README.md

ServerLogs

Project for Post-Graduate class Database Management Systems

Authors

- Papadopoulos Christos
- Papamichalopoulos Marios

Tools Used

- Spring Boot
- React
- PostgresSQL 11.6
- IntelliJ IDEA
- Webpack
- Various NPM dependencies (package.json)

How to run

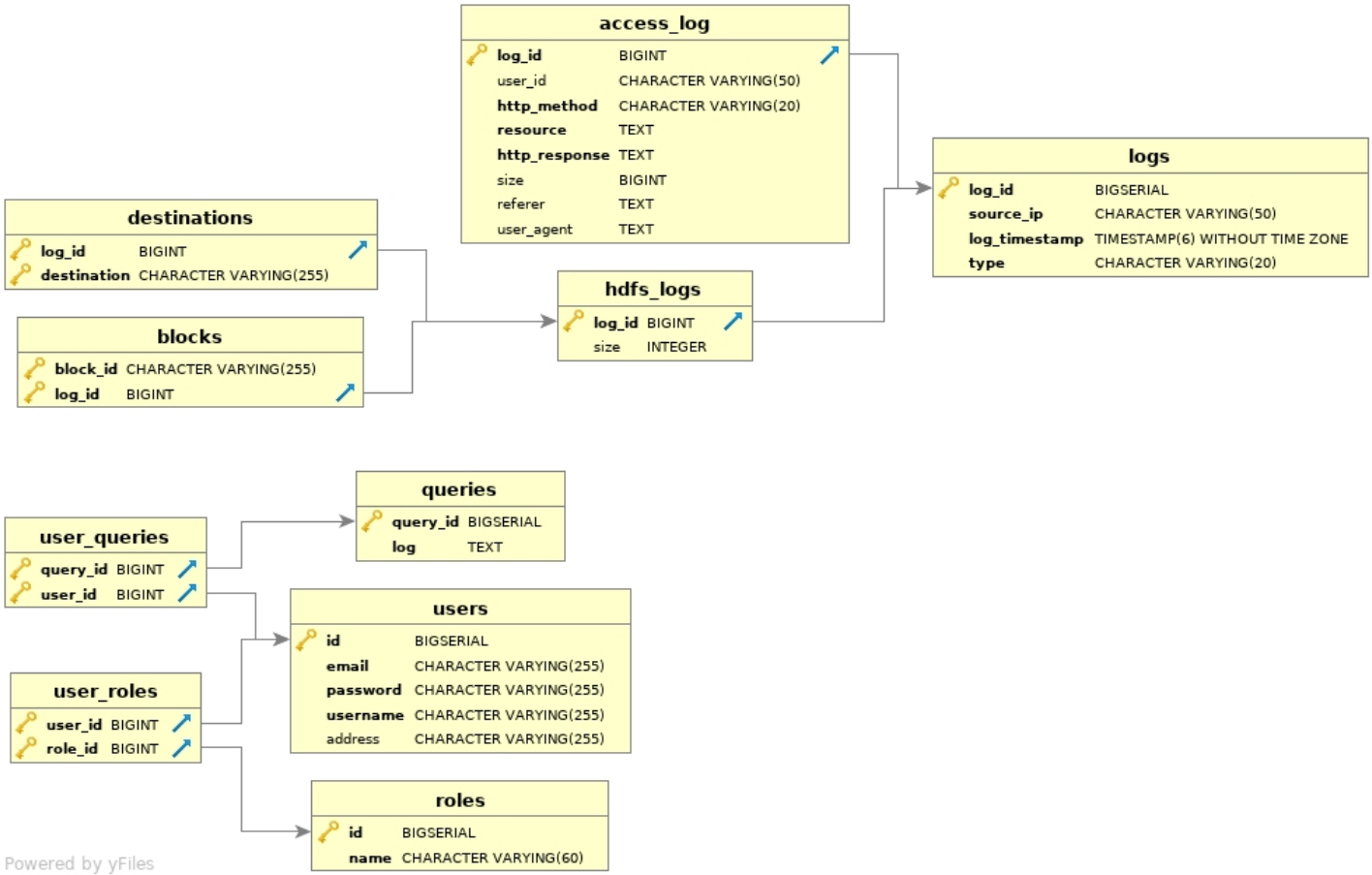
- Import project as Maven project in IntelliJ
- Extract the `logs.tar.gz` from the `logs` directory
- Use the python script `csv_parser.py` within the directory to parse the logs to CSV format.
- Import CSV files using pgAdmin 4.
- Run in the project folder the commands:

```
sudo npm install
sudo npm run build
```

