

HTML TWEAKS STARTED @ 6:13pm 2/26

Bullet point Write-Up & Project Planning

- Alexei

- In an America where states can be as starkly different as Kansas and California, the topic of comparing states often becomes a contentious debate full of lies and misinformation
- People need to make informed opinions. The data exists; but people will have a hard time making sense of them.
- Data Visualization is the solution. Plots speak louder than words.
- Project PRISM, the Project for Plotting to Re-imagine Interstate Migrations, aims to provide regular Americans the ability to make informed opinions about geographic mobility in the United States **through the prism of data visualization.**

- Justin

- The majority of our migration data was gathered from the US Census for all 50 states (+D.C) between 2014-2019. This required downloading 51 separate CSVs, and each file had 522 rows by 109 columns.
- While thorough, the CSVs were not initially structured in a way that we needed.
 - 1. Each CSV was for only one state
 - 2. The index only showed the 'Origin' state, not the 'Destination' state.
- To solve this, we created a for loop to add a "To_State" column then concatenated all 51 state tables into one big dataframe. This enabled us to Sort and GroupBy both 'Origin' and 'Destination' state, and helped us analyze migration flows in both directions. The end result was exported to SQL as a database
- With the data sorted, we created an Atlas to visualize data at two levels:
 - 1. WHERE migration is occurring
 - 2. Who is migrating
- A glance at the Atlas shows that the preferred destinations for in-migration are vibrant coastal states with growing metropolitan areas. In the breakdown, teal represents Millennials, purple Gen X, and orange represents Baby Boomers. Millennials make up over half of inbound migrants for 8/10 states. One theory is that Millennials 25-40yo are in life-stages that are associated with mobility, such as seeking employment, pursuing home ownership, or planting roots to grow a family.
- Florida and Arizona, in contrast to the other states, have mostly older inbound migrants. 32-35% are Baby Boomers, suggesting that maybe weather or cost of living play a factor in migration as these are likely destinations for retirees.
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- Alicia

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- I was curious about the **housing price, rental price and income** in relation to the state **migration**. Therefore, I picked the top 5 States that most people migrate in and out to do more in depth analysis. I used the single-family residences data from zillow to be my target focus here. **Single-family residence** means "a structure maintained and used as a single dwelling unit." To simplify this, it means this home is built as the residence for one family, person, or household, whose owner has an undivided interest in the unit.
- The top 5 states that people **migrated out** are: California, New York, Virginia, Florida, & Texas. The top 5 states that people **migrated in** are: Florida, Texas, California, North Carolina & Arizona.
- I used Hvplot to plot the average single-family housing price. With just a quick glance of eyes, we could see a trend of the states that people migrated out of that generally have higher housing prices and vice versa.
- **Outbound Migration (Migration Out)** - CA(Income - 519k+), NY(Income 301k+), VA(Income 268k+), FL(Income 224k+), TX(Income 189k+)
- **Inbound Migration (Migration In)** - FL(Income 224k+), TX(Income 189k+), CA(519k+), NC(185k+), AZ(239k+)
- I was interested to see the migration change of these states. To prevent biases, I did a calculation of the change of migration in and migration out, in relation to the median housing price. I found that **Florida, Arizona, and North Carolina** have more in-bound migration than outbound migration. The average housing price is **\$185k to \$239k** among these states. In contrast, the change of outbound migration is positive for states such as California, New York and Virginia, which has the average housing price of **\$268k to \$519k**
- Look at the scatter plot of Avg housing price Vs. Migration Out, it shows that the average housing price is generally higher with the positive outbound migration rate. On the left side, when there is a negative change of outbound migration, the housing prices in those states are lower.
- I wanted to see if there is any relationship between rent price vs migration behavior. I extracted the rent data from zillow. However, the limitation that I got into is that the data is not consistent. The data is based on the 40-60th percentile range and it was mostly in the metropolitan area. When I look at both graphs, it doesn't really show a big difference in terms of the median rent price between these states.
- Moving over the median income Choropleth map. I used the census data to extract the average median income between 2014-2019. The coastal states tend to have a little

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higher median income. Relating back to the earlier finding, the data suggested that people seem to prefer migrating out of the state with higher income and higher housing prices to the state with lower housing prices and slightly lower income. It also displays the trend that people from the West and East Coast are moving towards the Sunbelt region.

