

Will Charlotte, NC Population Growth Surpass San Francisco, CA?

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Agenda

- Introduction
- Data Cleanup & Exploration
- Data Process & Analysis
- Discussion
- Conclusion
- After Action Review
- Questions

Charlotte's Population Growth

- May 21, 2020 Charlotte Business Journal Reports
 - July 1, 2018- July 1, 2019 Charlotte added about 13,200 new residents
 - An increase of 1.5%
 - Surpassed San Francisco to become the 15th-largest city based on Census data.



Comparisons Charlotte vs. San Francisco

- Unemployment
- Poverty
- Household income
- Companies relocating their HQ to CLT
- Population evaluation (2011-2018)
- Population prediction (2019-2028)

Analysis Process

Identify Data Sources

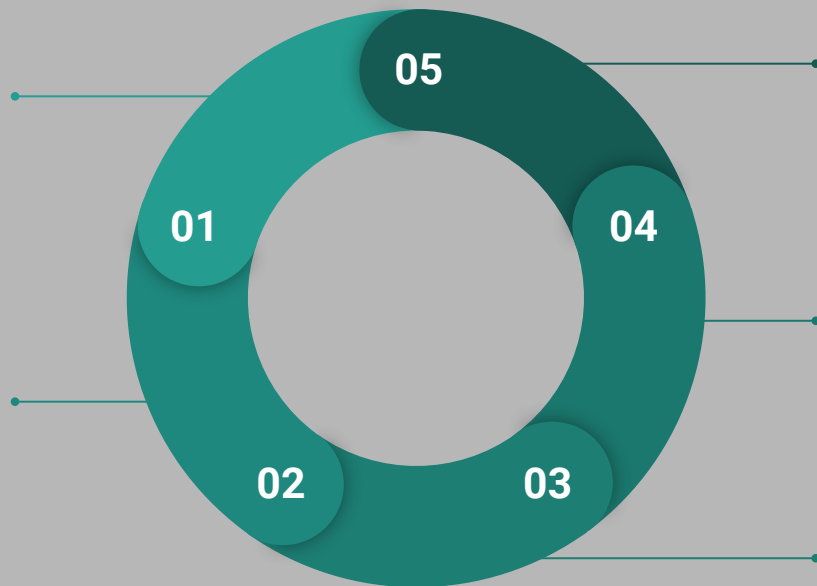
Selected an article claiming CLT population growth was outpacing SF. Pulled data from US Census Bureau to further delve into data.

Retrieve, Assemble, & Clean

Pulled APIs from US Census, selecting cities interested, parameters, and years.

Parameters: Places (cities), Population Count, Household Income, Unemployment Count, and Poverty Count

Collected Data from 2011-2018



Results

Although the original article claimed CLT had outgrown SF this year, we used our prediction model via linear regression equation to discover CLT population wouldn't pass SF until the middle of 2022.

Acknowledge Limitations

U.S. Census data we pulled only had 2018 as the most recent data collected, causing us to extrapolate data sooner than the current year. COVID-19 was also not included as an independent variable, but acknowledged as a factor.

Analyze for Trends

Organized data inside Jupyter Notebook, using pandas to clean and explore data. Imported Matplotlib to generate graphs of data, utilizing for loops, groupby functions, linear regressions, etc.