- Start from IntelliJ and you should be able to browse it from:

```
https://localhost:8080/
```

Final Schema



The main relation in our database is the logs relation. It contains all the information present in every type of log and it's primary key is an auto-incremented value which acts as the id for each log. This attribute is also referenced by every other relation in our schema and it allows us to have the database in second normal form (2NF) since there are no values dependent on a subset of any candidate key (the only candidate key here is the minimal superkey log_id). As for 3NF normalization we allowed some tables to remain non normalized (such as access table where some fields might be dependent on other non-candidate key fields) to speed up queries.

We also experimented with various indexes and index types. The most efficient index is a b-tree on the timestamp column on log_id as it speeds up ranged queries like function1 by quite a lot. This can be seen by the times displayed below:

SystemDB/postgres@Postgres

Query Editor | Query History

```
SELECT log_db.function1(
    '2004-10-10 10:10:10',
    '2019-10-10 10:10:10'
)
```

Data Output | Scratch Pad | Explain | Notifications | Messages

	function1 record
1	(access,3353…
2	(Receiving,17…
3	(Served,4287…
4	(delete,21784)
5	(Received,709…
6	(replicate,7002)

Successfully run. Total query runtime: 7 secs 817 msec. 6 rows affected.

Query Editor | Query History

```
SELECT log_db.function1(
    '2004-10-10 10:10:10',
    '2019-10-10 10:10:10'
)
```

Data Output | Scratch Pad | Explain | Notifications | Messages

	function1 record
1	(access,3353…
2	(Receiving,17…
3	(Served,4287…
4	(delete,21784)
5	(Received,709…
6	(replicate,7002)

Successfully run. Total query runtime: 1 secs 967 msec. 6 rows affected.

Some other indices like on http methods for the last functions did not give us any significant performance gains. Function5 was better with index on referer:

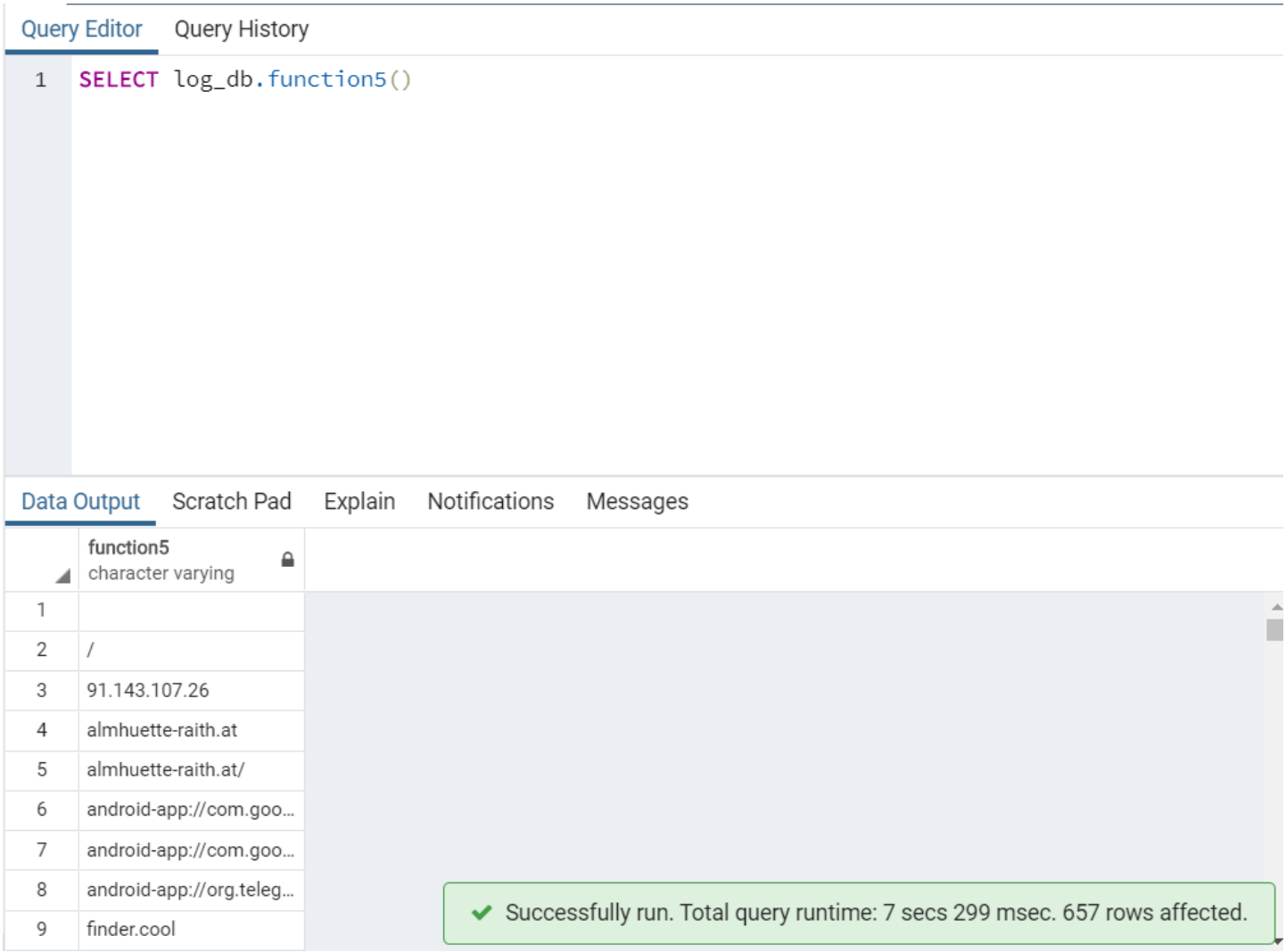
Query Editor | Query History

```
1  SELECT log_db.function5()
```

Data Output | Scratch Pad | Explain | Notifications | Messages

	function5 character varying
1	
2	/
3	91.143.107.26
4	almhuette-raith.at
5	almhuette-raith.at/
6	android-app://com.goo...
7	android-app://com.goo...
8	android-app://org.teleg...
9	finder.cool

✔ Successfully run. Total query runtime: 11 secs 307 msec. 657 rows affected.



