

DISTRIBUTED OPERATING SYSTEMS

PROJECT 4.1 : Twitter Simulator

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Bonus part

GROUP MEMBERS

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WHAT IS WORKING

Run the following commands from the directory containing mix.exs:

- Run *mix deps.get* to build all the dependencies.
- *mix escript.build*
- Run *escript ./project4_1 server* to start the server in command line .
- Run *escript ./proj4 simulate 127.0.0.1 num_user num_actors* to run the simulator in a different command line window.

We are sending messages at random rate. The num_user is created and monitors by each actor.

Where num_user represents the number of users created by the simulator, num_msg represents the number of tweets made by the user.

FUNCTIONALITIES IMPLEMENTED IN SIMULATOR

- We were able to register and delete the account.

- We were able to send the tweets and the tweets included hashtags.
- We were able to subscribe to user's tweets.
- We were able to implement Re-tweets.
- We were able to implement querying tweets subscribed to, tweets with specific hashtags, tweets in which the user is mentioned.
- We were able to deliver the above types of tweets live without querying.

Performance Analysis

- We were able to simulate the periods of live connections and disconnections as required by the bonus part, which is evident from the screenshot below.

```

9:30:07.143 [debug] Ready to accept new connections
9:30:07.145 [debug] Ready to accept new connections

9:30:15.655 [info] Twitter-engine (Statistics)
Tweets(per sec): 1314.5
Total Users: 1000
Online Users: 704
Offline Users: 296

9:30:25.662 [info] Twitter-engine (Statistics)
Tweets(per sec): 1818.1
Total Users: 1000
Online Users: 695
Offline Users: 305

9:30:35.650 [info] Twitter-engine (Statistics)
Tweets(per sec): 1843.7
Total Users: 1000
Online Users: 681
Offline Users: 319

9:30:45.659 [info] Twitter-engine (Statistics)
Tweets(per sec): 1795.3
Total Users: 1000
Online Users: 726
Offline Users: 274

9:30:55.677 [info] Twitter-engine (Statistics)
Tweets(per sec): 1804.8
Total Users: 1000
Online Users: 692
Offline Users: 308

9:31:05.672 [info] Twitter-engine (Statistics)
Tweets(per sec): 1821.7
Total Users: 1000
Online Users: 719
Offline Users: 281

9:31:15.674 [info] Twitter-engine (Statistics)
Tweets(per sec): 1843.0
Total Users: 1000
Online Users: 717
Offline Users: 283

```

We implemented a system for upto 6000 total users. The server was not able to handle requests for 9000 total users in our runs. (Screenshot contains metrics for 1000 users).

We can observe the random rate at which tweets were sent per second. And also the change of state of user from offline to online and vice versa.

- Zipf Distribution for subscribers:

```
22:48:24.356 [debug] user: h6xo7v5rgk updated subs: #MapSet<["k4rn39om4m"]>
22:48:24.357 [debug] user: kqvib065og updated subs: #MapSet<["h6xo7v5rgk"]>
22:48:24.357 [debug] user: k4rn39om4m updated subs: #MapSet<["1bmw53me5r"]>
22:48:24.357 [debug] user: dh7w25x51r updated subs: #MapSet<["5kbn6zg134", "h6xo7v5rgk"]>
22:48:24.357 [debug] user: c3u9ro88f8 updated subs: #MapSet<["8w216fjw9r"]>
22:48:24.357 [debug] user: 8w216fjw9r updated subs: #MapSet<["c3u9ro88f8", "di7kh4su54"]>
22:48:24.357 [debug] user: di7kh4su54 updated subs: #MapSet<["zj0c38i01m"]>
22:48:24.357 [debug] user: bgtduo54e updated subs: #MapSet<["9ka009pzu0"]>
22:48:24.357 [debug] user: 4tp4fz2inh updated subs: #MapSet<["di7kh4su54", "taj3uu546e", "zj0c38i01m"]>
22:48:24.357 [debug] user: 9ka009pzu0 updated subs: #MapSet<["taj3uu546e"]>
22:48:24.357 [debug] user: g93ix1pal1 updated subs: #MapSet<["d9wy9ek90c"]>
22:48:24.357 [debug] user: d9wy9ek90c updated subs: #MapSet<["g93ix1pal1"]>
22:48:24.357 [debug] user: 5yk35wnv5a updated subs: #MapSet<["dg6339ttad", "g93ix1pal1", "kxa24omcm8"]>
22:48:24.357 [debug] user: 5zknziz3mg updated subs: #MapSet<["5yk35wnv5a", "kxa24omcm8"]>
22:48:24.357 [debug] user: dg6339ttad updated subs: #MapSet<["tkfqk2jswd"]>
22:48:24.357 [debug] user: kxa24omcm8 updated subs: #MapSet<["g93ix1pal1"]>
22:48:24.357 [debug] user: jo1mr0aeag updated subs: #MapSet<["gyjcmasx81"]>
22:48:24.358 [debug] user: 2nhzrp8h3q updated subs: #MapSet<["73rf09xx0q", "c0h1w0lgka", "gyjcmasx81"]>
22:48:24.358 [debug] user: c0h1w0lgka updated subs: #MapSet<["jo1mr0aeag"]>
22:48:24.358 [debug] user: 73rf09xx0q updated subs: #MapSet<["2nhzrp8h3q"]>
22:48:24.358 [debug] user: gyjcmasx81 updated subs: #MapSet<["jo1mr0aeag"]>
22:48:24.358 [debug] user: 4dwvda5zxf updated subs: #MapSet<["jo1mr0aeag", "rxpxtdwz1"]>
22:48:26.665 [info] Twitter-engine (Statistics)
Tweets(per sec): 17.6
Total Users: 50
Online Users: 44
Offline Users: 6
```

