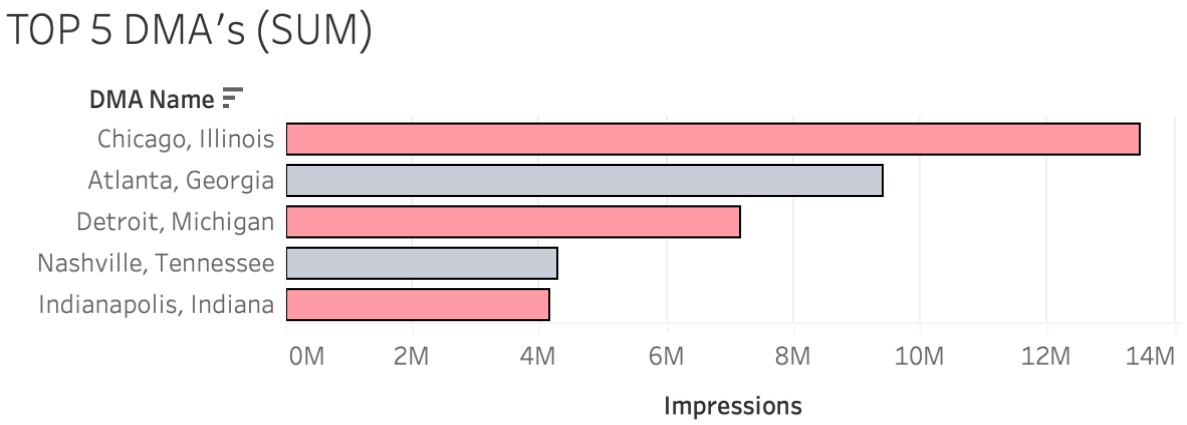
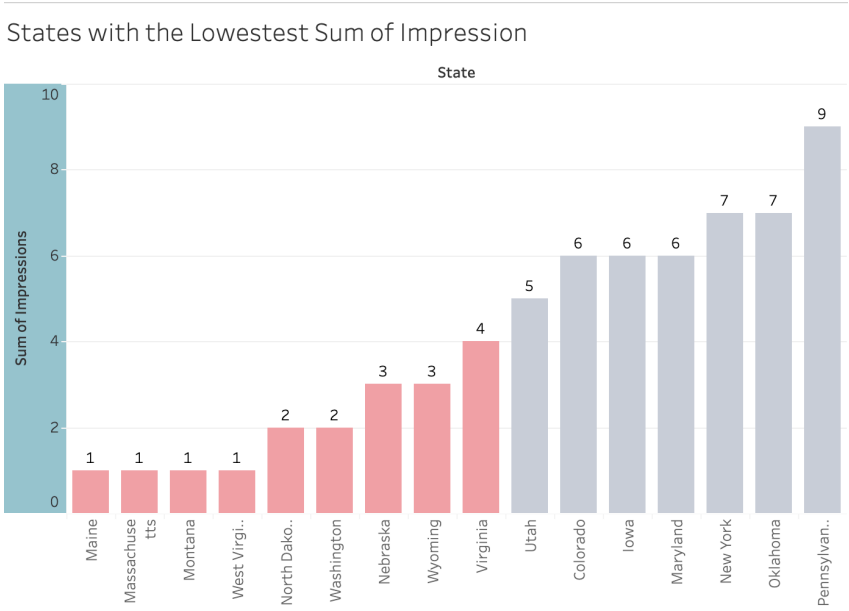
To kick off our project, we identified the top 5 Designated Market Areas (DMA's) that presented optimal opportunities within our device locations. These selected DMAs have been chosen based on the sum of impressions. By focusing our efforts on these key regions, we not only aim to leverage their inherent strengths and capitalize on emerging trends but it helps us lay a solid foundation for the sustained growth of our project.

With the help of Python, we were able to identify the top 5 DMA's (see below!)