Functions

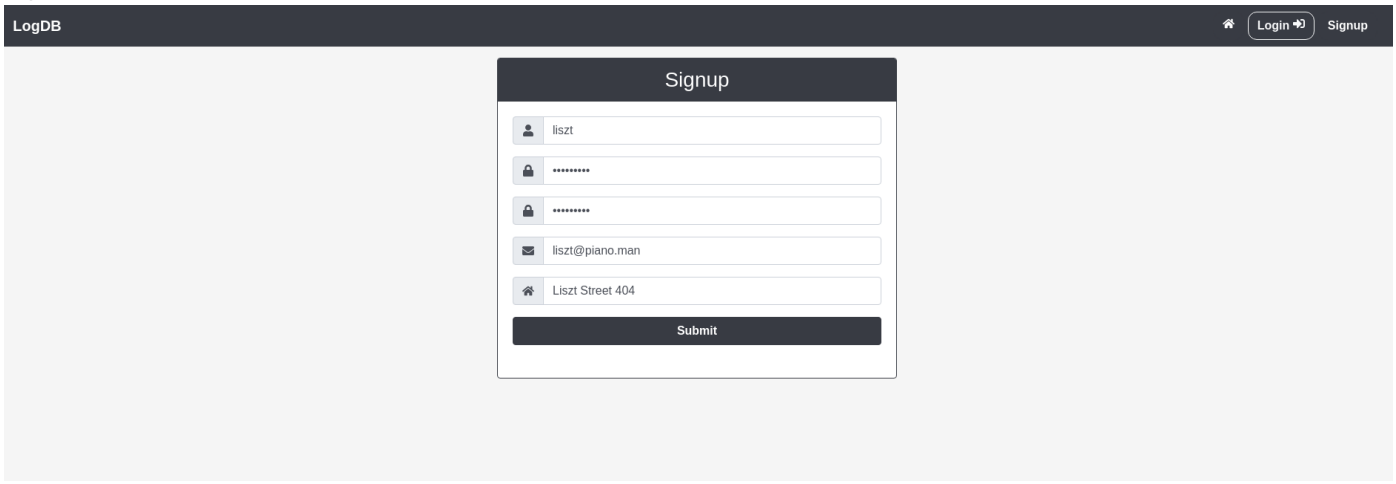
Their implementation can be seen through the file schema:

`src/main/postgresql/log_db.sql`

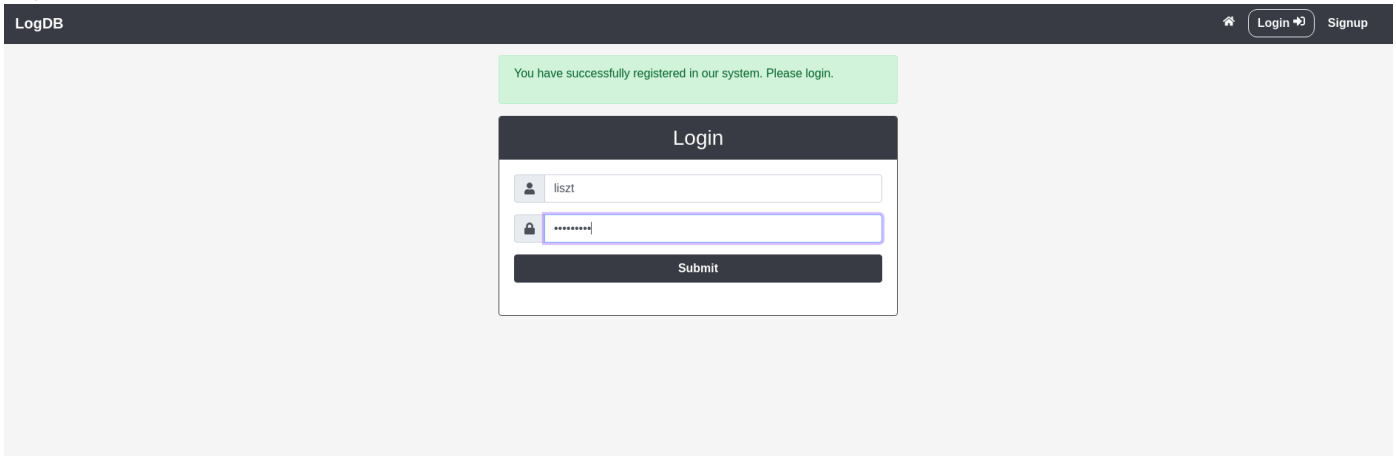
Sample Snapshots

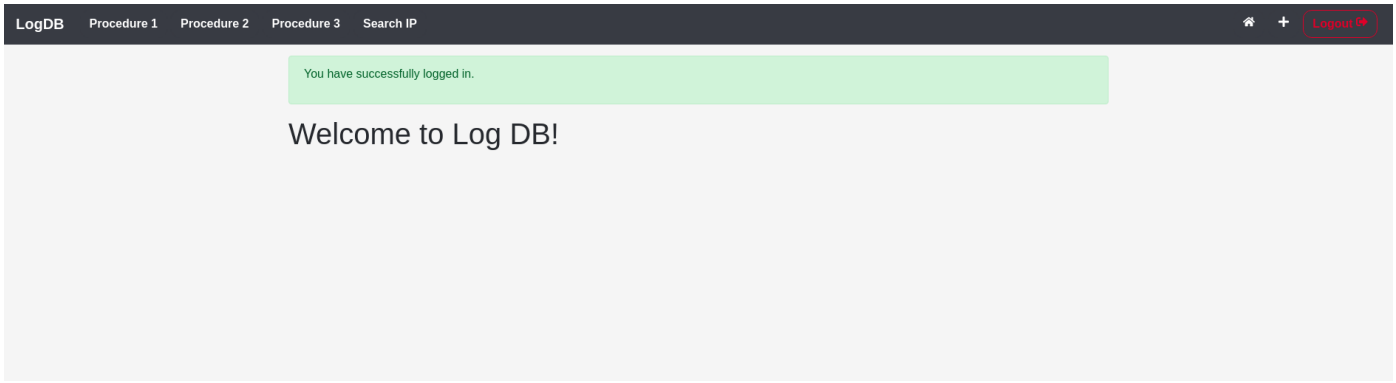
- Homepage

