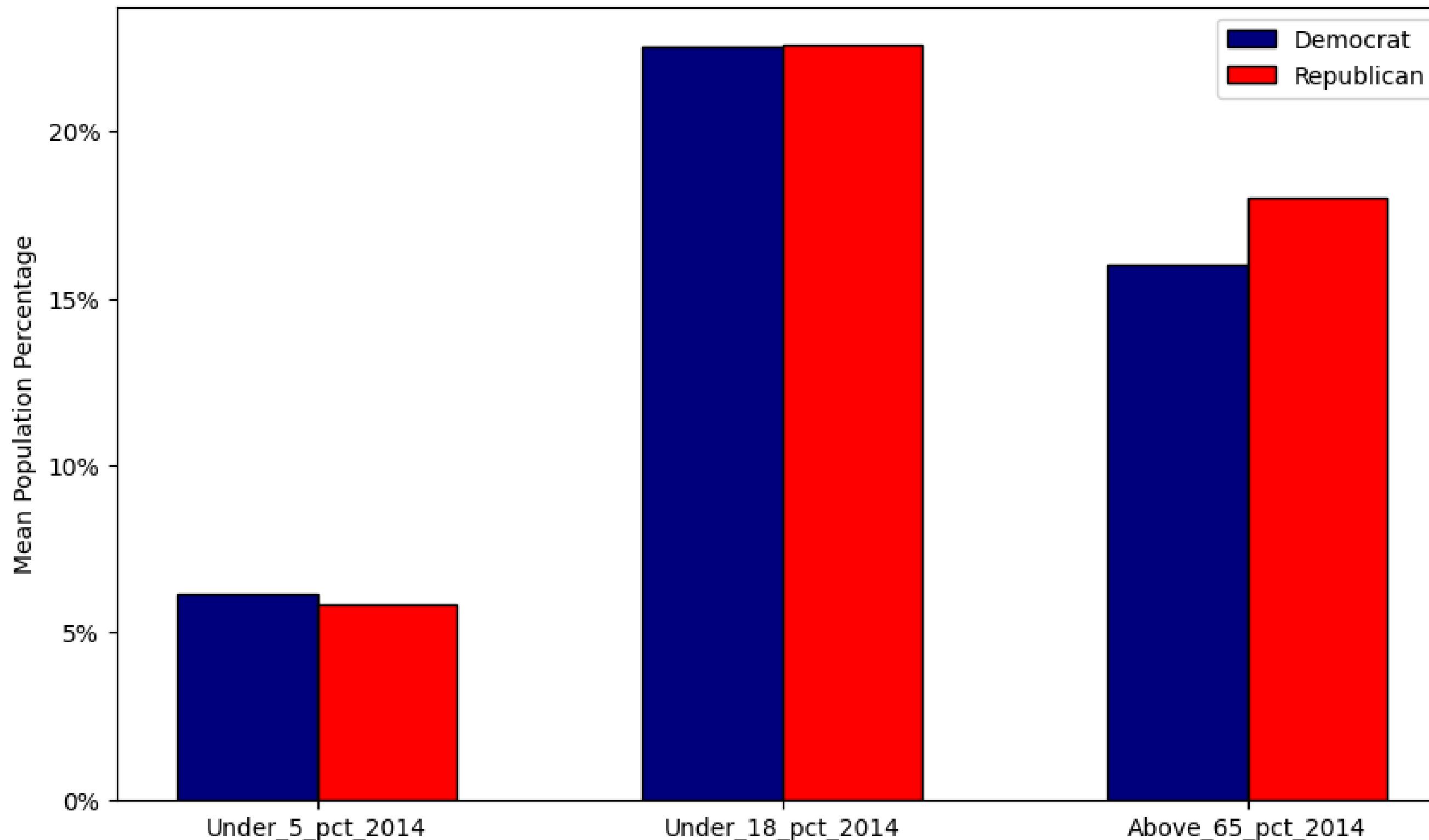
Large counties **aren't** necessarily **dense** (urban).

HOUSEHOLD AGE

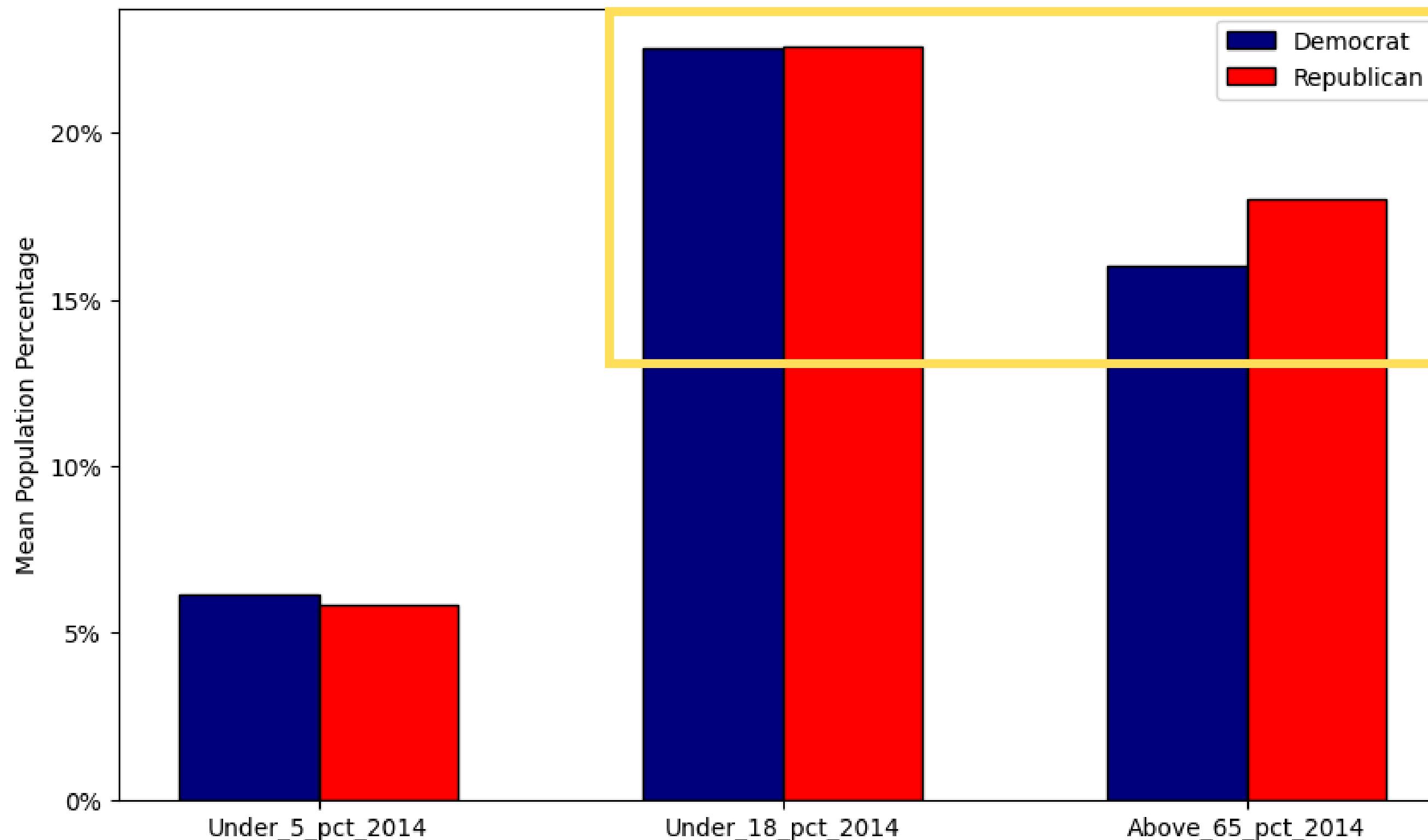
How do **age ranges** within a household affect voter tendencies?



HOW DO HOUSEHOLD AGE GROUPS CHANGE VOTING?

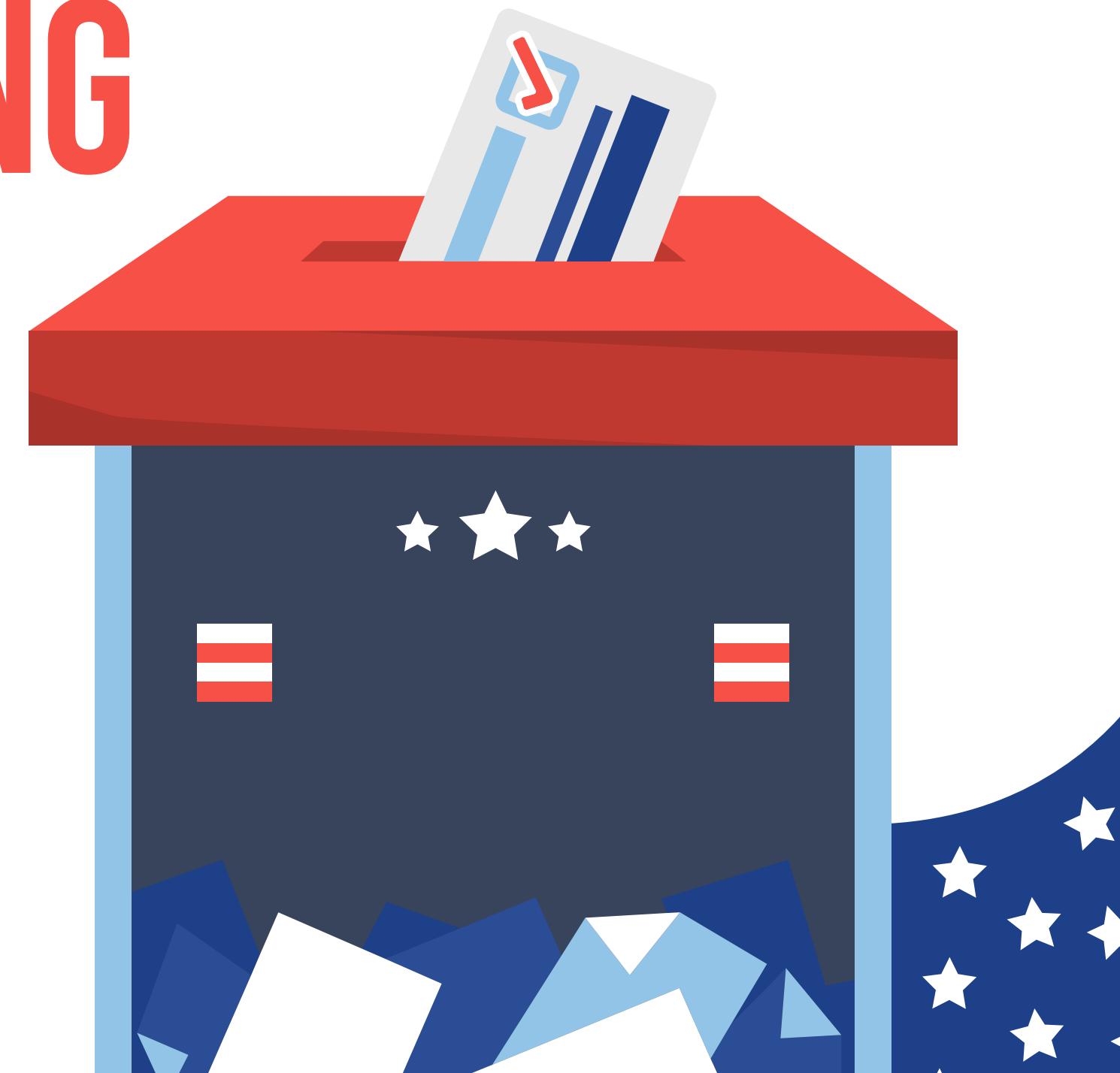


HOW DO HOUSEHOLD AGE GROUPS CHANGE VOTING?



FEATURE ENGINEERING

Can we **fine-tune** the model for better performance?



VARIANCE INFLATION FACTOR (VIF)

Purpose: Evaluates level of correlation between predictor (feature) in a regression model

A high ▲ VIF means a feature is **redundant** because it **shares too much info.** with other **features**

Can make the model unstable.