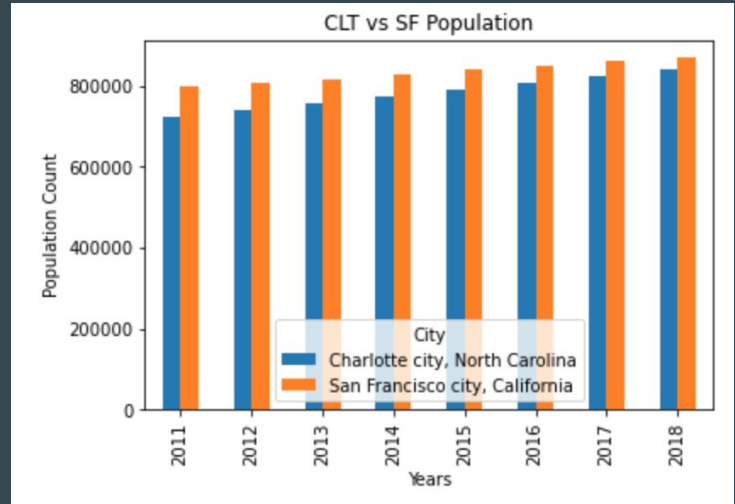
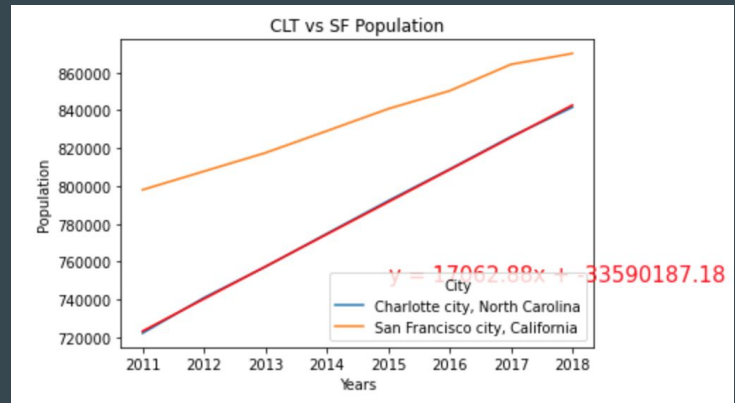
Data was presented mostly through line graphs due to the linear and continuous functions, plotted over time

Data Exploration and Cleanup Process

- Jupyter Notebook demonstration

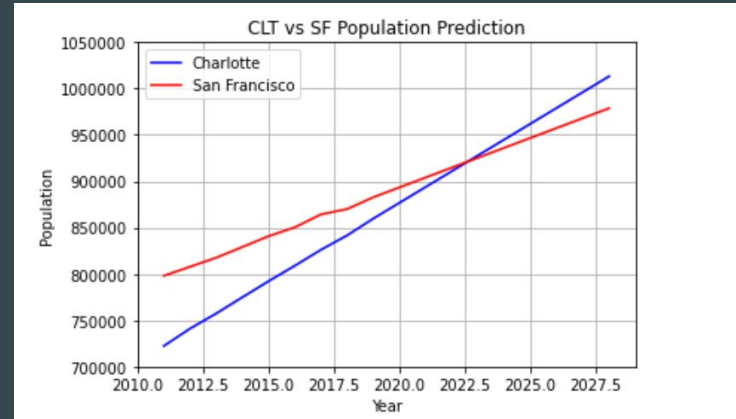
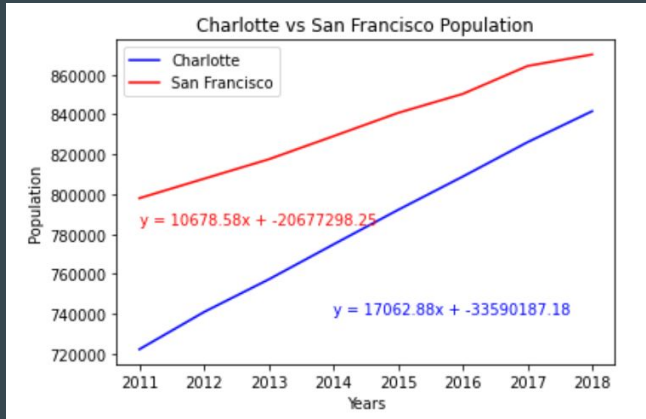
Population Count (2011-2018) Charlotte vs San Francisco

- After researching further, Charlotte has not passed San Francisco to become the 15th largest city yet as of 2018.
- Based off the population count in 2018, Charlotte is on the rise and the two cities have been close in size from 2011 to 2018.



