Synopsis for

Cognitive Tutor Recommendation System

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I. Title of the Project: -

Cognitive Tutor Recommendation System

II. Introduction and Objectives: -

a) Introduction: -

The Private Tutor Finder system is a pioneering platform designed to transform the trad
approach to private tuition in India by leveraging modern technology to bridge the ga
parents and qualified tutors. This system is developed in response to the increasing d
personalized education and aims to simplify the process of finding, evaluating, and booking tu
Additionally, it provides a robust platform for tutors to reach a broader audience, thereby enh
their professional opportunities and visibility.

The platform caters to the unique needs of three primary stakeholders: parents, tutors,
admin. By offering a user-friendly interface and integrating advanced technologies such as ma
learning for recommendations and sentiment analysis, the system promises to streamli
educational process and improve overall user experience.

b) Objectives: -

The key objectives of the Private Tutor Finder system are –

- User-Friendly Platform: To create an intuitive and easy-to-navigate platform that connec
  parents with tutors in their vicinity.
- Profile Management for Tutors: To allow tutors to manage their profiles, interact
  potential students, and update their availability and specialities.

- Administrative Oversight: To enable admin to oversee the system, manage tutor profiles and maintain an e-book library.
- Machine Learning Integration: To implement machine learning algorithms for recommending tutors based on specific criteria and analysing tutor reviews to enhance feedback and rating system.

III. Project Category: -

The project falls under the categories of:

- RDBMS: Relational Database Management System
- Artificial Intelligence: Incorporating machine learning algorithms for recommendations and sentiment analysis.

IV Tools/Platform: -

- Tools/Platform:
  - Backend: PYTHON
  - Frontend: HTML, CSS, JavaScript (Web Frame work: Flask)
  - Database: MySQL
  - Machine Learning Libraries:
    - Scikit-learn for Decision Tree and Sentiment Analysis
    - Tensor Flow
    - PyTorch

V Hardware and Software Requirement Specifications: -

- Hardware Requirements:
  - Server with at least 8 GB RAM and 500 GB HDD.
  - Client machines with at least 4 GB RAM and 250 GB HDD.

- Software Requirements:
  - Operating System: Windows/Linux/MacOS
  - Web Server: Apache/Nginx/Flask (Framework)

- IDE: Visual Studio Code/Pycham
- Browser: Chrome/Firefox

VI Problem Definition and Requirement Specifications:-

- Problem Definition:

Parents often struggle to find suitable tutors for their children. The traditional met
are time-consuming and inefficient. The Private Tutor Finder system aims to prov
seamless solution to this problem by offering an online platform where parents c
evaluate, and book tutors based on specific criteria.

- Requirement Specifications:

  - Functional Requirements:
    - User Registration and Login
    - Tutor Profile Management
    - Admin Management
    - Tutor Search and Filter
    - Booking and Rating Tutors
    - E-Book Library Access
    - Machine Learning-based Recommendations

  - Technical Specifications:
    - Secure login mechanisms
    - Data encryption for sensitive information
    - Efficient database queries and indexing
    - Scalable architecture to handle growing user base

