Home and rental prices visualization

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Agenda

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- Recap
- Viz iterations
- Final viz overview
- Live demo
- Usability testing overview
- Sample tasks
- Sample likert scale questions
- Testing results
- Insights

Users and tasks

Targeted users:

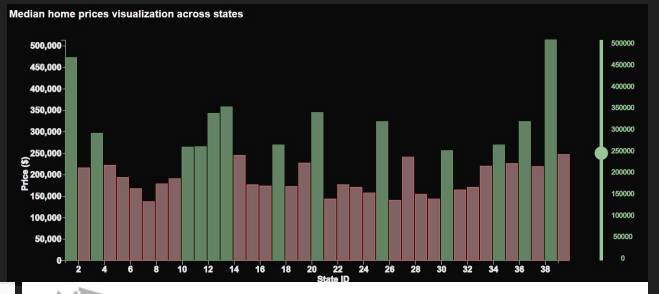
- Individuals or investors looking to invest in housing market
- Individuals considering renting vs buying

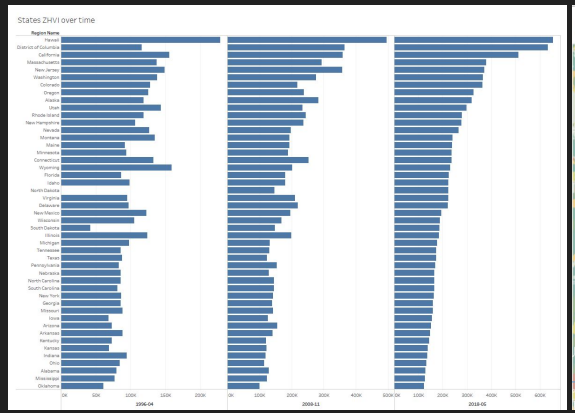
Tasks:

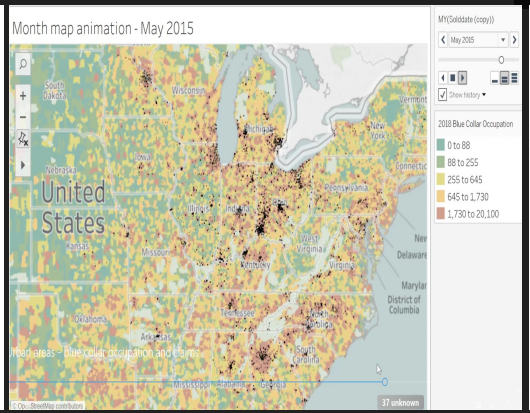
- Allowing user to be objective about buying/selling/renting decisions, via data driven approach, with viz focus in bringing out regional contrast
- Finding regional hot/cool spots in pricing/growth rate/inventory
- Knowing optimum buy/sell windows based on time seasonality
- Analyzing regional market trend via buyer-seller index
- Estimating affordability and break-even duration in an area

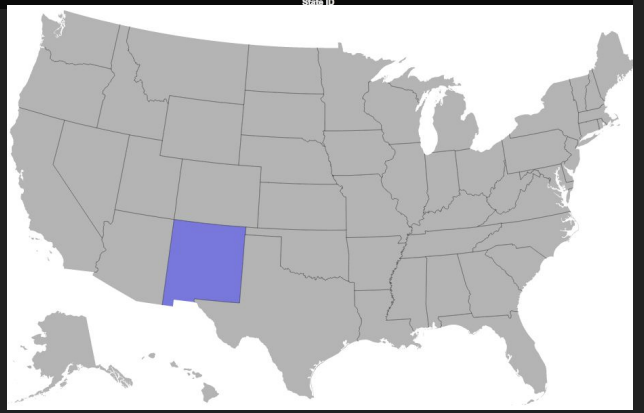
Recap

- Tableau
  - Planned to use bar/line charts
  - Explore plotting statistical metrics
- D3
  - Planned using interactive bar charts
  - Explore D3 topoJSON for base map layer