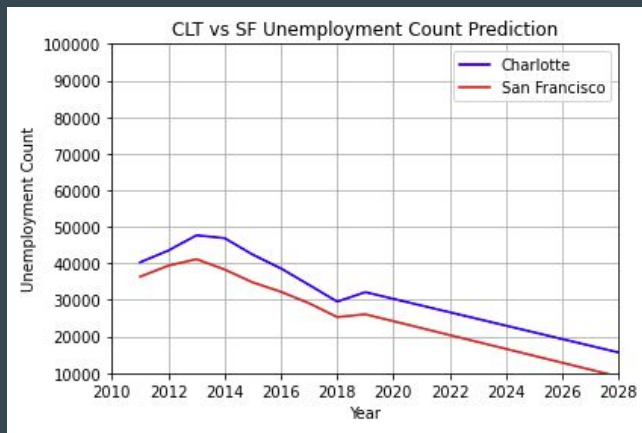
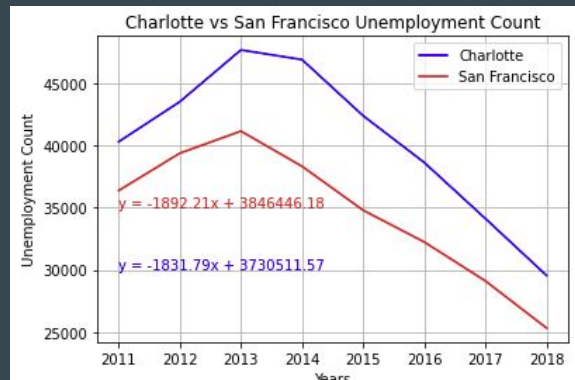
Population Prediction

- By using the linear regression for the population of Charlotte and San Francisco we predicted when Charlotte's population would exceed San Francisco's population.



What to expect of Unemployment when comparing Charlotte & San Francisco?

Both Charlotte and San Francisco share similar, negative growth rates (slope) that over time exhibit a decrease in Unemployment count per city. Looking at the projected unemployment count, by 2028, San Francisco is set to have a 64.3% decrease, while Charlotte also has a 47.1% decrease. The economic disruption caused by COVID-19, is a tremendous factor that will inevitably cause a hindrance in these results, that are currently based off most recent Census data.



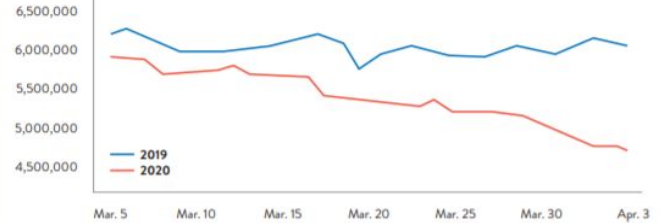
Year (unemployment count)	SF	CLT
2018	25,320	29,544
2020	24,182	30,296
2028	9,044	15,641

Effects of COVID-19 on Employment of Charlotte, NC

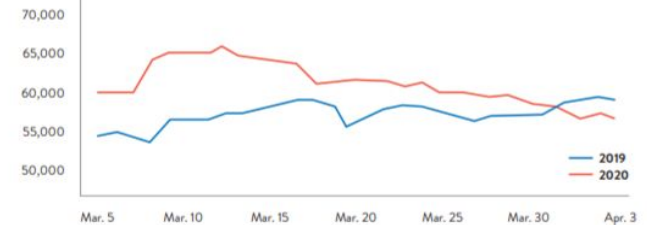
2019 Fortune 1000 company headquarters in the Charlotte Region