VARIANCE INFLATION FACTOR (VIF)

County_Size_Index

Population 2010	Households 2009_2013	Population 2014 estimate	Housing_Units 2014	...
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Youth_pct_2014

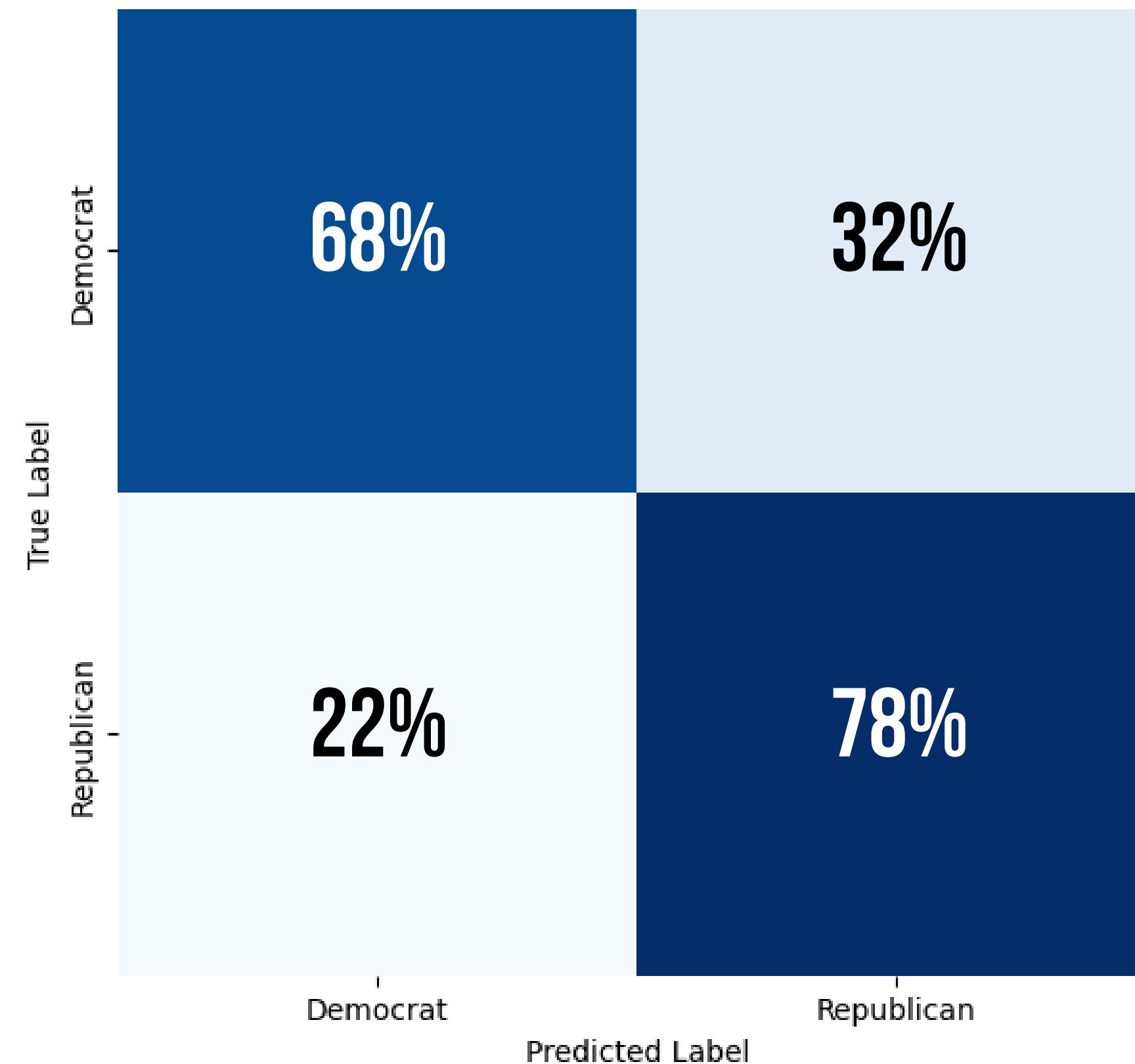
Under_5_pct_2014	Under_18_pct_2014
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Income_Index

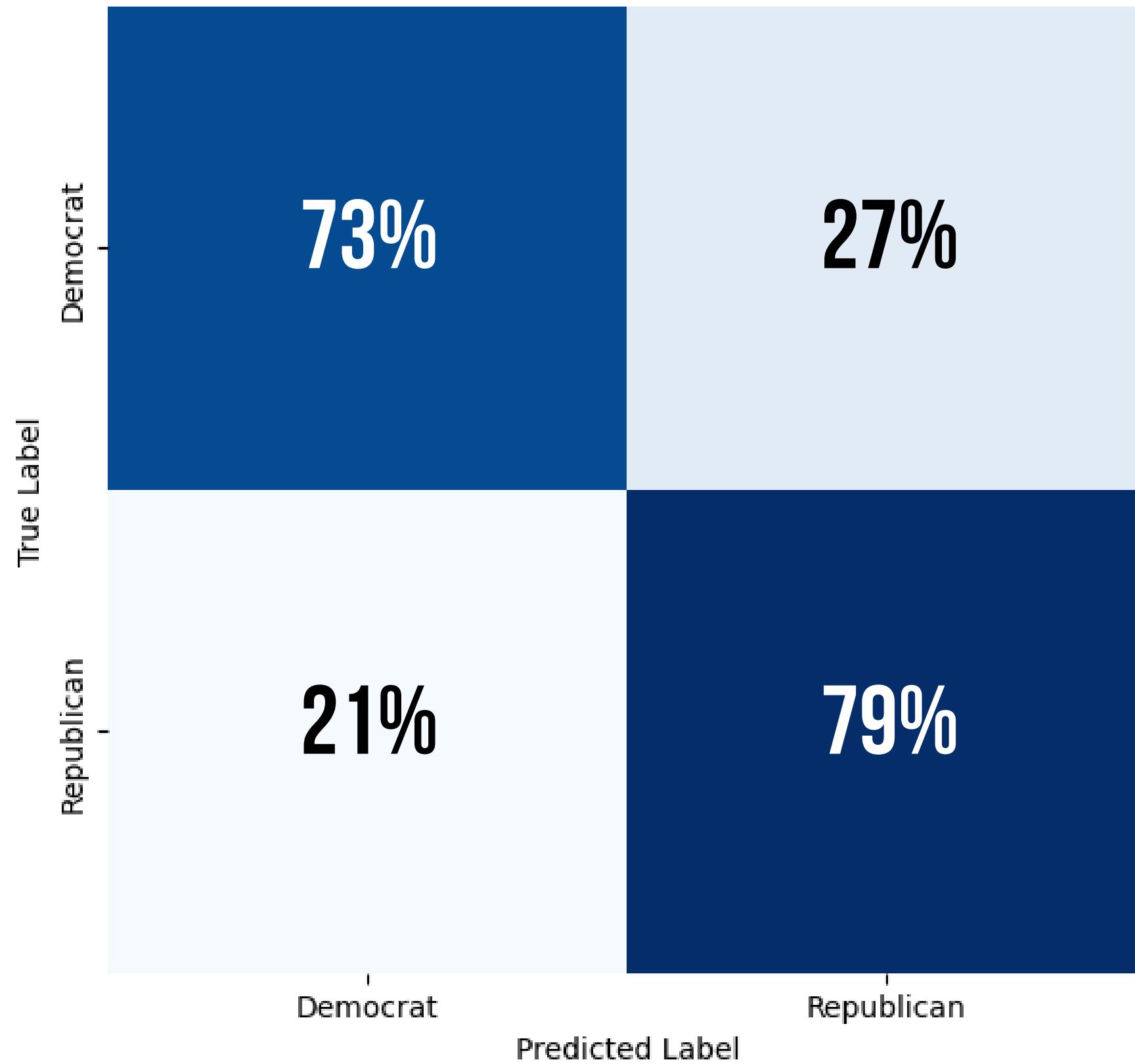
Median_Household_Income 2009_2013	Income_Per_Capita_2009_2013
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Correlation threshold = 0.8

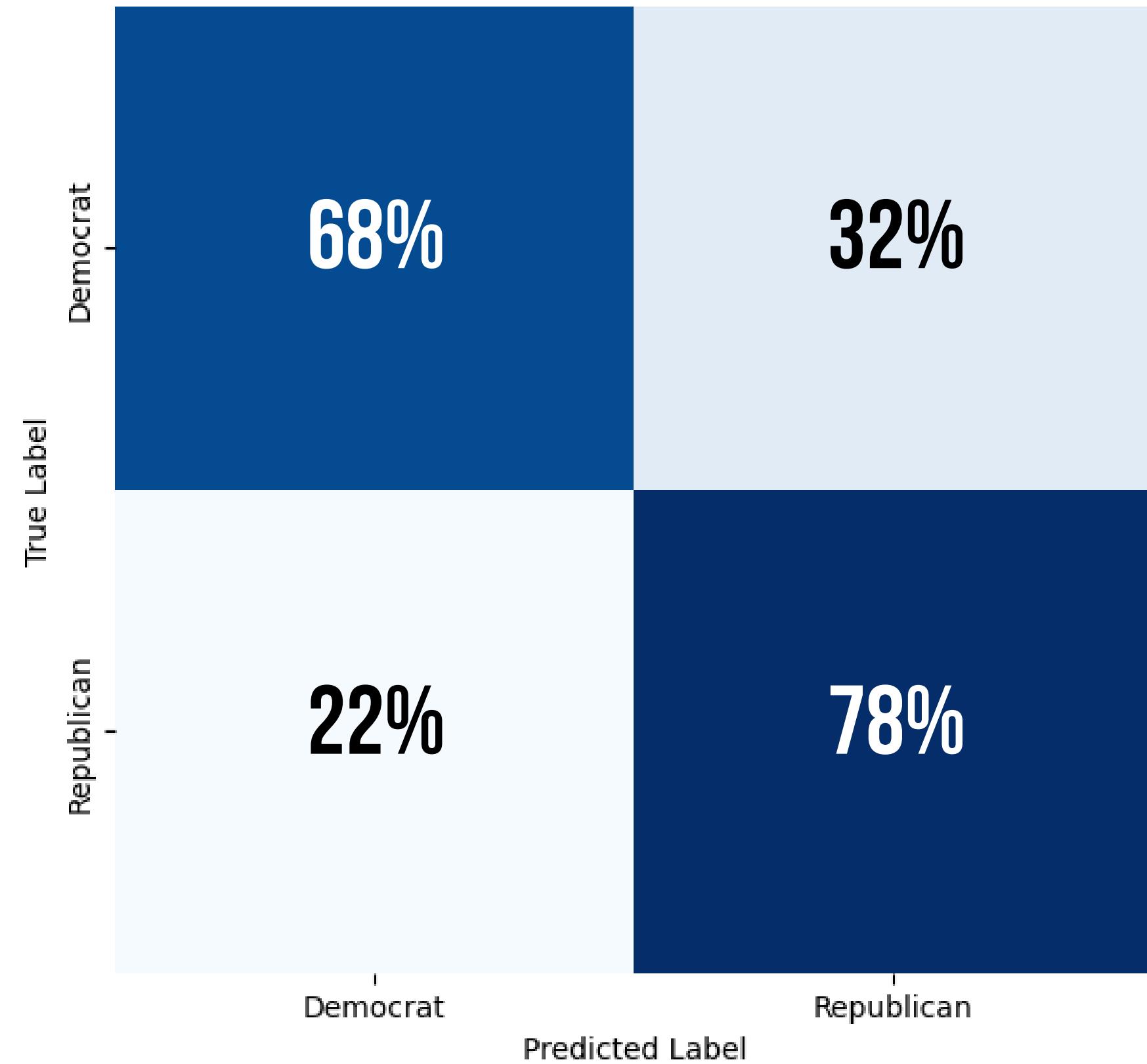
CONFUSION MATRIX



OLD



NEW



SUMMARY

- **Data Limitations:**
 - 35 % missing values
 - Data Imbalance: Republican-leaning
- Dense counties & Total Sales = More Democratic Tendencies
- Household Age Groups Influence Voting Dynamics
- Feature Engineering = We Tried - Accuracy Levels Dropped



THANK YOU

Questions?



WHY IS THIS THE CASE?

DATA IMBALANCE

With **many small** Republican-leaning counties, the model might “see” population as **positively correlated** with Republican outcomes.

OTHER VARIABLES

When controlling for race, poverty, age groups, etc., the partial relationship with population can flip sign.