- Sign Up

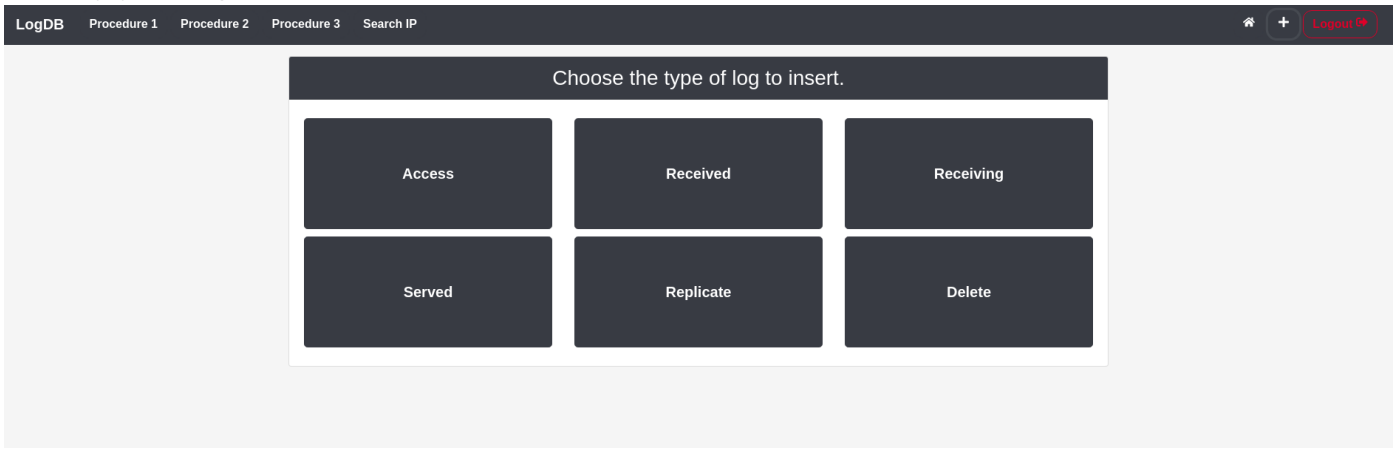


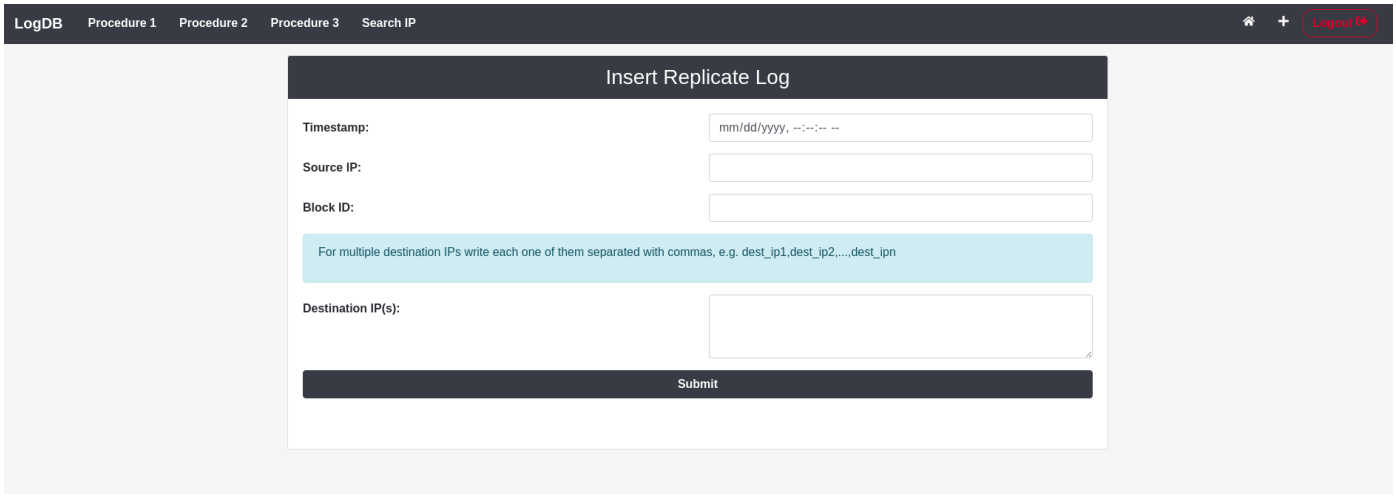
- Log In



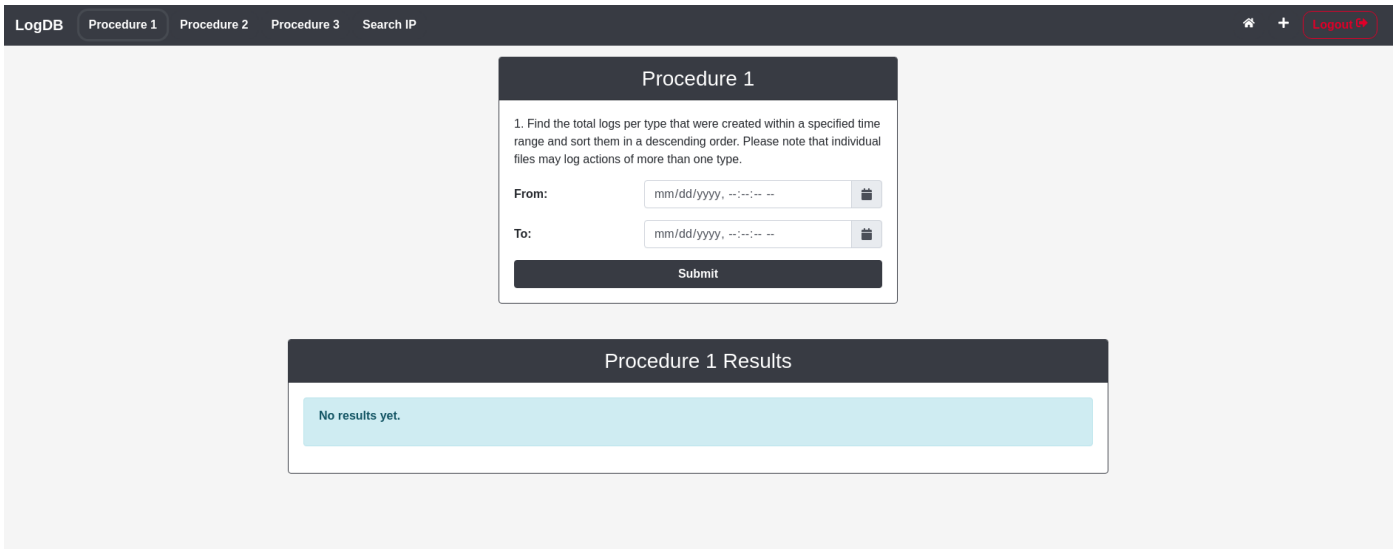


