



Data Science/Visualizations & the Real World

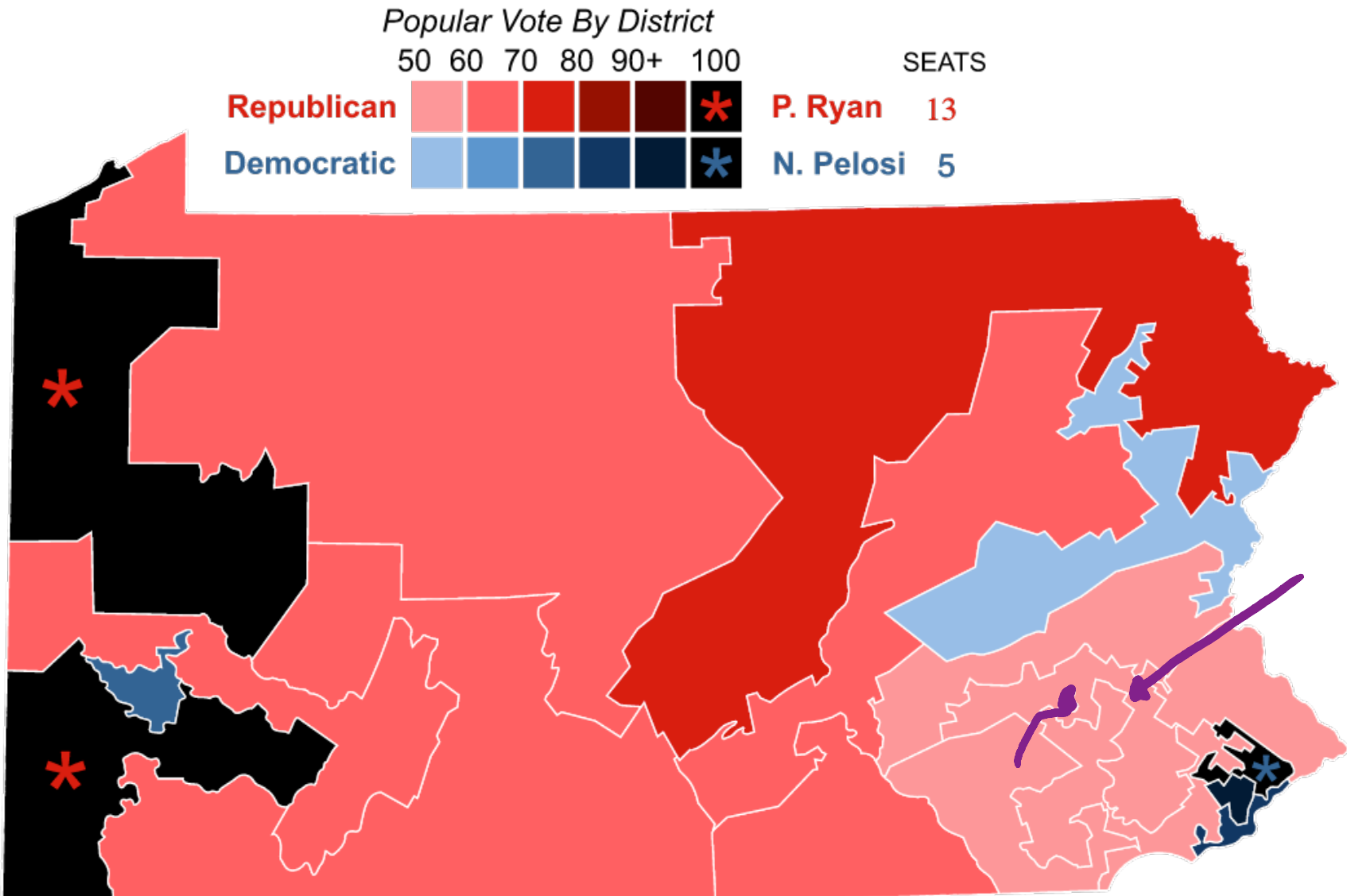
(One way computer programs have been used to address voting rights in the United States)

