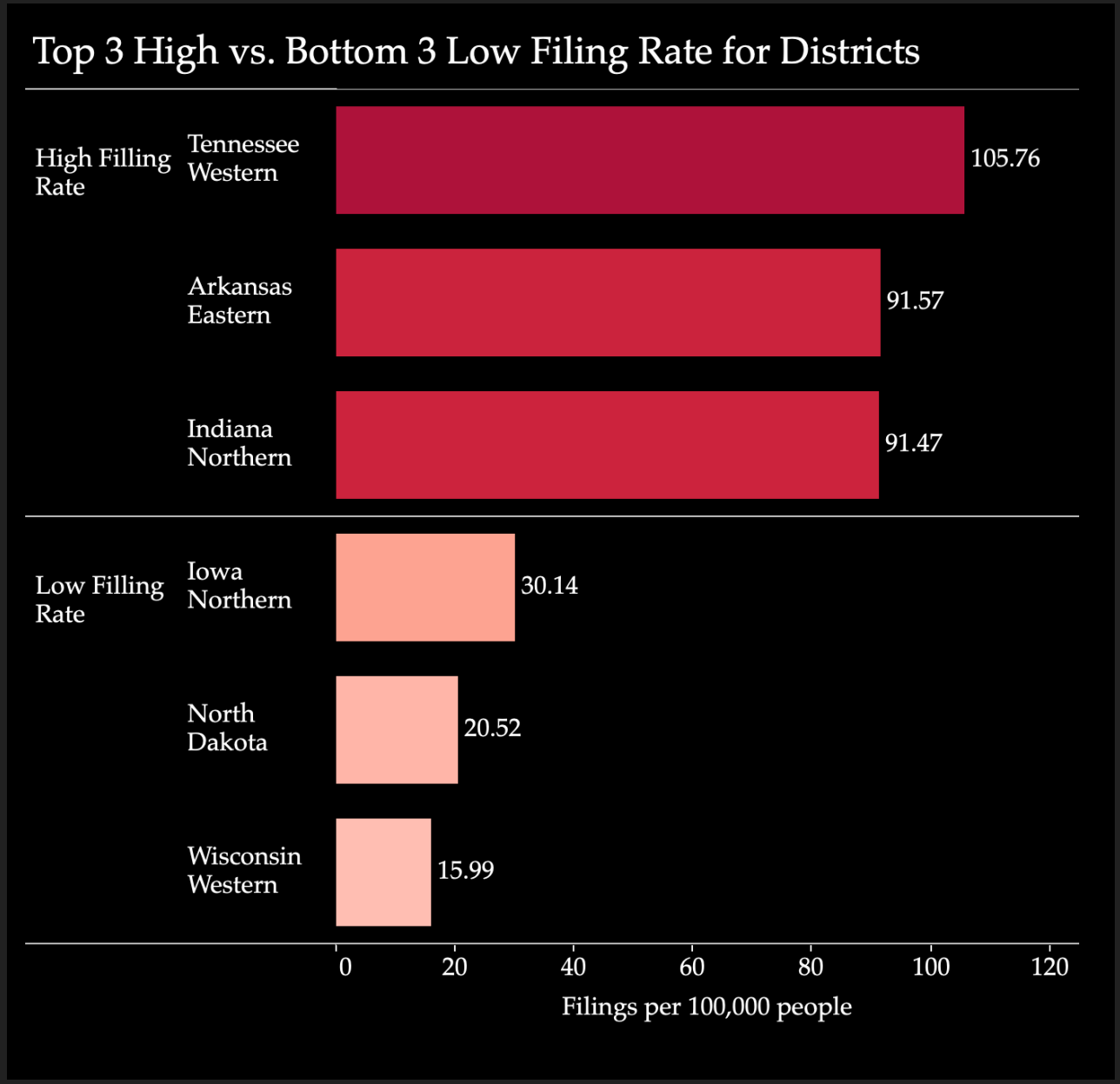
MUDAC 2020: Civil Right Case Insights

Team 43

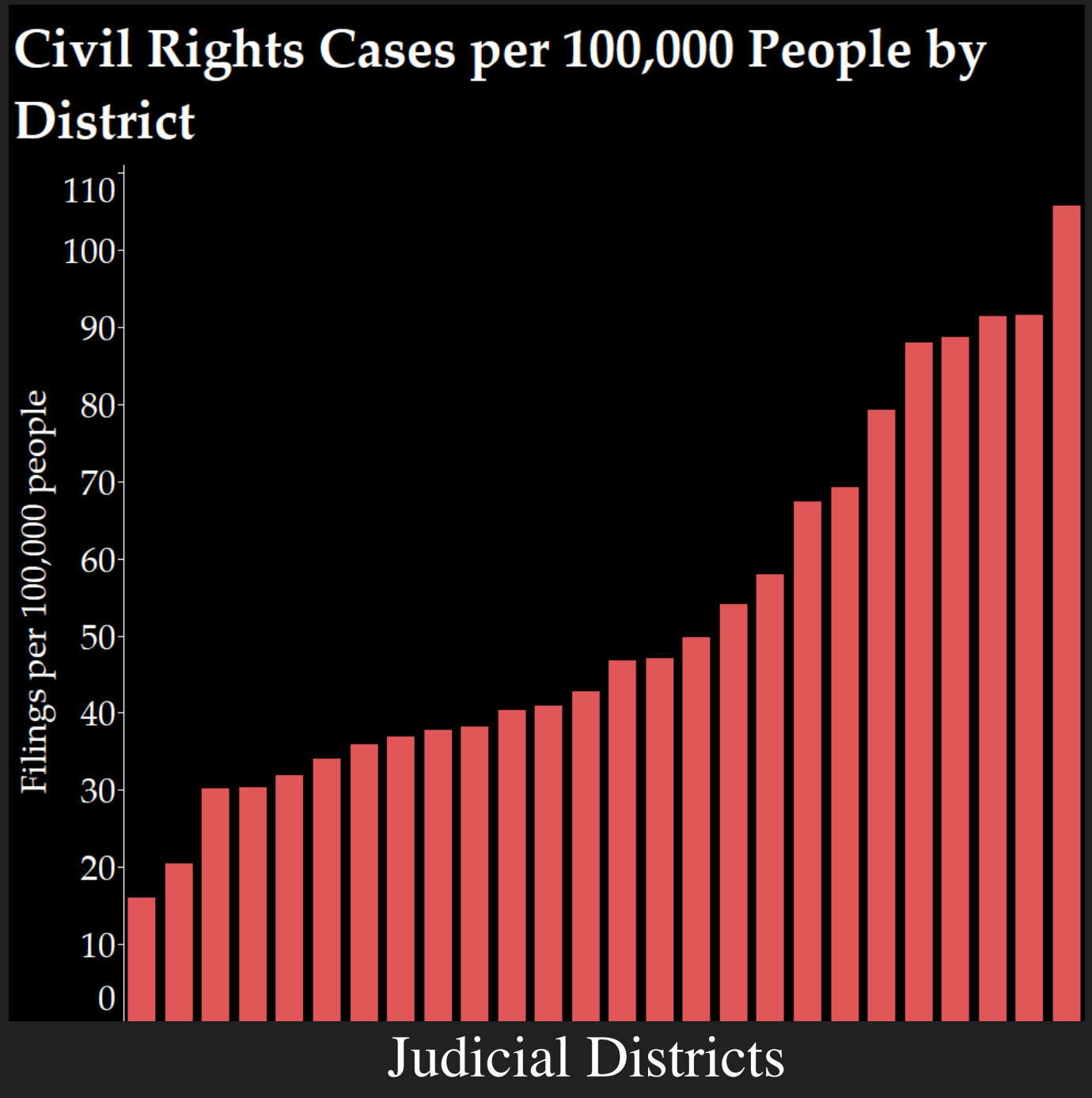
Start With Summaries

- The Scale is diverse, but not unwieldy
