Exabloom

Backend Technical Test

Objective

Develop a high-performance backend system capable of efficiently managing and querying a large-scale contact and messaging database.

Requirements

0. Before you start

You are only allowed to use PostgreSQL for the database.
You are only allowed to use Express for your backend

1. Database Setup

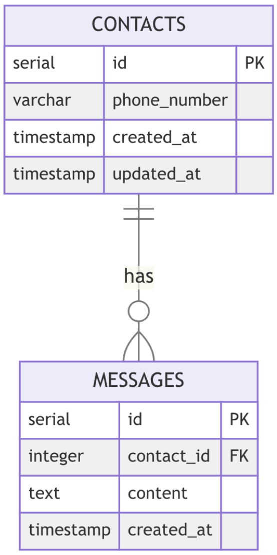
Create a database with two primary tables: contacts and messages. Schema is provided. Structure the messages table to store messages associated with the contacts.

2. Data Generation

Populate the database with 100,000 dummy contacts and 5 million messages randomly distributed among the contacts. For the messages, please incorporate the data in 'message_content.csv' (about 180k rows).

Download 'message_content.csv' here:
https://drive.google.com/file/d/1hwQyxSSYU5dhBjjZSbRiGC0QDafnLqyZ/view?usp=sharing

You can then generate dummy messages to produce a total of at least 5 million rows by using the message content within the csv.



Ensure a realistic distribution of messages across contacts.

3. Query Implementation

1. Implement an efficient query to retrieve the 50 most recent conversations, where:
   - A conversation is defined by the last message to or from a contact.
   - Results are ordered by the timestamp of the most recent message in descending order.

2. Incorporate pagination functionality to allow retrieval of subsequent sets of 50 conversations.

3. Implement a search feature that accepts a "searchValue" parameter, filtering results based on:
   - Message content
   - Contact name
   - Contact phone number

4. Performance Optimisation

Implement appropriate optimisations to enhance query performance.
You are permitted to make necessary modifications to the database schema to achieve optimal performance.

Evaluation Criteria

Correctness and completeness of the implementation
Query performance and scalability

Submission Guidelines

1. Upload all necessary code, scripts, and SQL queries to a public GitHub repository. Include a comprehensive README file with:

- Detailed setup instructions
- System requirements
- Any assumptions made during development
- Brief explanation of key design decisions

2. Record a video (using Loom with webcam ON) presentation that:

- Demonstrates the query performance
- Discusses the optimization strategies employed
- Addresses any challenges encountered and how they were overcome

3. Send the Github Repository link and video url via email to raffles@exabloom.com with subject “[Stage 2] Full Stack Software Engineer Intern / Backend: <Your Full Name>”

All the best