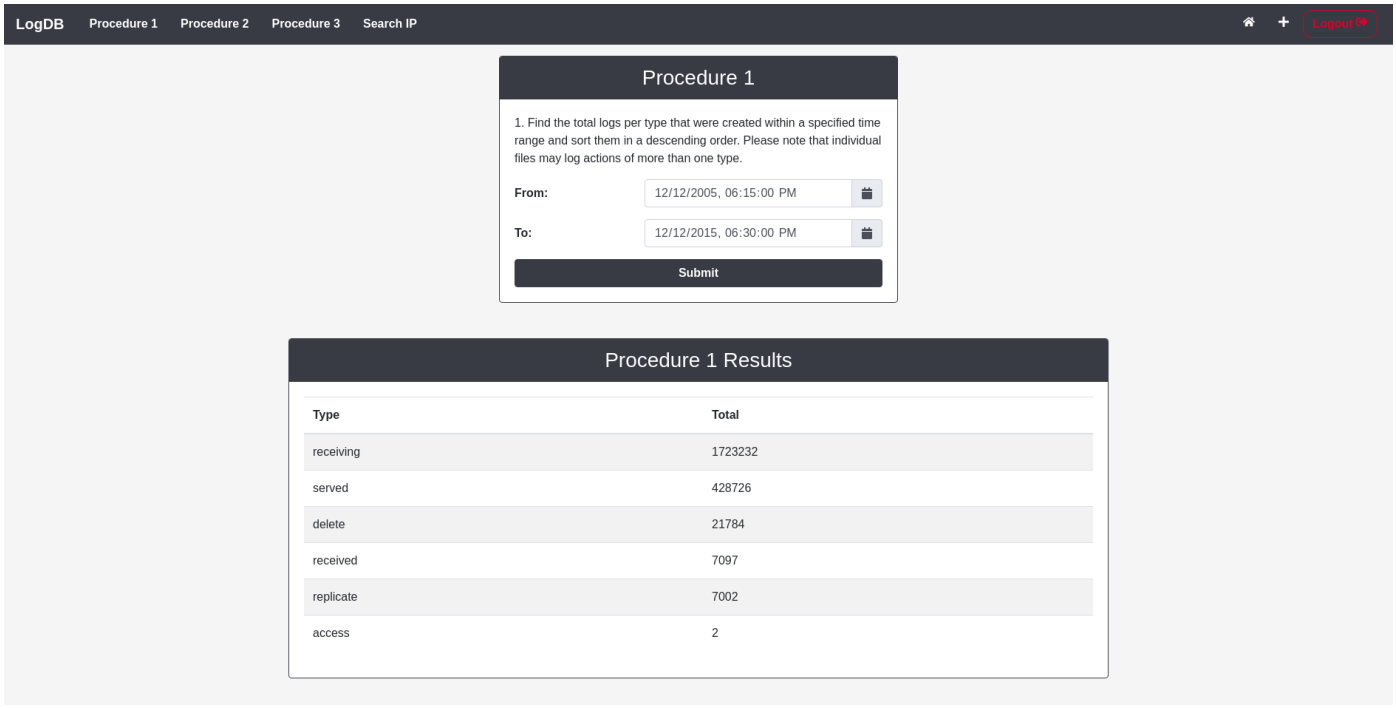
- Insert any type of Log





- Execute server procedures





Github Link

ServerLogs