*Introduction*

This project involves exploring and extracting data from an autocomplete API located at http://35.200.185.69:8000/. The API has multiple versions (v1, v2, v3), and the task is to extract all possible names from each version while respecting any constraints imposed by the API.

*Approach*

1. **API Exploration**: Initially, the API was tested with various queries to understand its behaviour and constraints.
2. **Rate Limiting Handling**: To avoid hitting rate limits, a delay was introduced between requests, and a retry mechanism was implemented for failed requests.
3. **Recursive Extraction**: A recursive function was used to extract names starting with each letter of the alphabet and then drill down into longer prefixes.

*Implementation*

1. **Python Script**: The script “name\_extractor.py” uses the requests library to make HTTP requests to the API and handles responses in JSON format.
2. **Logging**: Logging is used to track the extraction process and report any errors.
3. **Data Storage**: Extracted names are stored in sets for each API version to ensure uniqueness.

*Findings*

1. **API Behaviour**: The API returns a list of names based on the query string, with up to 10 results per query.
2. **Rate Limiting**: The API does not explicitly state its rate limits, but introducing delays helps avoid hitting them.
3. **Additional Endpoints**: No additional endpoints were discovered during this exploration.

*Challenges and Solutions*

1. **Rate Limiting**: Handled by introducing delays and implementing a retry mechanism.
2. **Recursive Depth**: Limited to avoid timeouts and ensure efficiency.

*Results*

1. **Total Names Extracted**: The total number of unique names extracted across all versions.
2. **API Version Results**: The number of unique names extracted from each API version.