- Smallest and largest 3 provide some context
- However, one also should look back at the bigger picture



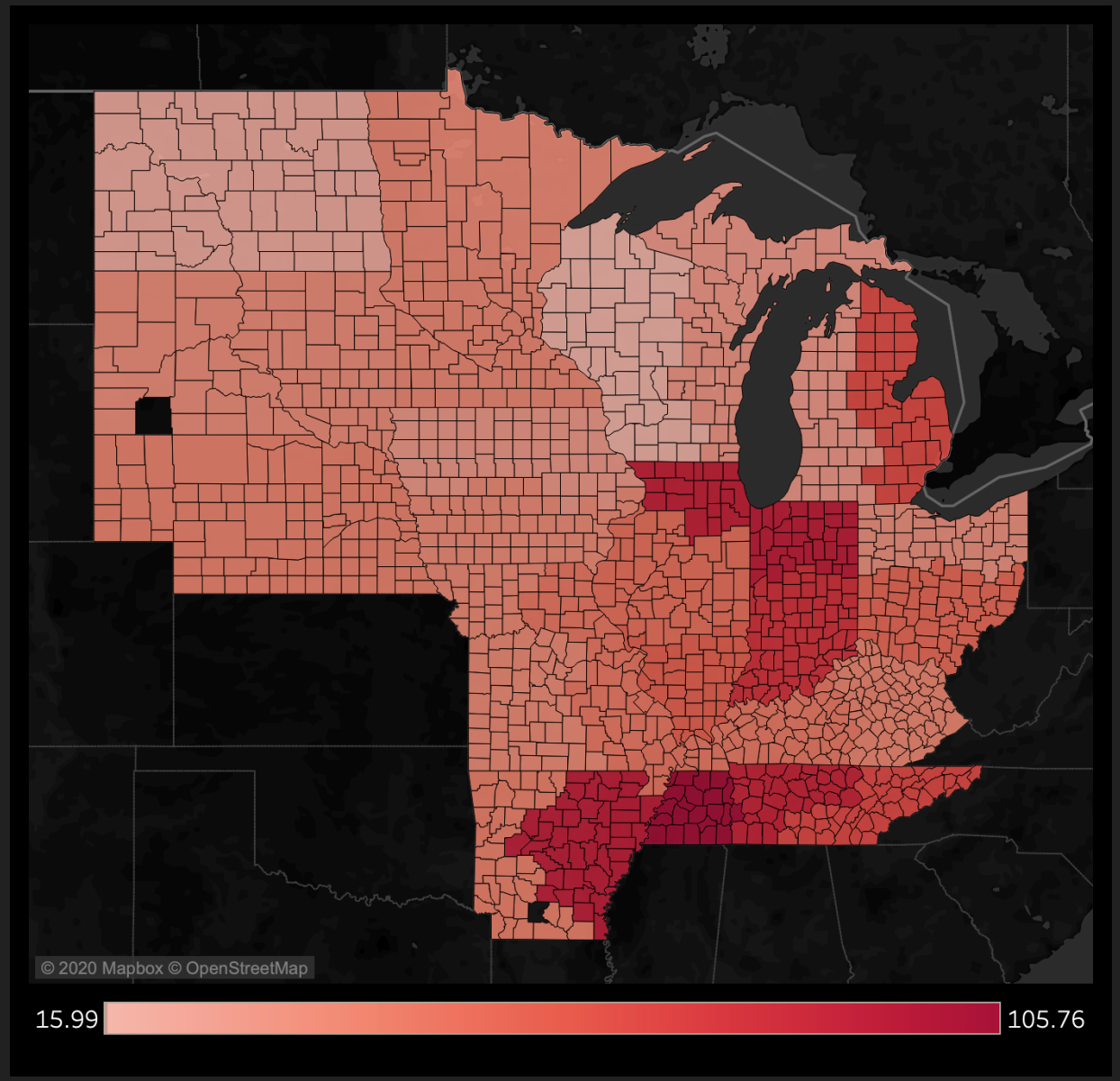
Summaries Cont.

