Ride Along

DAR report for Car News Center Feature

Team Specs

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CNC-2 - View Vehicle Safety Recalls

Technologies Options:

1. NHTSA Datasets and APIs (NHTSA Datasets and APIs | NHTSA)
2. Vehicle Recalls API (https://vehicledatabases.com/vehicle-recalls-api)
3. Safety Recalls API (https://www.carmd.com/api/safety-recalls-carmd-api/)
4. One Auto API (https://www.oneautoapi.com/home/api/)
5. Edmund Developer Network (https://developer.edmunds.com/api-documentation/vehicle/service_recalls/v1/02_recallrepository/findbymodelyearid/api-description.html)

Metrics:

Evaluation on scale from 1-5 with 5 being the best and 1 being the worst.
Weights from 1 to 1.2 with 1.2 being the most important

1. **Max number of request per month**
    a. **Scoring guidelines**:
        i. [5]: services provide unlimited requests per month for free
        ii. [4]: services provide over 1000 requests per month for free
        iii. [3]: services provide less than 1000 request for free
        iv. [2]: services does not provide free request but charge less than 100$ for a month subscription that allowed more than 100,000 requests (0.1$ for 100 requests)
        v. [1]: services does not provide free request but charge more than 100$ for a month subscription that allowed more than 100,000 requests (0.1$ for 100 requests)
    b. **Weights: 1.2** due to this metrics affect tremendously to the cost and performance of our product
2. **Average response time over 1000 iterations**
    a. **Scoring guidelines:**
        i. [5]: services provide result in less than 1 second for 15 iterations
        ii. [4]: services provide result in less than 2 second for 15 iterations
        iii. [3]: services provide result in less than 3 second for 15 iterations
        iv. [2]: services provide result in less than 4 second for 15 iterations
        v. [1]: services provide result in more than 5 second for 15 iterations
    b. **Weights: 1.0** even though this metric is importance since it's affect our performance, but it's not our major concern at the moment
3. **Highest range of vehicle production year**
    a. **Scoring guidelines:**
        i. [5]: Support all vehicles before and after 1980
        ii. [4]: Support vehicles from latest to 1912
        iii. [3]: Support vehicles from latest to 1981
        iv. [2]: Support vehicles from latest to early 2000s

v. [1]: Does not support latest vehicles

b. **Weights: 1.0** even though this metric affect our range of supported vehicles, but it's not our major concern at the moment

4. **Number of items per request**
   a. **<u>Scoring guidelines:</u>**
      i. [5]: Allow more than 100 items per request
      ii. [4]: Allow more than 70 items per request
      iii. [3]: Allow less than 50 items per request
      iv. [2]: Allow less than 20 items per request
      v. [1]: Allow 1 item per request
   b. **Weights: 1.1** this metrics also affect both the cost and performance of our product, due to the more items per request, we can make less queries for both testing and in deployment.
5. **Request per minute - How many request can we make to the API in a minute (Rate Limiting)**
   a. **<u>Scoring guidelines:</u>**
      i. [5]: More than 100 requests per minute
      ii. [4]: More than 60 but under 100 requests per minute
      iii. [3]: 60 requests per minute
      iv. [2]: Less than 60 requests per minute
      v. [1]: Less than 10 requests per minute
   b. **Weights: 1.1** this metric affect the performance of our product

	NHTSA	Vehicle Recalls API	Safety Recalls API	One Auto API	Edmund Developer Network
Max number of request per month [Weight: 1.2]	Unlimited number of calls per month [5]	15 requests per month [3]	No free, 100 requests for 0.05$ [1]	No free, it's 0.2$ per request [1]	30-day trial, after that 0.05$ per request [2]
Average response time over 15 iterations	2.800076723098755 seconds	2.486091375350952 seconds	5.303410533998055 seconds	3.80509875500002 seconds	2.806052375300552 seconds

[Weight: 1.0]	[3]	[3]	[1]	[2]	[3]
Highest range of vehicle production year [Weight: 1.0]	2024 - 1981 [3]	2023-1912 [4]	2024 - 1981 [3]	2024 - 1981 [3]	2024 - 1981 [3]
Number of items per request [Weight: 1.1]	1 item per request [1]	1 item per request [1]	1 item per request [1]	1 item per request [1]	1 item per request [1]
Request per minute - Rate Limiting [Weight: 1.1]	250 requests per minute (Testing was able to request 238 times in a minute without error on one machine) [5]	50 requests per minute [2]	60 request per minute [3]	40 - 60 request per minute (according to sales person it varies) [2]	50 request per minute [3]
TOTAL	20/27	13.9/27	9.6/27	9.5/27	12.8/27

Analysis:

- **Max number of request per month**: NHTSA and Vehicle Recall API are the most promising options for this metric, with NHTSA due to being government funded service, it appears that they do not charge for their services or any of the API, hence we do not have to pay for requesting information from their API. As for others, they only allow a short trial period or there is no free tier at all.
- **Average response time over 15 iterations:** We use the same black box testing methods, running a python script to make request to the API 15 times and record the time it takes to complete all 15 requests. Then we compare the time accordingly.
- **Highest range of vehicle production year:** Even though some of the services does not contain the data for recall information of some old vehicles, but the API does not give an error due to the validity of the VIN number provided before 1981, we still count them as supported by the API. Moreover, we do not weigh this metric a lot due to our expectation that not many users who owned vehicles before the 2000s will look for recall news due to the rarity of that information.
- **Number of items per request:** This metric is not weigh highly since even though it can affect the production cost, we don't really expect there to be an abundance requests for recall information.

- **Request per minute - Rate Limiting:** Since NHTSA that does not mention rate limit in their document nor answer our email, we try to run a python script to query to the API as many time as possible in one minute until either the time run out or the API reject the request. The number of time we get a response back from the API is recorded and display at the end in order for us to compared.

Conclusion

In conclusion, NHTSA is the best performed API, exceeding all of other options at almost every metrics, with the pricing being the most important as they don't limit as much compare to the others nor do they ask for money or subscription to their services. Surprisingly, Vehicle Recalls API came in second due to its performance and wide range of supported vehicles even though it's not free compare, it is still a good backup plan for our product in case the NHTSA API goes down.

Reference:

1. NHTSA API
    a. API Request Documentation:(https://vpic.nhtsa.dot.gov/api/)
    b. Supported Vehicle Year Range: (https://www.nhtsa.gov/part-583-american-automobile-labeling-act-reports)

2. Vehicle Databases:
    a. Supported Year:(https://vehicledatabases.com/vin-decode-api)

3. Safety Recalls API
    a. Pricing: (https://api.carmd.com/member/User/RequestFee)
    b. Documentation: (https://api.carmd.com/member/docs#safety-recalls)

4. One Auto API
    a. Pricing: (https://oneautoapi.com/pricing/)
    b. Documentation: (https://www.oneautoapi.com/service/recall-check/)

5. Edmund Developer Network
    a. Documentation: (https://developer.edmunds.com/api-documentation/vehicle/service_recalls/v1/02_recallrepository/findbymodelyearid/api-description.html)