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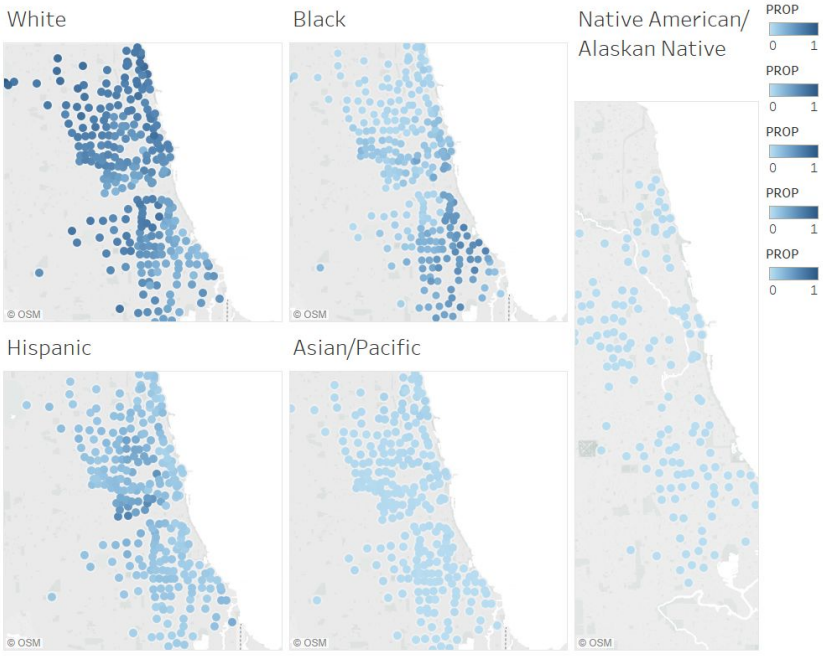
Checkpoint 6: Visualization

Visualization 1. The types of officers (based on race, gender, and salary) that have complaints placed against them in different areas of Chicago and to what extent does median income in areas match up to this.

To visualize the types of officers that were receiving allegations in different parts of Chicago, we plotted symbol maps in Tableau with a dot for each beat on the average location of all allegations connected to that beat. Dots were then colored using the category of interest. We made maps showing the proportion of allegations against officers of each race and each gender per beat, as well as maps showing the median income of civilians and the average salary of officers in a beat.

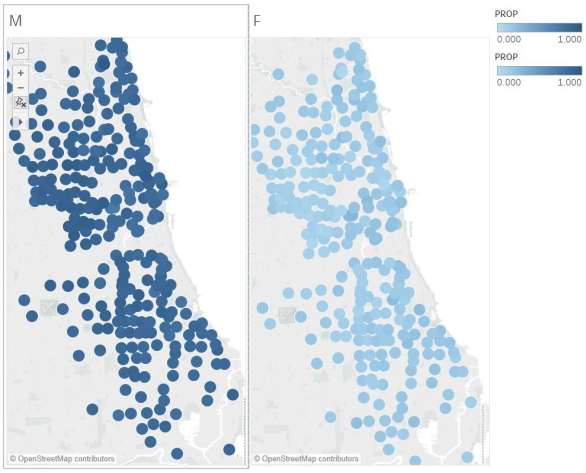
In our maps showing the proportions of allegations involving officers of a particular race by beat, the maps with the most notable disparity between areas of Chicago are those for white, black, and hispanic officers. The majority of allegation counts are against white officers for most beats but an area of beats in South Chicago near the shore appear to be an exception. Allegation counts involving black officers are shown to make up a higher proportion of all allegation counts in



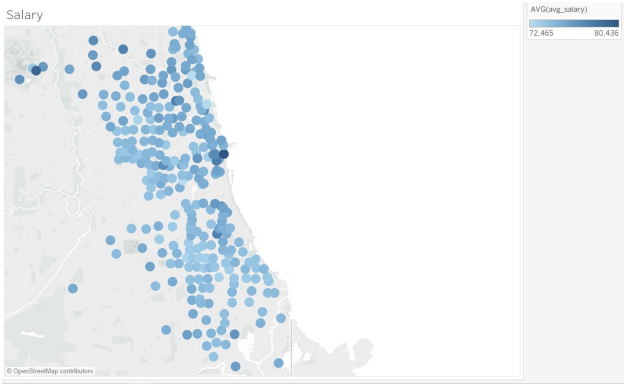
parts of South Chicago but never in North Chicago. There is a rise in the proportion of allegation

counts for Hispanic officers in a specific region that seem to correspond to South Lawndale and the Lower West Side which both have high hispanic populations. Asian/Pacific and Native American officer allegation counts are sparse across all beats. We have not normalized these proportions against the proportions that officers of the race make up each beat and so while there are disparities, these may be due to differing proportions of officer race across beats.

The maps for proportions of allegation counts against officers of a gender have little disparity. Female officers seem to make up a lesser proportion of allegation counts across all beats (around 10% to 18% of counts) with male officers being the opposite.



