Problem Statement: Rate Limiter

Problem Description: Identify a Developer profile on Github, when following attributes are given

- first name
- last name
- location

Once the profile has been identified extract following attribute from the profile

- Public Profile Detail
- Name of the repository where they are contributed
- No. of the commit made by that developer on those repository

The data should be gathered in minimum amount of time without wasting any resources or violating any condition mentioned by the host. GitHub applies rate limit to use their API. This rate limit differs an anonymous user and logged in user. **The solution should be able to extract data of more than 1000 developer without breaking rate limit.**

Team Members:

- NASHREEN SULTANA
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- ABHINAV KUMAR SINGH

Platform and language used :

- Spring-boot framework and Github APIs

Requirements for the software to run:

- Java JDK 1.8 or higher.
- Maven 3.2.5 or higher.

For Compilation and Execution:

- Build: *mvn clean install*
- Run: *./mvnw spring-boot:run*

An important thing to be mentioned here, for authenticate user access, kindly generate a token from Github, using url ***https://github.com/settings/tokens*** and store the generated token in application.properties file available under:

Other Sources -> src/main/resources -> <default packages> -> application.properties.

Approach taken and Our Understanding:

Rate limiting is used by different websites to control the rate of traffic sent or received by network interface controller and is used to prevent Denial of Service attack.

Before proceeding with coding part we have gone through many online documents such as:

https://spring.io/guides/gs/consuming-rest/, https://developer.github.com/v3/?, https://stackoverflow.com, https://start.spring.io/, etc.

Since we need to access GitHub for information we found out that GitHub provides us with APIs with the help of which we can access the website and get our required information. Hence we decided to for a Service Oriented Architecture (SOA), as everything is done by API calls and not internal java call, it keeps the application code decoupled from the client that will consume.

Given limited time, we decided to proceed with a framework as it is efficient (eliminates the need to write repetitive code), secured, provides support, etc. As our chosen language is Java, we have decided to use Spring Boot framework as it is currently famous and provides us with facilities like boilerplate Code, Annotations and XML Configuration. Hence we downloaded the required package from *https://start.spring.io/.*

We tried to write our code following Model-View-Controller architecture pattern, where out Model contains files such as:

- *User.java*
- *UserRequest.java*
- *Profile.java*
- *ProfileRequest.java*
- *Repository.java*
- *RepositoryRequest.java*
- *Commit.java*
- *CommitRequest.java*
- *RateLimit.java*
- *ResourceLimit.java*

The files mentioned above basically sends the required information to GitHub and the stores response it get from GitHub.

Our Controller contains a file *GitHubAPIController.java* which contains the required logics for mapping the APIs with the information provided by user and then get the response from github and store in the given data structure.

Our View do not contain anything as we have not written any code for UI.

There are other files such as:

- *RestConfi.java* where the serialization and deserialization logic for converting from json object to byte stream and vice-versa is written.
- Response files such as:
    - *GitHubUsersResponse.java*
    - *GitHubRepositoriesResponse.java*
    - *GitHubCommitsResponse.java*
    - *GitHubRateLimitResponse.java*
    - *GitHubResponse.java*

      The file mentioned above grabs the response from GitHub and stores it in the required data structure.

Format of the input for our application:

The input for our application must be given in the following form in the terminal/console/command prompt:

To extract User Information:

curl -d '[{"firstName":"nashreen","lastName":"sultana","location":"guwahati"}, {"firstName":"abhinav","lastName":"singh","location":"bihar"}, {"firstName":"suresh","lastName":"patir"}]' -H "Content-Type: application/json" -X POST http://localhost:8080/api/users

To extract Profile Information of a User:

curl -d '[{"profile":"nashreen"},{"profile":"abhicodesm"},{"profile":"suresh7586"}]' -H "Content-Type: application/json" -X POST http://localhost:8080/api/profiles

To extract Repository name of a User:

curl -d '[{"profile":"nashreen"},{"profile":"abhicodesm"},{"profile":"suresh7586"}]' -H "Content-Type: application/json" -X POST http://localhost:8080/api/repositories

To extract Number of Commits made by the User in the repository:

curl -d '[{"profile":"nashreen"},{"profile":"abhicodesm"},{"profile":"suresh7586"}]' -H "Content-Type: application/json" -X POST http://localhost:8080/api/commits

Given more time what could have been done?:

- Our application, at present, do not have any UI which makes it a bit cumbersome to enter details of so many users. Hence given more time we could have build, may be a html page containing rows and columns for easy enter of information.
- Our code is not automatically tested as we have not written for unit test and integration test. Only a bare minimum testing is available. Hence there may be cases where the application fails to give correct information.
- Also reading many documents, we have got to know that ideally GraphQL will be the right way to go. But since we had not that much idea about it and was did not have time to learn and apply we chose to go for the one we are accustomed to.