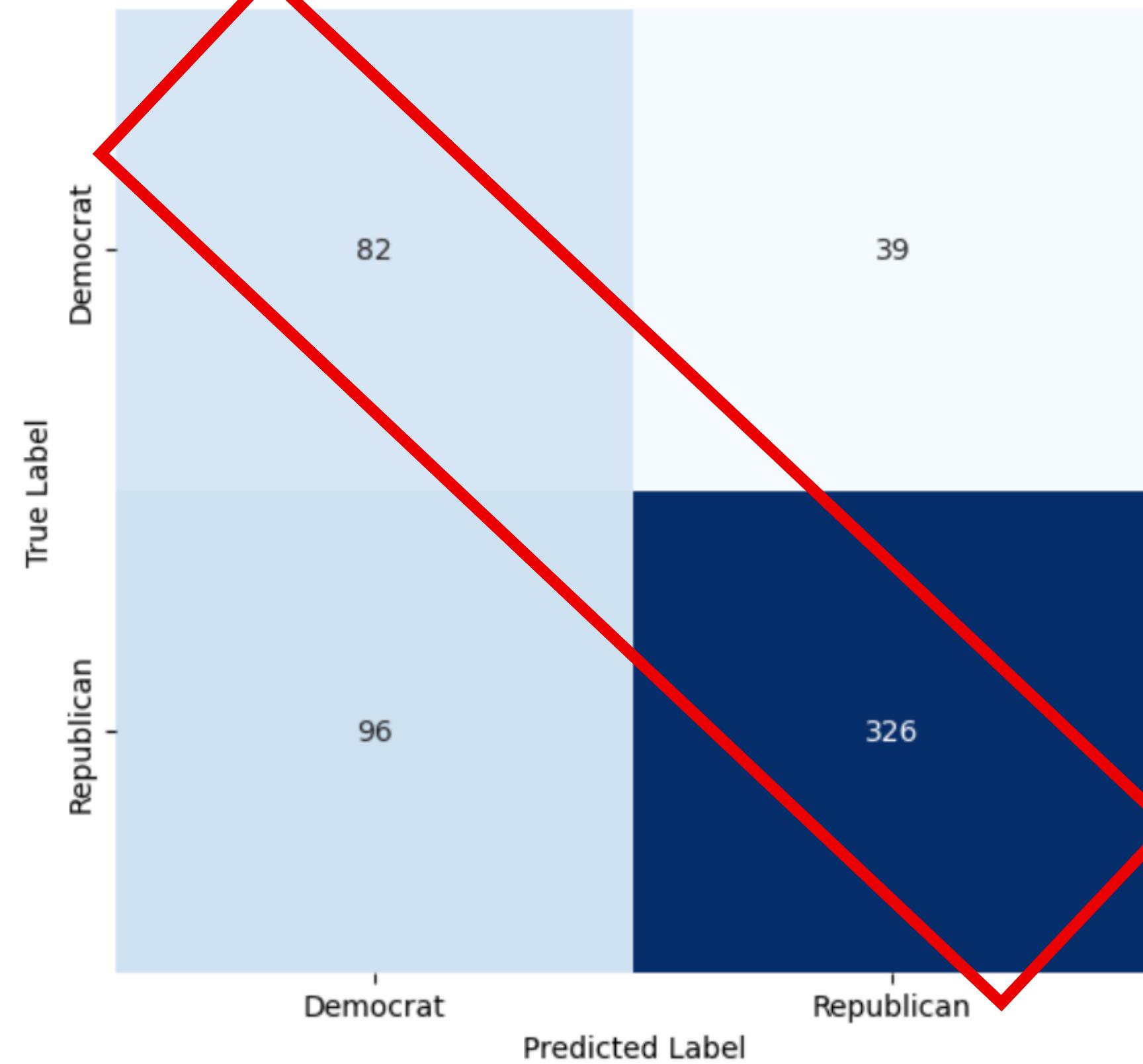
POPULATION VS. DENSITY

Large counties **aren't** necessarily **dense** (urban).

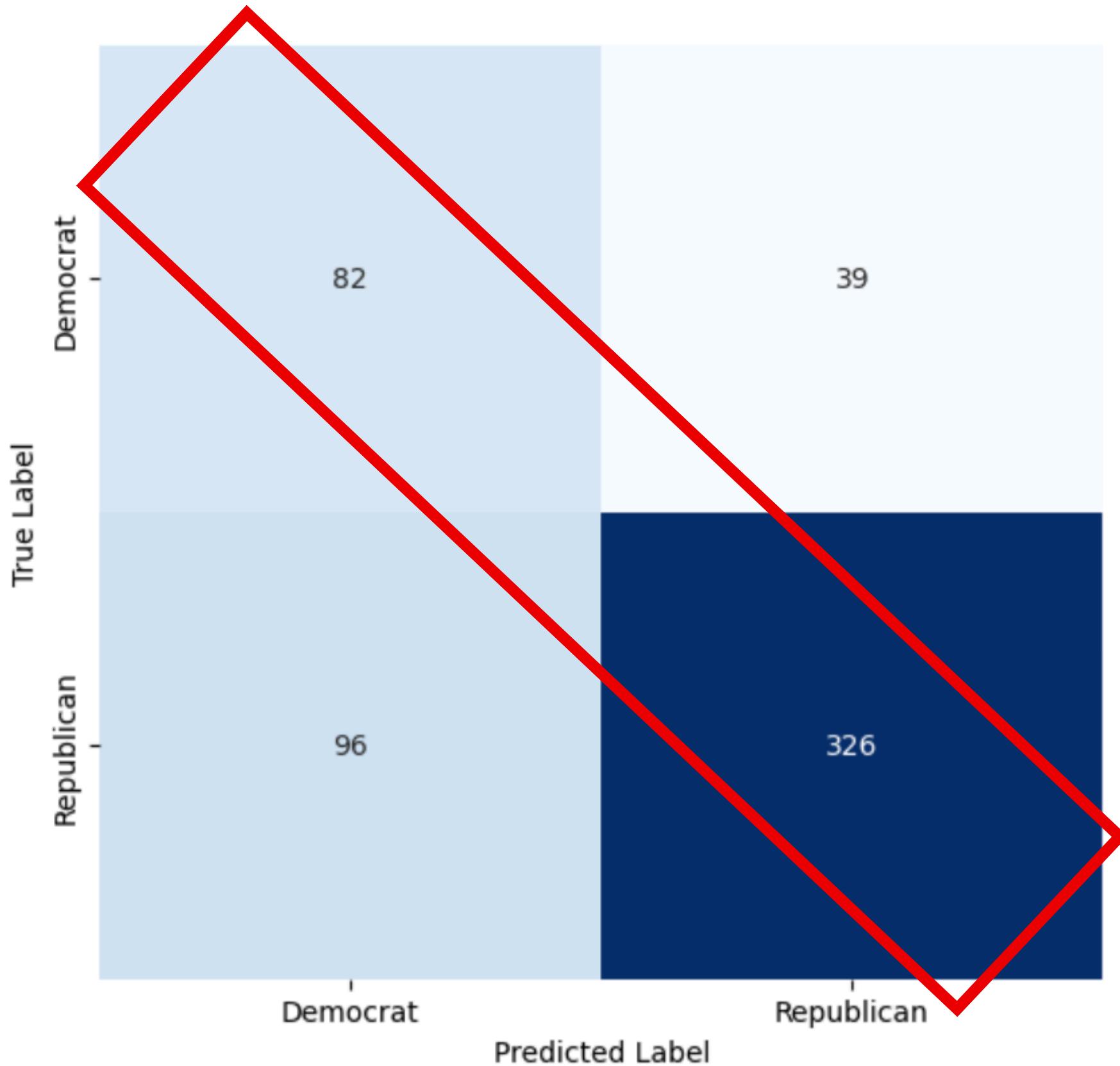
LOGISTIC REGRESSION MODEL



CONFUSION MATRIX



CONFUSION MATRIX

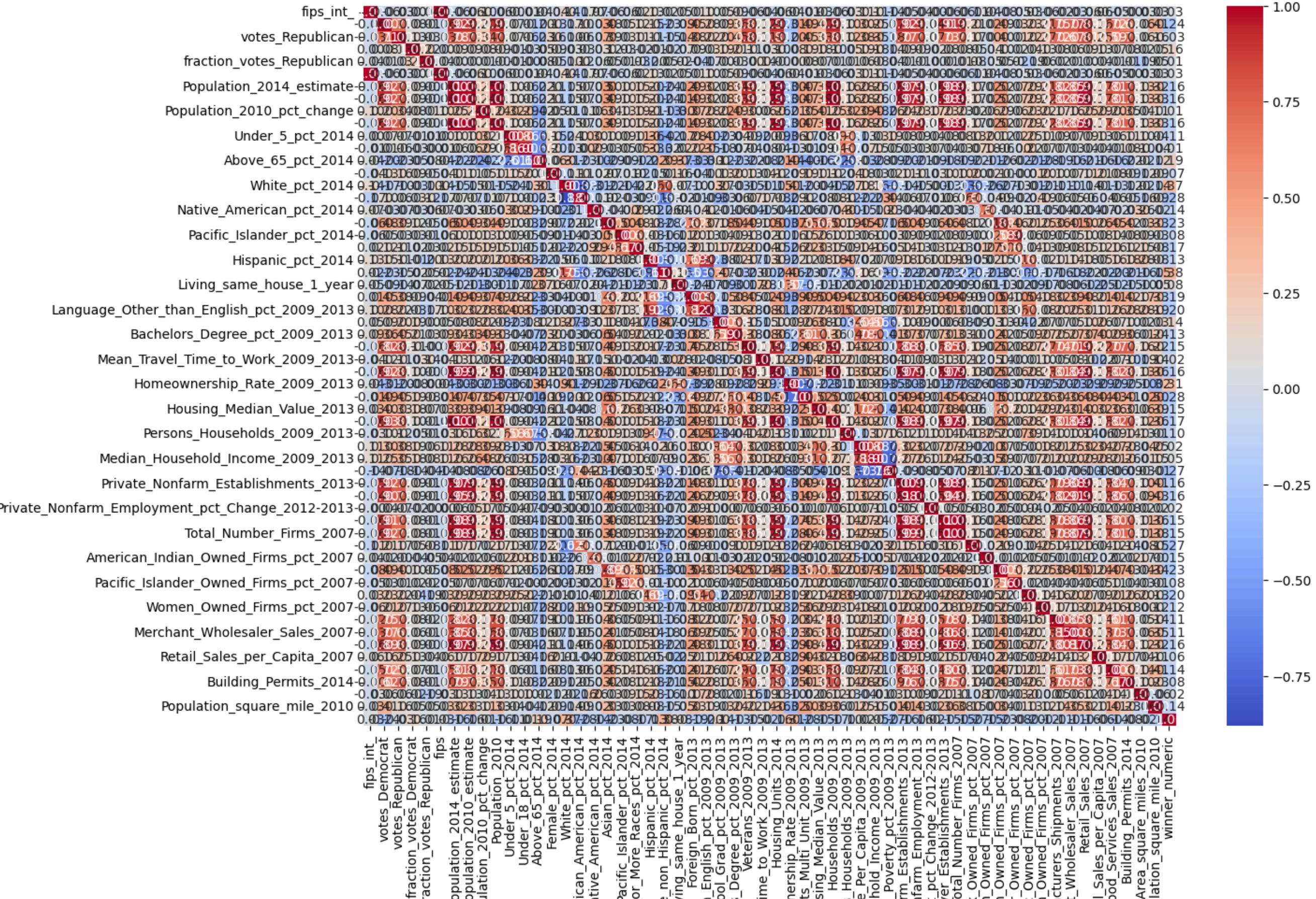


Columns used:

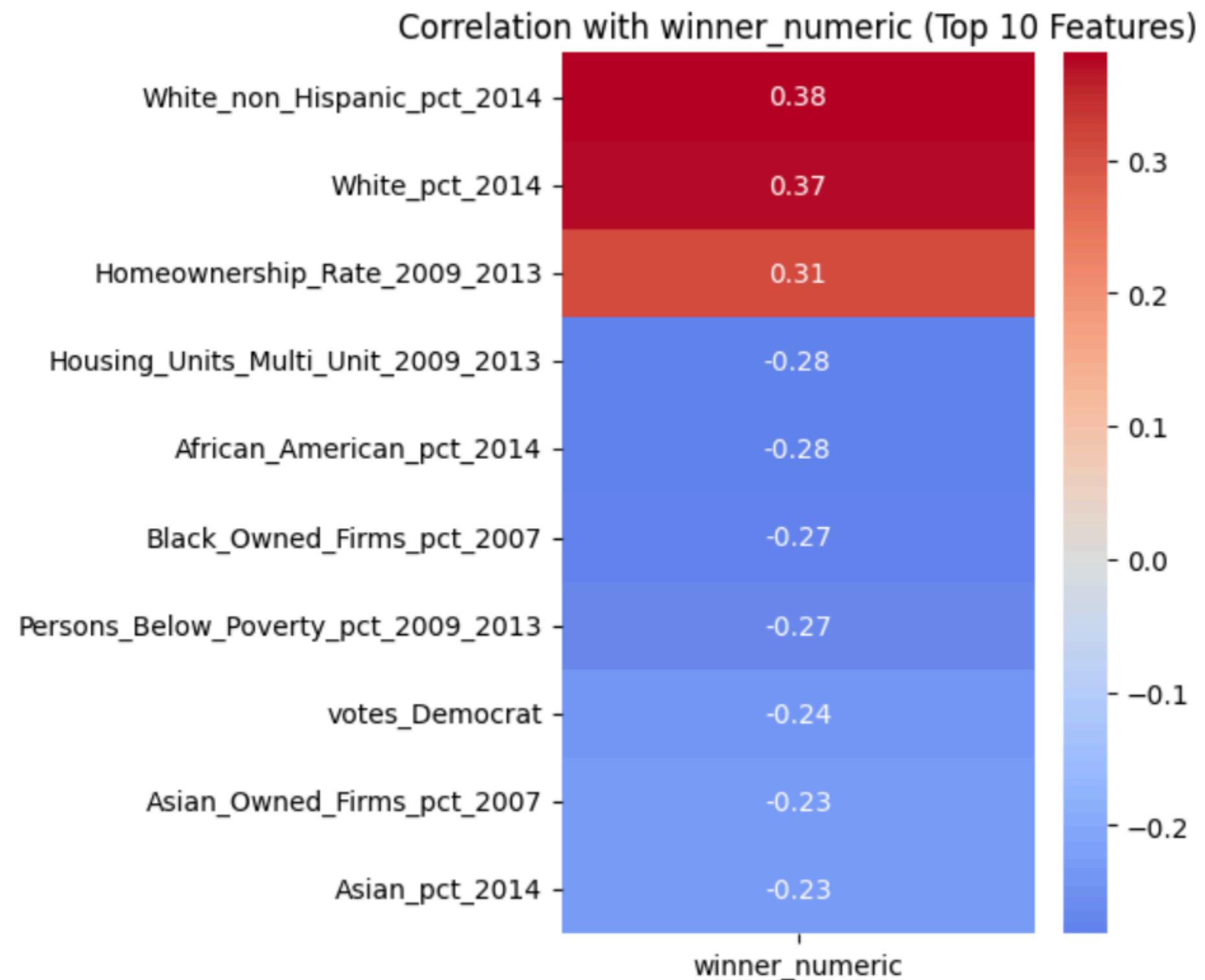
- White_non_Hispanic_pct_2014
- White_pct_2014
- Homeownership_Rate_2009_2013
- Housing_Units_Multi_Unit_2009_2013
- African_American_pct_2014
- Black_Owned_Firms_pct_2007
- Persons_Below_Poverty_pct_2009_201
- votes_Democrat
- Asian_Owned_Firms_pct_2007
- Asian_pct_2014

CORRELATION MATRIX

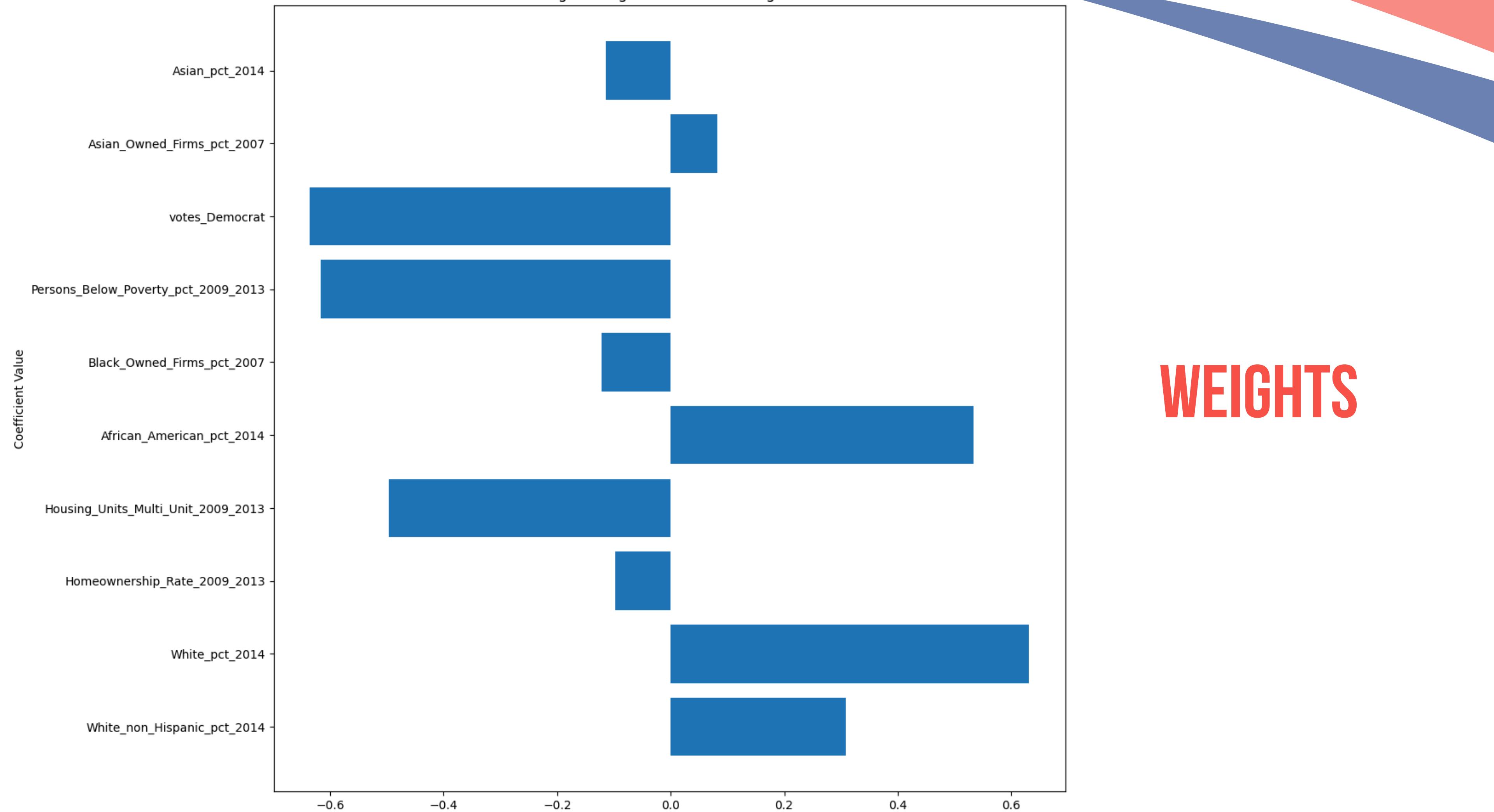
Correlation Matrix for Numeric Features



CORRELATION MATRIX



Logistic Regression Feature Weights



NEXT STEPS

COLLINEARITY

Many demographic indicators are highly correlated

IMBALANCE IN DATA

Republican class has well over three times as many samples as the Democrat class

TRY MORE COMBINATIONS

Look for more demographics that actually help predicting the winner party of a county/state



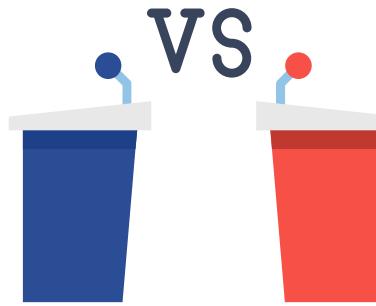
MORE COOL RESULTS... TO BE CONTINUED

MORE COOL RESULTS...



TRUST

Despite being red,
Mars is a cold place. It's
full of iron oxide dust



DIALOGUE

It's a gas giant,
composed mostly of
hydrogen and helium

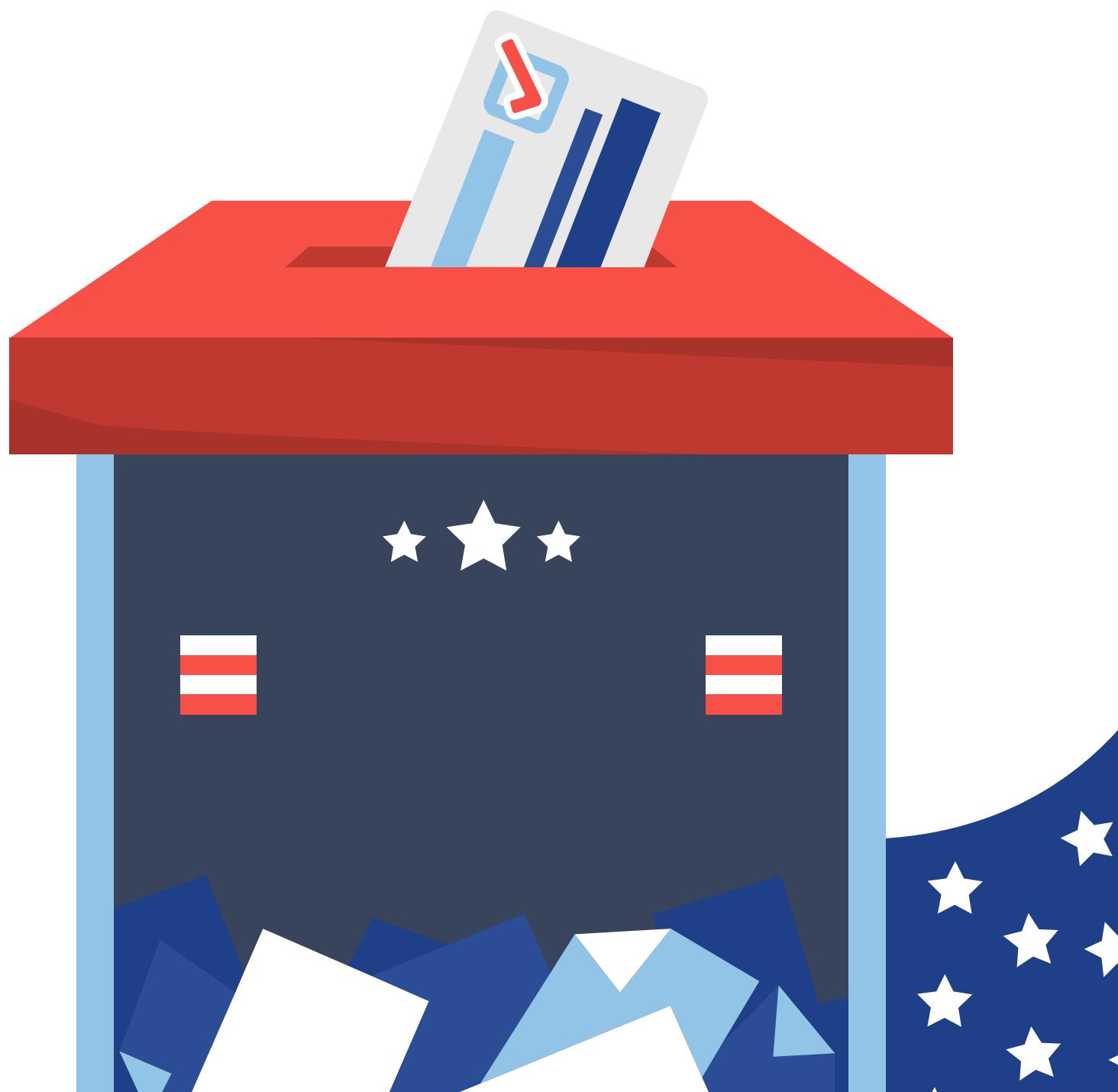


FAIR ELECTION

Jupiter is a gas giant
and the biggest planet
in the Solar System

OVERVIEW

Mercury is the closest planet to the Sun and the smallest one in the Solar System—it's only a bit larger than the Moon. The planet's name has nothing to do with the liquid metal



SWING STATES



COLORADO



FLORIDA



IOWA



MICHIGAN



NEVADA



NORTH CAROLINA



OHIO

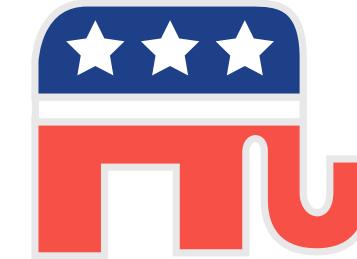


PENNSYLVANIA



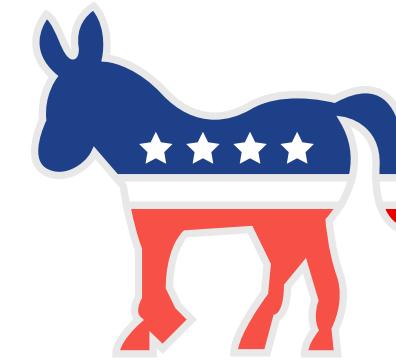
VIRGINIA

WHAT SETS US APART?