- While variation is high, it builds and tapers slowly
- Beyond the immediate edges, a cutoff isn't clear
- A sense of location may prove more useful



Heatmap of Civil Rights case files by court districts.

- Geography is easier to understand
- Specific concentrations do exist
- The general pattern should also be considered.

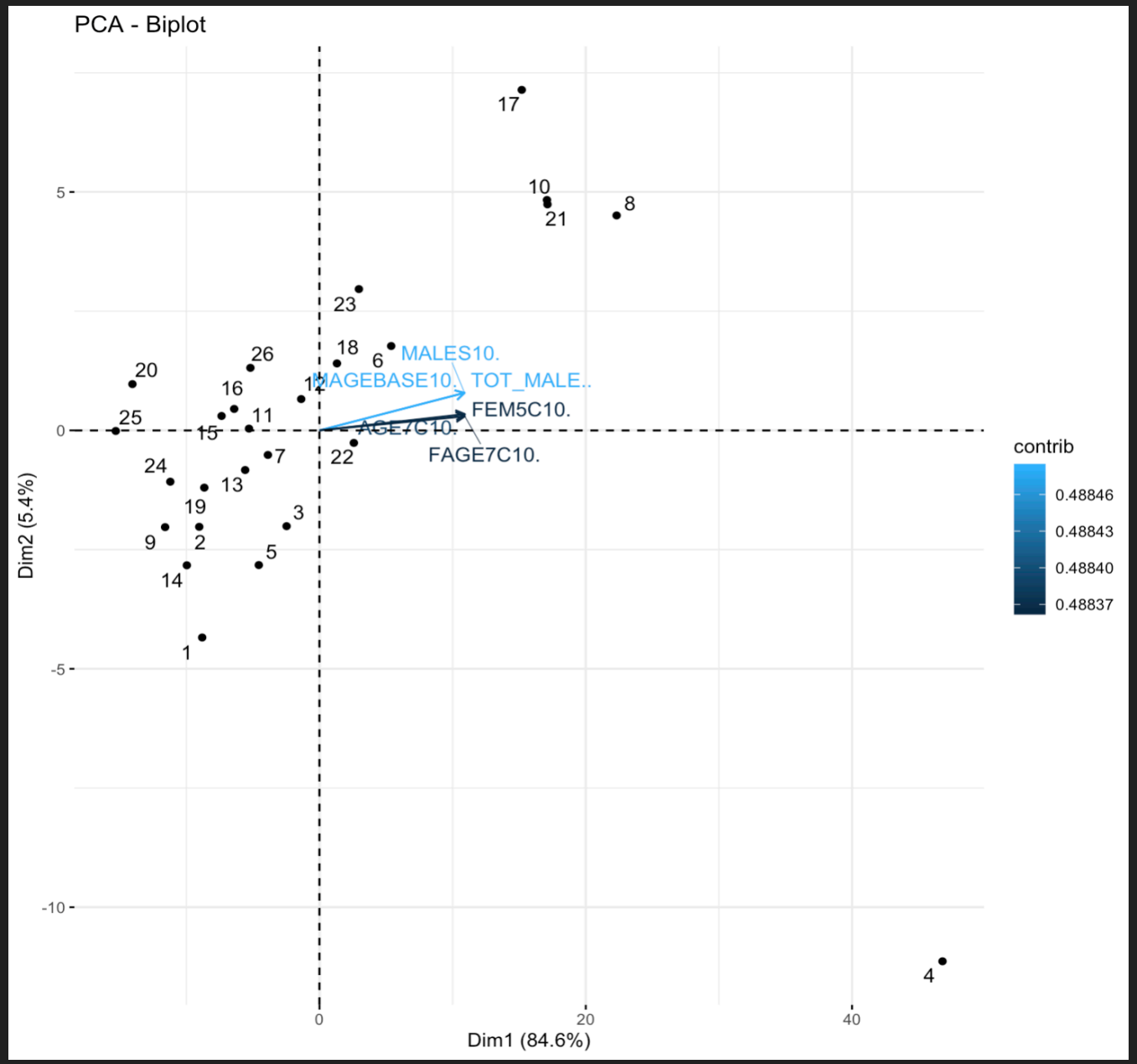


Digging Deeper