Sample Input and Output:

Input 1: Accessing user information:

curl -d '[{"firstName":"nashreen","lastName":"sultana","location":"guwahati"},{"firstName":"abhinav","lastName":"singh","location":"bihar"},{"firstName":"suresh","lastName":"patir"}]' -H "Content-Type: application/json" -X POST http://localhost:8080/api/users

Output 1:

[{"id":3772367,"login":"nashreen","url":"https://api.github.com/users/nashreen"},{"id":25388508,"login":"shubhamsingh28","url":"https://api.github.com/users/shubhamsingh28"},{"id":19511627,"login":"Rksingh620","url":"https://api.github.com/users/Rksingh620"},{"id":13099856,"login":"nirbhay02","url":"https://api.github.com/users/nirbhay02"},{"id":1784581,"login":"tapender-iitp","url":"https://api.github.com/users/tapender-iitp"},{"id":19291796,"login":"gyanarpit","url":"https://api.github.com/users/gyanarpit"},{"id":26683121,"login":"abhicodesm","url":"https://api.github.com/users/abhicodesm"},{"id":11514431,"login":"singhkundankumar","url":"https://api.github.com/users/singhkundankumar"},{"id":18064699,"login":"SnehaSingh05","url":"https://api.github.com/users/SnehaSingh05"},{"id":38839773,"login":"nihalsinghraju","url":"https://api.github.com/users/nihalsinghraju"},{"id":35363490,"login":"prakash2018","url":"https://api.github.com/users/prakash2018"},{"id":10682888,"login":"niveditasingh","url":"https://api.github.com/users/niveditasingh"},{"id":9380531,"login":"smnext","url":"https://api.github.com/

users/smnext"},{"id":41522741,"login":"Shivam0339","url":"https://api.github.com/users/Shiva m0339"},{"id":30654840,"login":"techieamit","url":"https://api.github.com/users/techieamit"},{ "id":25606577,"login":"yashwant29","url":"https://api.github.com/users/yashwant29"},{"id":11 138902,"login":"kuwar21","url":"https://api.github.com/users/kuwar21"},{"id":34533448,"login ":"Sujitkumarsingh1","url":"https://api.github.com/users/Sujitkumarsingh1"},{"id":35104153,"l ogin":"avinash0705","url":"https://api.github.com/users/avinash0705"},{"id":6791456,"login":" CanerPatir","url":"https://api.github.com/users/CanerPatir"},{"id":7391550,"login":"patiramya dav","url":"https://api.github.com/users/patiramyadav"},{"id":6785836,"login":"PatiR","url":"h ttps://api.github.com/users/PatiR"},{"id":27262831,"login":"patirasam","url":"https://api.github .com/users/patirasam"},{"id":6827697,"login":"patiru","url":"https://api.github.com/users/patir u"},{"id":21333109,"login":"patire-tu","url":"https://api.github.com/users/patire-tu"},{"id":313 68265,"login":"patirop","url":"https://api.github.com/users/patirop"},{"id":36693910,"login":" Patirla-SaiKiran","url":"https://api.github.com/users/Patirla-SaiKiran"},{"id":5762250,"login": "patirub","url":"https://api.github.com/users/patirub"},{"id":9629077,"login":"ibrahimpatir","u rl":"https://api.github.com/users/ibrahimpatir"},{"id":22480135,"login":"patiro","url":"https://a pi.github.com/users/patiro"},{"id":39272775,"login":"patirosa","url":"https://api.github.com/us ers/patirosa"},{"id":14077315,"login":"PatiriLambert","url":"https://api.github.com/users/Patir iLambert"},{"id":19549782,"login":"patirahardik","url":"https://api.github.com/users/patirahar dik"},{"id":7646463,"login":"patireis","url":"https://api.github.com/users/patireis"},{"id":4285 0096,"login":"patirazors1","url":"https://api.github.com/users/patirazors1"},{"id":18737687,"lo gin":"patirajtilak","url":"https://api.github.com/users/patirajtilak"},{"id":35606816,"login":"Pa tirck","url":"https://api.github.com/users/Patirck"},{"id":19654354,"login":"patireland1962","u rl":"https://api.github.com/users/patireland1962"},{"id":31076953,"login":"patiraghu","url":"ht tps://api.github.com/users/patiraghu"},{"id":33701484,"login":"patirb","url":"https://api.github .com/users/patirb"},{"id":37115809,"login":"patirwin22","url":"https://api.github.com/users/pat irwin22"},{"id":20065246,"login":"PatirEngineering","url":"https://api.github.com/users/Patir Engineering"},{"id":20824040,"login":"patirodrigues","url":"https://api.github.com/users/patir odrigues"},{"id":42820869,"login":"patiregina89","url":"https://api.github.com/users/patiregin a89"},{"id":34101806,"login":"patiramprajapati","url":"https://api.github.com/users/patiramp rajapati"},{"id":9967281,"login":"patire","url":"https://api.github.com/users/patire"},{"id":3417 0325,"login":"patiro-com","url":"https://api.github.com/users/patiro-com"},{"id":20664203,"lo gin":"patirobi2","url":"https://api.github.com/users/patirobi2"},{"id":29525462,"login":"PatiRS Lima","url":"https://api.github.com/users/PatiRSLima"}]

