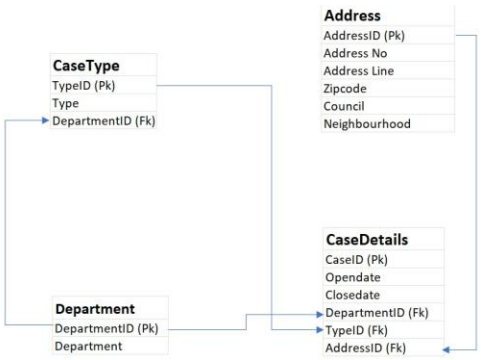
EAS503 Project Report: Group 29

Title: Data Visualization of Buffalo 311 Service Requests to find insights into department performance and request area density.

Introduction: As a part of this Project, we have used the Buffalo 311 Service Requests dataset available in the buffalo government website to visualize the data. This contains request details from 2008 and includes columns like Opendate, Closedate, Department, Case Type, Address, etc.

Abstract: In this project, as a part of our analysis, we will try to visualize subtle intricacies in the service requests data and there by providing insights to the Buffalo city government body to help manage requests in a better way. This will include individual department performance in dealing with the requests, areas that are giving more requests, year on year trend in number of requests, council and neighborhood effects on the requests raised, Impact and density of requests from different zip codes and number of requests relating to each case type under each department.

Data: We have cleaned the original dataset to remove unwanted columns, blanks and any redundancies. Our cleaned dataset consists of 10 columns and this data will be pushed into 4 tables as a part of the schema shown below.



Model: We have used Matplotlib and Plotly libraries to analyze our data. This will be including running select queries with necessary joins and clauses to fetch the required data and push the data into visualization logics and functions available in these aforesaid packages.

Analysis and Results:

- The zip code to requests map visualization shows large density on average in the zip code 14215.
- The year to number of cases graph shows increase in requests from 2008 to 2022. The pie chart to show the number of cases received by each department shows a larger partition associated to the Department of Public works
- Histogram shows a large number of requests for totes replacement to the department of public works

- Many housing violation request can be seen being raised in comparison to other requests
- Neighborhood to request histogram shows maximum requests from broadway Fillmore neighborhood and council to requests histogram shows maximum requests from Fillmore council
- Visualization also shows a large response time for the New Americans Department
- Year to average response time graph shows the performance of each department in closing the request from 2008 to 2022
- Year to Year average response time for each council and districts show decrease in the response time with year

Conclusion

- Department of Public Works is receiving a lot of requests compared to any other department
- New Americans Department performance to close a request is pretty low.
- Number of requests are increasing with year
- Fillmore council and Fillmore Broadway are throwing more requests than any other council and neighborhood
- The average response time in closing a request is getting better with year

Future Research Directions: Our current analysis will set a valuable context if the Department of Public works needs to include more people from other departments to its workforce to handle a large load of requests. We can implement statistical models like linear regression, etc., to plan for resource and budget allocations.

References:

https://data.buffalony.gov/

https://www.geeksforgeeks.org/matplotlib-tutorial/

https://matplotlib.org/stable/tutorials/introductory/pyplot.html

Appendix:

- Original Dataset size: 33 Columns, 1007795 entries
- Cleaned Data Set size: 10 Columns, 914817 entries
- Sample matplotlib figure: