Project 4 Report: Reddit Clone

Group Members

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Performance Metrics

Below are the performance numbers for the simulation of 1000 users:

Performance Metrics:
Runtime: 2.3174478s
Total Users: 1000 (Active: 561)
Total Posts: 2101
Total Comments: 326
Total Votes: 19678
Operations/sec: 9538.51

Different Observations:-

User	Active User	Post	Comment	RunTime(seconds)
1000	524	3511	544	6.3
1000	561	2101	326	2.3
1000	700	5000	12520	3.4
1000	210	5000	12470	2.4

```
Performance Metrics:
Runtime: 6.3722296s
Total Users: 1000 (Active: 524)
Total Posts: 3511
Total Comments: 544
Total Votes: 47686
Operations/sec: 8119.76
PS C:\Users\gargm\reddit-clone>
```

```
Performance Metrics:
Runtime: 2.3174478s
Total Users: 1000 (Active: 561)
Total Posts: 2101
Total Comments: 326
Total Votes: 19678
Operations/sec: 9538.51
PS C:\Users\gargm\reddit-clone>
```

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```
Message sent from user999 to user160: Hello!      Message sent from user880 to user421: Hello!

Performance Metrics:                              Performance Metrics:
Users: 1000                                       Users: 1000
Runtime: 3.4747154s                               Runtime: 2.4221724s
Total Posts: 5000                                 Total Posts: 5000
Total Comments: 12520                             Total Comments: 12470
Total Votes: 16624                                Total Votes: 0
Total Messages: 291                               Total Messages: 304
Operations/sec: 9910.16                           Operations/sec: 7338.04
PS C:\Users\gargm\reddit-clone>                   PS C:\Users\gargm\reddit-clone>
```

Instructions to Run

1. Unzip the `project4.zip` file.

2. Ensure Go is installed on your system (minimum version: 1.19).

3. Open a terminal and navigate to the project folder.

4. Run the following command to execute the project:

go run main.go

go run client.go

To run the tester, open the tester.go file and in the terminal use the command go run tester.go(verifies the information)

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5. The program will simulate 1000 users posting, commenting, voting, and sending messages on the platform.

6. Performance metrics will be printed in the terminal upon completion.

Description

This project implements a Reddit-like engine with the following features:

1. **User Registration**: Allows users to create unique accounts using the `RegisterAccount` function.

2. **Subreddit Management**:

   - **Create Subreddit**: Users can create new subreddits using the `CreateSubreddit` function.

   - **Join Subreddit**: Users can join existing subreddits using `JoinSubreddit`.

   - **Leave Subreddit**: Users can leave subreddits they no longer want to participate in using `LeaveSubreddit`.

3. **Posting**:

   - **Post in Subreddit**: Users can submit posts to subreddits using `PostInSubreddit`.

4. **Commenting**:

   - **Comment on Posts**: Users can add comments to posts using the `CommentOnPost` function.

   - **Hierarchical Comments**: Comments are stored hierarchically, allowing replies to both posts and comments.

5. **Voting**:

   - **Upvote and Downvote**: Users can upvote or downvote posts and comments using `Upvote`, which updates the overall karma of the user.

6. **Messaging**:

- **Direct Messaging**: Users can send private messages to each other using `SendDirectMessage`.

- **Retrieve Messages**: Users can fetch their messages using `GetDirectMessages`.

7. **Feed Generation**:

- **Personalized Feed**: Users can retrieve posts from subreddits they have joined using `GetFeed`.

8. **Simulator**:

- Simulates activity of 1000 users performing actions such as posting, commenting, voting, and messaging.

- Introduces delays and models user activity with concurrent goroutines for realism.

9. **Performance Metrics**:

- Measures runtime, total posts, comments, votes, messages, and operations per second to evaluate scalability.