Input 2: Accessing user's profile information:

curl -d '[{"profile":"nashreen"},{"profile":"abhicodesm"},{"profile":"suresh7586"}]' -H "Content-Type: application/json" -X POST http://localhost:8080/api/profiles

Output 2:

[{"id":3772367,"publicRepos":3,"publicGists":0,"followers":0,"following":0,"avatarUrl":"https://avatars3.githubusercontent.com/u/3772367?v=4","login":"nashreen","name":"Nashreen Sultana","url":"https://api.github.com/users/nashreen"},{"id":26683121,"publicRepos":6,"publicGists":0,"followers":0,"following":0,"avatarUrl":"https://avatars3.githubusercontent.com/u/26683121?v=4","login":"abhicodesm","name":"Abhinav Singh","url":"https://api.github.com/users/abhicodesm"},{"id":27897996,"publicRepos":0,"publicGists":0,"followers":0,"following":0,"avatarUrl":"https://avatars1.githubusercontent.com/u/27897996?v=4","login":"suresh7586","name":"Suresh Patir","url":"https://api.github.com/users/suresh7586"}]

Input 3: Accessing user's repository names:

curl -d '[{"profile":"nashreen"},{"profile":"abhicodesm"}]' -H "Content-Type: application/json" -X POST http://localhost:8080/api/repositories

Output 3:

{"user:abhicodesm":[{"name":"Text-editor","url":"https://api.github.com/repos/abhicodesm/Text-editor","owner":{"id":26683121,"login":"abhicodesm","url":"https://api.github.com/users/abhicodesm"}},{"name":"Intern_project","url":"https://api.github.com/repos/abhicodesm/Intern_project","owner":{"id":26683121,"login":"abhicodesm","url":"https://api.github.com/users/abhicodesm"}},{"name":"Team-viewer_project","url":"https://api.github.com/repos/abhicodesm/Team-viewer_project","owner":{"id":26683121,"login":"abhicodesm","url":"https://api.github.com/users/abhicodesm"}},{"name":"Team_viewer_project","url":"https://api.github.com/repos/abhicodesm/Team_viewer_project","owner":{"id":26683121,"login":"abhicodesm","url":"https://api.github.com/users/abhicodesm"}},{"name":"Firstc-Code","url":"https://api.github.com/repos/abhicodesm/Firstc-Code","owner":{"id":26683121,"login":"abhicodesm","url":"https://api.github.com/users/abhicodesm"}}],"user:nashreen":[{"name":"CoinCollectGame","url":"https://api.github.com/repos/nashreen/CoinCollectGame","owner":{"id":3772367,"login":"nashreen","url":"https://api.github.com/users/nashreen"}},{"name":"BlueOptimaProject","url":"https://api.github.com/repos/nashreen/BlueOptimaProject","owner":{"id":3772367,"login":"nashreen","url":"https://api.github.com/users/nashreen"}},{"name":"SpringBoot","url":"https://api.github.com/repos/n

ashreen/SpringBoot","owner":{"id":3772367,"login":"nashreen","url":"https://api.github.com/users/nashreen"}}]}

Input 4: Accessing user's number of commits in each repository:

curl -d '[{"profile":"nashreen"},{"profile":"abhicodesm"},{"profile":"suresh7586"}]' -H "Content-Type: application/json" -X POST http://localhost:8080/api/commits

Output 4:

{"author:nashreen":{"SpringBoot":1},"author:abhicodesm":{"Firstc-Code":1,"Text-editor":3,"Intern_project":4,"Team-viewer_project":3},"author:suresh7586":{"Assignment2-15103072":3,"g3-agile-lab-team_C_Bubble_Sort_Game_Project":2,"Assignment-3-15103072":5,"15103072.":16,"-15103072_Assignment-4":2}}