Gerrymandering

- gerrymander means: to manipulate the boundaries so as to favor one party or class
- gerrymander comes from:
 - Governor Elbridge Gerry + salamander

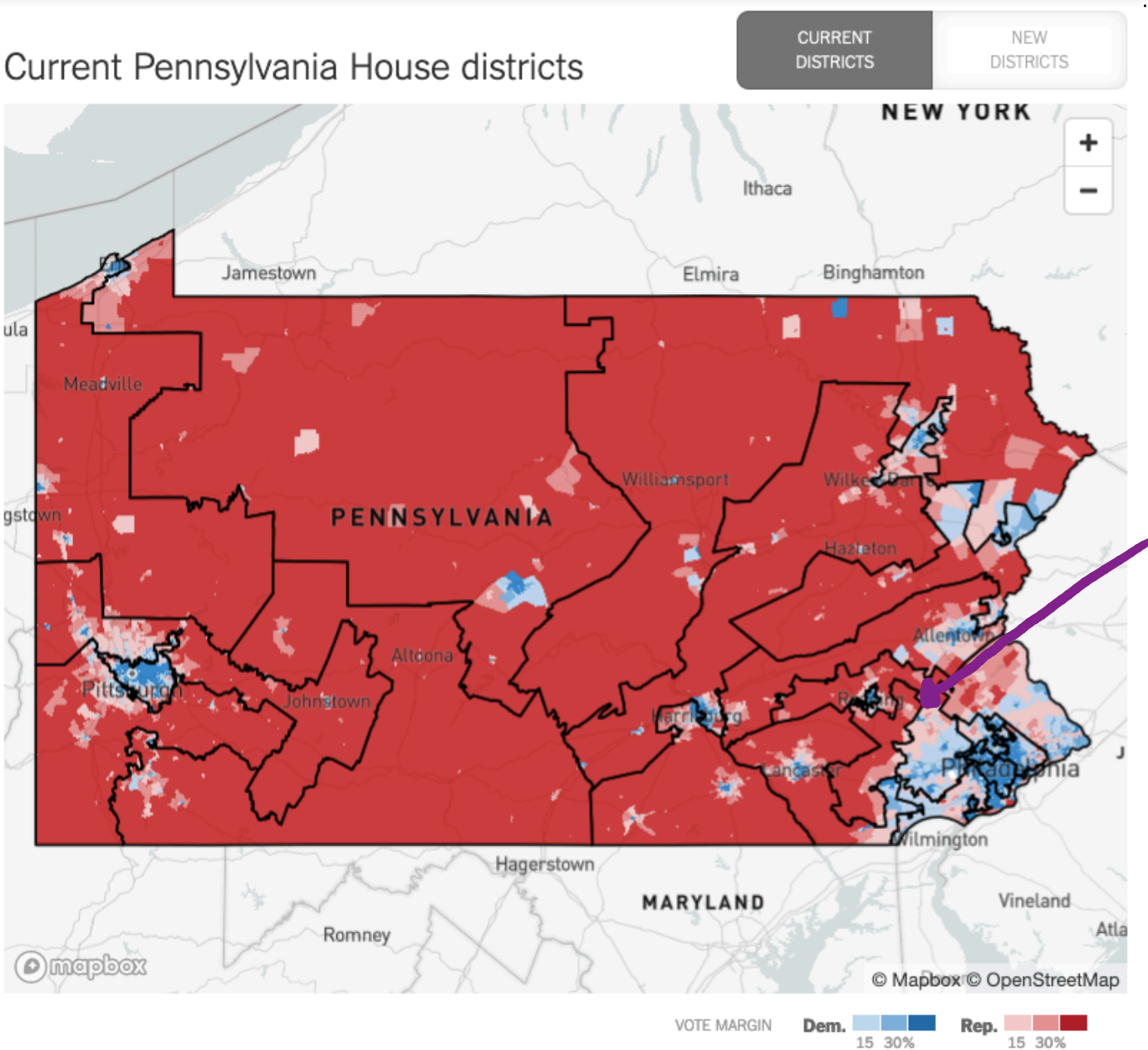
↳ of MA

Pennsylvania electoral map (2016)