REPUBLICANS

It's the closest planet to the Sun and also the smallest one in the Solar System



DEMOCRATS

Despite being red, Mars is a cold place. The planet is full of iron oxide dust

CORE VALUES

MARS

Mars is a very cold place

JUPITER

Jupiter is the biggest planet

NEPTUNE

Neptune is the farthest planet

SATURN

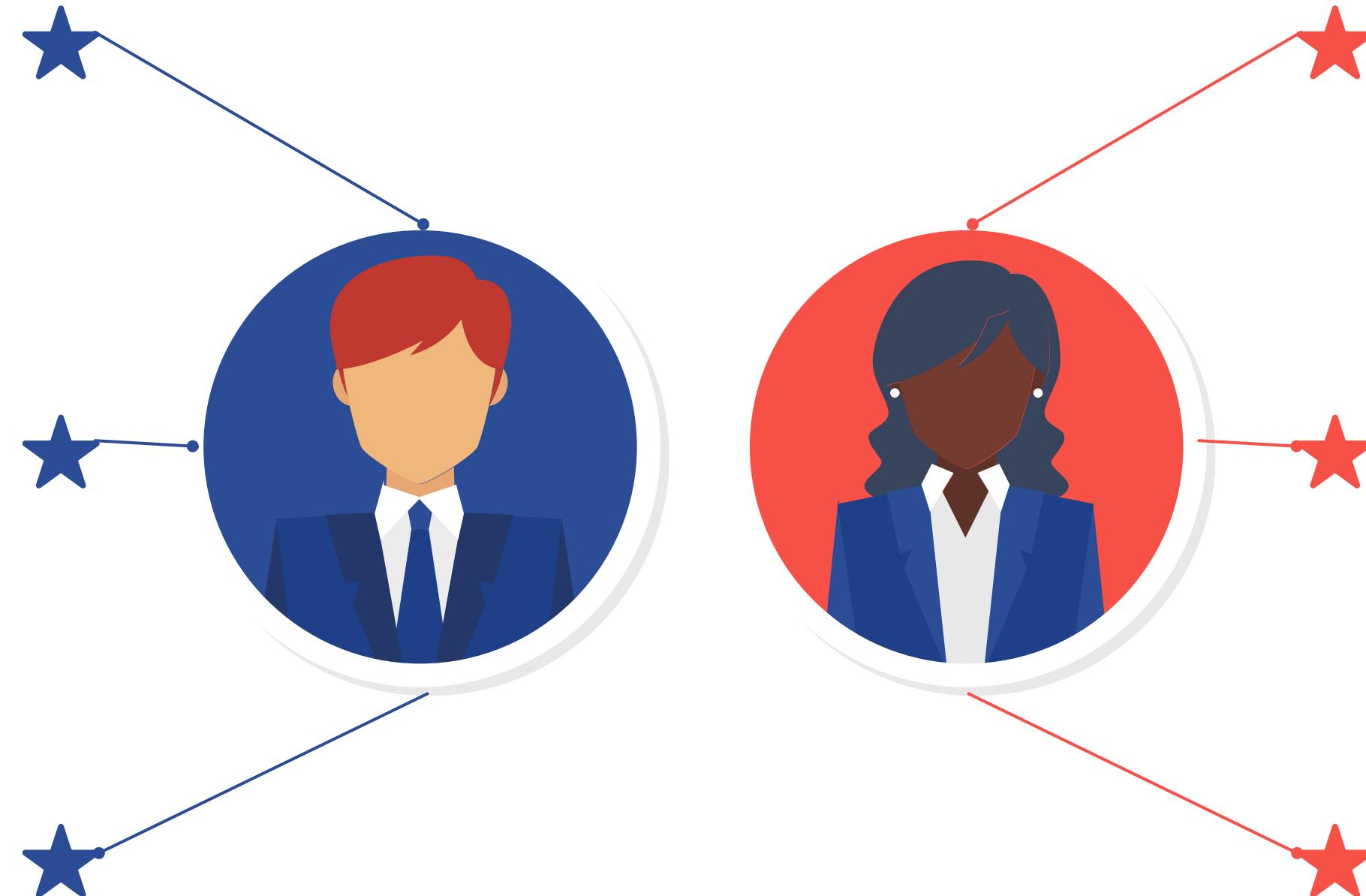
Saturn is the ringed one

VENUS

Venus has a beautiful name

MERCURY

Mercury is the smallest planet



VOTERS

MARS

Mars is a very cold place

JUPITER

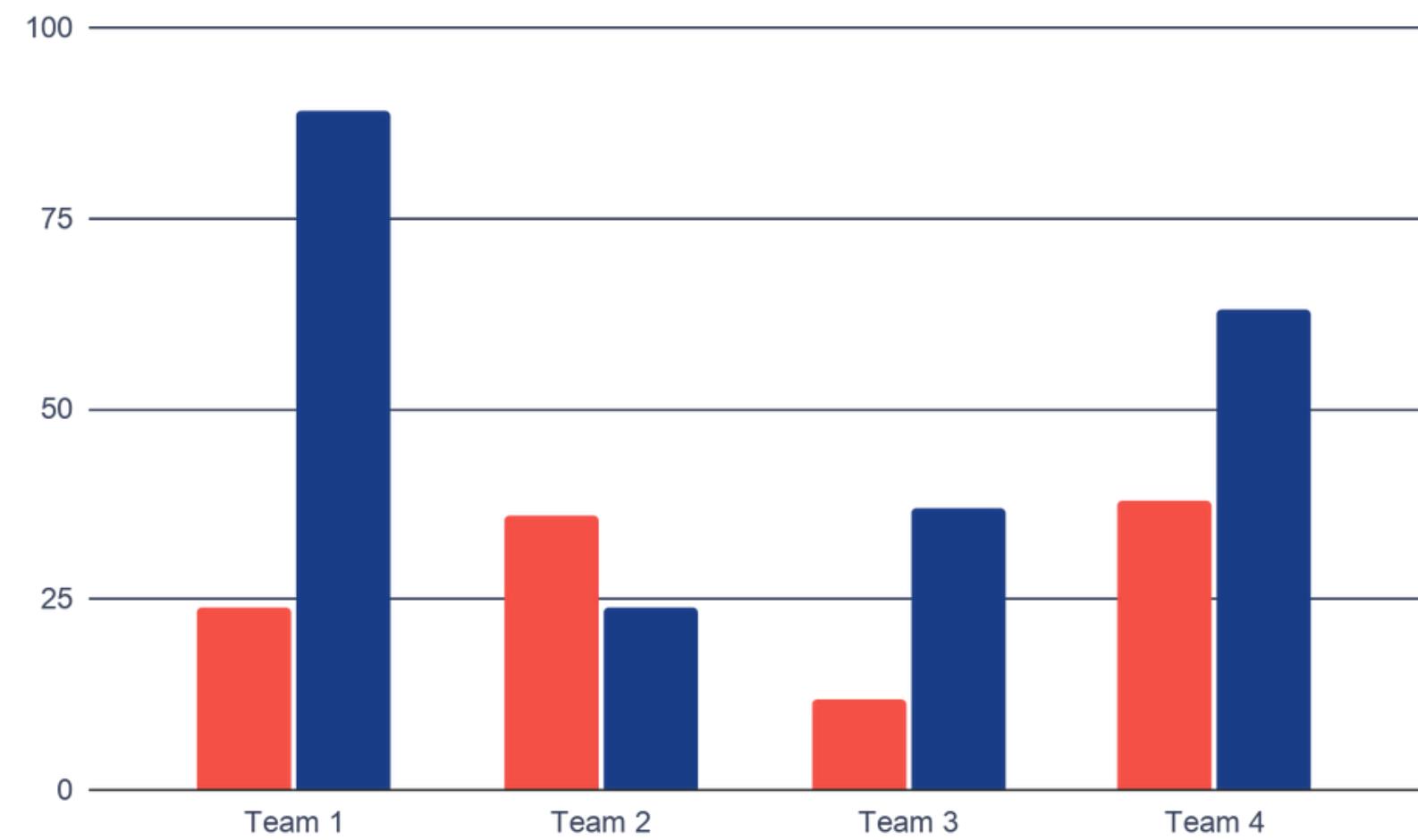
Jupiter is the biggest planet

SATURN

Saturn is the ringed one

VENUS

Venus has a beautiful name



To modify this graph, click on it, follow the link, change the data and paste the new graph here

VOTER PROFILE

GENDER



60%



85%

AGE

25-35



36-45



46-65



INTERESTS



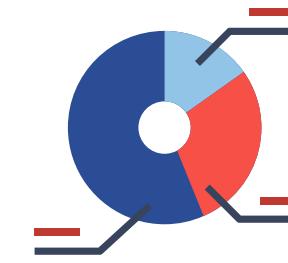
SURVEYS

MERCURY



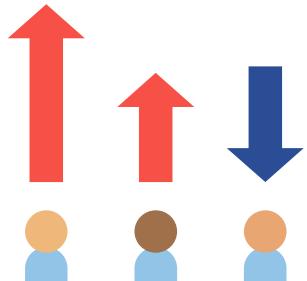
Mercury is the closest planet to the Sun

JUPITER

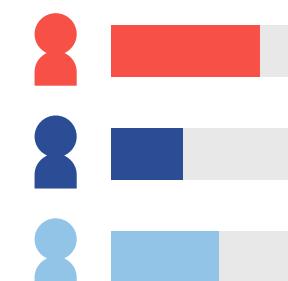


It's the biggest planet in the Solar System

VENUS

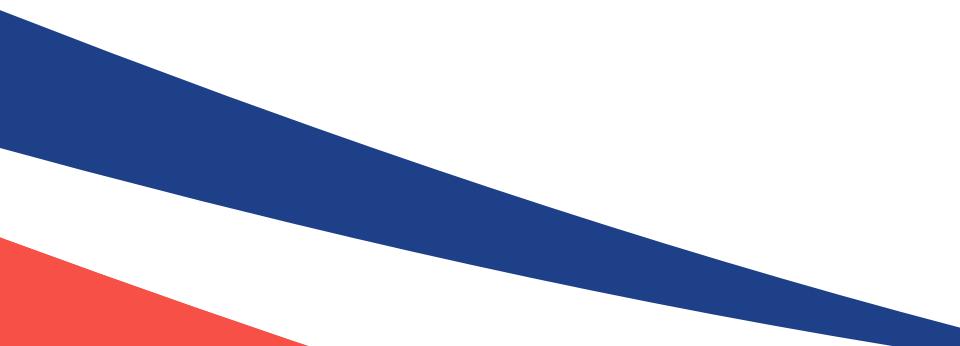


It has a beautiful name, but it's terribly hot



SATURN

Saturn is the ringed one and a gas giant



“This is a quote, words full of wisdom that someone important said and can make the reader get inspired.”

