1) For what purpose is a dashboard needed?

This dashboard is a data driven platform which combines various views to present key topics derived from the complex datasets mainly in order to draw valuable feedback and conclusions from it.

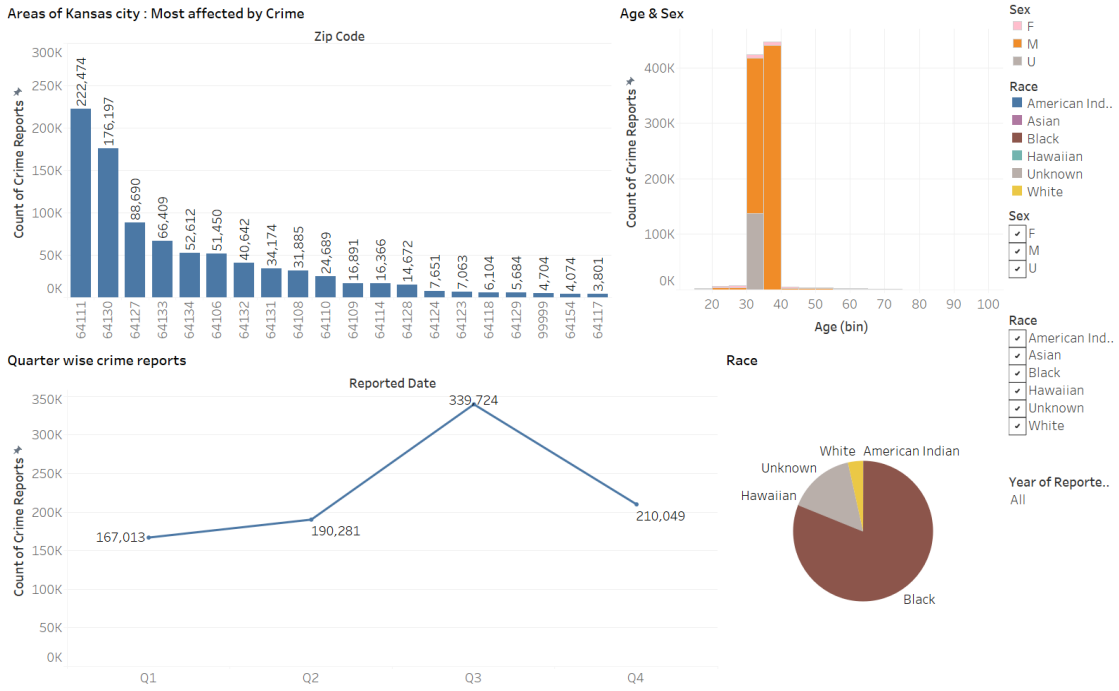
In the context of analyzing the merged datasets of “Kansas City Police Department” from 2016 - 2022, our dashboard seamlessly integrates various tasks/visualizations such as “crime reports based on demographic variables(age-sex breakdown/race distribution)” , “quarterly crime trends” , “Top 20 zip codes with high crime reports”. Dashboard helps the reader to easily look at the combination of the above mentioned views as they are linked appropriately with interactive mechanisms.

Our dashboard can serve as a single go to destination for any party who wants to understand the various crime patterns from years 2016-2022. (this is a consolidated dataset merging from the years 2016-22 to look at the cluster of zip codes where the crime reports are high from the past 6 years). Our dashboard can be utilized by the police department to enable law enforcement and community leaders to identify targeted interventions, allocate resources strategically based on the multi dimensional data that our dashboard provides.

