**Project Overview**  
In this project, the goal was to extract data from an autocomplete API located at <http://35.200.185.69:8000/>. The API provides multiple versions (v1, v2, v3), and the aim was to collect all possible names from each version while considering any restrictions or limitations set by the API.

**Methodology**

1. **Exploring the API**: The first step was to interact with the API using various queries to better understand its behavior and limitations.
2. **Managing Rate Limits**: To avoid exceeding rate limits, delays were incorporated between requests, and a retry mechanism was put in place to handle any failed requests effectively.
3. **Recursive Data Extraction**: A recursive approach was used to gather names starting from each letter of the alphabet, expanding the search to longer prefixes as needed.

**Execution**

* **Python Script**: A Python script, “name\_extractor.py,” was developed to send requests to the API using the requests library. The responses were processed in JSON format.
* **Logging**: A logging system was implemented to track the progress of the data extraction process and catch any errors that arose.
* **Data Management**: The extracted names were stored in sets to ensure that each name appeared only once, with separate sets used for each version of the API.

**Observations**

* **API Response**: The API returns a list of names based on the query, with a maximum of 10 names per query.
* **Handling Rate Limits**: Although the API does not explicitly mention rate limits, the delays introduced between requests helped avoid any issues.
* **Additional API Endpoints**: No additional endpoints were discovered during this process.

**Challenges and Solutions**

* **Rate Limiting**: The rate limiting was handled by adding delays and retrying failed requests.
* **Recursive Limitations**: The recursion depth was controlled to avoid long execution times and potential timeouts, ensuring that the process ran efficiently.

**Final Results**

* **Total Names Collected**: The total number of unique names extracted from all versions of the API.
* **Breakdown by Version**: The number of unique names retrieved from each version of the API.