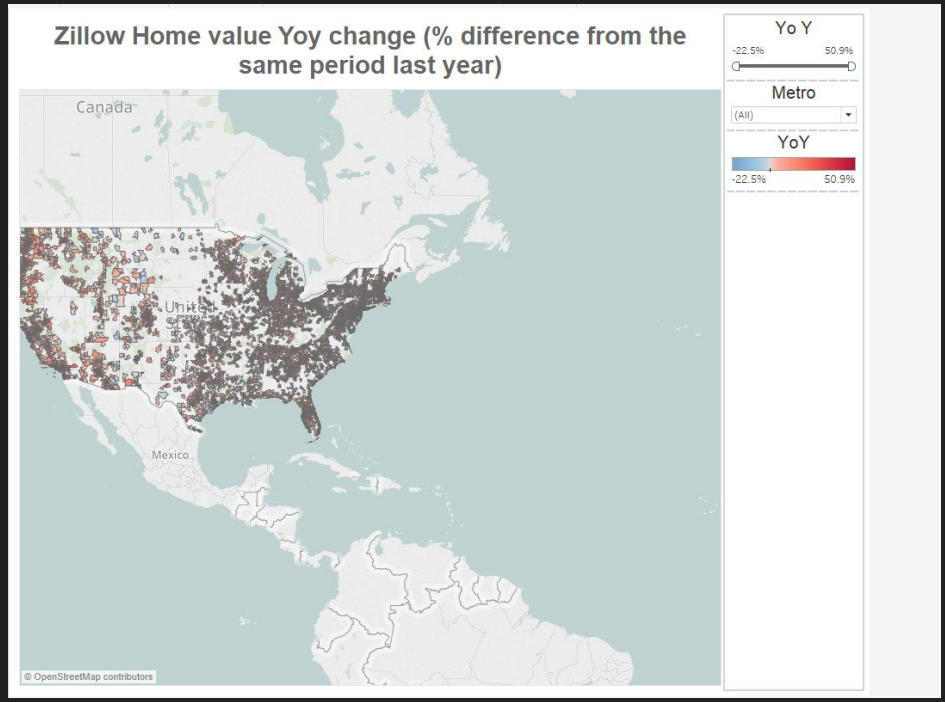






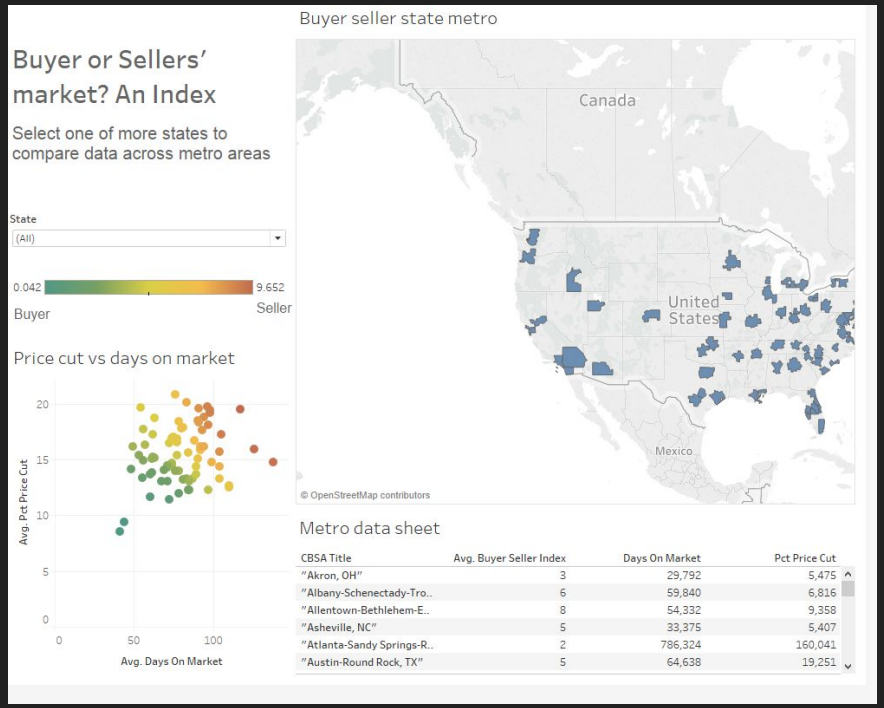
Viz iterations

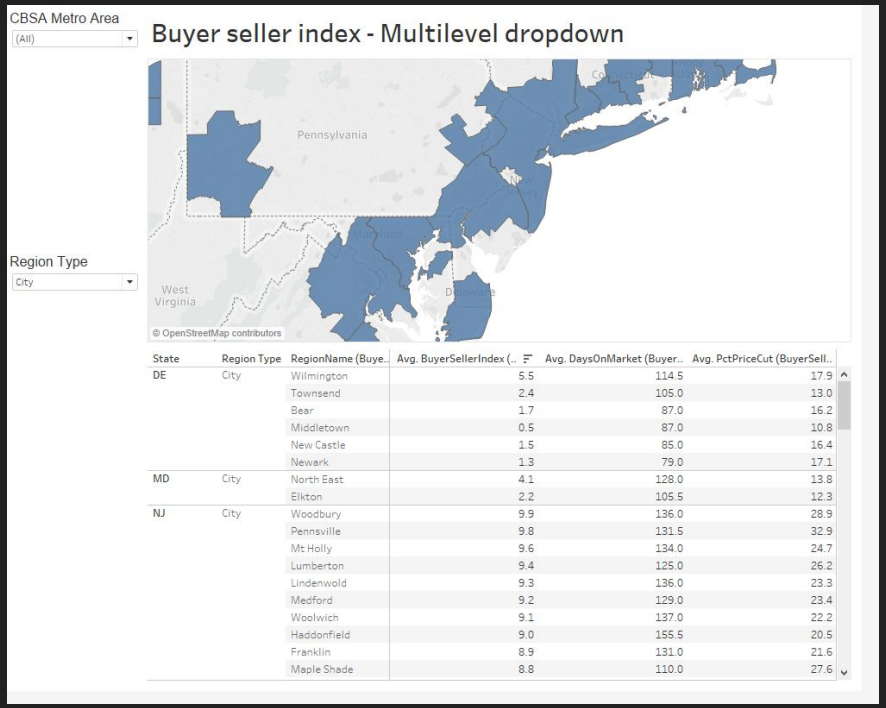
- Tableau as the choice
  - Quickest development cycle
  - Learning curve of topoJSON interfacing (geographical map was a cornerstone)
- Developed initial dashboards and asked users to informally test it, to help evolve the viz in parallel



Viz iterations (contd.)

- Compacted the dashboards, wherever possible, to cut redundancy





Final viz - overview

- Data
  - Majority is from Zillow, fetched from 80+ CSV files for each geographical cut
  - Geographically split by state, metro, county, zip code, neighborhood
  - Time series format for many metrics
  - Metrics - price index, next year forecast, median rental listings, days on zillow etc.
  - Population data is from US census
  - Performed inner joins on more than 10 data files
  - All data points presented, none removed
- Final viz
  - Dashboards: Total of 7
  - Design: Choropleth maps, each with different metrics
  - Methodology: Overview first, zoom, filter and details on demand next
  - Hosting: On Tableau public, available via berkeley.edu server
  - Rendering: Fixed (1100x1000) dashboard resolution, responsive on 4G LTE also

Live demo (link)

Usability testing overview

- Specific tasks (pool of 20 tasks)
  - Reading - values, units, tables, scales, legends
  - Interactions - sliders, searches, map controls (panning, zooming), tooltips
  - Inferring - distributions, relative comparisons, trends
- Likert scale questions for categorical evaluation of
  - Visual technique (choropleth maps)