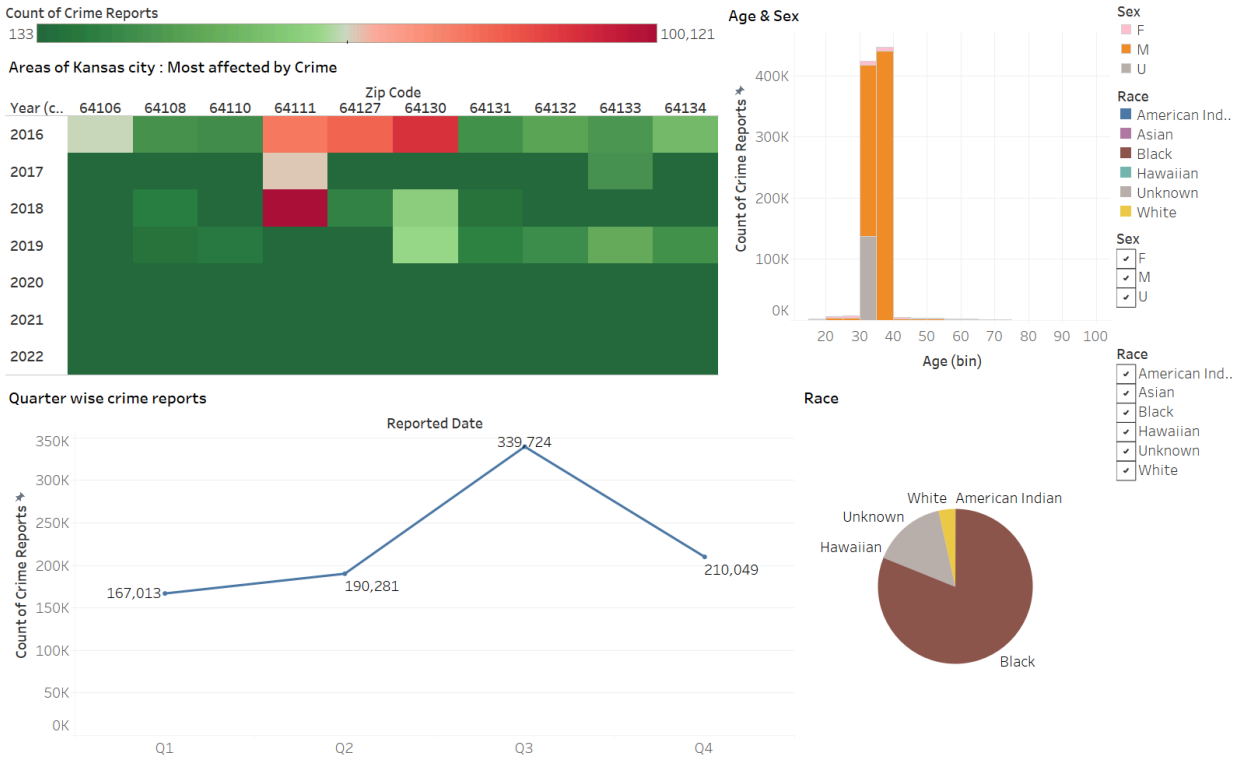
2) How did you modify the originally identified visualization tasks for dashboard design?

I have used 3 tasks for creating the dashboard(MDV1 & MDV2).

MDV1:



MDV2:



[MDV2 is just an alternative dashboard with a minor change of using an heatmap]

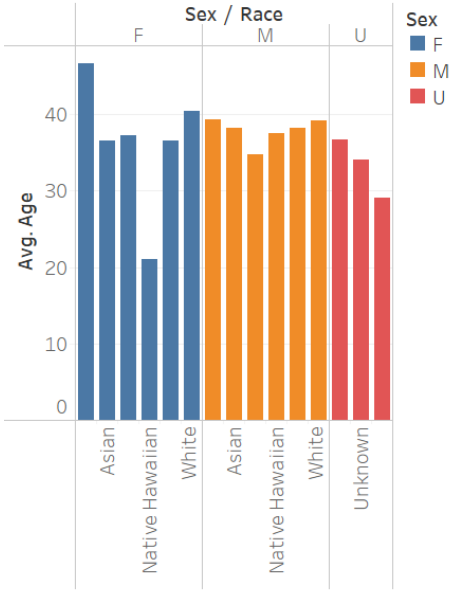
Used tasks:

T1V2: Compare the different quarters of the year with the Crime count to identify which quarter has the most number of crimes.
T2V1: Compare how crime rates relate to demographic variables like race, gender, and age.
T3V1: Identify the areas of Kansas city that are most affected by Crime.

[NOTE: MDV1 is the finalized dashboard for reference in this report/ppt]

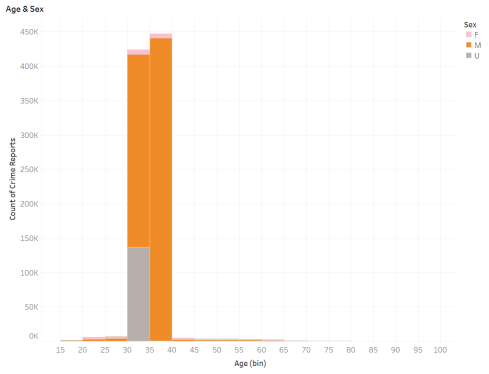
In the above dashboards, I have modified the original task [T2V1] to better fit our dashboard, below is a exported image of that worksheet for the reference:

Compare how crime rates(2016 - 2022) relate to demographic variables like race, gender, and age.

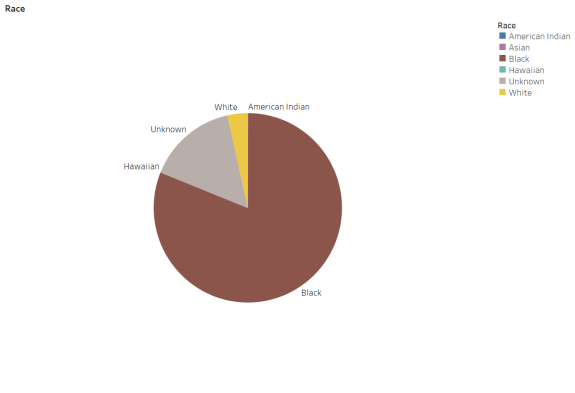


Average of Age for each Race broken down by Sex. Color shows details about Sex. The data is filtered on Age (bin), which keeps 21, 42, 63, 84 and 126. The view is filtered on Sex, which keeps F, M and U.