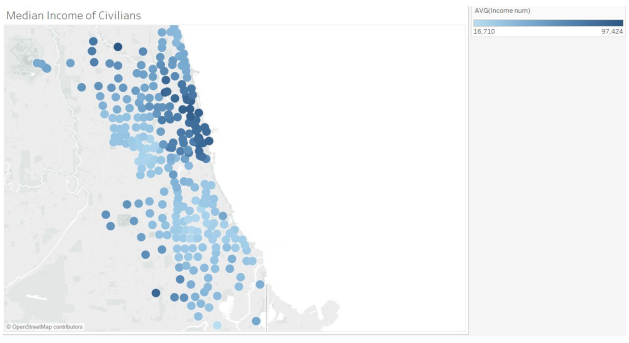
Allegation counts by gender by beat



Average officer salaries by beat

Likewise, there did not seem to be major trends for our map showing the average of the average salaries of officers involved in the allegations of each beat.

When all of our previous maps were compared to the average median income of the communities tied to the allegations in each beat, the region of high median income in central Chicago did not match up to the disparities seen in other maps. Assuming that the visualizations reflect reality, we learned from them that there is not an obvious connection between the race, gender, or pay of officers that get allegations in an area and the income of the civilians in the area. However, we have now seen explicitly that the proportions of officer race in allegations vary between areas of Chicago and how they vary.