  - Visual elements (axes scales, filters, legends, colors)
  - User onboarding (learning curve)
  - Information retrieval (easy/hard)
  - Overall (interaction)

Testing distribution:

- Informal testing and feedback during development cycle, with open-ended user exploration no specific tasks, with both US-based as well as non-US based users.
- Formal task driven testing with 6 users, via recorded interactive live sessions

Sample tasks

Example: ZHVI indicator map

1. What is the highest YoY change in San Francisco, and in which area(s)? (**read a value**)
2. In North Dakota, which area(s), if any, have YoY change of more than 10%? (**use slider**)
3. In San Jose, name 2 areas which have a YoY change of more than 30 % and two areas less than 2 % (**identify extremities, use scale sliders**)
4. How is the YoY distribution of San Diego compared to San Francisco? (**compare distributions**)
5. Overall in US, between East Coast and lower West Coast, how is the YoY change distributed? (**compare distributions**)

Sample likert scale questions

1. **In your opinion, which map view was the most useful**
- ZHVI indicator (YoY 10 yr compounded annual returns)
- Forecast YoY percent change for next year
- Break even time
- Affordability of an area
- Rental YoY percent change
- Opportunity window

2. **How responsive was the webpage from your experience**
- Very responsive - satisfied
- Somewhat responsive - needs improvement
- Not responsive - a turn off

3. **Should there be additional text/descriptions to explain features/functions on one or more maps**
- Yes, in a lot of places
- On just a few pages
- Not needed, just fine as-is