- Append Census data from ArcGIS Hub t
  our dataset to scrutinize demographics
- Focus on population density, race, and
  age
- take on a lot of predictors, then cut them
  down to the best

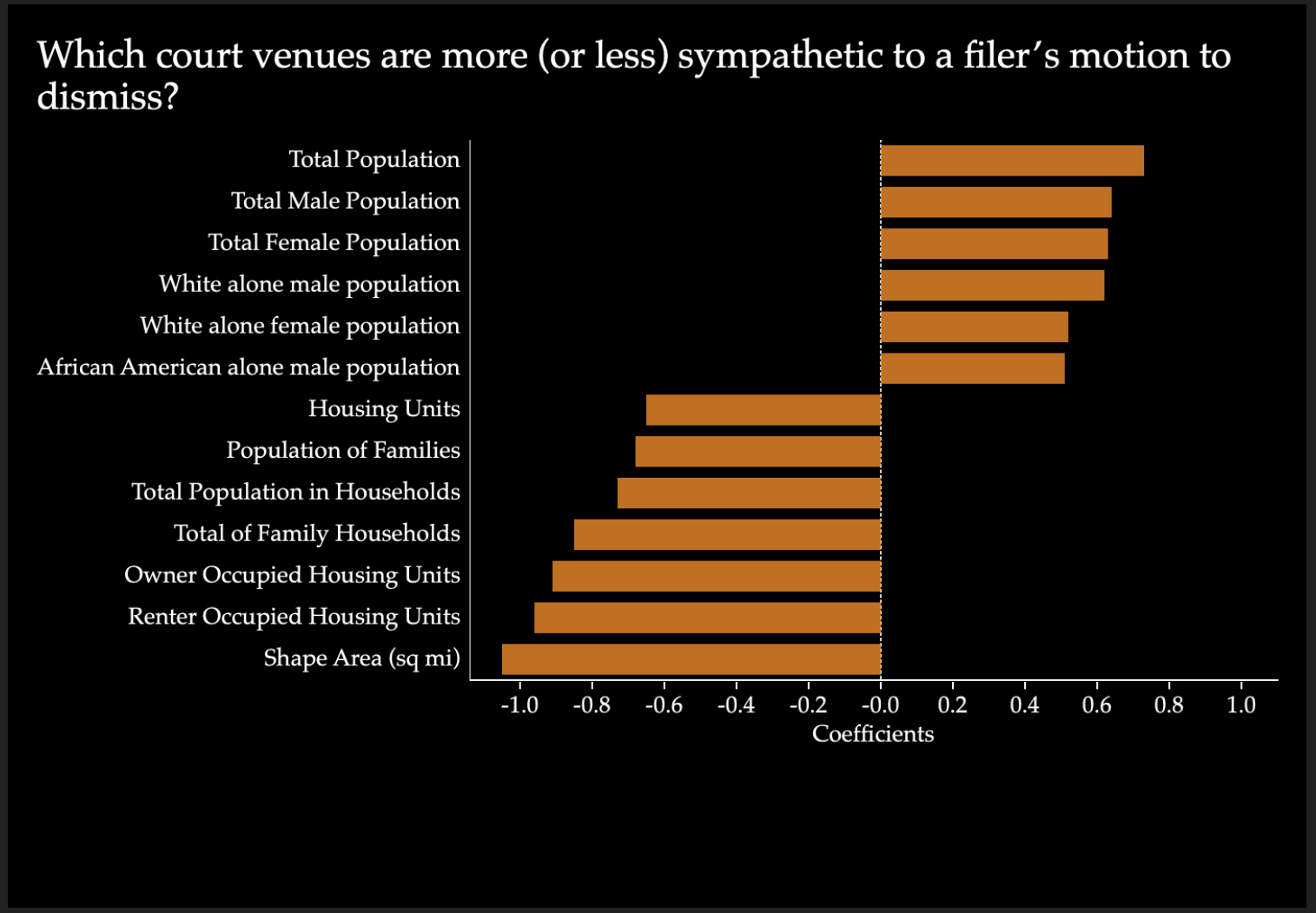
PC Biplot

- a visualization that explains contribution of variables
- We can see certain columns gravitating away from others
- These variables share features