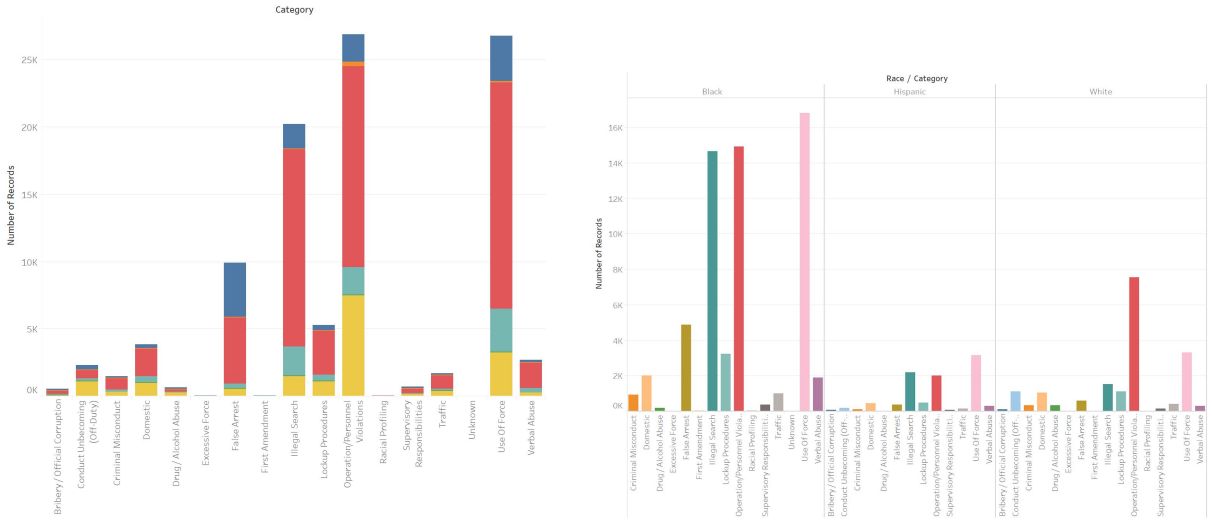


Median income of civilians by beat

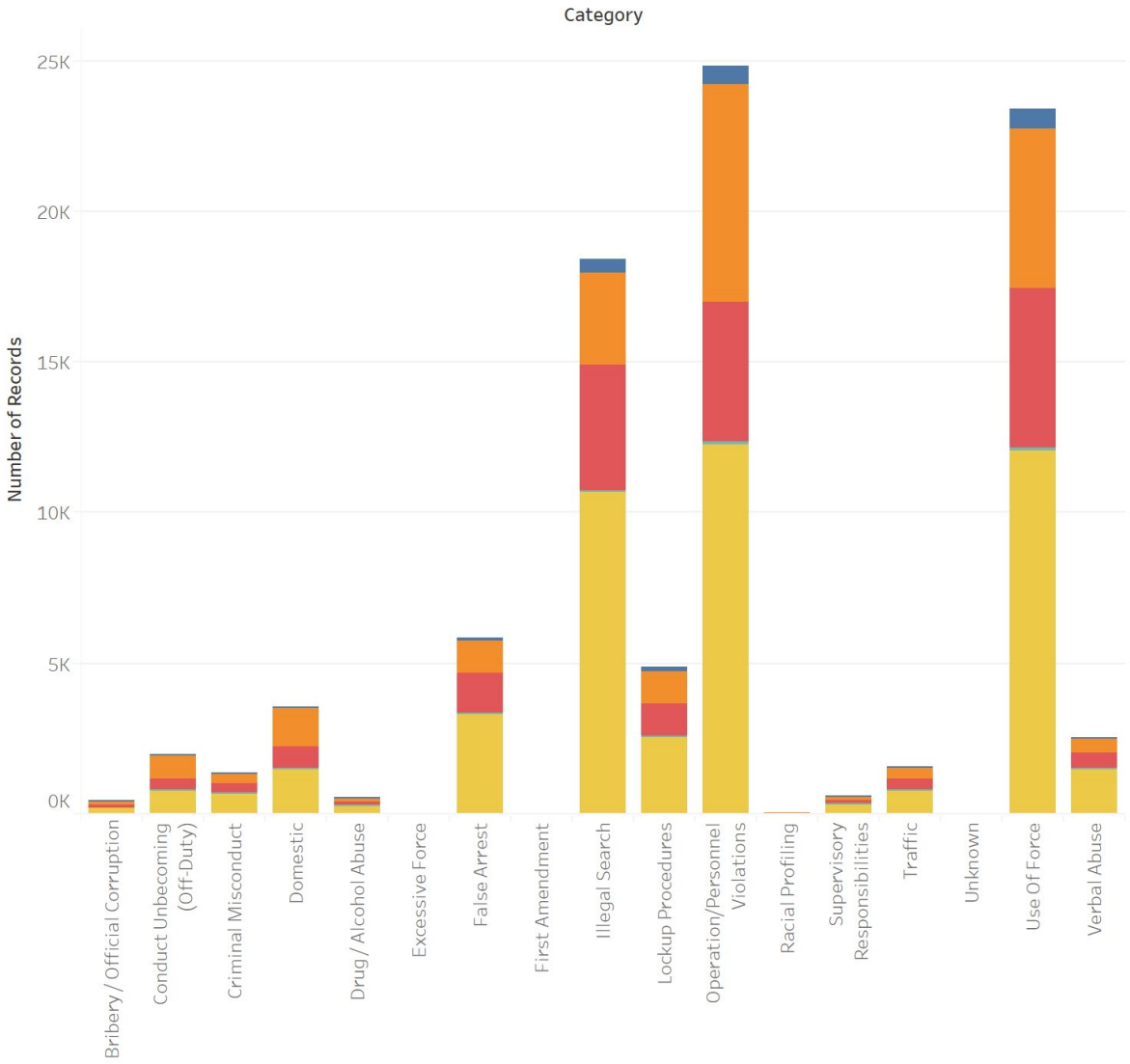
It was surprising how easy it was to work in Tableau and to construct graphs by simply dragging and dropping data columns into the appropriate shelves. The ability to construct custom columns and queries made it especially easy to construct maps on the fly as we thought through what we wanted to see. Creating symbol maps using latitude and longitude averages was confusing at first but became easy once things clicked.

Visualization 2. Relationship between the race of the complainant and the nature of the complaint.

To visualize the relationship between the race of the complainant and the nature of the complaint, we first set the complainant race and the complaint category as dimensions and the number of records as measures. The categories in the table were complaints such as Operational/Personnel Violence, Use of Force, Illegal Search, etc. We tried various charts for visualization such as side-by-side bar charts, stacked bars, and packed bubbles. The side-by-side bar charts allowed us to isolate each race and examine the distribution of complaints for each race across various complaint categories. However, we felt that the stacked bars allowed us to look at each complaint category and the percent of each complainant race that this category consisted of.



However, we realized it might be more interesting to look at the race of the officers and the nature of the complaint instead of the race of the complainants because this would fit our theme of learning about the officers better. We therefore swapped complainant race for officer race. Since the only thing we switched out was race, we decided to again look at the stacked bar chart to see if there were any complaint types where the race of the officer seemed to be significant.



We found that for the most part, for each complaint category, approximately half of the complaints were against white officers and about 25% against black and hispanic officers. However, there were a few complaint categories where the ratio of complaints against black officers was almost as much as the ratio of complaints against white officers. For instance, in complaints categorized as Domestic, approximately 43% of the complaints were against white officers and approximately 36% of the complaints were against black officiers. A similar case exists in the category of Conduct Unbecoming (Off-Duty).

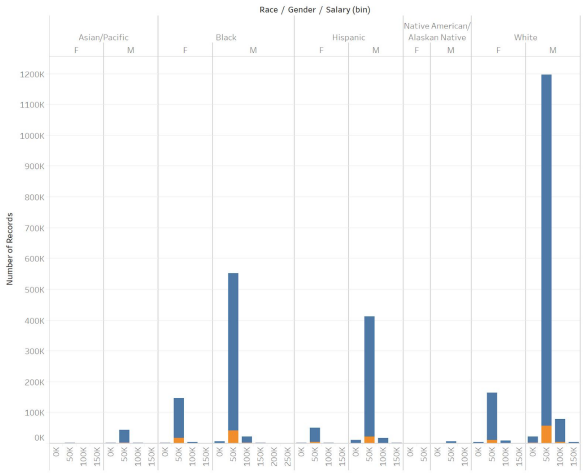
For the most case, the ratio of the number of complaints against an officer is consistent with the distribution of officers in the workforce by race. However, it seems that black officers have almost as many complaints as white officers in Domestic and Conduct Unbecoming (Off-Duty) complaint categories.