—SOMEONE FAMOUS

★ 03 ★

GOALS & STRATEGY

You could enter a subtitle here if you need it

IMPORTANT STATES



VENUS

Venus has a beautiful name



SATURN

Saturn is the ringed one



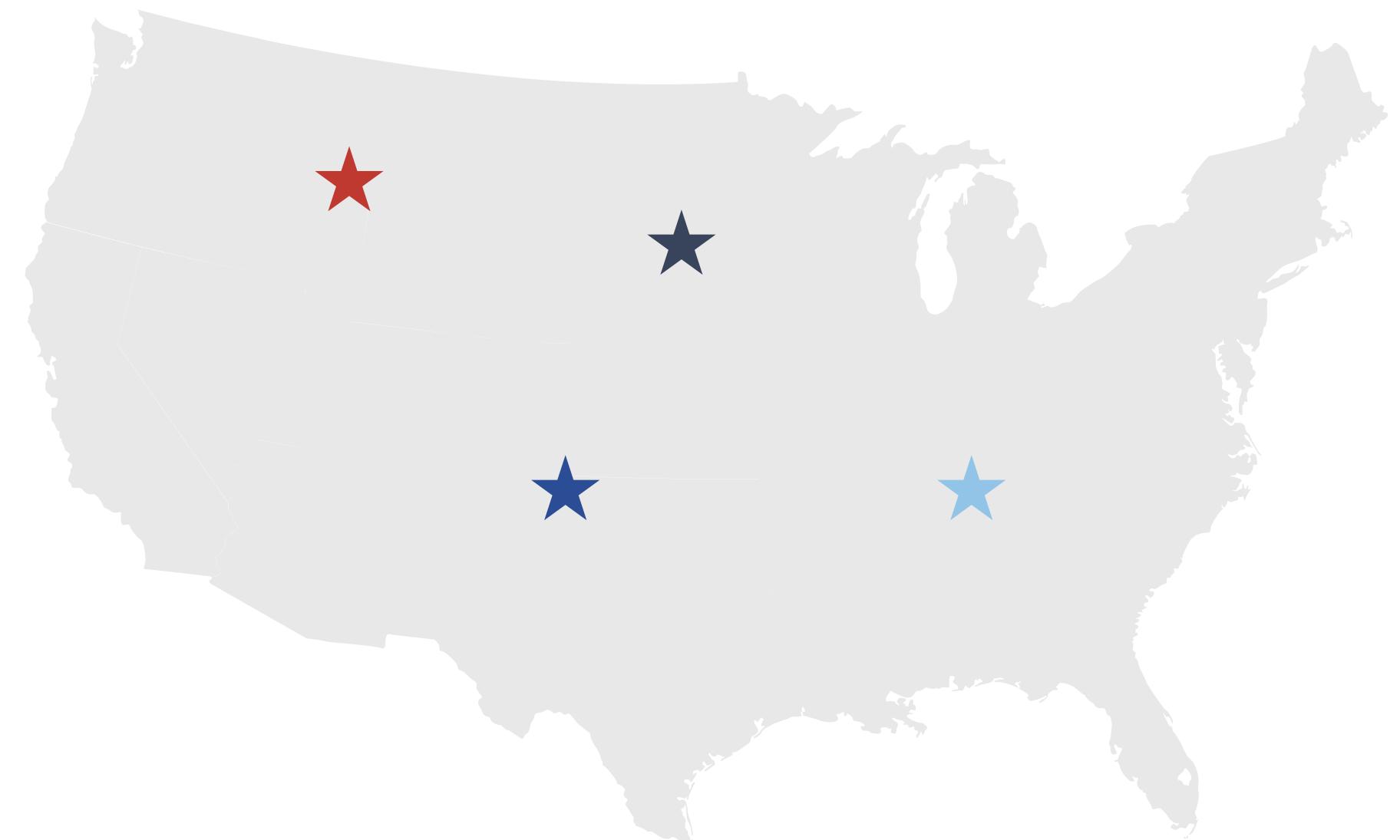
MERCURY

Mercury is the smallest planet



MARS

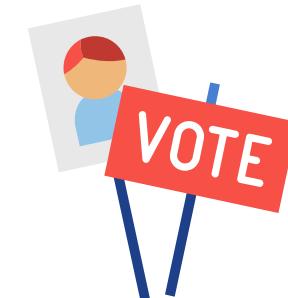
Mars is a very cold place



STRATEGY



STEP 1
Mercury is the
smallest planet



Saturn is the
ringed one

STEP 2



STEP 3
Venus has a
beautiful name



Mars is a very
cold place

STEP 4

ELECTION DESCRIPTION

DEMOCRATS

REPUBLICANS

FUNDING

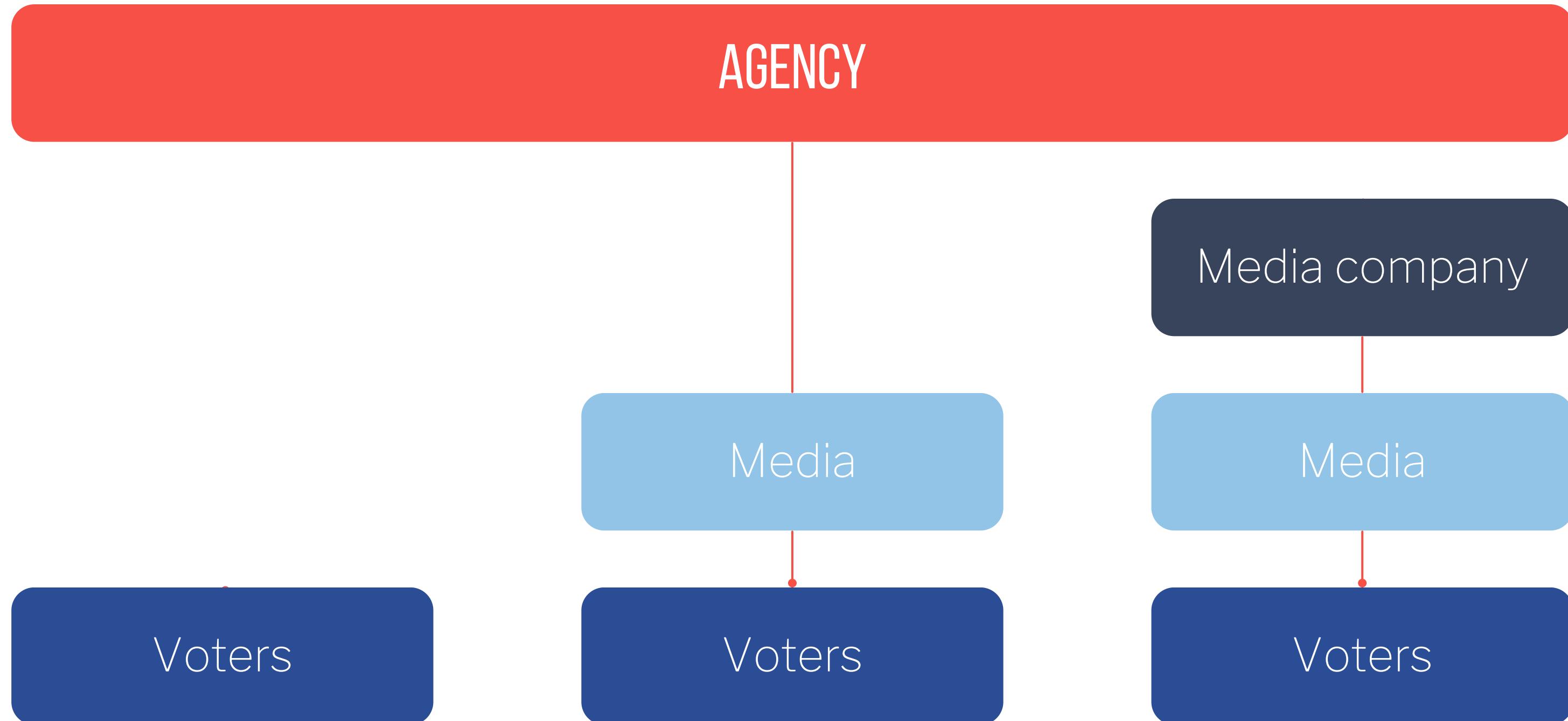
\$23,667

Mercury is the closest planet
to the Sun

\$98,567

Venus has a beautiful name,
but it's hot

MARKETING CHANNELS



PROMOTION



MERCURY

Mercury is the closest planet to the Sun



VENUS

Venus has a beautiful name, but it's terribly hot



MARS

Despite being red, Mars is a cold place



JUPITER

It's the biggest planet in the Solar System



SATURN

Saturn is the ringed one and a gas giant



NEPTUNE

Neptune is the farthest planet from the Sun

A decorative arrangement of American flags and stars. In the top left corner, there is a cluster of red, white, and blue stars of various sizes. Below this, two small American flags are positioned diagonally: one larger flag on the left and a smaller one partially overlapping it on the right. The background is white.

A PICTURE IS WORTH
A THOUSAND WORDS



\$45,000,000

Is the total budget for the campaign

ADVERTISING CAMPAIGN 1



CHANNEL

Multimedia

BUDGET

\$ 25,000,000

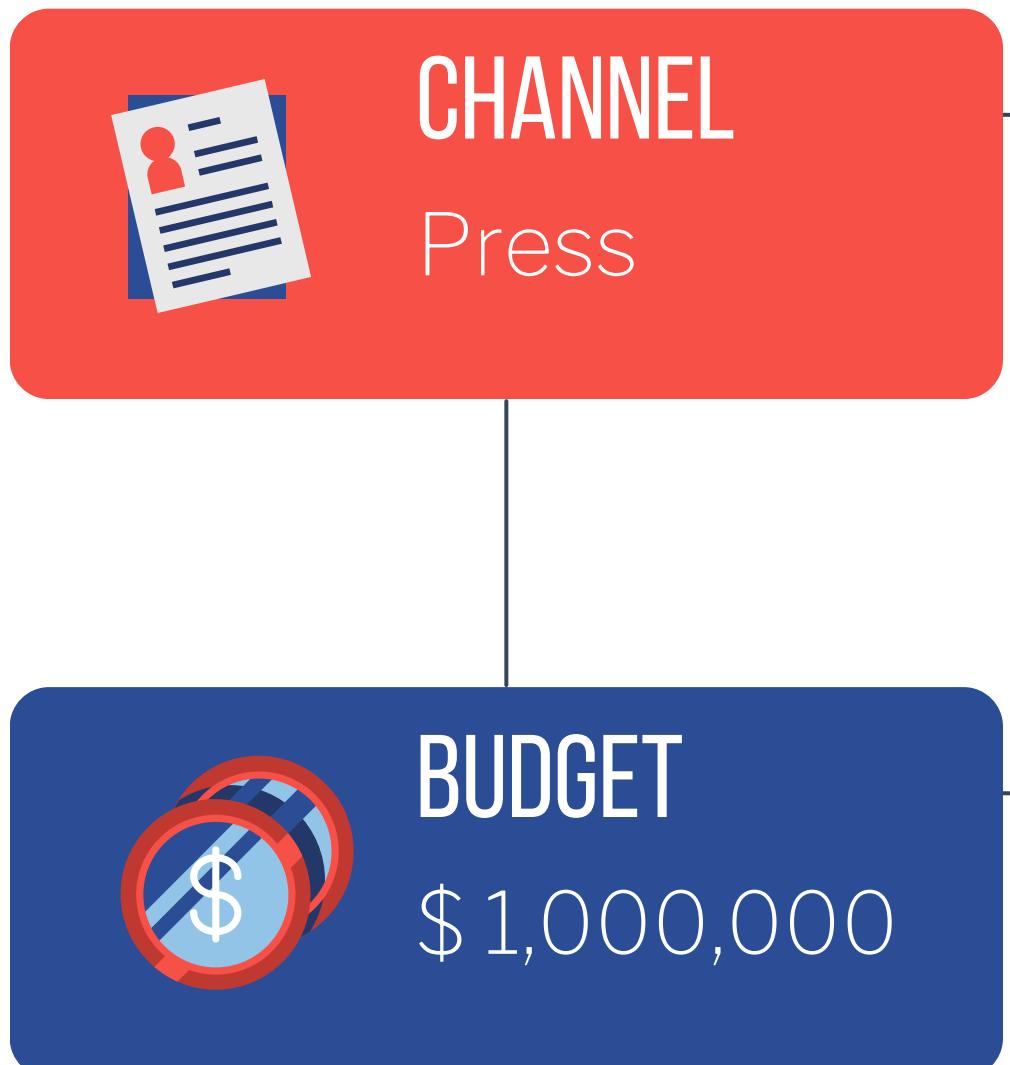
GOALS

- Here you can list your goals
- Here you can list your goals
- Here you can list your goals