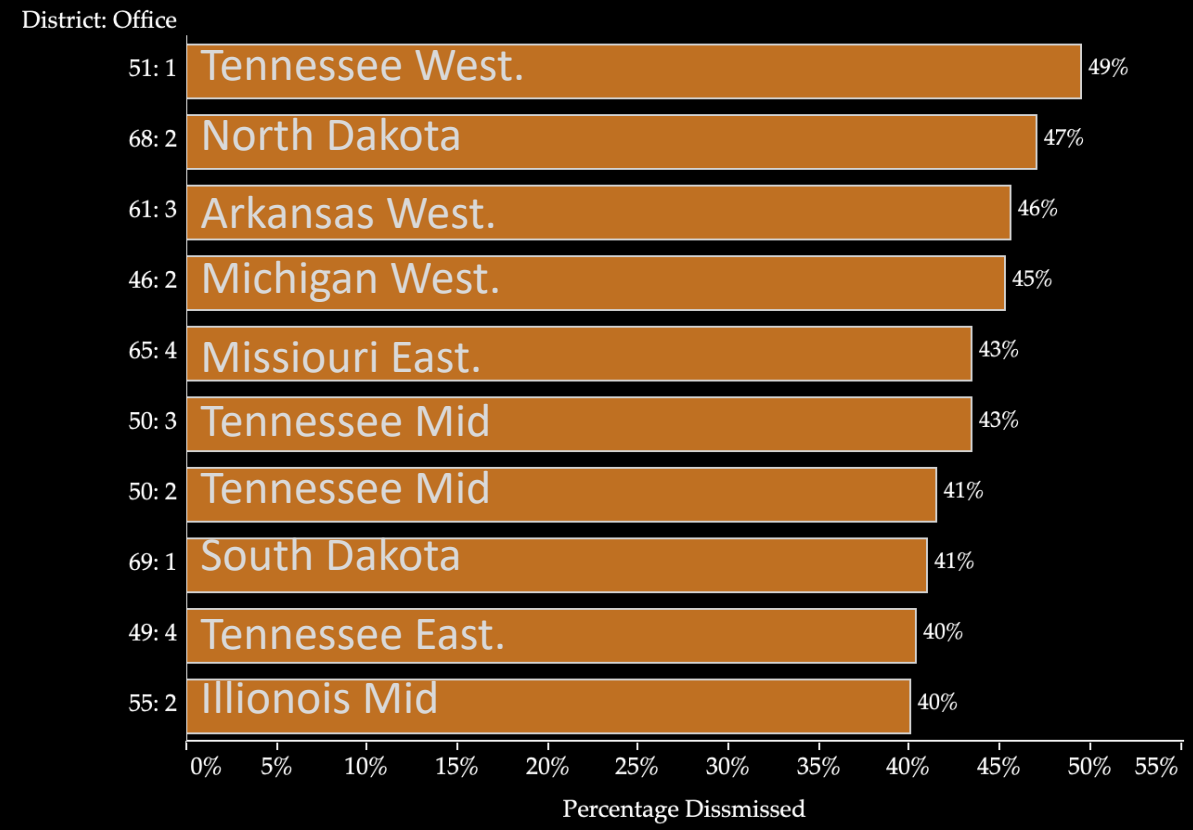
Patterns Emerge – table for important variables

- Larger populations of lonelier people imply dismissal
- Complex social units in more open areas imply the opposite
- Does a social environment care more for civil rights?