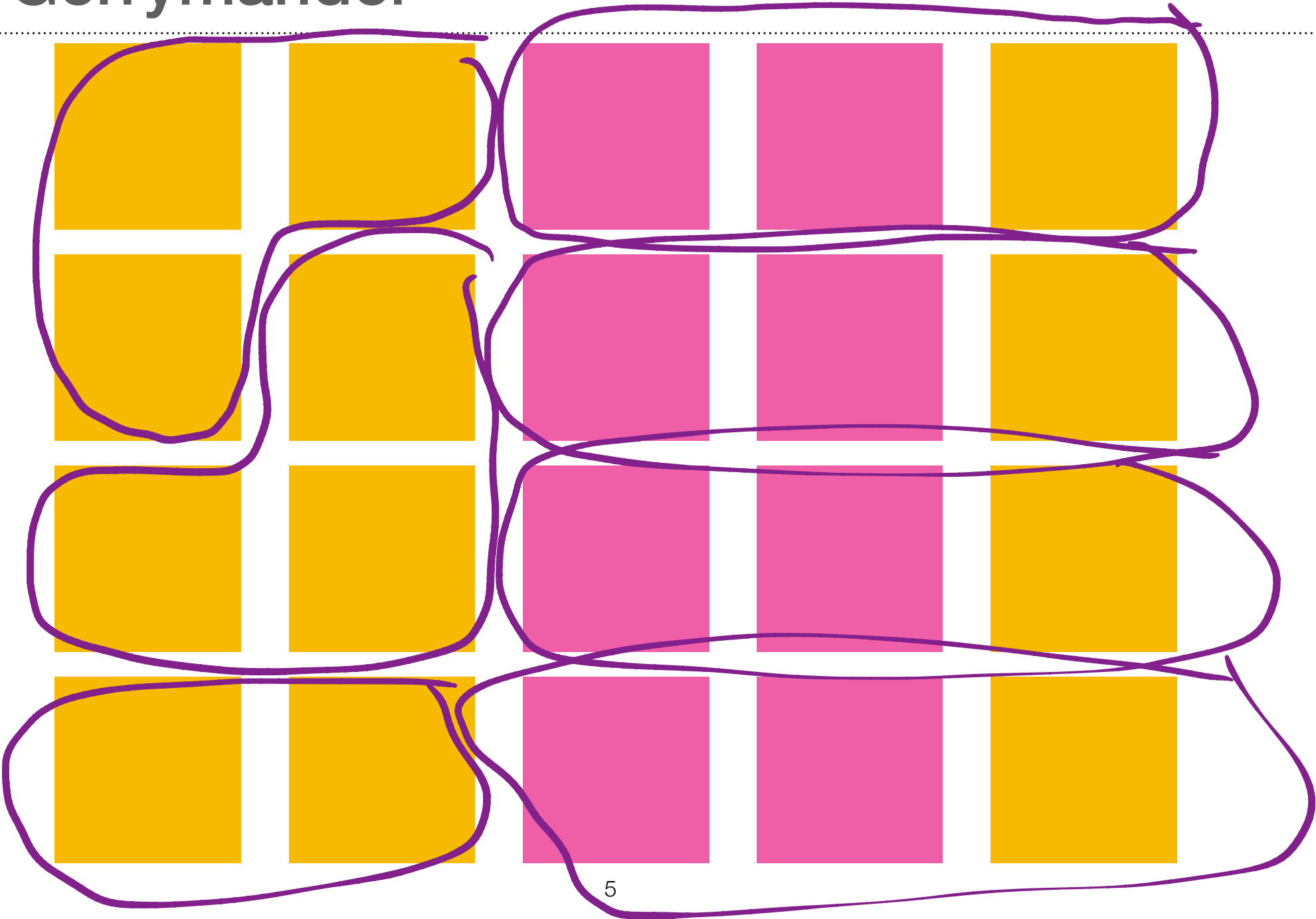
<https://www.wired.com/story/pennsylvania-partisan-gerrymandering-experts/>