VII Project Planning and Scheduling: -

- Gantt Chart
- PERT Chart

GANTT CHART

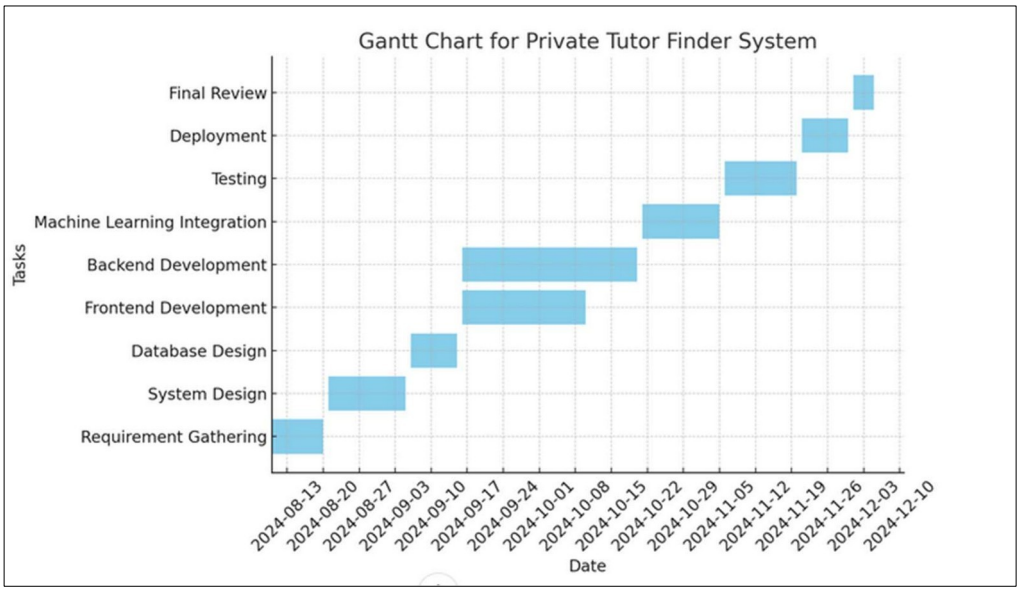

Chart I

PERT CHART

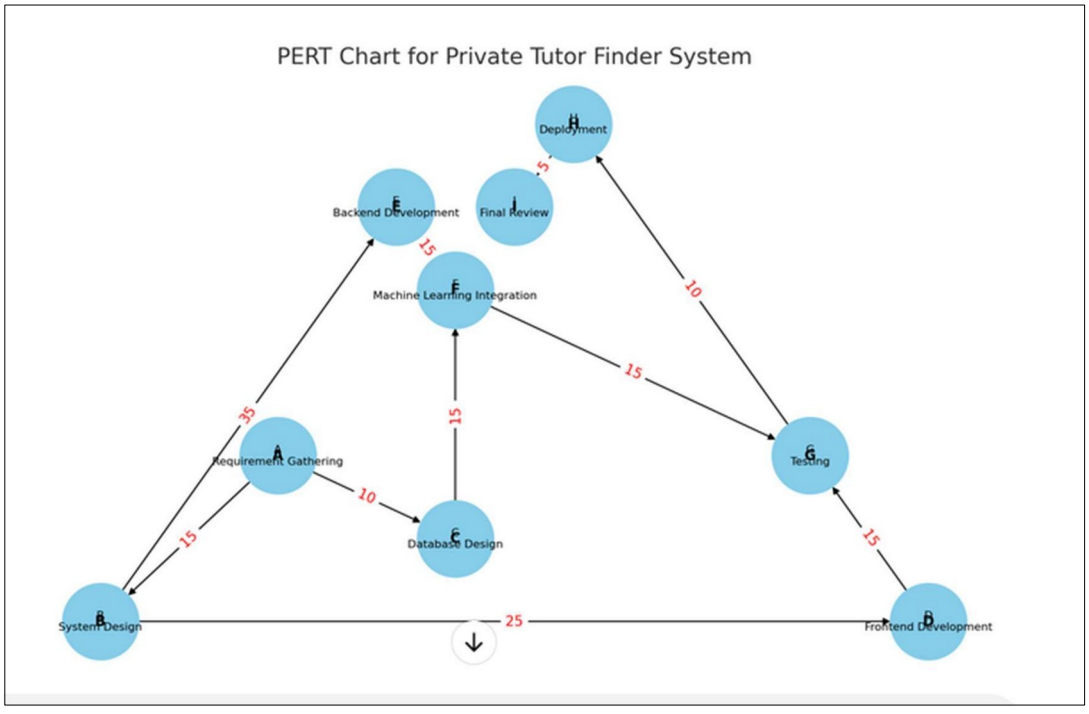

Chart II

VIII Scope: -

The system is designed to encompass the functionalities required by three main Admin, Parents, and Tutors. Each of these entities has distinct features that ensure se interaction and efficient management within the platform. The scope of the system includes:

- Admin functionalities for managing tutors, parents, and e-books.
- Parent functionalities for registering, filtering tutors, requesting demo lectures, booking and accessing e-books.
- Tutor functionalities for profile management, accepting demo lecture requests, and managing bookings.