- User feed displayed:

(Note: We commented out the user feed output in *twitter-engine.ex* line 292 since it was making twitter-engine statistics hard to read.)

Messages sent to offline/disconnected users are saved in the feeds table and sent to the user when the user is back online.

19:26:40.444 [debug] ubtxl39ch8's feed: [{"k3gxtbf2tvir9oq9nkykblkd3s00fdzpxl k f7ws g v 9xj1h c1klp1rde2eki 4 s0hk5hu6lkboxwh724qm qggzdqor4f1", "zx2pouzxaof703orjqvpa2 lko1cvc243q mcd j02apcxnyo a9x5bt195j8n 6anv86zff kw8vo42hyeqsl4a3wlejgh7q6v", "z9ly4tr2owxe jkxl942ghw dmhsgkkl1lrhp6ptkpy2uj53qbf664yi6zo1mve1qfcqz1d 1kb58 z6ue fludxda e9tdfm so0", "qrp273kpo89 xwi9o c2g300svalcc82 5mqcies2kf 67xowc068o1lphve89 hgyzoqhg5b013jrzsnyvohuabipc c2xvj1b", "1u7tig 75mvu p9 lc7pmjlupk4rg5l 4v7v1yw652tw3fdexmh7 8w820v4mahjmrhn9 s 137ug20nx94d10 m8ftysdm 8p8"], ["0cqwy19 i9 6ku iyvv2fm le2txv6 b1jr56 3g a1k9r y5cvrifivptj59 z4djugpkf 8ggzrduxgw7r2mthwafrcncini7"]}]

19:26:40.444 [debug] ubtxl39ch8's updated feed: [{"ro3tm3jx rah4xifv ollb2k2hg 38vc4b of bk 3s3es4l lerwhttnc37t6 rlf ht8lcn49ha vmcc2h iy9rbwub3 xh93", "k3gxtbf2tvir9oq9nkykblkd3s00fdzpxl k f7ws g v 9xj1h c1klp1rde2eki 4 s0hk5hu6lkboxwh724qm qggzdqor4f1", "zx2pouzxaof703orjqvpa2 lko1cvc243q mcd j02apcxnyo a9x5bt195j8n 6anv86zff kw8vo42hyeqsl4a3wlejgh7q6v", "z9ly4tr2owxe jkxl942ghw dmhsgkkl1lrhp6ptkpy2uj53qbf664yi6zo1mve1qfcqz1d 1kb58 z6ue fludxda e9tdfm so0", "qrp273kpo89 xwi9o c2g300svalcc82 5mqcies2kf 67xowc068o1lphve89 hgyzoqhg5b013jrzsnyvohuabipc c2xvj1b", "1u7tig 75mvu p9 lc7pmjlupk4rg5l 4v7v1yw652tw3fdexmh7 8w820v4mahjmrhn9 s 137ug20nx94d10 m8ftysdm 8p8"], ["0cqwy19 i9 6ku iyvv2fm le2txv6 b1jr56 3g a1k9r y5cvrifivptj59 z4djugpkf 8ggzrduxgw7r2mthwafrcncini7"]}]

