Documentation for AskToMentor Database Design

Overview

AskToMentor is a platform that connects mentees with mentors for various academic and career-related guidance. To efficiently manage the mentor-mentee interactions and provide a robust recommendation system, we have designed two databases. The first database focuses on storing information related to mentor ratings, sessions, and feedback. The second database is used for the recommendation system, which helps match mentees with mentors who align with their preferences and requirements.

Importance of Using MongoDB

MongoDB is chosen as the database for this project due to its flexible schema design, scalability, and ease of use. Given that our data involves complex relationships and nested structures (such as multiple sessions for a single mentor), MongoDB's document-based storage allows us to store related data in a hierarchical format. This approach minimizes the need for complex joins and offers faster querying capabilities. MongoDB's ability to handle large volumes of unstructured data makes it ideal for the dynamic nature of mentor-mentee interactions.

Database 1: Final Rating Prediction Database

The Final Rating Prediction Database is designed to store details related to each mentor's sessions, feedback, and ratings. This data is crucial for calculating the mentor's final rating, which is an aggregate measure of their performance based on mentee feedback.

Fields in Final Rating Prediction Database

- _id: Unique identifier for each document

- mentor_id: Unique identifier for the mentor

- mentor_name: Name of the mentor

- mentor_final_rating: The average rating of the mentor, calculated from all individual mentee ratings

- mentees: An array containing details of each mentee who has interacted with the mentor

Each element in the mentees array includes:

- mentee_id: Unique identifier for the mentee

- mentee_name: Name of the mentee who requested a session

- requested_date: Date when the mentee requested the session, stored in ISO format (YYYY-MM-DD)

- requested_time: Time when the mentee requested the session, in 24-hour format (HH:MM)

- status: Indicates whether the session request was accepted or rejected (Accepted/Rejected)

- session_type: Type of session requested (One-on-One/Group/Workshop)

- session_duration: Duration of the session in minutes or hours

- session_held: Status of the session, indicating if it was held on time, delayed, or suspended (On time/Delay/Suspend)

- mentor_response_time: Time taken by the mentor to respond to the mentee's request (within 24 hours, within 48 hours)

- feedback: Feedback provided by the mentee regarding the session

- mentee_rating: Rating given by the mentee to the mentor (1-5 scale)

- mentee_satisfaction_level: Derived field indicating the sentiment of the mentee's feedback (Positive/Neutral/Negative)

Example Document

```
{

  "_id": "1",

  "mentor_id": "mentor_123",

  "mentor_name": "John Doe",

  "mentor_final_rating": 4.5,

  "mentees": [

    {

      "mentee_id": "mentee_001",
```

```json
    "mentee_name": "Alice Smith",

    "requested_date": "2024-09-01",

    "requested_time": "10:00",

    "status": "Accepted",

    "session_type": "One-on-One",

    "session_duration": 60,

    "session_held": "On time",

    "mentor_response_time": "within 24 hours",

    "feedback": "Great session, very informative!",

    "mentee_rating": 5,

    "mentee_satisfaction_level": "Positive"
},
{

    "mentee_id": "mentee_002",

    "mentee_name": "Bob Johnson",

    "requested_date": "2024-09-02",

    "requested_time": "14:30",

    "status": "Rejected",

    "session_type": "Group",

    "session_duration": 90,

    "session_held": "N/A",

    "mentor_response_time": "within 48 hours",

    "feedback": "N/A",

    "mentee_rating": 0,

    "mentee_satisfaction_level": "Neutral"
}
```

]
}

Purpose of the Final Rating Prediction Database

This database helps in understanding each mentor's performance over time by capturing detailed feedback from mentees. The data stored in this database is used for:

- Calculating the final rating of mentors, which will influence their visibility and credibility on the platform.

- Performing sentiment analysis on the feedback to understand the overall satisfaction of mentees.

- Analyzing mentor responsiveness and session outcomes to improve the quality of services offered.

Database 2: Recommendation System Database

The Recommendation System Database is designed to store detailed information about mentors. This information will be used to match mentees with mentors who meet their preferences, such as specific skills, experience, and availability.

Fields in Recommendation System Database

- _id: Unique identifier for each document

- mentor_id: Unique identifier for the mentor

- full_name: Full name of the mentor

- about: Brief description about the mentor

- location: Location of the mentor

- headline: Headline used by the mentor to describe themselves

- skills: List of skills that the mentor possesses

- education: Educational background of the mentor

- experience: Brief summary of the mentor's professional experience

- rating: The final predicted rating from the Final Rating Prediction Database

- available_day: Days when the mentor is available (e.g., Monday, Wednesday)

- available_time: Time slots when the mentor is available, in 24-hour format (HH:MM-HH:MM)

- subject: Preferred subject(s) the mentor wants to teach

- specialization: Specific topics or areas within the preferred subject that the mentor specializes in

- year_of_experience: Total years of experience the mentor has

- language: Languages the mentor can speak

- availability_status: Indicates whether the mentor is currently available to take new mentees (Yes/No)

- mentor_image_url: URL of the mentor's profile picture

- mentor_rating_trend: Indicates whether the mentor's rating is improving, declining, or stable over time

- certifications: List of relevant certifications held by the mentor

- courses_taught: Specific courses or curricula that the mentor has taught in the past

- preferred_teaching_style: Indicates whether the mentor prefers a structured or flexible teaching style

- background_image: URL of a background image that represents the mentor's profile

Example Document

```
{

  "_id": "2",

  "mentor_id": "mentor_456",

  "full_name": "Jane Doe",

  "about": "Passionate educator with a focus on data science and machine learning.",
```

"location": "Mumbai, India",

"headline": "Data Science Mentor",

"skills": ["Python", "Machine Learning", "Data Visualization"],

"education": ["MSc in Computer Science", "PhD in Data Science"],

"experience": "Over 10 years of experience in data science and teaching",

"rating": 4.8,

"available_day": ["Monday", "Wednesday", "Friday"],

"available_time": "09:00-12:00",

"subject": "Data Science",

"specialization": ["Machine Learning", "Data Analysis"],

"year_of_experience": 10,

"language": ["English", "Hindi"],

"availability_status": "Yes",

"mentor_image_url": "https://example.com/jane_profile.jpg",

"mentor_rating_trend": "Improving",

"certifications": ["Certified Data Scientist", "Python for Data Science"],

"courses_taught": ["Introduction to Data Science", "Advanced Machine Learning"],

"preferred_teaching_style": "Structured",

"background_image": "https://example.com/jane_background.jpg"

}

Purpose of the Recommendation System Database

The purpose of this database is to:

- Provide a comprehensive profile of each mentor to assist in matching them with suitable mentees.

- Enhance the recommendation algorithm by including detailed information such as mentor skills, availability, specialization, and preferred teaching style.

- Offer mentees a better selection process by presenting them with mentors whose skills, experience, and availability align with their needs.

Importance of Two Separate Databases

The reason for creating two separate databases is to optimize the system's performance and functionality:

- Final Rating Prediction Database: Focuses on capturing session-level details and feedback to compute mentor ratings. This data is primarily used for analytics and reporting purposes to assess mentor performance and identify areas for improvement.

- Recommendation System Database: Contains rich profile information about each mentor, which is used by the recommendation algorithm to suggest the most suitable mentors to mentees. This database is optimized for quick lookups and filtering based on multiple criteria.

By separating these concerns, we ensure that the system is scalable, maintainable, and performs efficiently for both real-time recommendations and analytical tasks.