IX Analysis: -

- Data Flow Diagrams (DFDs):
    - Level 0 DFD: Overview of the system

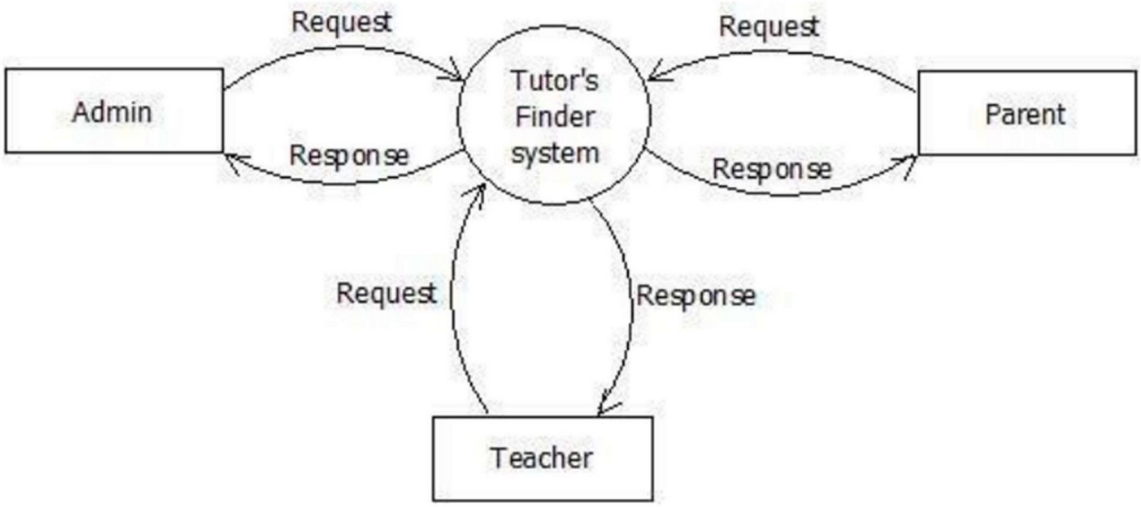

Figure 1

- Level 1 DFD: Admin Level

