Rising Rents: Going West

Summary

Rent prices have risen steadily for a clear majority of the nation in the five years following the U.S. housing crisis for a number of reasons including urban gentrification and luxury apartment construction. The West in particular has paced the growth with cities like San Francisco, Seattle, and Denver all experiencing over 45% hikes in rent. In many cities, rising rent costs have outpaced wage increases and inflation to put a strain on the spending power of households.

Design

The final design is a dimple storyboard with a time series in the main plot and bar graph in the indicator button plot. The indicator plot groups the cities by region. This was chosen to give a representation of rent prices and growth in comparable cities geographically. The average percent change in rent price from 2012-2017 per region is the x axis measure to give an indication of how prices changed. The main plot spans from 2012 to 2017 and shows the growth or decline of rent prices in major cities (top 100 population). The Zillow Rent Index is used for average prices and is defined at the end of the explanation text. The legend is dynamic and changes to show which cities are currently being plotted. Each plot contains the same six colors for the sake of continuity (two have seven so a seventh color was assigned for these).

A variety of changes occurred at the core of the project throughout the process of getting feedback. The plot went from a dual scatterplot/time series to a storyboard to give it a clear, dynamic look. The original thought was to have a narrative about the housing crisis in 2011 and the subsequent recovery, but since the Zillow Index is more rent based it made sense to switch to the rise in rent prices in certain sections of the nation. Several options were explored to see what would be best to plot in the indicator button side, and eventually percent change was decided upon. Other features explored were current price, number of cities represented, and population ranks. Finally, the color choices are specifically set for each city. Originally each city had its own distinct color which made sense when all the cities were in the same plot, but with the large number of cities in the dataset a lot of them were similar. Since only six or seven appear in the final version per plot, it made sense to predetermine which colors would appear. Final changes following the Udacity review are described in the summary section of Feedback for index_final1.

Feedback

1. (sketch_1 and sketch_2)
   Summary: Two graphs showing all the top 100 cities by population on the same plot. One is a time series from 2012-2017 of prices and the other is a scatterplot of current price vs. percent change from 2012-2017.

Feedback (Jack): Likes the line graph better than the scatterplot. Need to find a way to add animation. Too many cities on the same plot to know what's going on.

2. (index_1)
   Summary: First attempt at a storyboard for animation.
   Feedback (Myles): Storyboard is a good concept. Like the buttons and ability to toggle between states. Too big of a difference in cities per state. Legend is not functional and not changing to show each state that's posted. Need to order states in some format that makes sense. Graph is fairly sluggish from the amount of data.

3. (myleszillowstoryboard)
   Summary: Legend code is added to make interactive and show current cities plotted. States that received funding from the Hardest Hit Fund are plotted in a time series with cities they have in the top 100 population.
   Feedback (Jack): Graph needs work on the dimensions. Needs to be centered, colored better, quicker to toggle between states and to load. Six years is a long time, think about shortening the time period.

4. (zillowstoryboardmovetomiddle)
   Summary: Chartcontainer is used to express dimensions in percentages and the plots are scaled to move to the middle of the page.
   Feedback (Jacob): Point of the plot is not very clear. What are you trying to show? Why are buttons all different sizes? Is there a way to just show how they have changed without looking at the lines? Some of the plots have the same colors so you must mouse-over to see which city it is.

5. (secondstory)
   Summary: Idea was hatched to add a second storyboard to main chart to show a bar graph of percent changes for each city. Rough sketch was produced here. Variable for region was created and added to each city to plot cities together geographically. HHF cities were replaced.
   Feedback (Jack): Too much going on in the plot. It might be better to just find a way to make your line graph more clear. What is rent index and where did you get the data from? Like the move to regions from states to show discrepancies for different parts of the country and where rent is rising fastest.

6. (index_final)
   Summary: Bar graph idea was scratched. Changed colors in line graph to be same 6 colors in each iteration of plot so as not to have same colors on the same pot. Indicator button plot was sub-setted to show average current rent prices per region.
   Feedback (Jacob): Much more polished than any graph so far. Better use of labels to explain everything that the axes and variables represent. Coloring looks way better since it's uniform. Zillow logo is a nice touch to give them credit for data source.
   Feedback (Udacity Review): When changing the size of the viewing window, there is some overlap with text. The y-axis changing with each plot can be hard to compare between regions.

The use of animation could be stopped after one round. The y axis doesn't need a decimal point or a $0 line. Why did you decide on final rent as the indicator plot? Coloring in the horizontal bars shouldn't be prominent in the real plot and the legend order should be consistent in coloring. Variable and value need better names, and what do 6 best and worst changes actually mean?