Pennsylvania electoral map (2016)



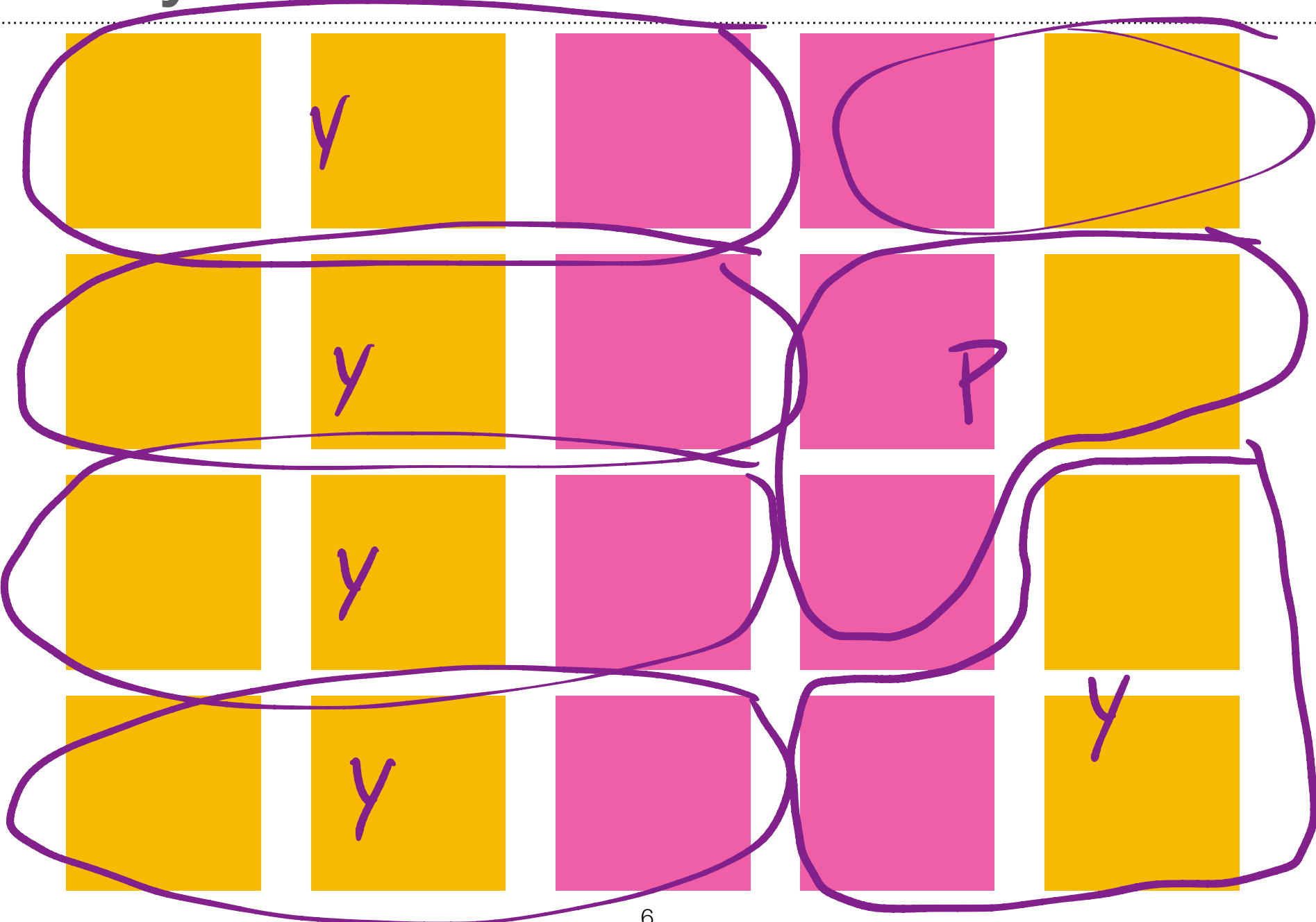
How to Gerrymander

3 yellow, 4 pink



How to Gerrymander

5 yellow, 1 pink, 1 toss-up



Using Data Science in the Courts

- Two computational arguments were made to overturn the 2016 PA electoral maps:
 - 1) editing the current map
 - 2) drawing a new map