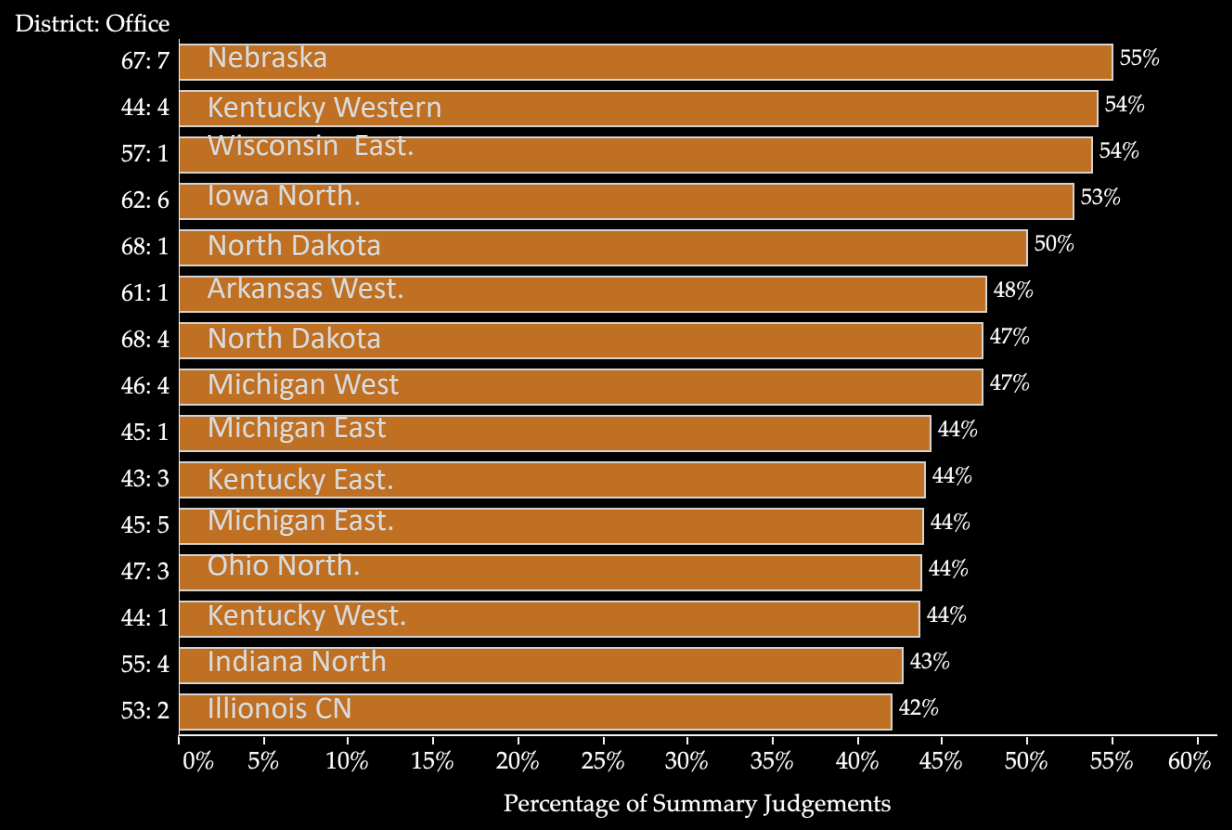


Civil Right Case Filing Rate for Venues

Which court venues are more (or less) sympathetic to a filer's motion to dismiss?



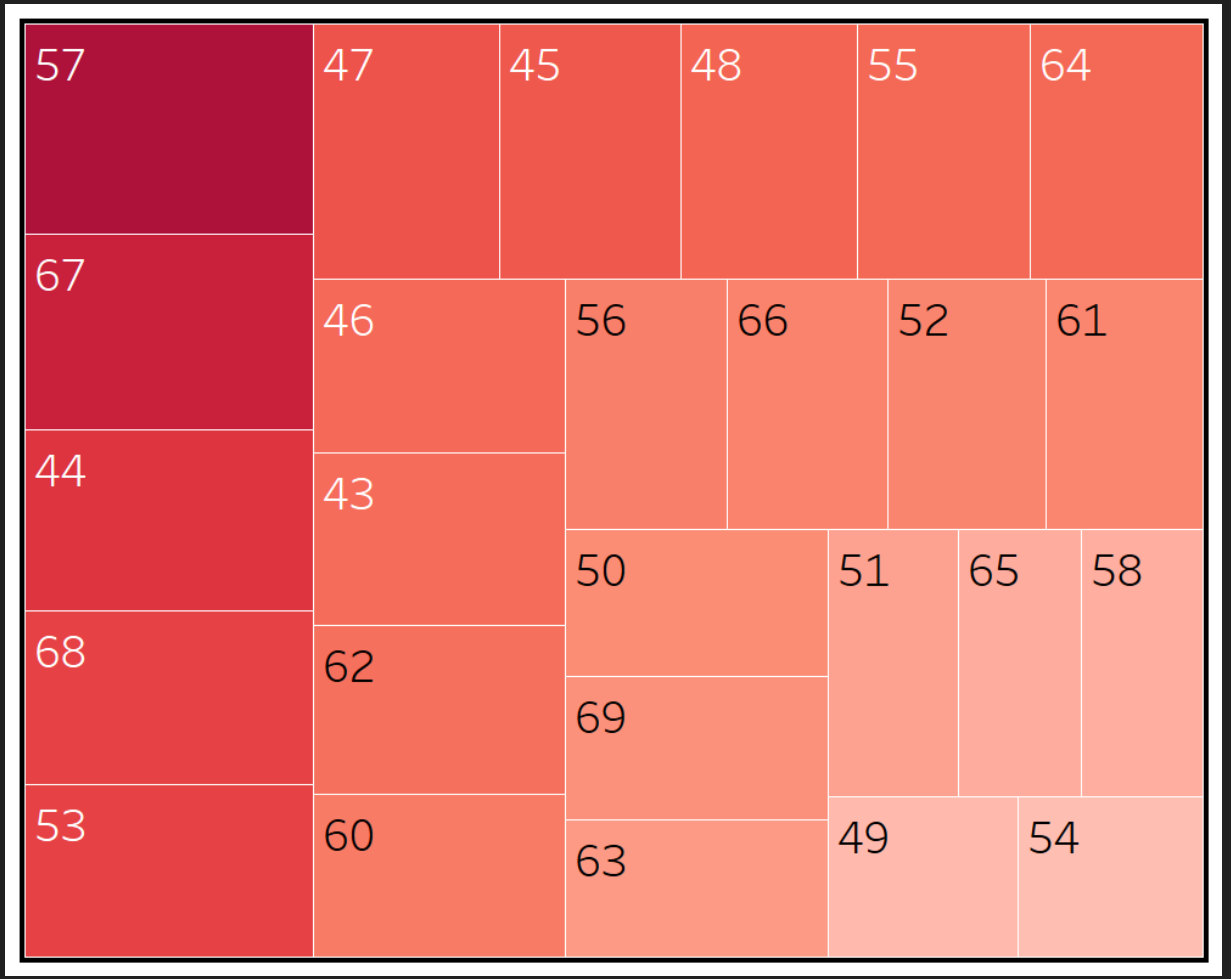
Which court venues are more (or less) sympathetic to a filer's motion for summary judgement?