DESCRIPTION

Mercury is the closest planet to the Sun and the smallest one in the Solar System

ADVERTISING CAMPAIGN 2



DESCRIPTION

Mercury is the closest planet to the Sun and the smallest one in the Solar System

GOALS

- Here you can list your goals
- Here you can list your goals
- Here you can list your goals

PR OUTREACH

MEDIA CHANNELS

Multimedia

GOALS

50%

KEY MESSAGES

It's the ringed one

Radio

10%

It's the biggest

Press

40%

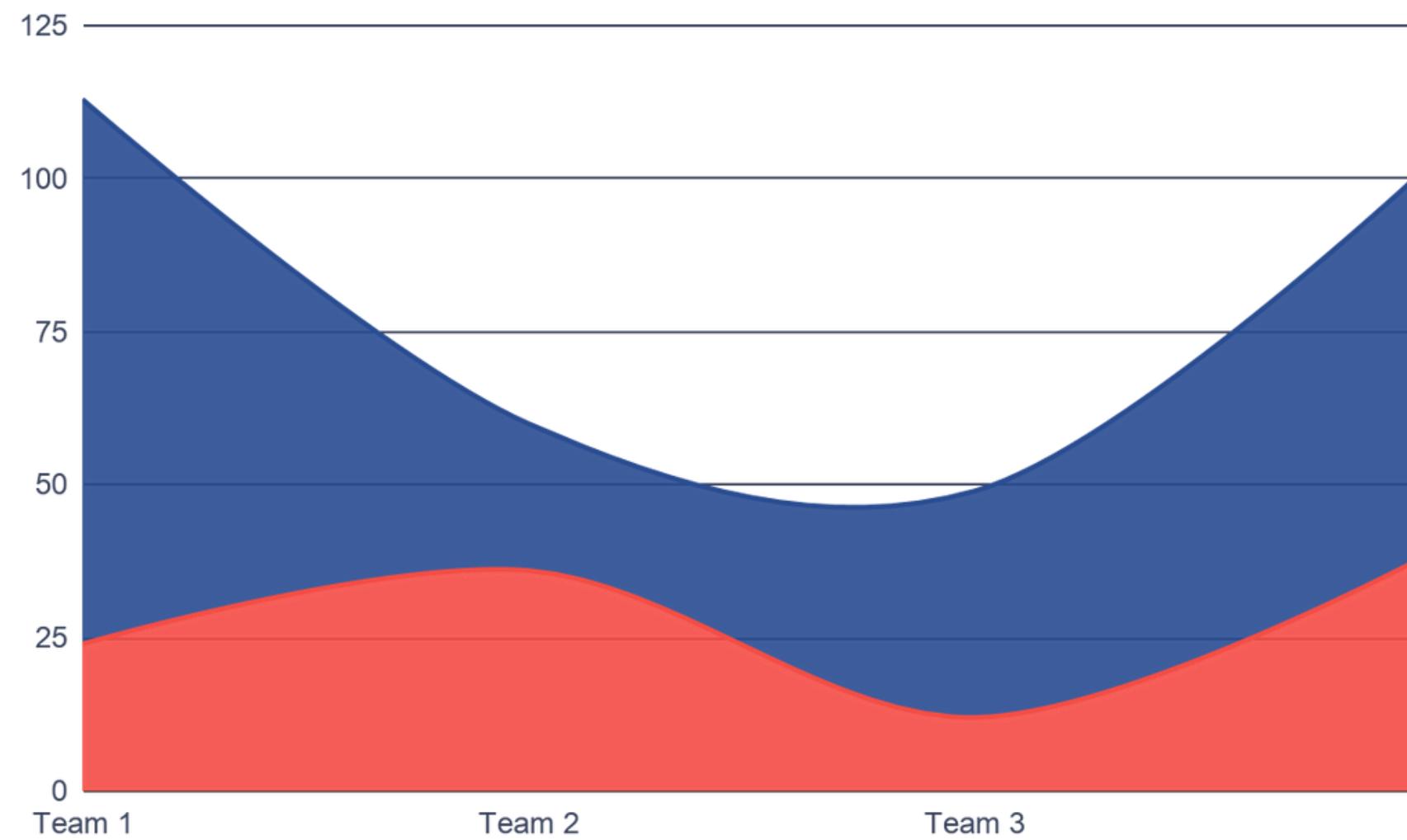
Mars is a cold place

BUDGET ALLOCATION

VENUS	MERCURY	JUPITER	SATURN
\$2,000	\$3,100	\$400	\$1,300
\$3,400	\$600	\$200	\$100
\$4,000	\$1,600	\$800	\$500



PREDICTED REACH



20,000
Retweets

100,000
Mentions & interactions

To modify this graph, click on it, follow the link, change the data and paste the new graph here

TIMELINE

MERCURY

1

Mercury is the
smallest planet

Saturn is the
ringed one

2

SATURN

VENUS

3

Venus has a
beautiful name

4

MARS

Mars is a very
cold place

MULTIMEDIA

Mercury is the closest planet to the Sun and the smallest one in the Solar System—it's only a bit larger than the Moon



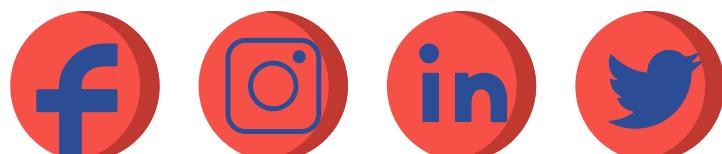
Insert your multimedia content here

OUR TEAM



Mercury is the closest planet to the Sun and the smallest one in the Solar System—it's only a bit larger than the Moon

THANKS!



Do you have any questions?

youremail@freepik.com

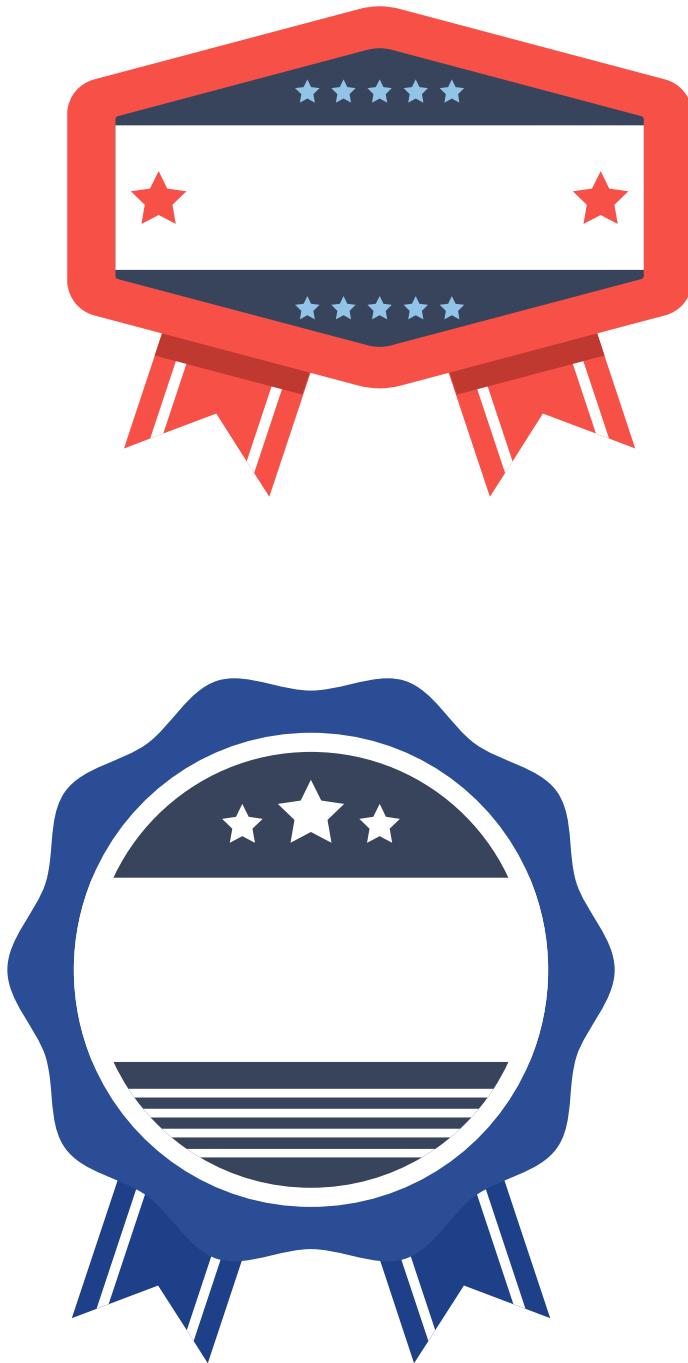
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RESOURCES

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- [President's day](#)
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PHOTO

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- [Red and blue stars with usa flag on white background](#)
- [Multiethnic man and woman with american flags](#)

ICON

- [Elections Icon Pack](#)

