SalaryRentComparison

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Motivation & Objective

- **Motivation:**
    - Job market and cost of living are hard to grasp
    - Address the complex nature with comparative features and visual modeling
    - Aid users in making informed decisions based on existing salary and rent dynamics

- **Objective:** Analyze the rent prices & software developer salaries across various cities within the United States
    - Create an interactive map, visualizing the rent to salary ratio for cities
    - Provide the functionality to compare two cities to better gauge the pros and cons of potential relocation
    - Find the *best value cities, cities with the most opportunity*, and the overall *correlation between salary and rent prices*

Our Application

- Built with Dash and Plotly
- Written in Python
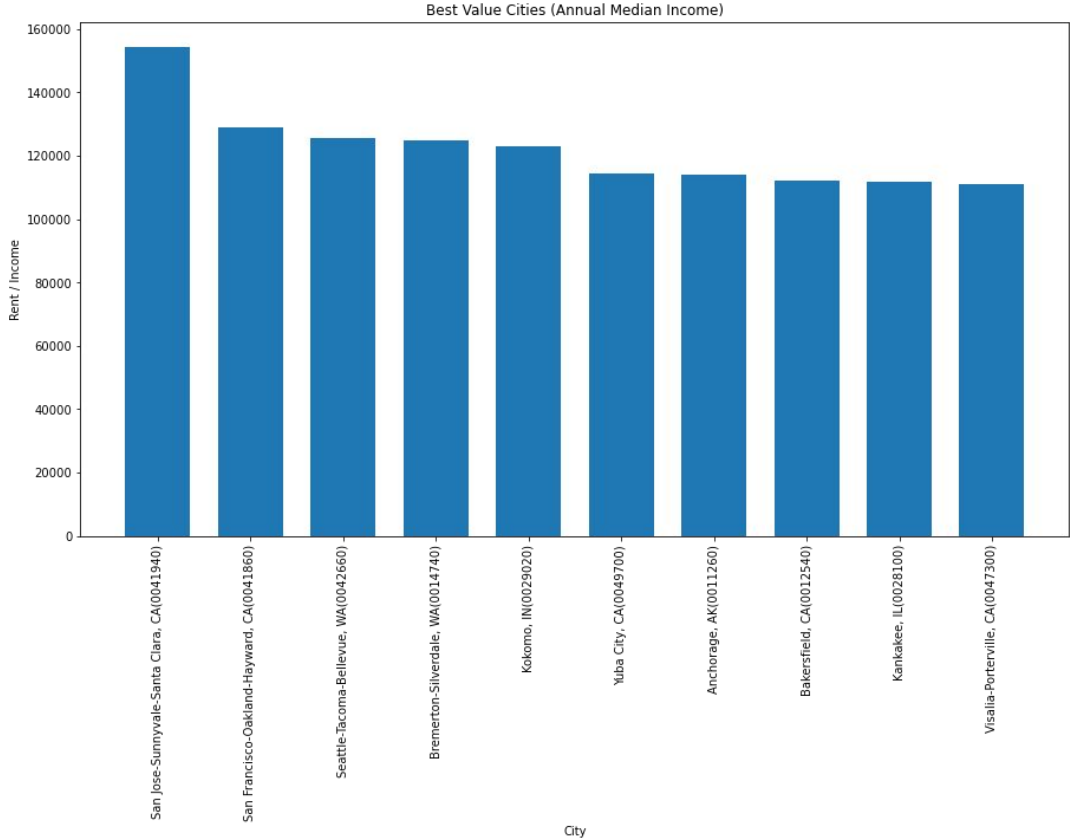- Utilized Pandas and Numpy
- *Demo*

Our Data

- **Data Sources:**
  - **Rent data**: *Zillow Observed Rent Index*
    - Provided rental data for various cities in the U.S. from 2015 to 2023
  - **Salary data**: *U.S. BLS Occupational Employment & Wage Statistics for Software Developers in Multiple Geographic Areas*
    - Provided salary data for various cities in the U.S. for software developers in 2022