Courtroom Bias

- Districts and Courts can skew more towards defendants or plaintiffs
- Best shown by looking at percentage rates of motion approval
- The why is tougher, but demographics offer ideas.

Area plot of average percentage rates for Judgement Supremacy Motions by District



Courtroom Score

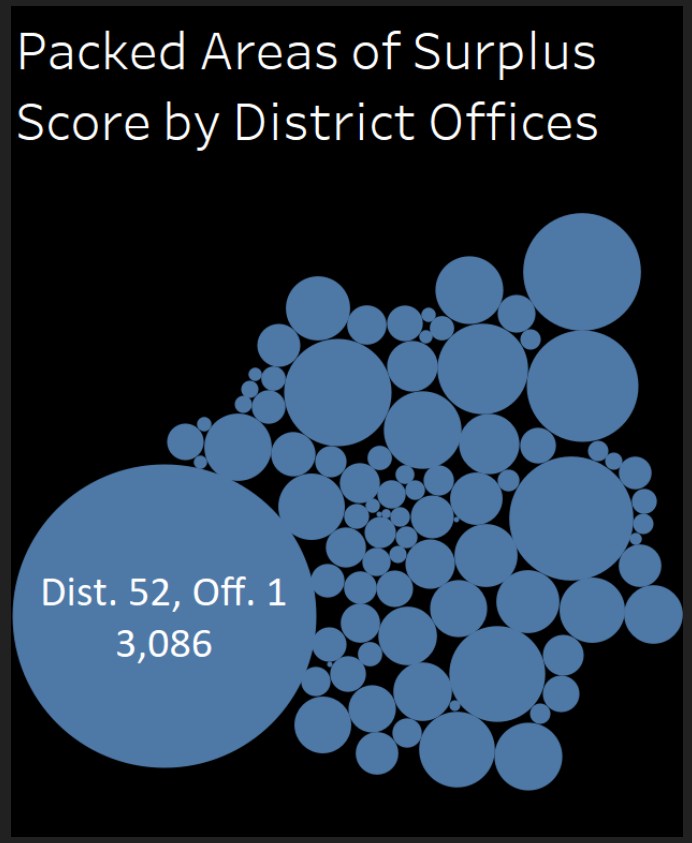
- A numeric measure gotten from total motion verdicts

- Only one kind of termination per trial, a pass negates previous failures

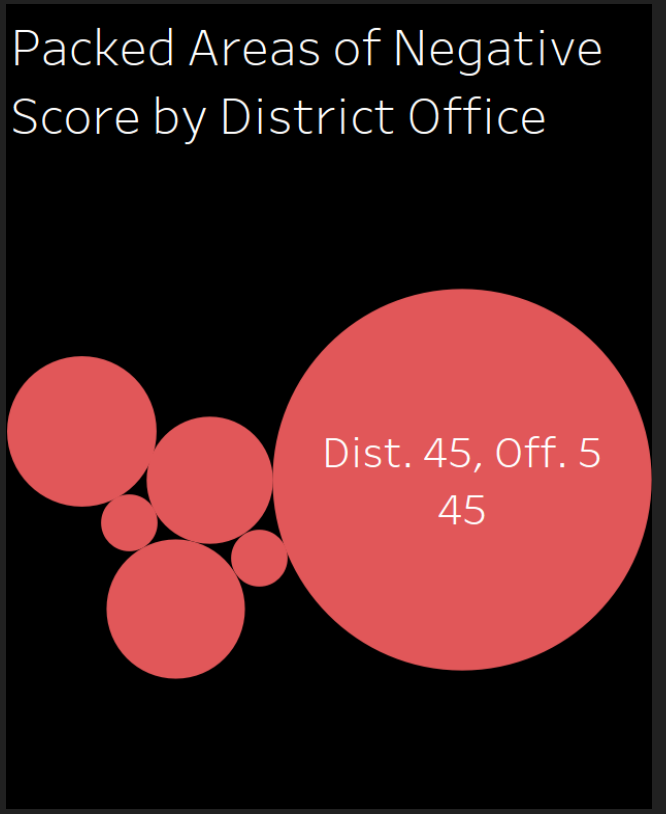
Denied	Denied as Moot	Other	Granted in Part	Granted
-2	-1	0	+1	+2

Visualizing Scores

- All but 6 districts favor defense
- Dist. 52, Office 1 (Oakland County, Michigan) seems to favor them excessively high
- Dist. 45, Office 5 (Bexar County, Texas) is the most in favor of the plaintiff by this metric