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#c03931

#e8e8e8

#ffffff

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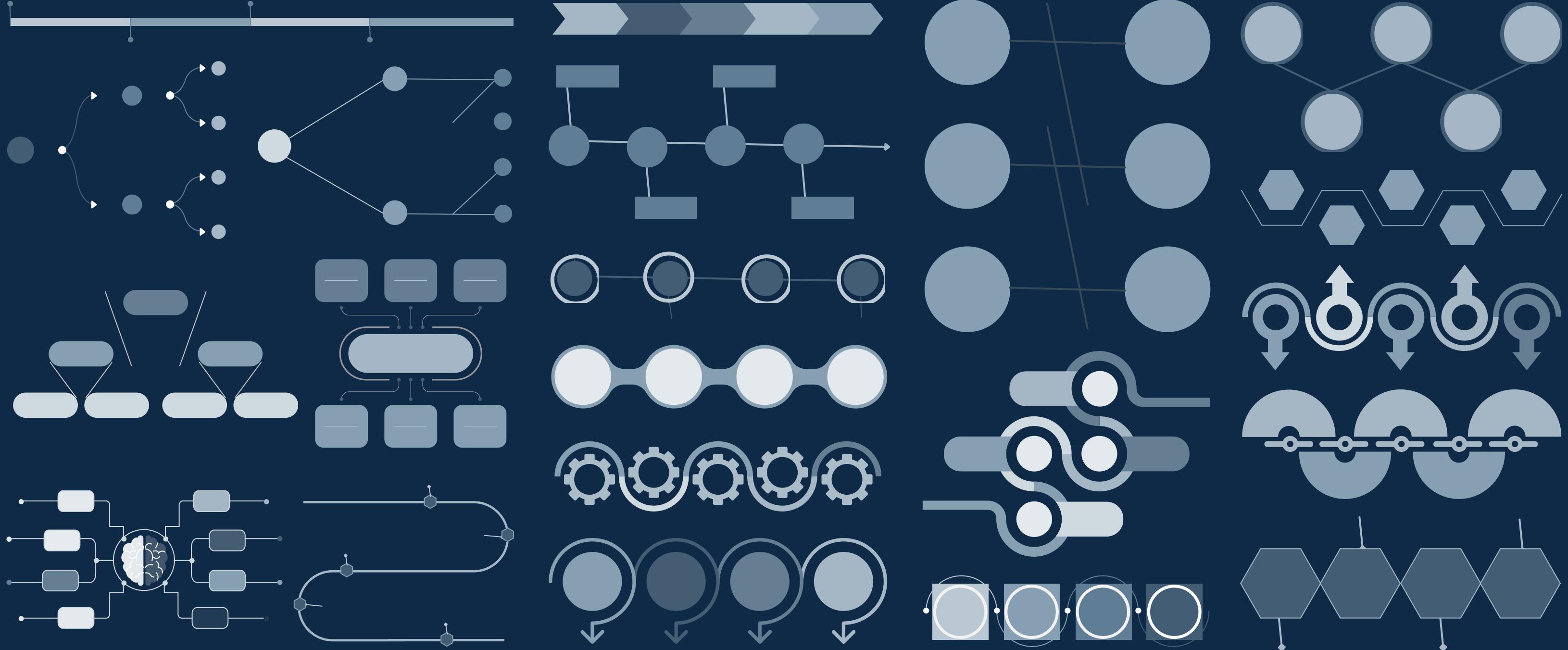
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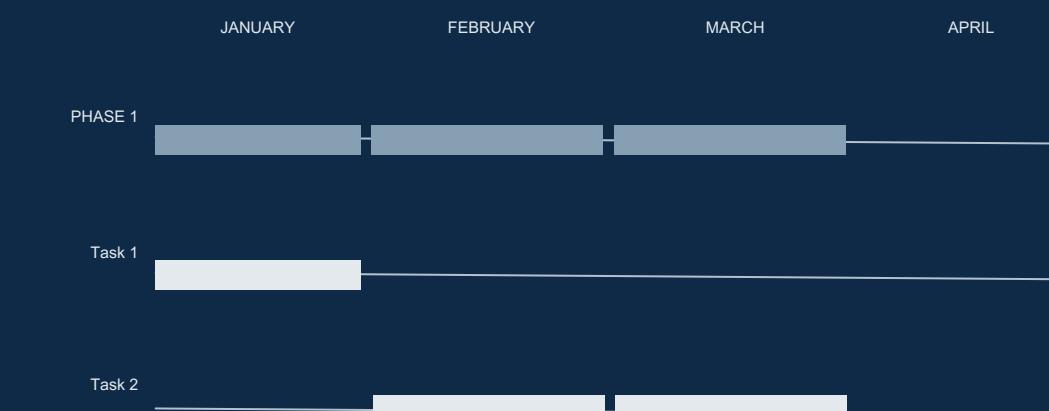
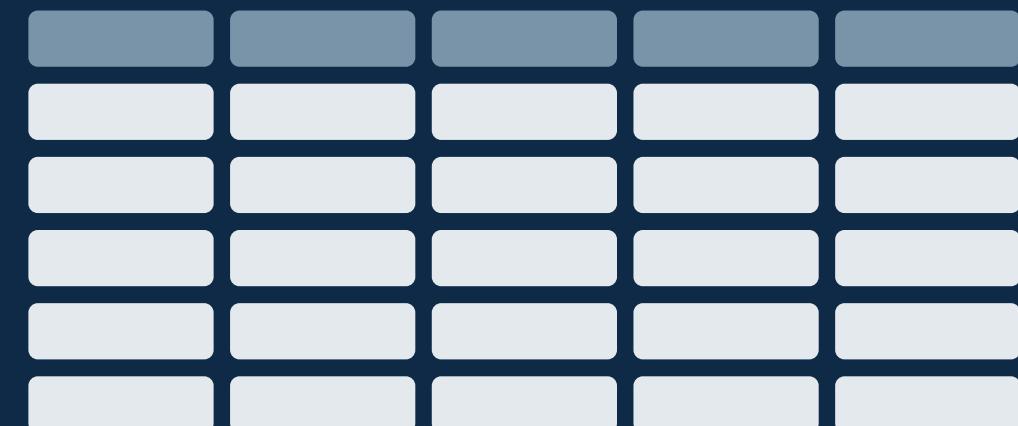
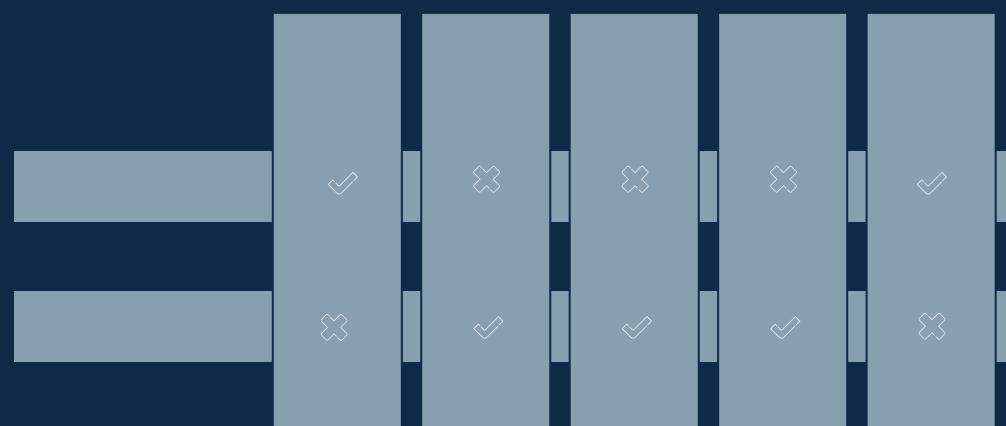
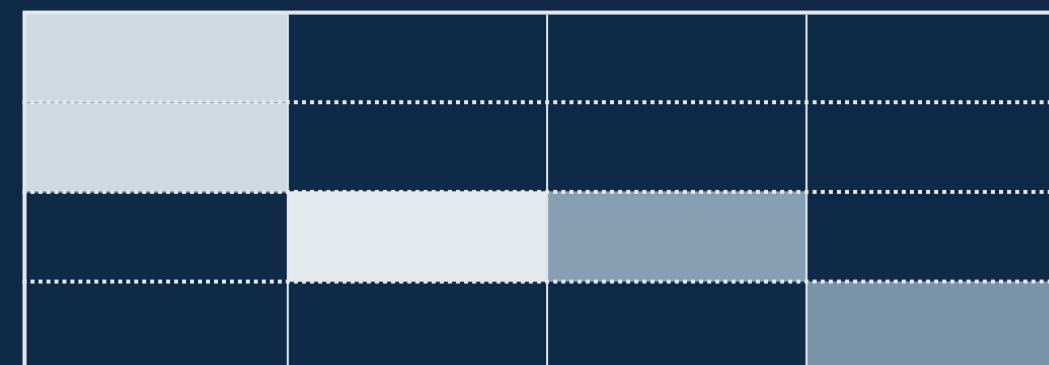
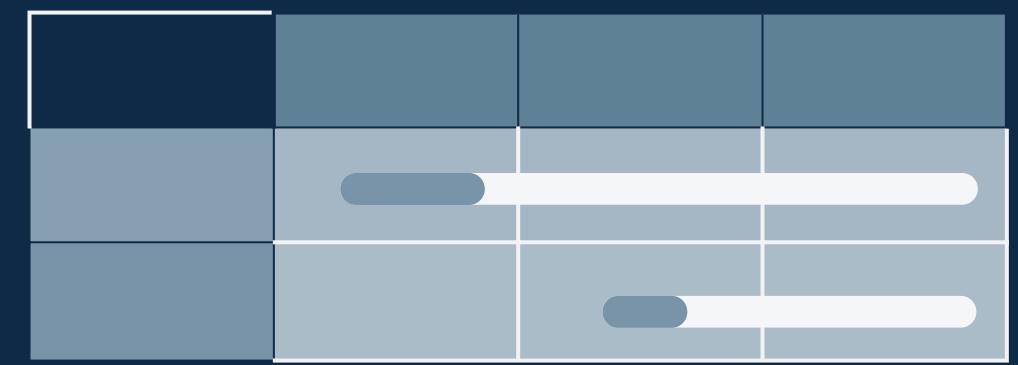
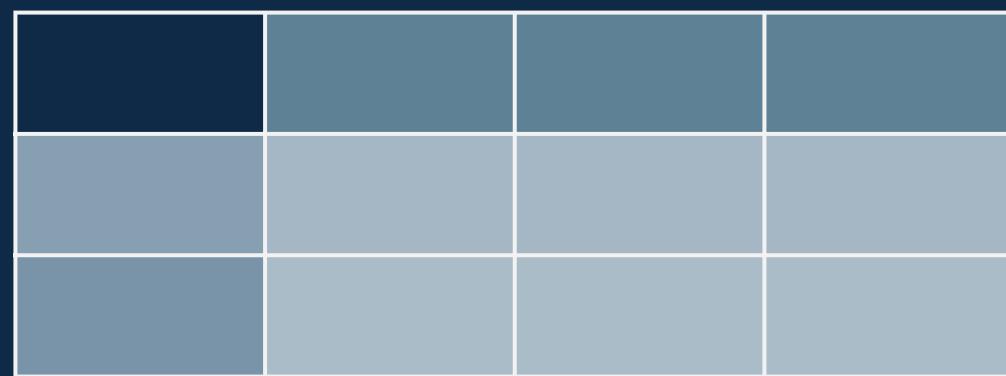
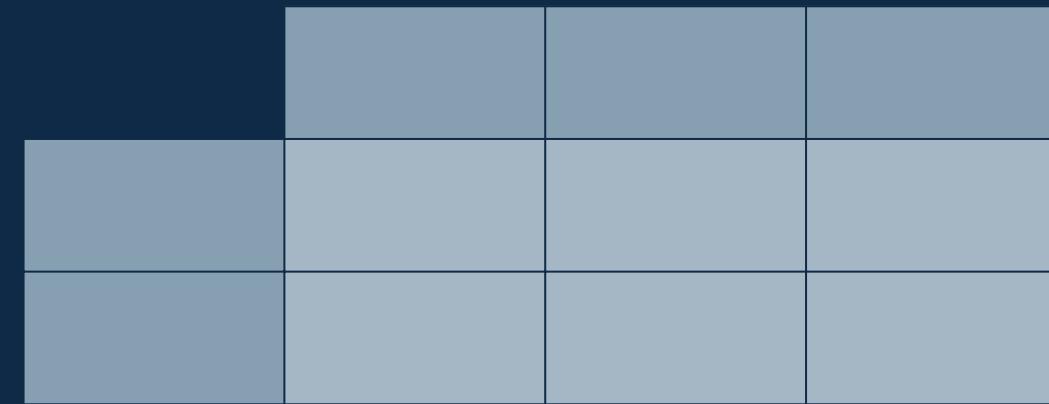
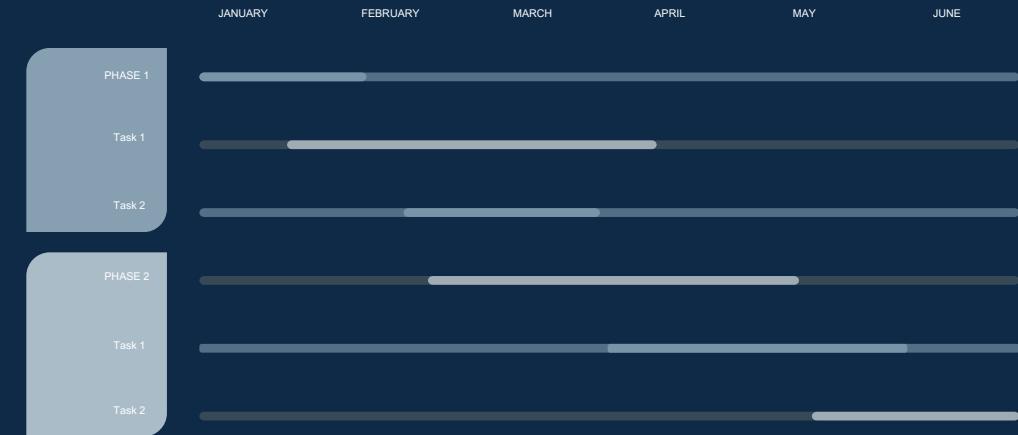
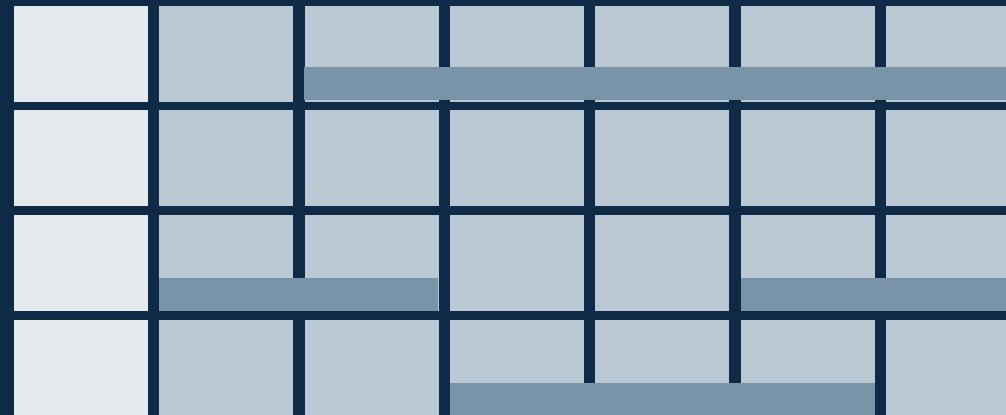
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Educational Icons



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Help & Support Icons



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