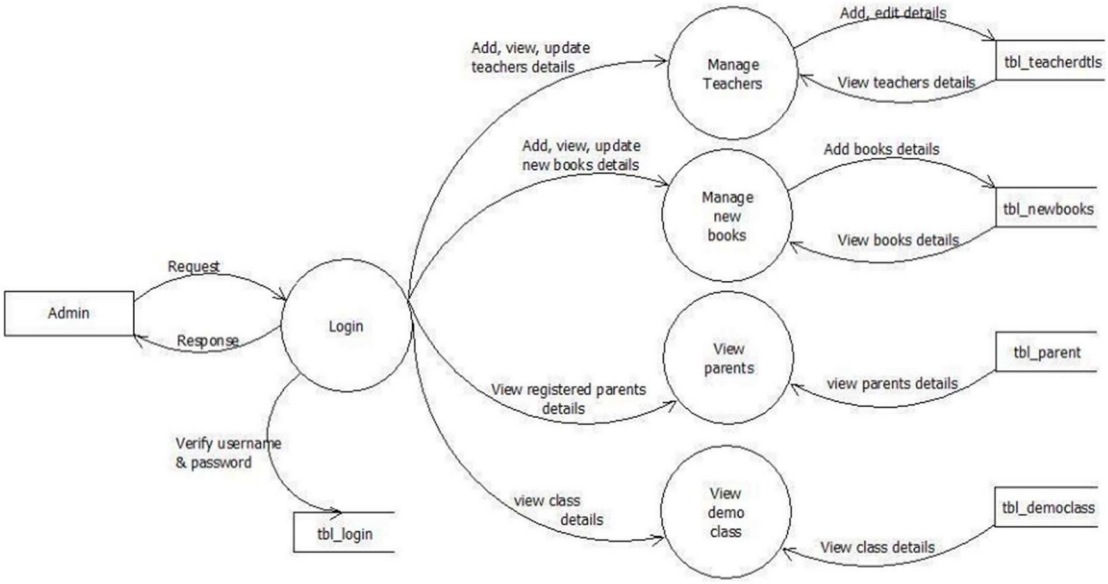

Figure 2

- Level 2 DFD: Teacher Level

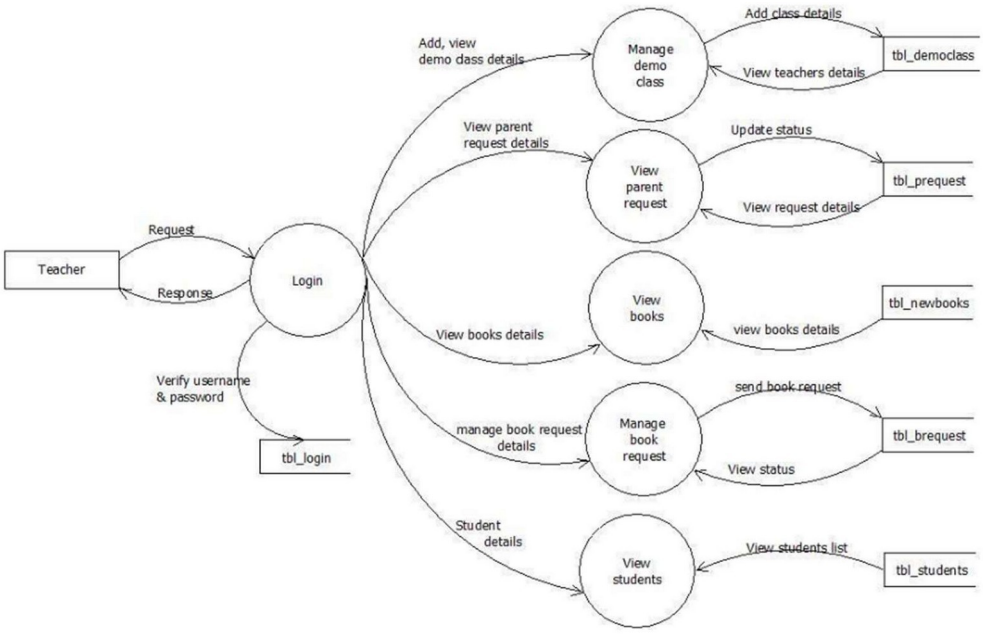

Figure 3

- Level 3 DFD: Parent Level