Using Data Science in the Courts

- 1) editing the current map
- Wes Pegden
- "Imagine, Pegden told the court, you've touched down in a new city and asked your taxi driver to drop you at any restaurant, something that would give you a sense of the local culinary scene. You give the cabbie a fat tip, go inside the restaurant, and have a terrible meal. Did the driver bring you to a bad restaurant on purpose? Or is it a true reflection of all of the restaurants in the city?"

Using Data Science in the Courts

- 1) editing the current map
 - it would be intractable to visit ALL of the restaurants to fully answer the question
 - but what about the ones next door?

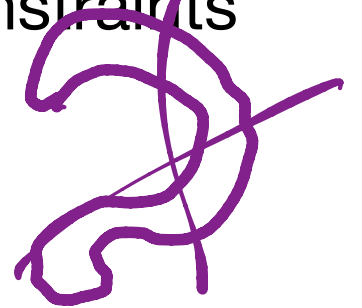
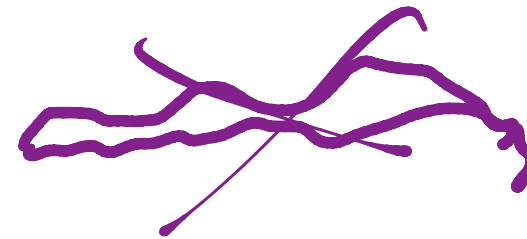
Using Data Science in the Courts

- 1) editing the current map
 - write a computer program that starts with the current map
 - automatically make 1 trillion slightly different maps from the original
 - (restrict the program to only acceptable maps)
 - measure the partisan slant of the automatically generated maps. Is it similar to the partisan slant of the existing map?

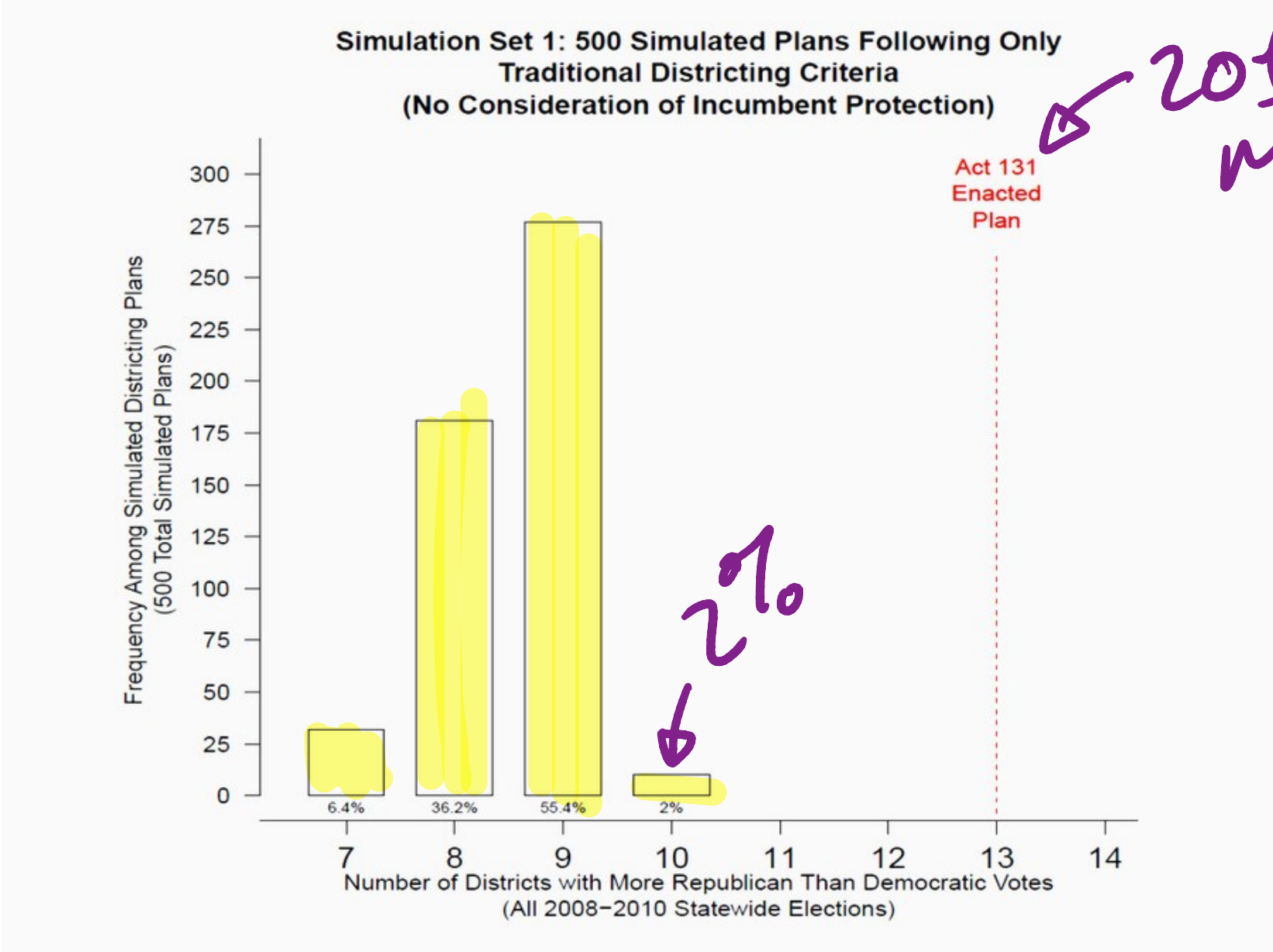
existing map: +13 R seats
more slanted than: 99.99...
auto matically generation