Additionally, we have identified the bottom 60 Designated Market Areas (DMAs) based also on a summation of impressions. This detailed analysis provides valuable insights into areas where impressions may be comparatively lower, allowing us to identify potential challenges and opportunities for improvement. This holistic understanding of the bottom 60 DMAs is integral to our comprehensive market strategy, ensuring a nuanced and adaptive approach that considers both high-performing and underperforming regions

From the analysis of the bottom 60 DMA, we concluded that there were many DMAs with only an impression of under 5, however if we were to exclude all of these DMAs there will be many states that will lose a huge number of their cumulative impressions. For example, North Carolina has a total of 35 DMAs however about 6 of DMAs have an impression of 1 which is about 14%. Instead of excluding DMAs we decided to analyze on a State Level. From the state level we can now exclude States shown in the chart to the right.



KPIs: Cost Per Acquisition (CPA), CPC (Cost Per Click), CPM (Cost Per Mille), CTR (Click-Through Rate), CVR (Conversion Rate)

For the audience segments, we measured the KPIs to identify the best-performing audience segment for each KPI. One challenge we faced was that some KPIs had very few impressions and clicks. This inflated the data and made it not representative of the best-performing KPIs. For example, an audience segment had 2 impressions and 1 click which made its conversion rate 50%. Although this conversion rate is high, it is inflated due to the lack of impressions and clicks. To remedy this, we only analyzed audience segments with a minimum of 100 clicks. The best performing audience segment for each KPI is below:

1. **Top Impressions & Clicks:** Demographics » Household Income (USD) » Unknown
2. **Top Conversion Rate:** In-Market Categories » Autos & Vehicles » Motor Vehicles » Motor Vehicles by Type » Hatchbacks
3. **Top CTR & CPC:** Sub&NonSub_Business_MobileVisitors
4. **Top CPA:** In-Market Categories » Business Services » Business Technology » Web Services » Domain Registration
5. **Top Cost Per Mille:** Affinity Categories » Sports & Fitness » Sports Fans » Fans of Australian Football

Identifying the top & bottom-performing devices :

In the ever-evolving world of technology, new devices emerge constantly, vying for the top spots in terms of performance and popularity. While some devices fail to make a significant impact and quickly fade into obscurity, others rise to prominence, capturing the attention of consumers and critics alike. In this part of the project, we delve into the realm of top-performing and underperforming devices, exploring the factors that contribute to their success or demise.
While we have been working on this data, some of the problems with the lowest-performing devices are that these devices may suffer from outdated hardware compared to newer models. Aging technology and software compatibility affect their ability to keep up with the demands of contemporary applications and operating systems; Competition pressure and limited features, other competitors offer more advanced features at similar price points. For example, many consumers target a certain group of their needs Picture quality, processor, RAM, storage, and many other features. But, in the long run, android and Apple were always at the top of the data finding when it came to people's wants and needs for devices.

A major clause that came up in cleaning device data was Windows phone devices. The last software update for Windows was released in 2019, which means that having data on them is meaningless. Windows phones are no longer in use, and if they were, you would be at risk of additional or more data breaches. “As of December 10, 2019, Windows 10 Mobile users are no

longer eligible to receive new security updates, non-security hotfixes, free assisted support options, or online technical content updates from Microsoft for free. (Microsoft)" https://support.microsoft.com/en-us/windows/windows-10-mobile-end-of-support-faq-8c2dd1cf-a571-00f0-0881-bb83926d05c5

The analysis of top and bottom-performing devices across key DMAs (Top 5) reveals Motorola and Samsung as consistent top performers in significant markets, including Chicago, Atlanta, Nashville, and Indianapolis. Google also maintains a strong presence in multiple DMAs, such as Chicago, Atlanta, Detroit, and Indianapolis. Conversely, Wiko consistently emerges as a bottom performer across Detroit, Nashville, and Indianapolis, with generic devices consistently occupying the bottom tier in Chicago, Atlanta, Nashville, and Indianapolis. The data reveals varying average Costs Per Acquisition (CPA) for different mobile phone brands and models across cities. Wiko (All Models) has the highest CPA in Detroit at 6.10 and the lowest in Indianapolis at 1.58. Generic (All Models) shows fluctuating CPAs, with Atlanta at 0.81 and Detroit at 4.12. Apple (All Models) maintains consistently low CPAs, with Nashville at the highest, 0.26. Google and Samsung exhibit similar CPAs, while Motorola has generally low values. LG (All Models) has minimal CPAs, with Detroit and Atlanta showing the highest and lowest figures, respectively. The data provides insights into advertising costs for different mobile phone brands in these cities.