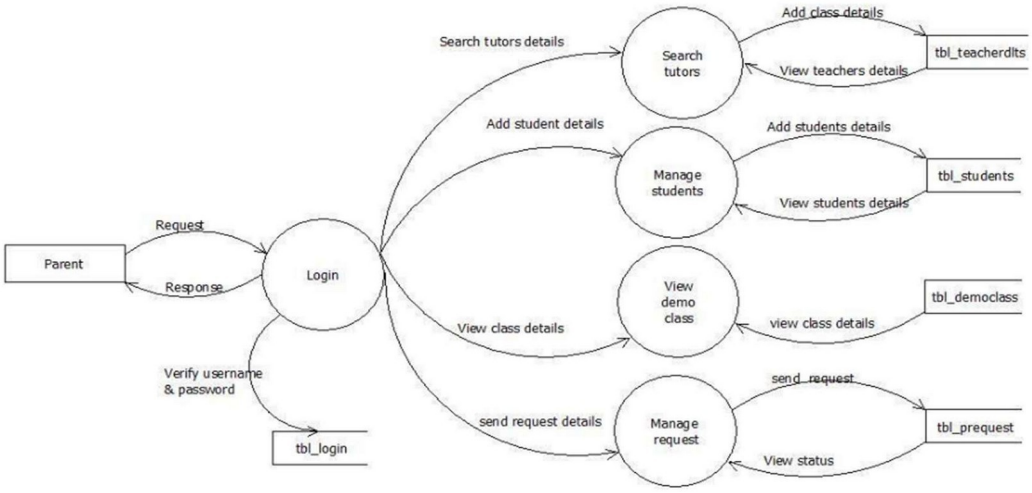

Figure 4

- Entity – Relationship (ER) Diagrams:

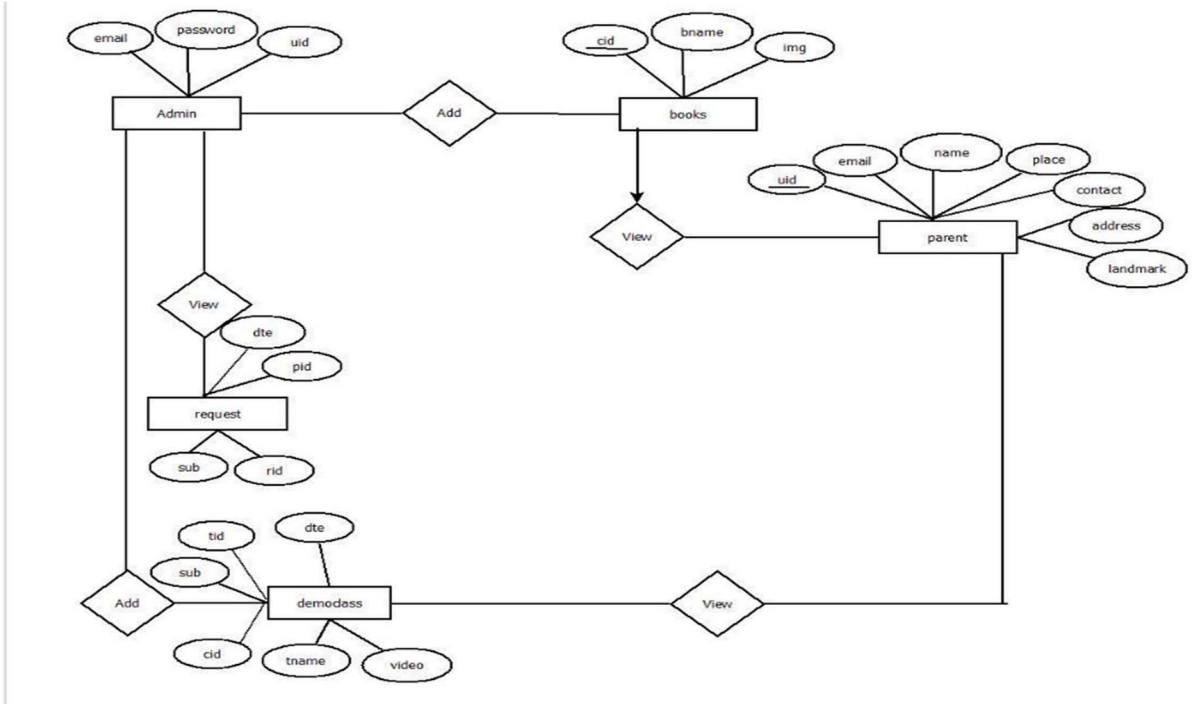

Figure 5

- Activity Diagram:

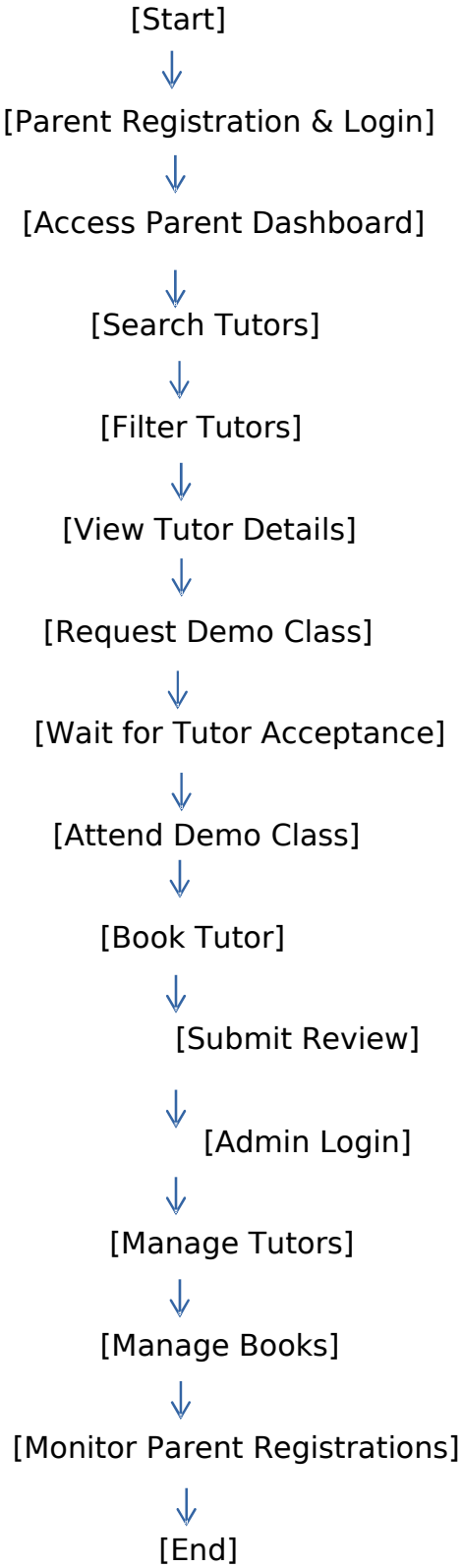

Figure 6

X Database and Tables Detail: -

Database Structure:

Tables: 1

Table Name: tbl_parent

Primary key: pid

Field Name	Data Types	Constraints	Description
Pid	Int(5)	Primary key	Parent registration id
Pname	Varchar(25)	Not Null	Name of parent
Address	Varchar(30)	Not Null	Address
Cno	Bigint(12)	Not Null	Contact number
Email	Varchar(30)	Not Null	Email of Parent

Tables: 2

Table Name: tbl_login

Foreign key: uid

Field Name	Data Type	Constraints	Description
Uid	Int (5)	Foreign key	Login id
Uname	Varchar (25)	Not Null	Username
Upass	Varchar (30)	Not Null	User password
Utype	Varchar (20)	Not Null	User type

Tables: 3

Table Name: teachers

Primary key: slno

Field name	Data Type	Constraints	Description
*slno	Int (5)	Primary key	Teacher id
Tname	Varchar (25)	Not Null	Name of teacher
T_address	Varchar (30)	Not Null	Address
T_place	Varchar (25)	Not Null	Place
gender	Varchar (8)	Not Null	Gender
T_cno	Bigint (12)	Not Null	Contact Number

T_subject	Varchar (30)	Not Null	Subject
T_email	Varchar(30)	Not Null	Email id of teacher
Documents	Varchar (20)	Not Null	Documents
Flink	Varchar(20)	Not null	Face book link
Whatsupno	Bigint(12)	Not null	Whatsup number
Atime	Time	Not null	Available time
Adays	Varchar(25)	Not null	Available days
Cls	Varchar(15)	Not null	Class