19:26:40.445 [debug] aorw8la96w's feed: ([], [])

19:26:40.445 [debug] aorw8la96w's updated feed: [{"3jow8uxa7qtlu2wzkefv7xkdw48rd1nne kw d0fs xx mftm ghjwxywgk7d15j4o933c 0 kjrrhp4 zj2elxla08jp58ubek"}, ([])]

19:26:40.474 [debug] ubtxl39ch8's feed: [{"ro3tm3jx rah4xifv ollb2k2hg 38vc4b of bk 3s3es4l lerwhttnc37t6 rlf ht8lcn49ha vmcc2h iy9rbwub3 xh93", "k3gxtbf2tvir9oq9nkykblkd3s00fdzpxl k f7ws g v 9xj1h c1klp1rde2eki 4 s0hk5hu6lkboxwh724qm qggzdqor4f1", "zx2pouzxaof703orjqvpa2 lko1cvc243q mcd j02apcxnyo a9x5bt195j8n 6anv86zff kw8vo42hyeqsl4a3wlejgh7q6v", "z9ly4tr2owxe jkxl942ghw dmhsgkkl1lrhp6ptkpy2uj53qbf664yi6zo1mve1qfcqz1d 1kb58 z6ue fludxda e9tdfm so0", "qrp273kpo89 xwi9o c2g300svalcc82 5mqcies2kf 67xowc068o1lphve89 hgyzoqhg5b013jrzsnyvohuabipc c2xvj1b", "1u7tig 75mvu p9 lc7pmjlupk4rg5l 4v7v1yw652tw3fdexmh7 8w820v4mahjmrhn9 s 137ug20nx94d10 m8ftysdm 8p8"], ["0cqwy19 i9 6ku iyvv2fm le2txv6 b1jr56 3g a1k9r y5cvrifivptj59 z4djugpkf 8ggzrduxgw7r2mthwafrcncini7"]}]

19:26:40.474 [debug] ubtxl39ch8's updated feed: [{"0iodyy9i02djlqx58zhmubqz75zpljgzk96 u2j88u b43s18xc95dgbstdu681aw8 a8ae2f9tnuvxvy8 xiojxz0crg6z2ay2", "ro3tm3jx rah4xifv ollb2k2hg 38vc4b of bk 3s3es4l lerwhttnc37t6 rlf ht8lcn49ha vmcc2h iy9rbwub3 xh93", "k3gxtbf2tvir9oq9nkykblkd3s00fdzpxl k f7ws g v 9xj1h c1klp1rde2eki 4 s0hk5hu6lkboxwh724qm qggzdqor4f1", "zx2pouzxaof703orjqvpa2 lko1cvc243q mcd j02apcxnyo a9x5bt195j8n 6anv86zff kw8vo42hyeqsl4a3wlejgh7q6v", "z9ly4tr2owxe jkxl942ghw dmhsgkkl1lrhp6ptkpy2uj53qbf664yi6zo1mve1qfcqz1d 1kb58 z6ue fludxda e9tdfm so0", "qrp273kpo89 xwi9o c2g300svalcc82 5mqcies2kf 67xowc068o1lphve89 hgyzoqhg5b013jrzsnyvohuabipc c2xvj1b", "1u7tig 75mvu p9 lc7pmjlupk4rg5l 4v7v1yw652tw3fdexmh7 8w820v4mahjmrhn9 s 137ug20nx94d10 m8ftysdm 8p8"], ["0cqwy19 i9 6ku iyvv2fm le2txv6 b1jr56 3g a1k9r y5cvrifivptj59 z4djugpkf 8ggzrduxgw7r2mthwafrcncini7"]}]

19:26:40.517 [debug] cua9tag6ii's feed: ([], [])

19:26:40.517 [debug] cua9tag6ii's updated feed: [{"8r4 sqoqjhzr146n2 nx1kejad 7 ttv8ivb rwtlwqd188unvyhp28cu xr0ii426ad i8k8 fgaosqud3lgoticplpehvmt2p"}, ([])]