Testing results (top 5)

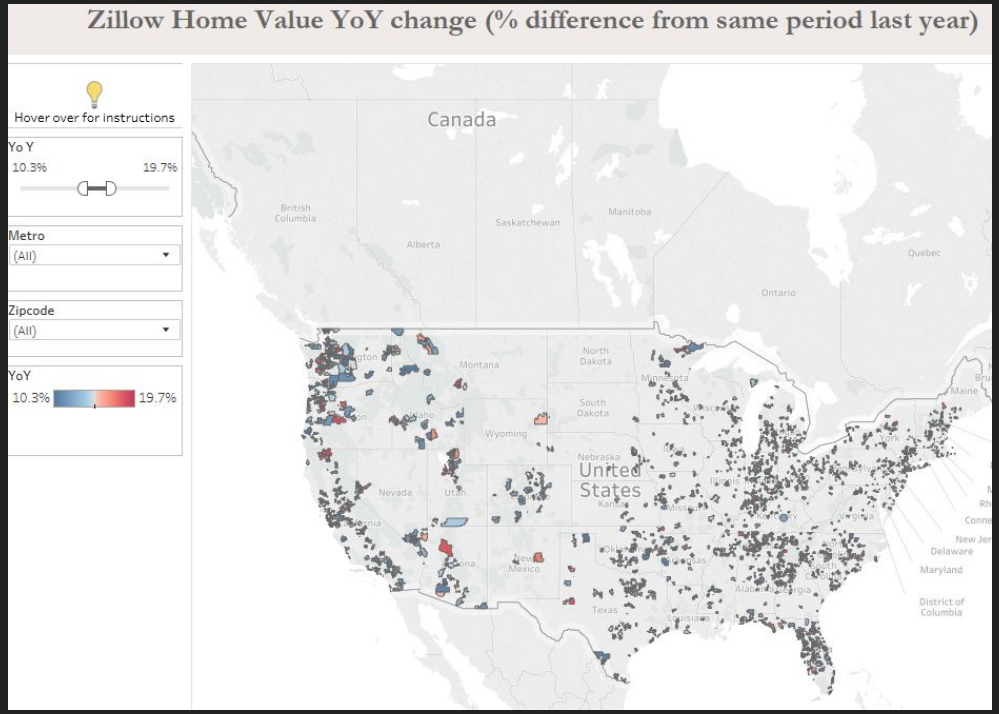
- ➔ Severity rating - major usability issue: (3), not a real problem: (2)
- ➔ No critical issues: (4) found in testing

1. User needed more than expected time to familiarize with the page (**3**)
   - Action: add more explanations, tooltips about the metrics and controls
2. Scale on affordability map is confusing to interpret (**3**)
   - Action: remove negative numbers, and directly employ filtering of map regions
3. Better to have multi-selection filters in drop down list (**2)**
   - Action: add this feature for effective comparisons
4. Slow map responsiveness (**2**)
   - Action: none - out of scope
5. Unintuitive map controls - need to be like Google Maps (**3**)
   - Action: none - out of scope

Insights

Viz 1:

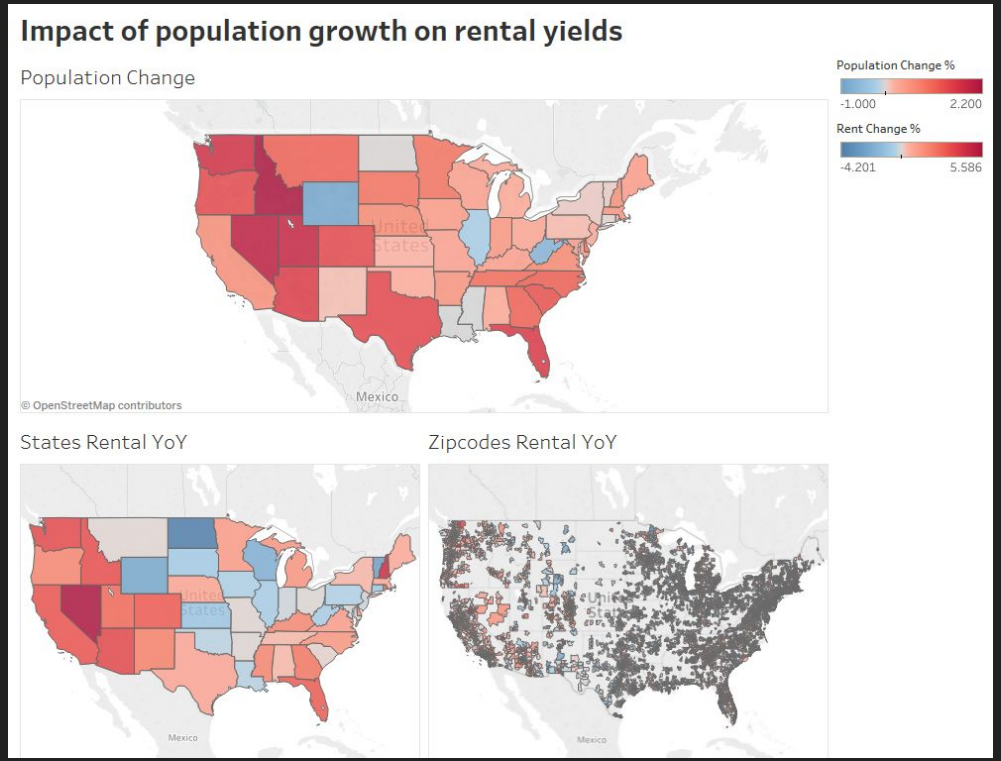
- The housing market was hot for most of the country
- Very few places had negative returns, esp in the western half of the country
- WA state seems to be the most concentrated region with strong growth



Insights

Viz 2:

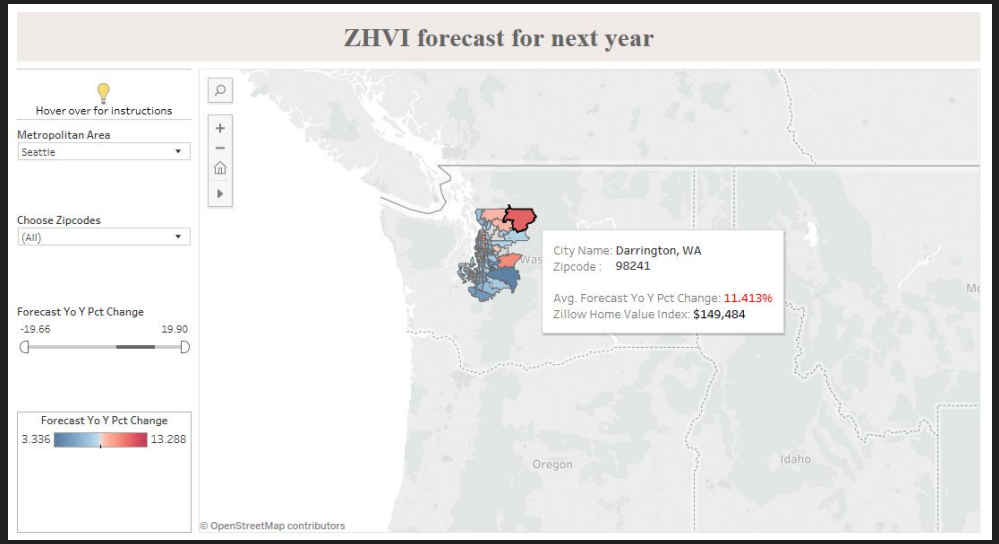
- Population growth seems to be correlated to Rental YoY growth
- Nevada seems to have the strongest growth while Wyoming had the most decline



Insights

Viz 3:

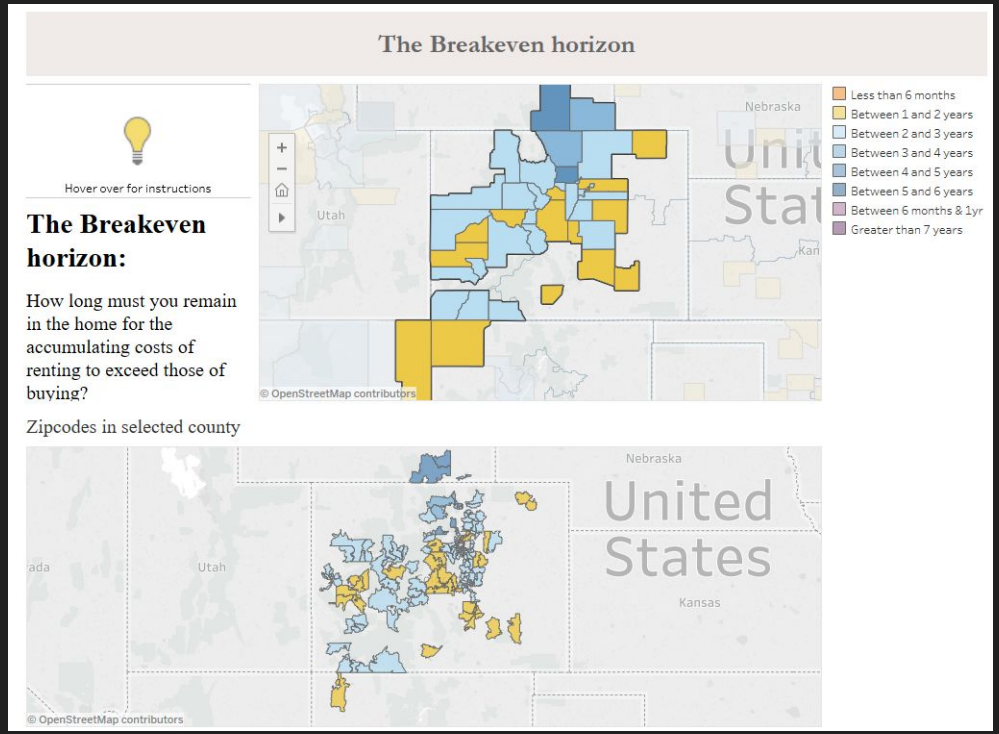
- If I were to invest in Seattle area, then Darrington seems to be a good area



Insights

Viz 4:

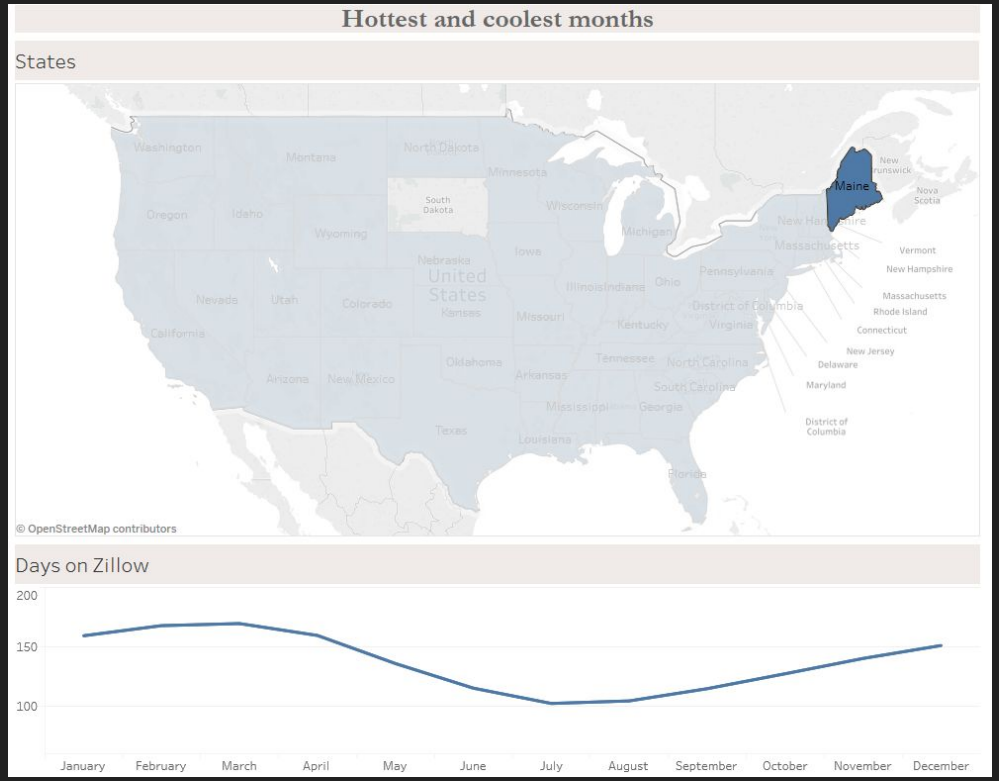
- In most of Colorado, if I were to live more than 4 years, it is wiser to buy a home rather than rent



Insights

Viz 6:

- In Maine, if I find a home I like, and if it is February, it maybe ok to bargain hard



Insights

Viz 7:

- Seattle is an extremely strong sellers' market

Thanks

Questions

Feedback