Tables: 4

Table Name: Newbooks

Primary key: sn

Field Name	Data Types	Constraints	Description
*sn	Int (5)	Primary key	Book id
Bname	Varchar(25)	Not Null	Name of book
Author	Varchar(30)	Not Null	Author name
Publication	Varchar(30)	Not Null	Book publications
Subject	Varchar(30)	Not Null	Subject
Rackno	Int(5)	Not Null	Rack number
Nbooka	Int(5)	Not Null	No of books
Image	Varchar(50)	Not Null	Images of books

Tables: 5

Table Name: democlass

Primary key: sno

Field Name	Data Types	Constraints	Description
*sno	Int (5)	Primary key	Class id
Subject	Varchar (25)	Not Null	Subject of class
Cdetails	Varchar(30)	Not Null	Class details
Video	Varchar (50)	Not Null	Class videos

**Tid	Int (5)	Foreign key	Teachers id
Dte	Date	Not null	Date
**Tname	Varchar (20)	Foreign key	Name of teacher

Tables: 6

Table Name : sbreq

Primary key: sn

Field Name	Data Types	Constraints	Description
*sn	Int (5)	Primary key	Book request id
**Bid	Int (5)	Foreign key	Book id
**Bname	Varchar (30)	Foreign key	Book name
**Tid	Int (5)	Foreign key	Teacher id
Tname	Varchar (30)	Not Null	Name of teacher
Dte	Date	Not Null	Date
Status	Varchar (25)	Not Null	Status

Tables: 7

Table Name : Tbl_demo

Primary key: sn

Field Name	Data Types	Constraints	Description
*sn	Int (5)	Primary key	Parent class request id
**Tid	Int (5)	Foreign key	Id of teacher
*Pid	Int (5)	Foreign key	Id of parent
Pname	Varchar (25)	Not Null	Name of parent
**Sid	Int (5)	Foreign key	Id of students
Sname	Varchar (25)	Foreign key	Name of students
Subject	Varchar	Not Null	Subject
Dte	Date	Not Null	Date
Cdetails	Varchar (30)	Not Null	Class details for student
Img	Varchar (50)	Not Null	Student picture
Clink	Varchar (25)	Not Null	Class link

Status	Varchar (20)	Not Null	Status

Tables: 8

Table Name : students

Primary key: sid

Field Name	Data Types	Constraints	Description
*Sid	Int (5)	Primary key	Student id
Sname	Varchar (25)	Not Null	Name of students
**Pname	Varchar (30)	Foreign key	Name of parent
**Pid	Int (5)	Foreign key	Id of parent
Clad	Varchar (30)	Not Null	Class
Img	Varchar (50)	Not Null	Image of students

Tables: 9

Table Name : rating

Primary key: rid

Field Name	Data Types	Constraints	Description
*Rid	Int (5)	Primary key	Rating id
**Tname	Varchar (25)	Foreign key	Name of tutor
*Tid	Int(5)	Foreign key	Tutor id
Subject	Varchar(25)	Not Null	Subject
Rtng	Int (8)	Not Null	Rating
**Pid	Int (5)	Foreign key	Parent id
Dte	Date	Not Null	Date

Tables: 10

Table Name: messages

Primary key: id

Field Name	Data Types	Constraints	Description
*id	Int (5)	Primary key	Message id
**uid	Int (5)	Foreign key	User id

**did	Int (5)	Foreign key	Tutor id
Message	Varchar (25)	Not Null	Message
Dte	Date	Not Null	Date
**uname	Varchar (20)	Foreign key	Parent name
**dname	Varchar (20)	Foreign key	Tutor name