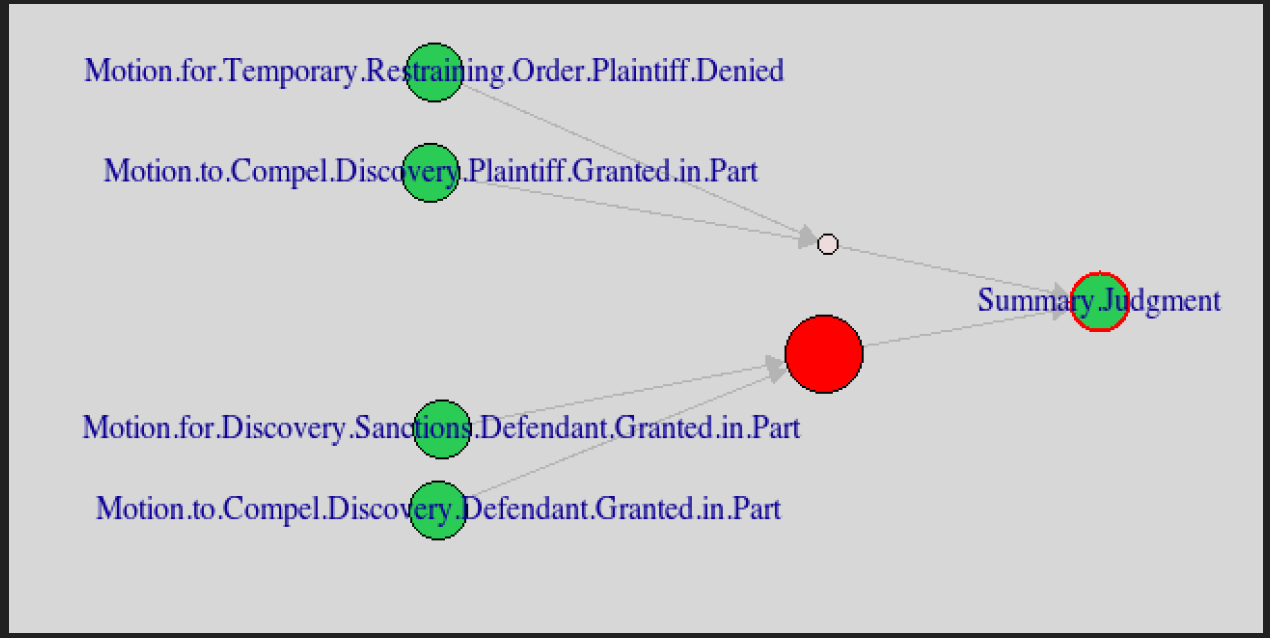


Note the differing Scales



Associations for Motion and Judge's Verdict on Outcom

- A more direct take on a court's attitude
- Sample size still is expected to be very low
- The findings may push one to try and pursue the collection this metric further



Best Decision Rules for Summary Judgement

Rule Set-up	Count	Support	Confidence	Lift
Motion to Compel Discovery Defendant Granted in Part,Motion for Discovery Sanctions Defendant Granted in Part	7	0.05%	87.5%	3.64
Motion to Compel Discovery Plaintiff Granted in Part, Motion for Temporary Restraining Order Plaintiff Denied	6	0.05%	87.6%	3.56

Best Decision Rules for Settlement

Rule Set-up	Count	Support	Confidence	Lift
Motion.for.Protective.Order.Plaintiff.Granted,Motion.for.Protective.Order.Defendant.Other	11	0.09%	78.5%	2.02
Motion.to.Compel.Discovery.Plaintiff.Granted.in.Part, Motion.for.Protective.Order.Plaintiff.Granted,Motion.to.Compel.Discovery.Plaintiff.Other	10	0.08%	77.7%	1.98

Association Rule Comprehends

- Pro-defendant motions lead to Dismissal, pro plaintiff ones lead to Sum. Judge.
- Settlements tended to see shared approval between each's demands
- Powerful when they occur, but low presence weakens practicality

Demographics on Outcome

- Using shrinkage methods reduction techniques such as elastinet and stepwise reduction
- Start with a lot a variables
- narrow it down to the most useful and least collineated

Predicting Future Cases

- Utilize the best variables we found both from and outside the provided data
- Hope to provide a probability of outcomes
- Use multiple models, cross-validate to find the best

Models Considered (Judgement Summary)

MODEL	AUC	ACC. On Train	ACC on Validation
Random Forest	84.84%	80%	81%
Neural Network	82.82%	81%	78%
Logistic Regression	80.8%	80%	80%
Step-Wise	75%	78%	73%
Elastic Net	76%	74%	78%

Final

- Judgement Summary – Random Forest
- Settlement – Neural Network
- Each model performed the best in its category

Conclusion

- The makeup of a community in terms of raw population impacts the perception of civil rights cases
- In general, there is a skewness towards the defendants for these kinds of cases for the observations observed
- However, we only have data for a portion of the United States, among other critiques
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