Team Big Data
11/28/2022

DAR Report
Maps API

Technologies:

1. Google Maps Platform
2. Amazon Web Services, Location Services
3. Mapbox
4. Esri Arcgis

Metrics:

1. Total amount of markers
2. Amount of markers until noticeable lag
3. Map load time
4. Marker Load time
5. Pricing
6. Data Rate Limit

Introduction

The problem is that we need a map to display one of our key features. The litter map needs a map in order to function. The time required to design a map API will take too long to complete within our project plan. The technologies chosen were selected because of their reputation and wide spread use.

Technologies /metrics	Google Maps API	Amazon Web Services	Mapbox	Esri Arcgis
Total amount of markers	Unlimited[4]	Unlimited[4]	Unlimited[4]	30000[1]
Amount of markers until noticeable lag / lowered Framerate	1000[4]	500[2]	500[2]	1000[4]
Map load time	300 - 500 ms[4]	1 second[3]	1 second[3]	3 Seconds[1]
Marker load time	~100 ms[4]	120 - 150 ms[3]	120 - 150 ms[3]	1 second[1]
Pricing (USD)	0.007[4]	0.04[3]	2.50[2]	500 per year[1]

Data Rate Limit	30000[2]	100000[4]	100000[4]	?[1]
Total	22	19	18	9

Each of the pricing is per 1000 users that have loaded a map and is for the first 100000 users in a month

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Discussion

Google's pricing, although labeled as 0.007 is actually free for the first 28,000 users using the map. This is due to Google having the first 200 dollars of credits be free for each month.

For Mapbox there is noticeable lag at 500 markers without a map. There is subtle lag between 300 - 450 markers. Load time for the markers was low but that may be because I was not loading a map.

AWS' maps from appearances look to provide similar experiences to the others. However, AWS allows for multiple ways to render the map. The service itself does not necessarily render them, it rather, outsources them to different libraries. This has benefits however it uses react. Amazon web services allows the use of the mapbox coding for the interactive map.

Esri Arcgis has a sample of how the map would look. Using the map, which is likely in an ideal condition. While the map load time took 3 seconds to render the marker load time took 1 additional second after the map had loaded. Since the Esri Arcgis is not as flexible of an API as the others, and it is more limited in terms of providing memory it is likely less fit for our application. Arcgis also does not provide a data rate limit from their website or even secondary sources.

Conclusion

While Amazon is a close competitor with google for the maps it does not beat it out as google provides their own maps and hosting the API at a lower cost. MapBox pricing is what brings down the effectiveness of the API as the cost is greater than any of the other APIs. Esri Arcgis does not match the same levels as other technologies and may not provide what we need in a publicly available interactive map. Google Maps API looks like the preferable choice to use in our application. While the data rate limit is lower than its contemporaries it still provides an adequate amount of data that can be used for our needs.

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