XI System Features: -

- Admin
  - Login: Secure access to the admin portal.
  - Manage Tutors: Add new tutors, update profiles, and register tutors by providing credentials via email.
  - Manage E-Books: Add and manage e-books in the library.
  - Manage Parents: View and manage registered parents' details.
- Parents
  - Registration and Login: Simple registration and secure login process.
  - View and Filter Tutors: Browse through tutor profiles, filter based on subject and experience.
  - Request Demo Lecture: Request a demo lecture with selected tutors.
  - Book and Rate Tutors: Book tutors online after demo lectures and provide ratings based on the experience.
  - Access E-Books: View and utilize the e-book library.
- Tutors
  - Login: Secure login using credentials provided by the admin.
  - Profile Management: Set up and update their profile information.
  - Manage Requests: View and accept demo lecture requests, manage bookings.
- Machine Learning Integration
  - Collaborative Filtering: recommends tutors to parents based on the preferences o other parents with similar interests.
  - Content – Based Filtering: recommend the tutors based on the profile and preferences of a parent by considering attributes like subjects, location, and experience

- Decision Tree Algorithm: This algorithm recommends tutors to parents based on t subject and experience criteria, helping parents make informed decisions.
- Sentiment Analysis: This algorithm parent reviews to award points to tutors, enhancing the rating system by providing more nuanced feedback.
- Use Scikit-learn for content-based filtering / developing a custom model using TensorFlow or PyTorch

XII System Modules

- Registration Module
  - Register Parents: Handles the registration of parents, ensuring a simple and secur process.
- Book Details Module
  - Add New Books: Admin can add new books to the library.
  - Update Book Details: Admin can update details of existing books.
- Booking Request Module
  - Send Book Request: Parents and tutors can request books.
  - Update Request: Admin can update the status of book requests.
- Demo Class Module
  - Add Demo Class Details: Admin can add details of demo classes.
  - Update Demo Class: Admin can update demo class information.
  - View Demo Class Video: Parents can view demo class videos.
- Tutor’s Request Module
  - View Demo Class: Parents can view demo classes for tutors.
  - Send Request for Tutor: Parents can send requests for tutors after viewing demo classes.

- Views Module
  - Tutor’s List: View a list of registered tutors.
  - Parent’s List: View a list of registered parents.
  - Student’s List: View a list of students.
  - Books List: View a list of available books.
  - Demo Class: View demo class details.
  - Booking Request: View and manage booking requests.
    - Approved: View approved booking requests

- Rejected: View rejected booking requests.
- Tutor's Request: View and manage tutor requests
  - Approved: View approved tutor requests.
  - Rejected: View rejected tutor requests.

XIII Data Structures:

- Arrays and lists for storing temporary data.
- Hash maps for quick lookup operations.

XIV Implementation Methodology:

- Agile Development: Iterative development with continuous feedback and improvements

XV Reports:

- User Activity Reports
- Booking Reports
- Tutor Performance Reports

XVI Implementation of Security Mechanisms:

- User Authentication: Secure login using hashing algorithms.
- Data Encryption: Encrypt sensitive data stored in the database.
- Access Control: Role-based access control for different user types.

XVII Future Scope and Further Enhancement

- Mobile Application: Develop a mobile app for easier access.
- Advanced Analytics: Implement more advanced analytics for better insights.
- Integration with Other Platforms: Integrate with educational platforms for additional resources.

XVIII Expected Outcomes: -

- Robust and Scalable Platform: A platform capable of managing tutor-student interaction efficiently.
- Enhanced Tutor Visibility: Improved visibility for tutors, leading to better professional opportunities.

- Improved Student Learning Experiences: Enhanced learning experiences for students through better tutor matches.
- Data-Driven Recommendations: Recommendations based on data analysis to continuall improve service quality.

XIX Challenges and Solutions: -

- Data Privacy: Implementing strong security measures to protect user data.
- Scalability: Ensuring the system can handle a growing number of users efficiently.
- Machine Learning Accuracy: Continuously refining algorithms for better recommendations and sentiment analysis.

XX Conclusion

The Private Tutor Finder system aims to bridge the gap between parents seeking education for their children and tutors looking for teaching opportunities. By integrating adva technologies and user-centric features, this system has the potential to significantly im private tuition landscape in India. The platform's emphasis on personalized education, management, and data-driven recommendations promises to enhance the overall educational experience for both students and tutors.

XXI Bibliography: -

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