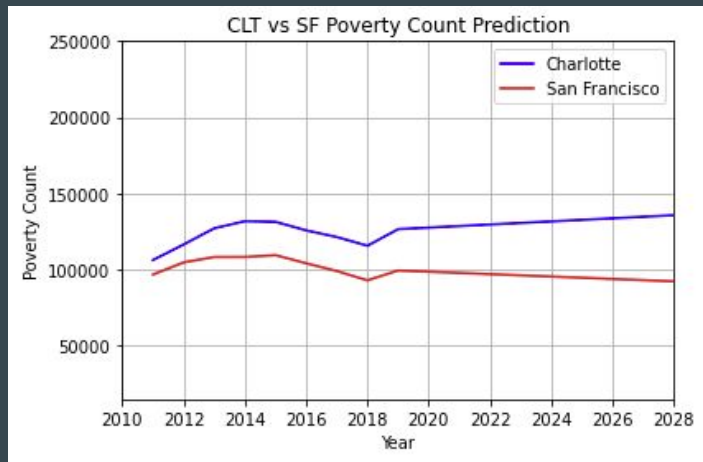
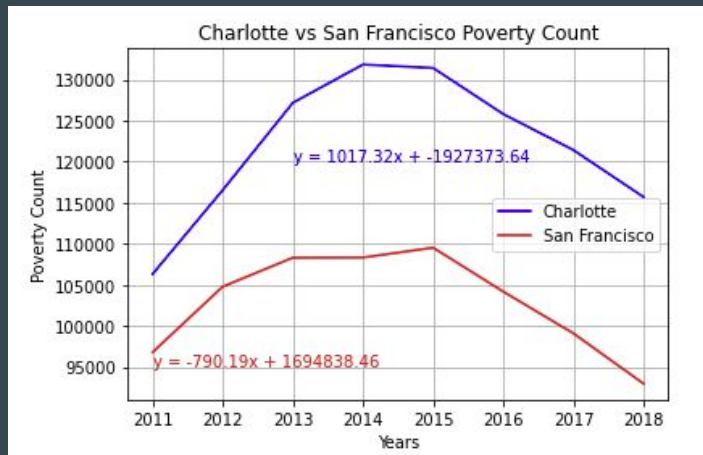
2019 Fortune Rank	Company Name	Headquarter City	2018 Revenue	2018 Fortune Rank
25	Bank of America	Charlotte	\$110.6B	24
42	Lowe's	Mooresville	\$71.3B	40
120	Nucor	Charlotte	\$25.0B	151
126	Duke Energy	Charlotte	\$24.1B	125
316	Sonic Automotive	Charlotte	\$9.9B	298
342	Brighthouse Financial	Charlotte	\$8.9B	n/a
511	Domtar	Fort Mill	\$5.5B	517
555	Sealed Air	Charlotte	\$4.7B	456
563	Coca-Cola Bottling Company	Charlotte	\$4.6B	576
569	CommScope	Hickory	\$4.6B	554
590	JELD-WEN	Charlotte	\$4.3B	625
702	Albemarle Corporation	Charlotte	\$3.4B	723
876	Curtiss-Wright	Charlotte	\$2.4B	885
962	SPX Flow	Charlotte	\$2.1B	967

Full-Time Jobs Postings, United States, March 2020 and 2019



Total Full-Time Jobs Postings, Charlotte Region, March 2020 and 2019





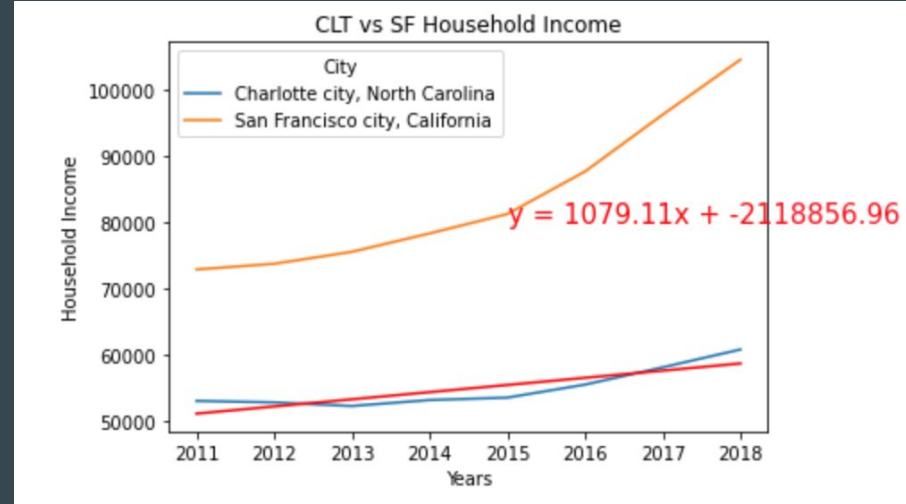
How can we expect Poverty to change over the next decade?

Charlotte, NC possesses a higher rate of poverty, averaging 1.3 times higher than San Francisco. After using the regression model as the basis for poverty count prediction, by 2028 Charlotte is projected to have an increased count by 17.33%. Contrastingly, San Francisco's negative rate of change attributes to its projected decrease in poverty by -0.69%.

Poverty Count	San Francisco	Charlotte
2018	92,979	115,699
2020	98,655	127,613
2028	92,333	135,751

Household Income- Charlotte vs San Francisco

- Based off of census data from 2011 to 2018 the average household income in Charlotte stayed less than \$60,000. The big difference is that San Francisco has increased from \$70,000 in 2011 and in 2018 the average household income is above \$100,000.
- There is a huge gap between the two cities and this could be due to the cost of living.