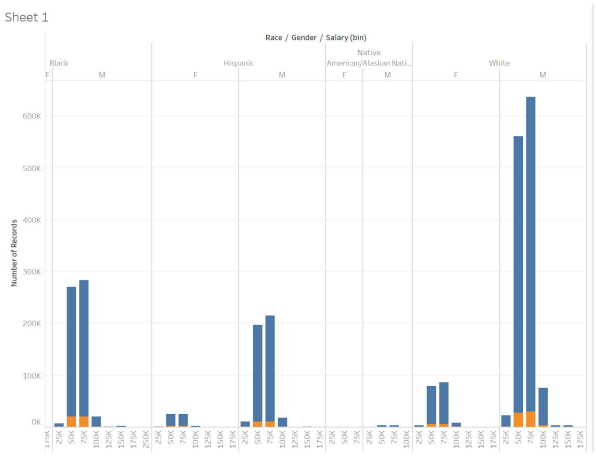
Visualization 3. Relationship between the gender, race and salary of the officer and the proportion of complaint sources in the complaints they receive between officers and civilians

For this visualization, the dimensions were set to be gender, race, and salary of the officer and the measure was the number of records, both for if the complainant was an officer or if the officer was not a complainant. We again first looked through the different visualizations possible for this data and found that the stacked bars allowed for us to visualize the data between race, gender, and salary the clearest. We initially were unsure how to get the proportion of complaint sources in the complaints using Tableau. We were trying to use custom SQL queries to get a total count on the number of instances for each officer ID where the field Is Officer Complainant was true and false and then plot that value, but we found it was a bit tricky to aggregate over rows.

However, after tweaking with the visualization, we found out that we were able to clearly visualize the proportion of complaint sources as either officer or civilian if we set the marks field to be Is Officer Complainant. Since our measure was the number of records, it split the bar chart by the two possible values for Is Officer Complainant, which is the proportion we were looking for. It was very useful to add color to the marks at this point in order to see the separation between the two counts.

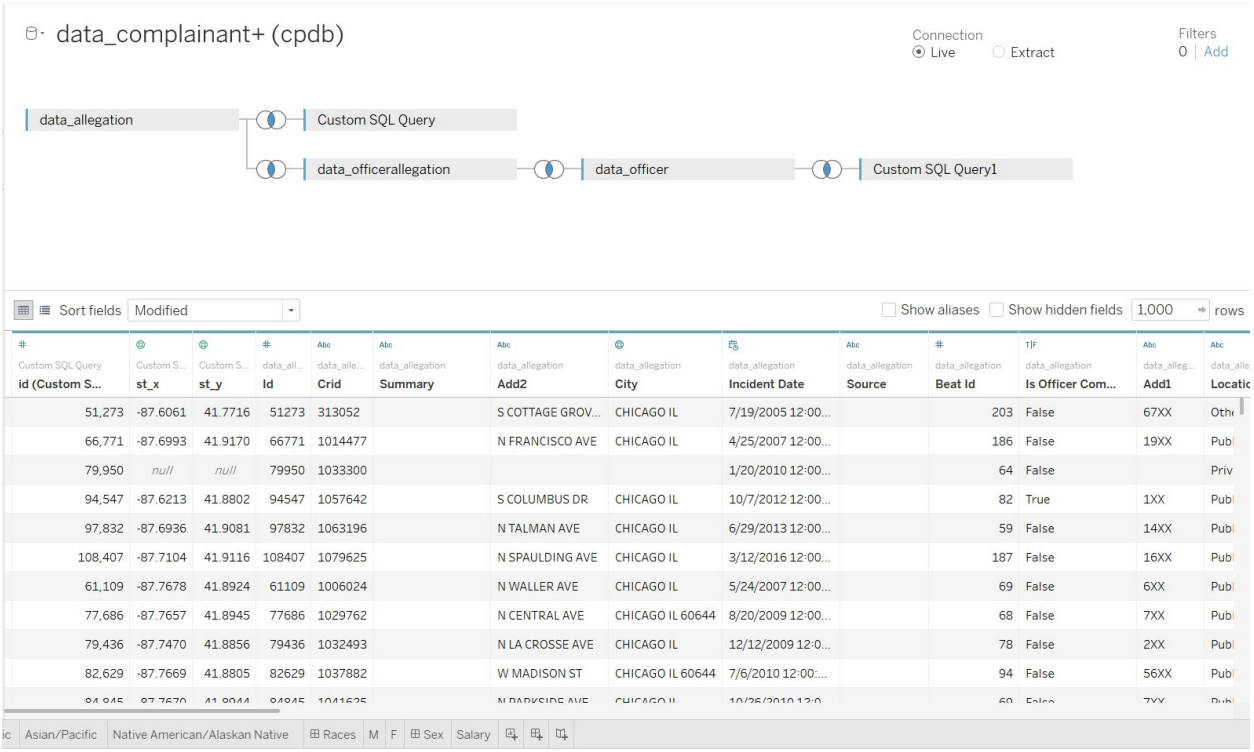
We also tried a few different sizes for salary bins for the officers. At first we only had bins every $100K, but in this visualization we weren't able to deduce much because most of the records fell between $50K and $100K. We then decided to bin the salary in ranges of every $50K. We found out after using Tableau for visualization that there were in fact far less cases where a complaint was placed against an officer by another officer. The only visible occurrence was in the $50-100K salary range. However, even when the bins are divided again, the proportion between 50K and 75K remain almost identical for each race.

