

DOSP PROJECT 4 PART 2

Group Members:

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Instructions for running the code:

```
dotnet fsi server_2.fsx
```

```
dotnet fsi client.fsx 10 30
```

```
dotnet fsi client.fsx (Number of users to be simulated, Duration between login and logout in seconds).
```

Demo Video Link:

<https://youtu.be/M73OWMPDtXQ>

Project Explanation:

Server Side:

Has all the end points such as Register User, Login, Logout, Tweet etc

The server and the client communicate with each other using web sockets. These **web sockets** are implemented using **Suave library**.

The user has to register first in order to use all the functionalities of twitter.

When someone tweets, it is saved to user's tweet table and follower's tweet table.

The tweet is sent to all the followers of that particular user.

Along with that, all the hashtags and mentions in the tweet are also saved in hashtag table and mentions table.

We have endpoints such as HashtagQ, MentionsQ and GetAllUserTweets.

The data from all these endpoints come to Suave webserver.

When the request comes to the Suave server, it sends the data to the backend of actors.

Client Side:

The client.fsx file is run after the server is started on different port in different process in terminal 2,

Client boots at IP: 0.0.0.0 and port 8080

Client emulates the whole operation of twitter.

The User has to register and then login with a valid username and password.

ZipFDistribution function prepares distribution of subscribers and tweets.

A Zipf distribution of followers is constructed for a given number of users, with the user with the highest rank having more followers than the user with the lowest rank. A user with a high rank tweets more, and the tweets are also distributed using ZipF distribution.

Occurrence = (ZipF constant * Total Number of Elements) / (Rank of the Element). Here ZipF constant is considered to be 0.30 for both tweet and subscriber distribution.

We simulate the users with the help of actors where each actor acts as a user.

Flow of actions performed by the user:

- 1) The user first registers on twitter app
- 2) User logs in after successful registration
- 3) User can enjoy functionalities like subscribe, tweet, retweet etc
- 4) User session is the time elapsed between login and logout

Maximum Load:

Maximum number of users simulated: 700, Session time 250 seconds

Performance Stats:

Users	Session Time	Registration Requests	Login Requests	Follow Requests	Tweet/Retweet Requests	Logout Requests	Data Query Requests
20	60	15	15	7	110	15	13
100	120	80	80	66	375	79	70
300	180	250	250	180	1200	250	210
500	240	300	300	225	2330	293	265
700	250	445	445	270	3150	435	405

Users	Session Time	Successful Registration Requests	Successful Login Requests	Successful Follow Requests	Successful Tweet/Retweet Requests	Successful Logout Requests	Successful Data Query Requests
20	60	15	15	6	100	15	13
100	120	80	80	59	320	80	69
300	180	250	250	143	1125	245	190
500	240	300	291	198	1900	270	225
700	250	445	423	201	2650	410	398