Using Data Science in the Courts

- 2) drawing a new map
 - Jowei Chen
 - write a program that draws entirely new maps under certain constraints
 - districts should be compact
 - preserve municipal boundaries
 - have equal populations

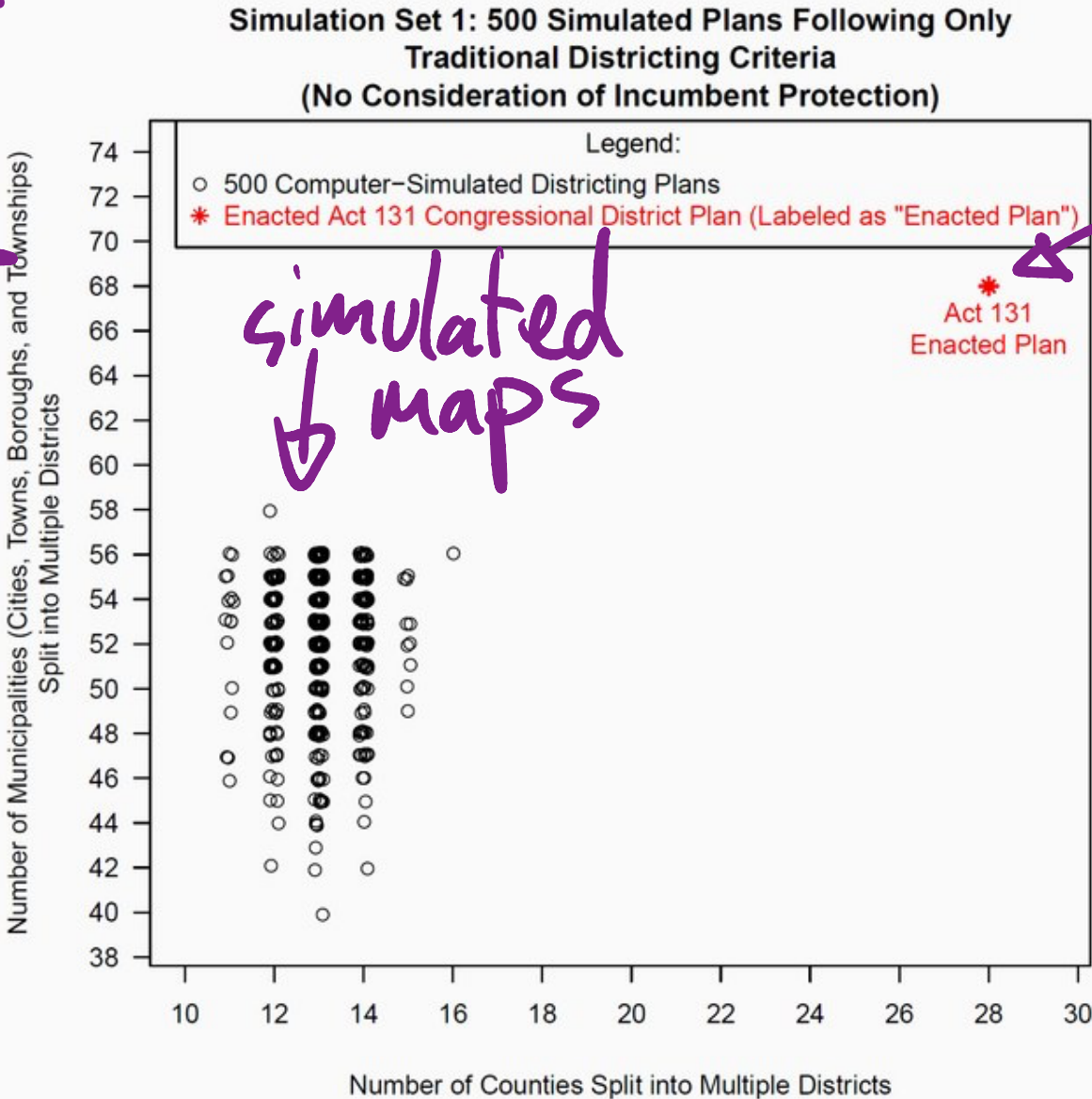


Using Data Science in the Courts



Using Data Science in the Courts

Municipalities



simulated maps

2011

Counties

Using Data Science in the Courts

- Read the full story (with summaries of other arguments that were made):