As you can see, our task [T2V1] only shows the distribution across the demographic variables. It shows the average age on the Y-axis and the respective distribution, as it suits our task definition. But in order to incorporate that task into our dashboard to extract more information and to compliment the rest of the charts, I modified the task and divided it into two visualizations for the broader context of the dashboard.
Exported images are attached below:



The trend of count of Crime Reports for Age (bin). Color shows details about Sex. The data is filtered on Action (Zip Code), Action (Race), Action (QUARTER(Reported Date)) and Action (Year (copy),Zip Code). The Action (Zip Code) filter keeps 91 members. The Action (Race) filter keeps 6 members. The Action (QUARTER(Reported Date)) filter keeps 4 members. The Action (Year (copy),Zip Code) filter keeps 380 members. The view is filtered on Exclusions (Age (bin),Sex) and Sex. The Exclusions (Age (bin),Sex) filter keeps 41 members. The Sex filter keeps F, M and U.



Race. Color shows details about Race. The marks are labeled by Race. The data is filtered on Action (Zip Code), Action (Age (bin),Sex), Action (QUARTER(Reported Date)) and Action (Year (copy),Zip Code). The Action (Zip Code) filter keeps 91 members. The Action (Age (bin),Sex) filter keeps 42 members. The Action (QUARTER(Reported Date)) filter keeps 4 members. The Action (Year (copy),Zip Code) filter keeps 380 members. The view is filtered on Race, which keeps 6 of 6 members.

After modification of the task [T2V1], it better fits our dashboard, now that it's showing the age bins, sex, race and the corresponding number of crime reports.

I also added a “Year” filter to the task [T1V2] in order to understand the data in a holistic way. This modification helps us in linking with other charts and work cohesively and provide a better understanding of the dataset.

"I enhanced Task [T3V1] by introducing a temporal dimension, transforming the initial bar chart into a more informative heat map. However, in order to visualize numerous zip codes in the heatmap presented challenges in terms of interactivity. Managing the selection and tracking of zip codes became intricate. To address this, I finalized the initial dashboard [MDV1] and connected the heatmap to link with subsequent tasks. The second dashboard will integrate these tasks seamlessly, allowing for a comprehensive and user-friendly visualization incorporating an expanded set of zip codes."

I also introduced filters in our dashboard which aren't in the initial task visualization.

3) How do the different views complement each other in generating data-driven inferences?

Different views can help us extract more information that would not have been possible with just one. When combined, our visualizations provide a more comprehensive and insightful understanding of the data.

Inferences:

In our dashboard, “Areas of Kansas city : Most affected by Crime”***[T3V1]*** is the ***anchor sheet***.

1. The sheet “***Age & Sex***” when interacted with the ***anchor*** sheet, gives us the information about the distribution of sex and age in that particular selected zip code. At the same time, when I select on any of the age bars or sex bars, it gives us the ranking of zip codes (according to crime reports). I couldn't get any of the above information from a single view.

2. The “***Quarterly crime report trends***" sheet compliments the ***anchor sheet*** as well. For example, if I want to know how the crime reports are distributed across the quarters in a particular zip code, the combination of these two charts will give us the solution. And vice versa as well, if I want to check which zipcode is having the highest crime reports in quarter 3, I can look at the combination of these views by simply selecting on Q3.

3. By integrating “***Quarterly crime report trends***” with the ***"Age & Sex"*** and ***"Race"*** sheets enables inferences about whether demographic distribution in crime reports changes across different quarters.

4. Combining the “***Quarterly crime report trends***” view with the "***Age & Sex***" view allows for inferences about how crime rates vary across different age groups over different quarters. For example, if I want to know whether certain age demographics are more active during specific seasons, this combination answers our question of interest, providing insights into age-specific temporal patterns.

5. Integrating the ***"Age & Sex" , "Race"*** sheets with the "***Quarterly crime report trends***" sheet can give us the information about how certain demographics are active during post covid and pre covid times using the "year" interactive mechanism. For example, I can select 2017,2018 years to look at the pre covid distribution and can select 2021,2022 years to look at the post covid distribution. I can also compare how the zipcode distribution has changed during this covid transition by integrating the ***anchor sheet.***

The above drawn inferences are only possible by integrating one view with another/multiple view(s), which shows that each chart is complementing the others to enhance the understanding of data.

Dashboard Notes:

1. MDV1 is the finalized dashboard which is integrated with three tasks (T1V2,T2V1,T3V1)
2. I have added filter dropdowns for year, race, sex for better selection and interaction.
3. All the sheets are linked to each other as per our task definitions and are solution oriented.
4. A much deeper analysis and visualization between covid cases and crime reports (T6) will be integrated in the next dashboard
5. Only the tasks which are integrated in the Dashboard 1 [MDV1] are kept in the twbx file(rest are removed).