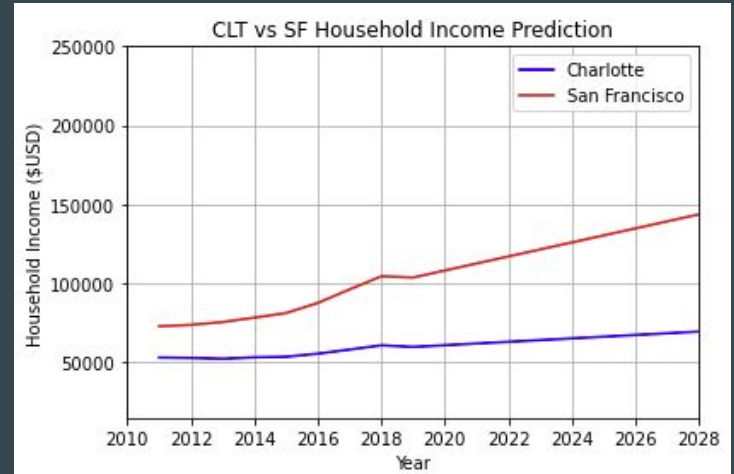
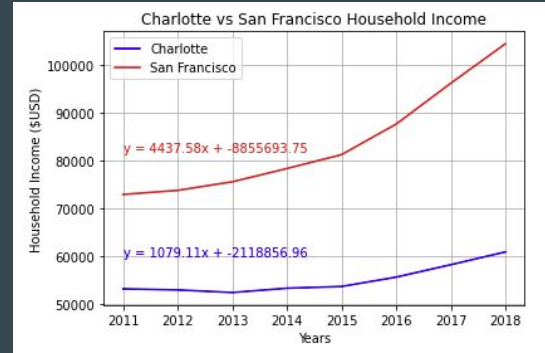


- Median home cost in Charlotte: \$228,800
- Median home cost in San Francisco: \$1,378,300

What can we expect household income to be by 2028?

U.S. Census provided us with data up until 2018, where we generated regression equations to predict and extrapolate household income up through 2028. There exists a positive correlation between the two growth models, where household incomes of both Charlotte (CLT) and San Francisco (SF) are projected to increase. SF growth rate (slope) is roughly 4.1 times larger than that of CLT, contributing to its more significant upsurge of household income by 2028.

Median Household Income	San Francisco	Charlotte
2018	\$104,552.00	\$60,886.00
2020 (prediction)	\$108,218.00	\$60,945.00
2028 (prediction)	\$143,718.00	\$69,578.00



Implications

As population rises resources are depleted, the environment can be compromised, and quality of life can be impacted.

- Infrastructure
- Education
- Affordable Housing & Accessible Healthcare
- Resources: Water, Food Supply, Electricity, Public Health and Sanitation
- Employment Opportunities

Charlotte must address competing priorities with limited resources.

Conclusion and Summary

	Charlotte	San Francisco	Charlotte	San Francisco	Charlotte	San Francisco
	2018		2020		2028	
Unemployment Count	29,544	25,320	30,296	24,182	15,641	9,044
Poverty Count	115,699	92,979	127,613	98,655	135,751	92,333
Household Income (USD)	\$60,886.00	\$104,552.00	\$60,945.00	\$108,218.00	\$69,578.00	\$143,718.00
Population Count	841,611	870,044	876,830	893,433	1,013,333	978,862

- Charlotte's population count is on the rise and will pass San Francisco in 2022-2023.
- The household income between the two cities are not close.
- The cost of living in San Francisco is much higher than Charlotte.
- The biggest challenge we had is that the only data we could find went to 2018 which led us to calculating predictions.
- Why would anyone want to live in San Francisco?

References

- [Charlotte Regional Business Alliance](#)
- [WSOCTV Population Article](#)
- [Best Places](#)
- [AARP Salary Report](#)
- [Charlotte Business Journal](#)
- [U.S. Census Bureau Places Documentation](#)
- [U.S.Census Bureau Variables Documentation](#)
- [Census Github](#) (Years - 2011 to 2018)