Rent Price vs Annual Median Wage

Best & Worst Value Cities

```
Area Name
San Jose-Sunnyvale-Santa Clara, CA(0041940)    154498.832208
San Francisco-Oakland-Hayward, CA(0041860)     128893.948498
Seattle-Tacoma-Bellevue, WA(0042660)           125687.103718
Bremerton-Silverdale, WA(0014740)              124686.774863
Kokomo, IN(0029020)                            122921.318458
                                                      ...
Santa Fe, NM(0042140)                           62092.106930
Enid, OK(0021420)                               60365.027321
Gainesville, FL(0023540)                        58196.659751
Cape Girardeau, MO-IL(0016020)                  56051.085238
Hattiesburg, MS(0025620)                        43941.508408
Name: Disposable Income, Length: 319, dtype: float64
```
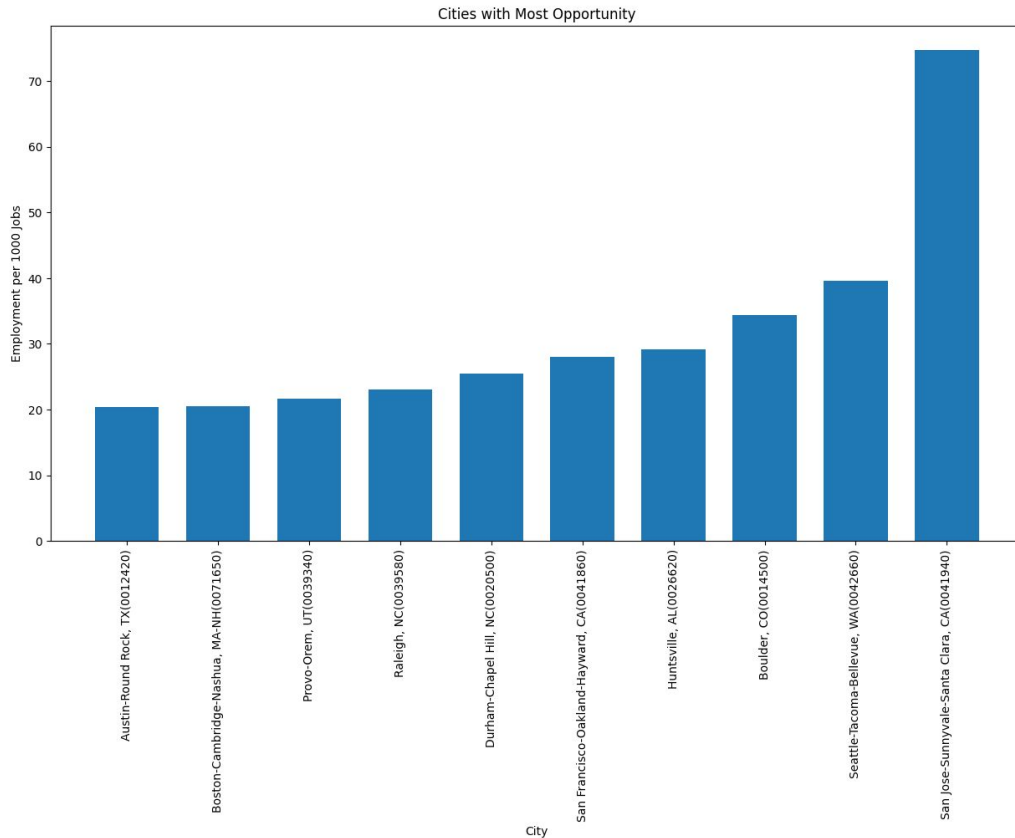

Best Value Cities (Annual Median Income)

Cities with Most Opportunity

```
Area Name
San Jose-Sunnyvale-Santa Clara, CA(0041940)        74.674
Seattle-Tacoma-Bellevue, WA(0042660)               39.642
Boulder, CO(0014500)                               34.338
Huntsville, AL(0026620)                            29.105
San Francisco-Oakland-Hayward, CA(0041860)         28.007
                                                      ...
Texarkana, TX-AR(0045500)                           0.922
Hammond, LA(0025220)                                0.920
Brunswick, GA(0015260)                              0.747
Houma-Thibodaux, LA(0026380)                        0.676
Terre Haute, IN(0045460)                            0.540
Name: Employment per 1,000 jobs, Length: 319, dtype: float64
```


Cities with Most Opportunity

Best Cities for Software Developers

- Based on disposable income and job opportunities.
- Values are normalized and averaged, giving each city a value between zero and one.

1. San Jose - CA
2. Seattle - WA
3. San Francisco - CA
4. Boulder - CO
5. Durham - NC
6. Raleigh - NC
7. Huntsville - AL
8. Colorado Springs - CO
9. Boston - MA
10. Charlotte - NC
11. Denver - CO
12. Trenton - NJ
13. California - MD
14. Bremerton - WA
15. Portland - OR
16. Provo - UT
17. Baltimore - MD
18. Atlanta - GA
19. Richmond - VA
20. Dallas - TX

Application Feasibility and Data Limitations

- **Data Limitations:**
    - Timeliness of data
    - Matching data across sources (attrition of data)
        - Needed data from multiple sources on same geo space (zip code/metros/counties)
        - Data cleaning (NaN, "-", None) values
- **Is this app useful?**
    - This type of service usually requires subscription or has very limited features
    - Good tool for job seekers and new grads

Future Work

- Have more robust, timely data sources
- Include other data sources to better estimate the total cost of living within these cities
  - Data for taxes, cost of living (average spent at grocery store, gas, etc)
- Evaluate more than the median wage (less accurate for new or very experienced developers)
- Include more than software developer wages