7. (index_final1)
   Summary: A number of changes occurred following the first Udacity Review. All the text from the title, explanation, and Zillow credit were put in header, paragraph, and footer tags instead of appended svgs for better scaling and formatting. The decimal point after prices was removed. The coloring of the horizontal buttons was changed so that it did not include colors that appear in the graph. Variable and value features now have Year and Price labels. The wording of Best and Worst now reads Biggest and Smallest for percent changes. The console.log() tags were removed. The indicator labels were placed a little further into the horizontal bars. The horizontal bars now show percent change instead of current rent price. This looks a little awkward and wasn't chosen in the original submission because the 6 Smallest Change button is negative. However, overall it does add more to the plot and the narrative that western regions' rents are growing at a faster clip. Finally, the main suggested change that was the toughest decision to implement was the fixed y-axis. It does make sense that it is hard to compare different plots to one another with a changing axis, but California rents skew the axis so much that fixing the max at $5,000 really takes away a lot from most of the other plots that group their cities around $2,000. Though it is much harder now for a viewer to discern what is going on with these cities, it was determined that if the main narrative is to show how rents have risen in the West, fixing the axis wins out, and the fluctuating axis should be held off until future iterations of similar storyboards.

   Also, a few design choices that were encouraged to explore further did not result in any changes. First, the suggestion to scrap the animation feature of the plot was looked at in detail. In the end, the decision to keep it was made. A user is already able to stop the animation indefinitely until another click is made and toggle between any region without the animation starting again. The animation also helps set the plot and storyboard apart from other stagnant graphs and gives the viewer a passive viewing experience to take in all the information until they find a specific region to dive deeper into. Another suggestion was to fix the colors in the legend for each plot. The cities that appear in the top 6 changes and bottom 6 changes also appear in their respective regions, and each legend for region is sorted in order by population size. To keep the colors in a specific order, the compilations would have to start listing smaller cities above larger (i.e. Salem, OR in front of Seattle, WA). While this was explored, in the end it was determined that the magnitude of the city was the most important factor as long as the colors stayed consistent throughout the different iterations.

Resources

"Advanced Storyboard Control." Dimple.js.
http://dimplejs.org/advanced_examples_viewer.html?id=advanced_storyboard_control

"Affordable Housing Policy Rent Apartments." Curbed. http://www.curbed.com/2016/5/19/11713134/affordable-housing-policy-rent-apartments

"Delete Column from Pandas Dataframe." Stackoverflow. http://stackoverflow.com/questions/13411544/delete-column-from-pandas-dataframe

"Deleting Dataframe Row in Pandas." Stackoverflow. http://stackoverflow.com/questions/18172851/deleting-dataframe-row-in-pandas-based-on-column-value

"Dimple.aggregateMethod." Github. https://github.com/PMSI-AlignAlytics/dimple/wiki/dimple.aggregateMethod

"Dimple.legend." Github. https://github.com/PMSI-AlignAlytics/dimple/wiki/dimple.legend

"Dimple.js Aggregating." Myles from Udacity Forum. https://discussions.udacity.com/t/dimple-js-aggregating/241284/13

"Dimple.js Show X-Axis." Stackoverflow. http://stackoverflow.com/questions/21291628/dimple-js-show-x-axis-label-but-if-value-is-null-dont-place-a-circle-on-char

"Dimple Time Format Juggling." Dimple. http://stackoverflow.com/questions/20195870/dimple-time-format-juggling

"How Rising Rents are about to Crush American Spending Power." Fiscal Times. http://www.thefiscaltimes.com/2015/10/23/How-Rising-Rents-Are-About-Crush-American-Spending-Power

"HTML Color." Computer Hope. http://www.computerhope.com/htmcolor.htm

"Pandas.melt." Pandas. http://pandas.pydata.org/pandas-docs/stable/generated/pandas.melt.html

"Rent Index." Kaggle. https://www.kaggle.com/zillow/rent-index

"Rents Now Top List of Fastest Rising Prices." CNBC. http://www.cnbc.com/2016/06/16/rents-now-top-list-of-fastest-rising-prices.html

"U.S. Cities where Residential Rent is Rising Fastest." Bloomberg. https://www.bloomberg.com/news/articles/2016-10-07/the-u-s-cities-where-residential-rent-is-rising-fastest

http://stackoverflow.com/questions/489340/vertically-align-text-next-to-an-image