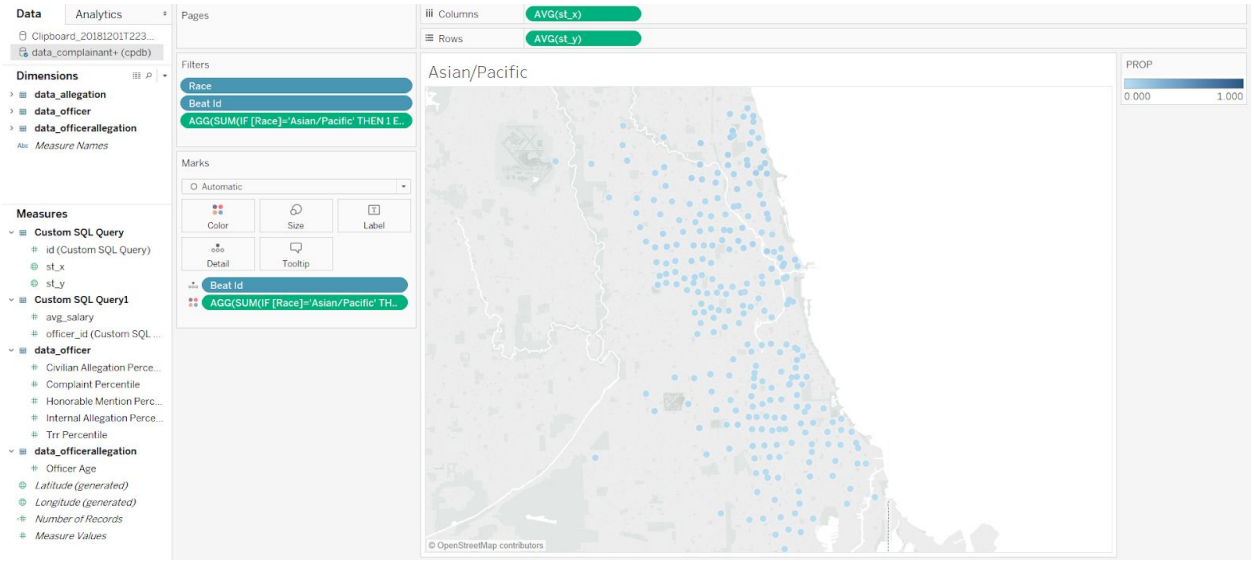


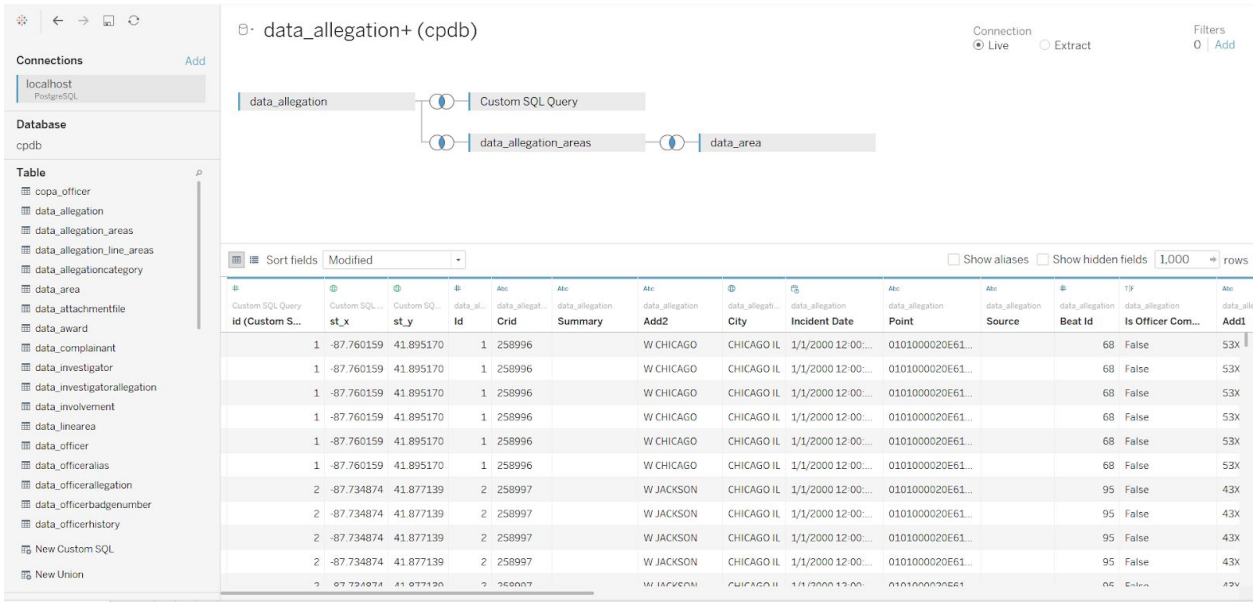


Screenshots

Question 1:



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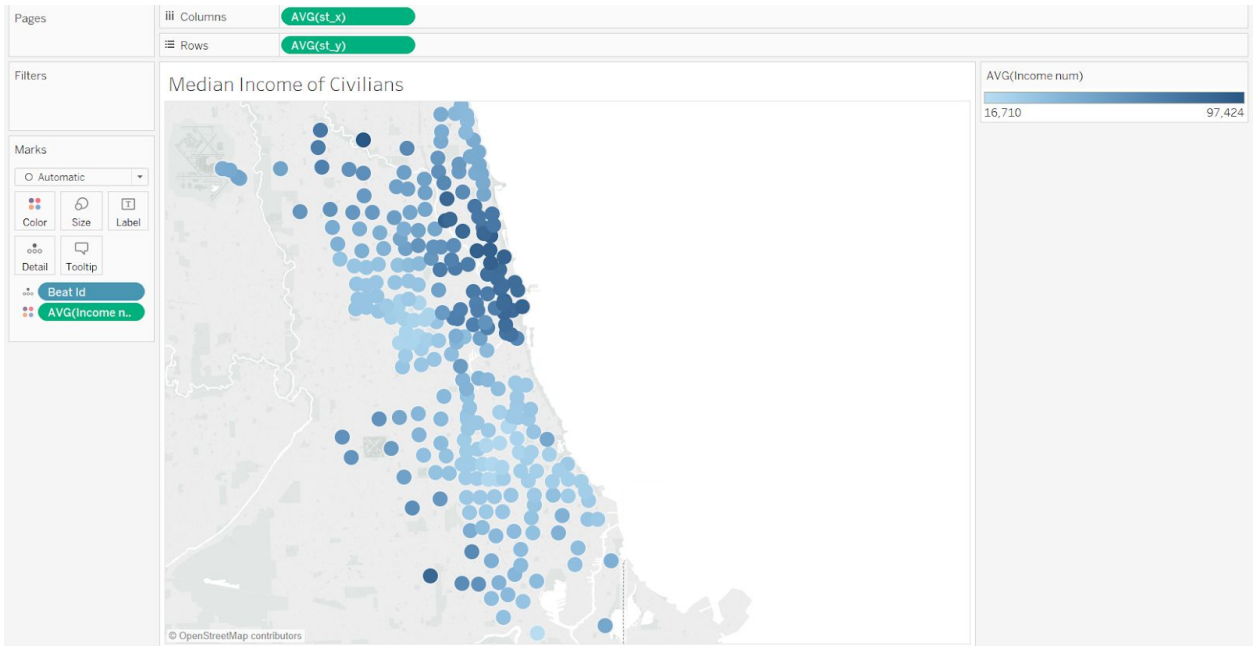
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