<https://www.wired.com/story/pennsylvania-partisan-gerrymandering-experts/>
- Look at the newest congressional districts:
- <https://www.cnn.com/interactive/2022/politics/us-redistricting/pennsylvania-redistricting-map/>

Using Data Science in the Courts

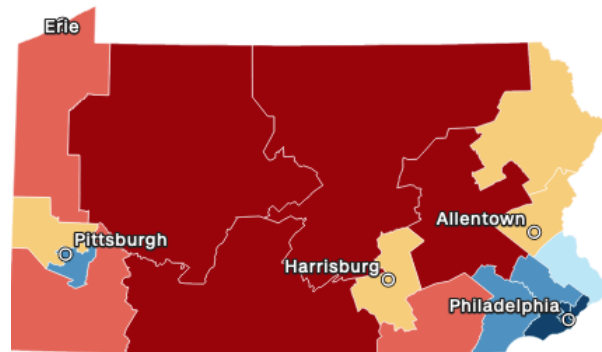
How the districts voted in 2020, by presidential vote margin in percentage points



2022

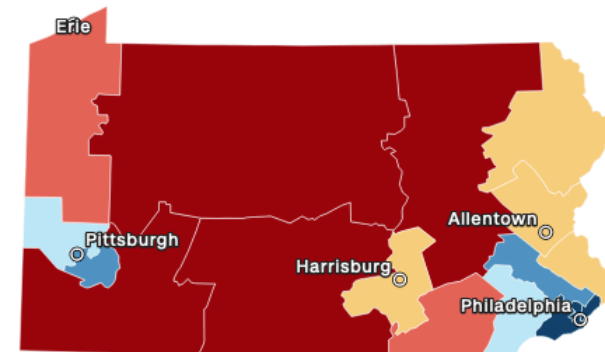
Old Map

Drawn by: Courts



New Map

Selected by: Courts



OLD MAP
18 districts



-1R

NEW MAP
17 districts (-1)

