Distributed Operating Systems
Project 4.1
Twitter Engine using Elixir

Group Members-

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Implementation-

The goal of this project is to simulate Twitter like engine in Elixir. In this part, the basic functionalities like create an account, delete an account, login i.e. create an active user, publishing and distributing tweets, retweet, check most trending hashtag, check mentions by other users etc. have been implemented. To demonstrate the working, we have used random generators as many places as we are not taking input of tweet from command line. When we put number of users (num_user) and number of messages (num_msg), every user creates num_msg number of random tweets. These tweets might or might not have a hashtag and user mention depending upon the random number generator. The hashtag/mention in any tweet is detected Regex and stored in the respective tables. Any user can check the tweets he/she is mentioned in and the most trending hashtag. He/she can also check the tweets with specific hashtag. Followers for every user are generated using a random number generator. Any tweet posted by any user gets reflected in his follower's newsfeed as well. A user can retweet any other user's tweet which will also get reflected in this follower's newsfeed.

The Server engine starts first which creates a GenServer for every user and starts a GenServer which creates ETS tables for every functionality. Whenever any function/command is called by the Client, the server is called to perform the corresponding function and all the users get updated with the changes in the engine. Example- If user10 tweets something and user2 follows user10 then user2 can see the tweet of user10.

Input-

mix run proj4.exs num_user num_msg

Here, num_user – Number of users to be created

        num_msg – Number of tweets every user should create

Performance analysis for different inputs-

Parameters		Time taken (in milliseconds)				
Number of Users	Number of Messages	Create tables	Create all users	Create active users	Send tweets and generate newsfeed	Make followers
10	5	0	0	16	109	0
100	10	0	0	15	110	0
1000	25	0	15	0	344	16
10000	45	16	78	15	4735	94
100000	50	16	984	94	57603	985

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Parameters		Time taken (in milliseconds)			
Number of Users	Number of Messages	Retweet	Fetch and display newsfeed	Delete an account	Time to check mentions
10	5	0	0	0	0
100	10	0	0	0	0
1000	25	0	0	0	0
10000	45	0	15	0	0
100000	50	0	15	30	0

Performance graph-
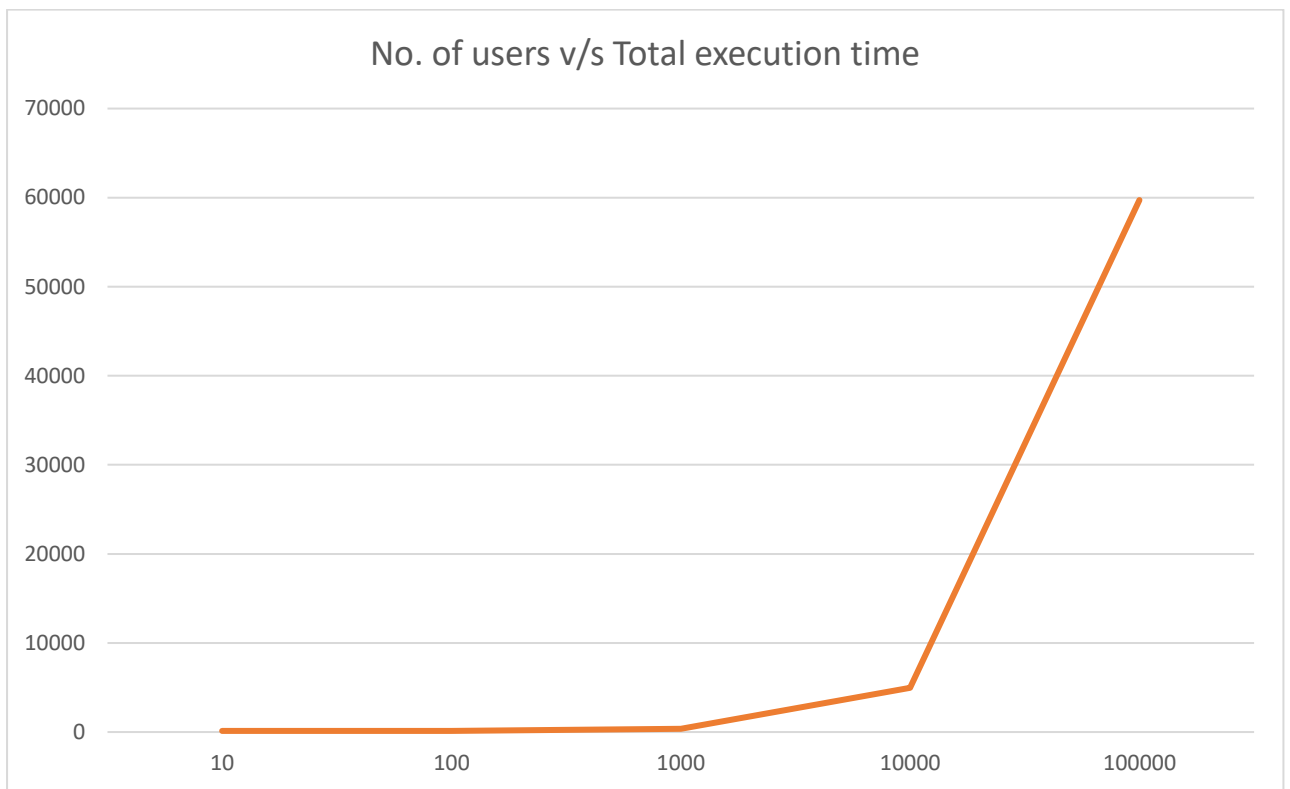
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Sample input-

mix run proj4.exs 100 10

Sample output-

```
C:\Users\Akash\Desktop\twitter>mix run proj4.exs 100 10
Time to create tables = 0 milliseconds
Time to create all the users = 0 milliseconds
Time to create active users = 16 milliseconds
Time to send tweets and generate newsfeeds = 109 milliseconds
Time to make followers = 0 milliseconds
Time to retweet = 0 milliseconds
Hi, I am user75, message no10
Hi, I am user75, message no9
Hi, I am user75 student of #COP5615 @user45
Hi, I am user75, message no7
Hi, I am user75, message no6
Hi, I am user75 student of #COP5615 @user35
Hi, I am user75, message no4
Hi, I am user75, message no3
Hi, I am user75, message no2
Hi, I am user75, message no1
Time to fetch and display newsfeed = 0 milliseconds

Time to delete an account = 16 milliseconds

User53 is mentioned in the following tweets
Hi, I am user88 student of #COP5615 @user53
Hi, I am user52 student of #COP5615 @user53
Hi, I am user47 student of #COP5615 @user53
Hi, I am user35 student of #COP5615 @user53
Hi, I am user33 student of #COP5615 @user53
Hi, I am user27 student of #COP5615 @user53
Hi, I am user19 student of #COP5615 @user53
Time to check mentions = 0 milliseconds
```