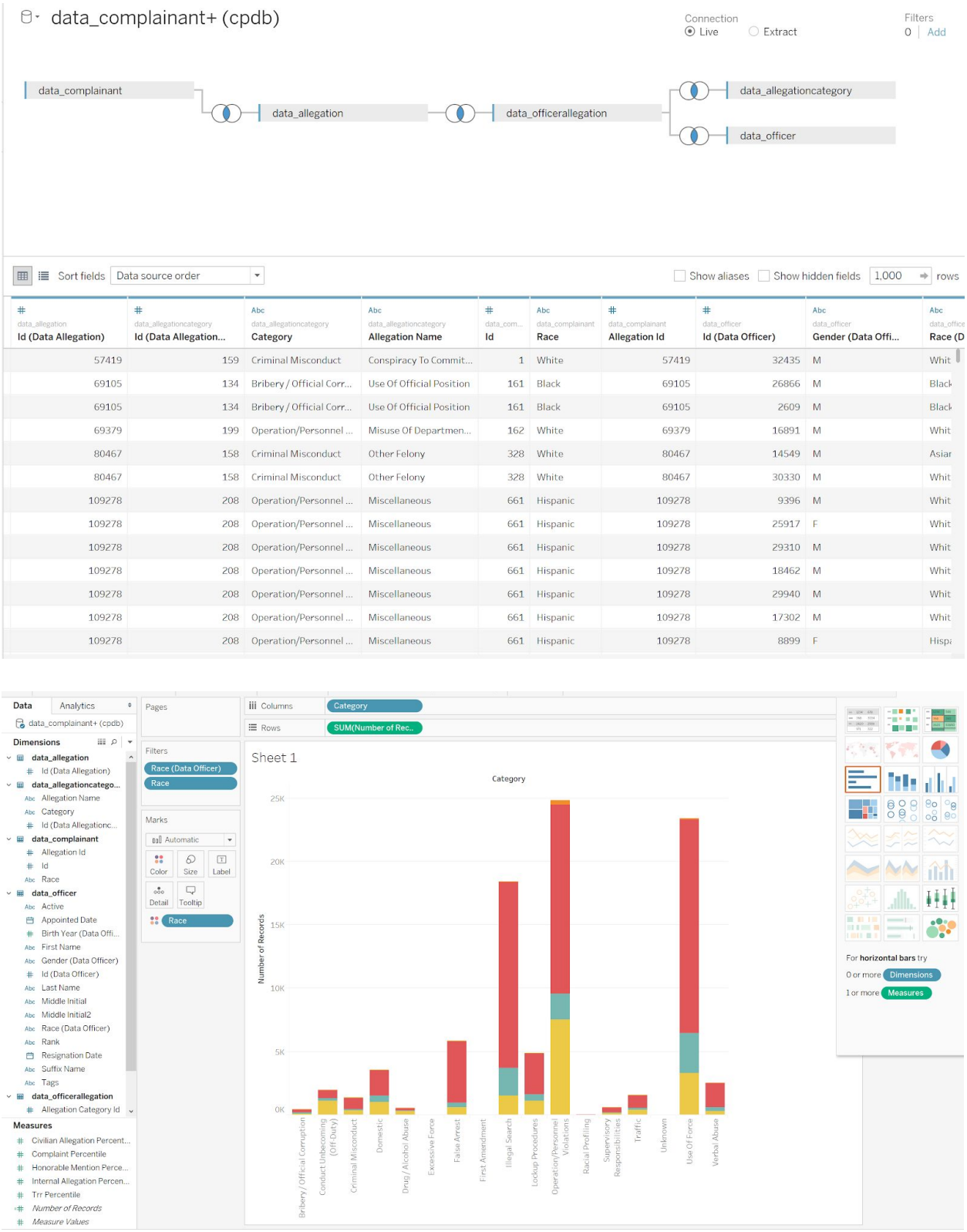
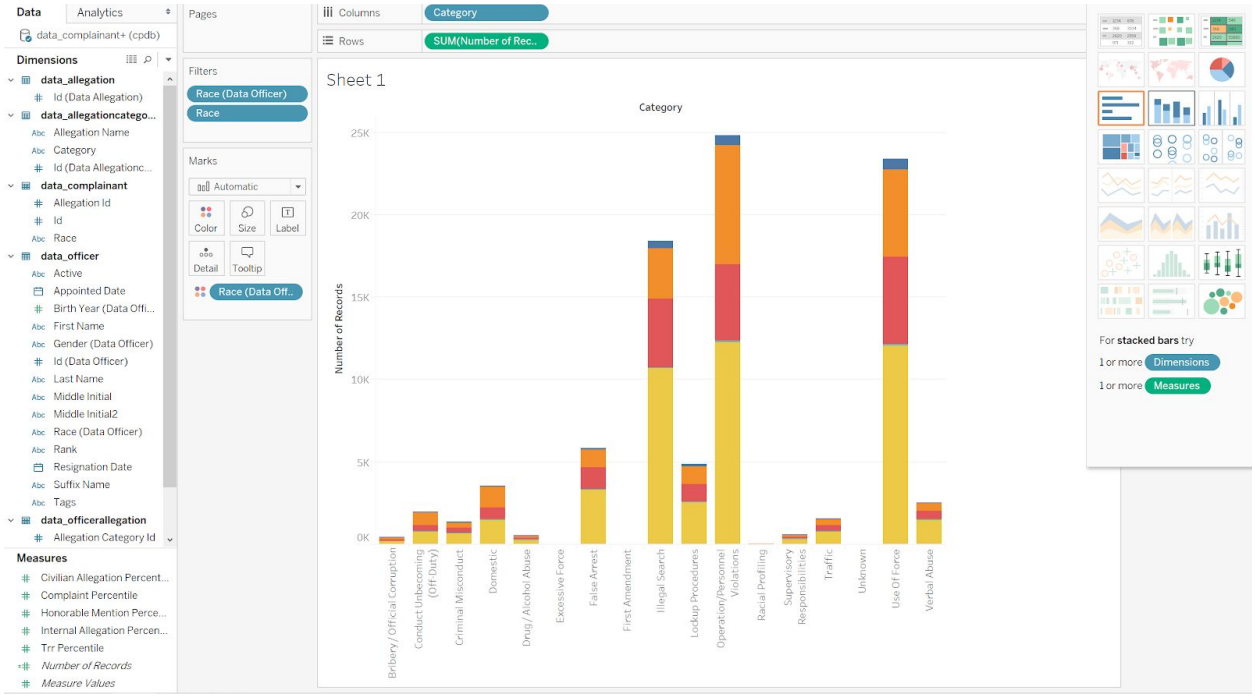
© OpenStreetMap contributors