- Relating back to Justin's finding, Millennial made up half of the migration population, and they are the most mobile generation. Looking at the statistic below, it further proves my hypothesis that millennials are moving to regions with lower housing prices despite lower median income, as they are in the time of settling down for either family, career or other factors that will be analyzed more with Rob's analysis below.
- **Outbound Migration State & Millennial Populations**
 - CA 56%, NY 59%, VA 57%, FL 52%, TX 58%
- **Inbound Migration State & Millennial Populations**
 - FL 39%, TX 59%, CA 64%, NC 53%, AZ 43%

● Rob

- With the ability to gather migration counts into and out of each state, correlations were looked for between several variables such as average commute time to work, median home price, median income, and temperature.
- As mentioned before, the migration data was taken from the U.S. Census for all 50 states, and the total migration counts into and out of each state was calculated by filtering this data by in or out of each state, summing the counts for each state, and finally merging this data into a separate csv that would be used for the D3 scatter plot.
- The average temperatures for each state were taken from the weather API OpenWeatherMap into pandas to be reformatted into a master csv that would be later used for an interactive scatter plot. The rest of the x-axis data to be plotted was scraped from tables from trusted web pages into pandas and formatted into the master csv.
- D3 was used to create an interactive scatter plot with these values in order to find what factors contributed most to people moving into and out of each state, and to look for trends or patterns associated with migration flows.

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Tasks and Project Planning

[InterState Migration Proposal](#)

Potential data flow:

Import raw data into Jupyter notebook > Pandas to clean and make dataframe > export directly to SQL database > call database from Flask > call flask route using JavaScript

Data source:

[Census MDAT template](#)

NEW LINK - [Census MDAT template](#)

State boundaries JSON - [State boundaries](#)

To do list

- Flip dataframe by adding .T (*transpose*). The state names will turn to indexes, the feature will turn to columns ✓
- One large interstate migration database ✓
 - Concat 51 separate state databases ✓
 - Make ages unique by appending education ✓
 - JUSTIN: ALABAMA-KANSAS ✓
 - ALEXEI: KENTUCKY - NORTH CAROLINA ✓
 - ROB - NORTH DAKOTA - WYOMING ✓
- Create SQL engine and load database ✓
- HTML and route (reference hw #12)
 - FLASK, SQLAlchemy PostgreSQL ✓
 - <https://stackabuse.com/using-sqlalchemy-with-flask-and-postgresql/>
 - Connect to the Database ✓
 - HTML
 - Navbar ✓
 - Divs ✓
- Weather API ✓
- Fix config.py/login.py ✓
- Dataframes ✓
 - Top 5 origin and destination states exported as csv ✓
 - 0 out state within state migrations ✓
 - Drop "Total" from original CSV? ✓
- Leaflet Map migrations ✓
- Animated JS library
 - JQuery

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- Rob to add to D3, Justin to help
 - Screenshots of data cleaning and transform ✓
 - Everyone write a blurb on own comparison HTML file
 - Update self portraits
 - Update descriptions
 - 3 slides
 - Limitations
 - Where project will be in 6mo - 1yr
 - Conclusion/Summary
 - Repository housekeeping
 - Delete unneeded files
 - Merge data into jupyter notebook
 - Move HTML files to **Flask/templates**
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- Alicia
 - Housing price (rent/mortgage price - dashboard)
<https://www.zillow.com/research/data/>
- Medium/median income
- https://data.world/garyhoov/household-income-by-state/workspace/file?filename=household_median_income_2017.csv
- <https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-income-households.html>

Chart reference:

- <https://www.census.gov/search-results.html?searchType=web&cssp=SERP&q=Income%20tax>
- Alexei
 - **Most common migration** (using the Leaflet to show the migration pattern)
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- Justin
 - Map with pins (in and outside of California) over 10 years
 - <https://www.census.gov/data/tables/time-series/demo/geographic-mobility/state-to-state-migration.html>
 - <https://www.census.gov/library/stories/2019/04/moves-from-south-west-dominant-recent-migration-flows.html>
 - Drop pin on map to show where people move out of state (5)
 - Drop pin on map to show where the people move to (5)

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- Inspiration: <https://www.northamerican.com/migration-map>
 - Pie chart
 - <http://sashakavun.github.io/leaflet-piechart/example.html>
 - Activities
 - 17.1.3
 - Markers stored as list
 - 17.2.1
 - Boroughs drawn line
 - [Record of SQL Queries](#)
- Rob
 - Visualization:
 - <https://www.northamerican.com/migration-map>
 - Generation - Boomer, Millennial, Gen-Z etc.
 - Weather (Temperature) -
 - [https://www.currentresults.com/Weather/US/average-annual-state-temperatures.php#:~:text=State%2Dwide%20averages%20of%20annual,F%20\(11.5%20%C2%B0C\).](https://www.currentresults.com/Weather/US/average-annual-state-temperatures.php#:~:text=State%2Dwide%20averages%20of%20annual,F%20(11.5%20%C2%B0C).)
 - Cost of Living
 - <https://worldpopulationreview.com/state-rankings/cost-of-living-index-by-state>
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