Question 2:

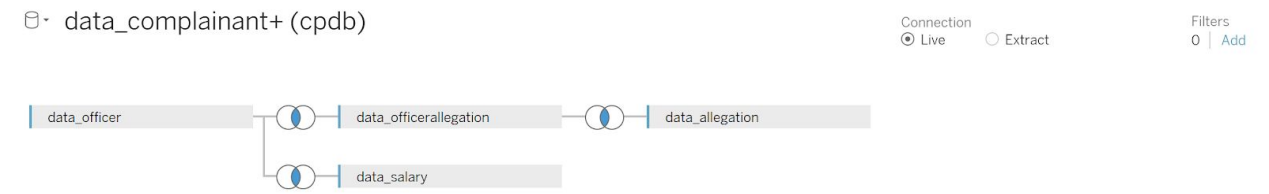


(complainant race)



(officer race)

Question 3:



Sort fields Modified — Show aliases — Show hidden fields — 1,000 rows

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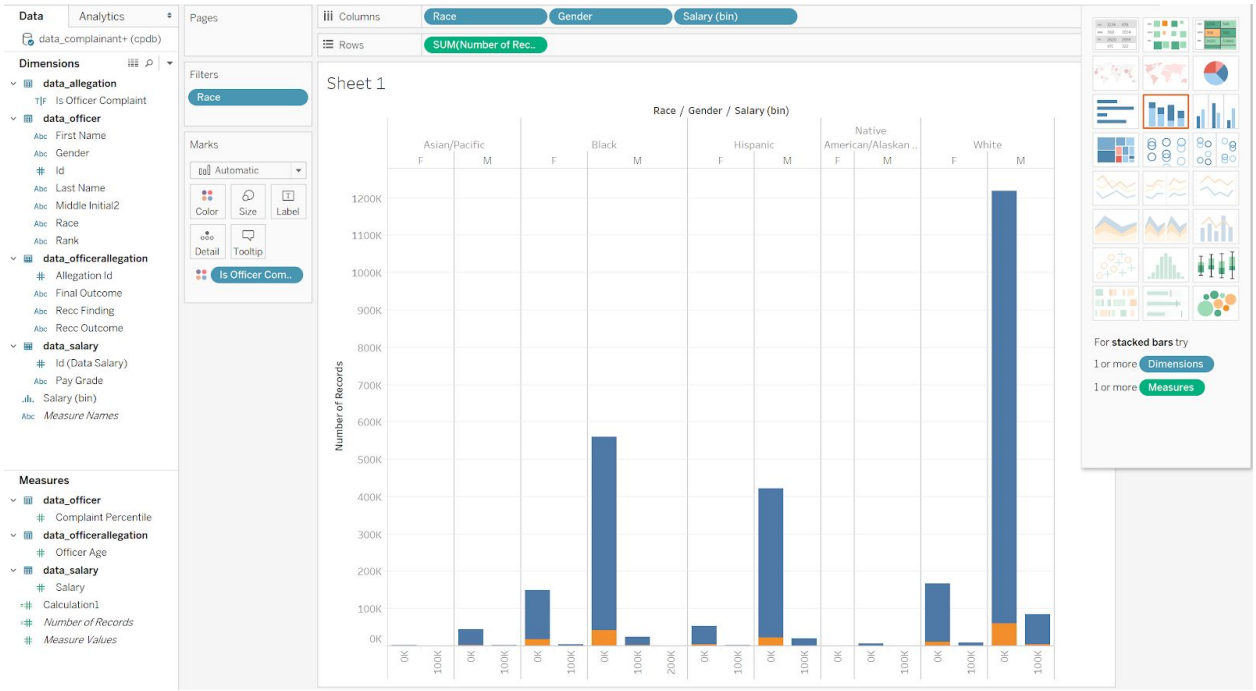

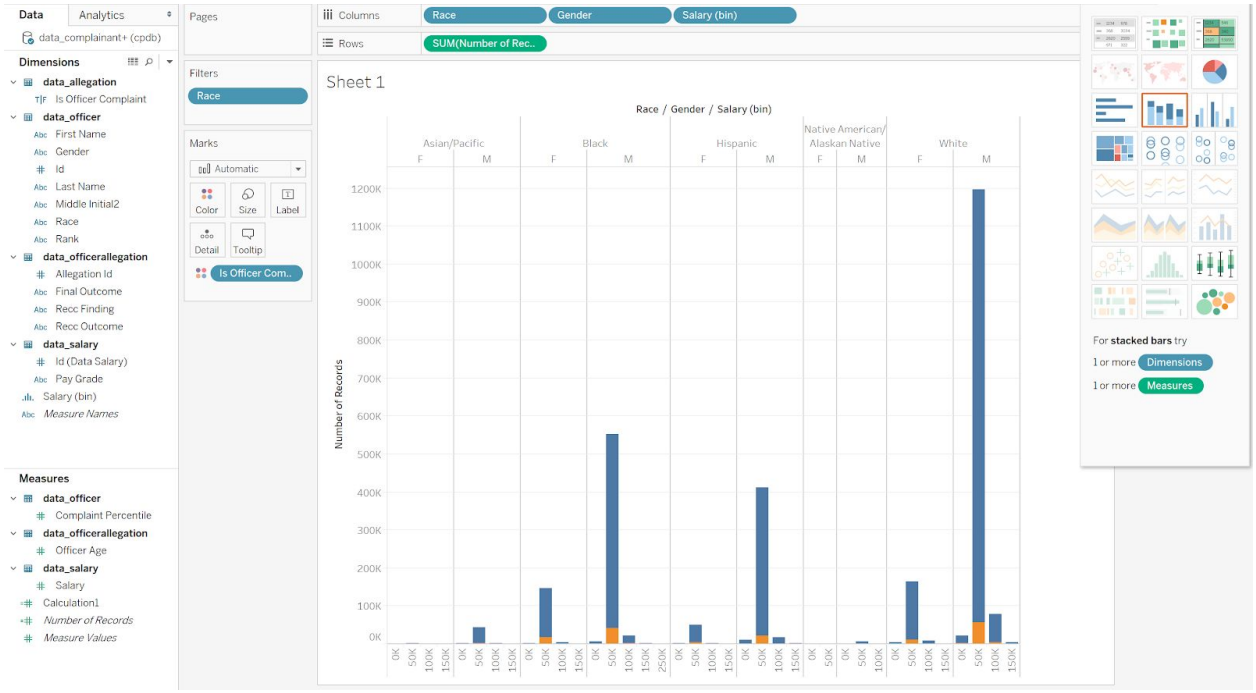
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1 or more Measures