System Design Specification

Project Name: FindAcademia
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1. System Overview

The **FindAcademia** system is designed to provide users with a platform to search for IT and Management colleges across India. The system comprises several key components that work together to deliver a seamless user experience. These components include:

- **User Interface (UI):** A web-based front-end developed using HTML, CSS, and JavaScript, allowing users to search for colleges by city, state, category, and course.
- **Database:** A SQL-based database storing information on colleges, including their names, addresses, contact details, categories, and courses offered.
- **Backend Server:** A server built using Node.js and Express that handles user requests, processes search queries, and retrieves relevant data from the database.
- **Search Algorithm:** The search engine filters colleges based on user input and displays relevant results in real-time.
- **System Architecture:** The system follows a client-server architecture where the front-end interacts with the backend through API calls, and the backend communicates with the database to fetch and display the results.

2. System Architecture

The **FindAcademia** system architecture is designed as a distributed client-server system that ensures seamless interaction between the user interface, server, and database. The architecture focuses on efficiency, reliability, and scalability.

The system architecture includes the following key characteristics:

- **Operational Architecture Characteristics**:
  - **Availability**: The system ensures continuous access for users to search for colleges.
  - **Performance**: The application provides fast response times for search queries.
  - **Reliability**: Data retrieval and display are consistent, minimizing downtime.
  - **Scalability**: The architecture can be scaled to handle a larger number of users and data as required.
- **Structural Architecture Characteristics**:
  - **Configurability**: The system allows easy configuration of new data or colleges into the database.
  - **Extensibility**: It can be expanded with additional features, such as advanced search filters.
  - **Portability**: The system is designed to be deployed across various platforms, including Windows and Linux.
- **Cross-Cutting Architecture Characteristics**:
  - **Security**: The system ensures secure data handling and user privacy.
  - **Usability**: The user interface is intuitive, making it easy for users to search for and find colleges.
  - **Privacy**: User data and search results are handled confidentially.

5.1 Architectural Strategies

The **FindAcademia** system is built using the following major components:

- **Frontend (User Interface)**: Developed using HTML, CSS, and JavaScript, providing users with an easy-to-navigate interface to search for colleges.

- **Backend (Server)**: Node.js and Express are used for handling requests, processing data, and communicating with the database.

- **Database**: A SQL-based database stores college details, including names, addresses, courses offered, and contact information.

- **API Layer**: Connects the frontend to the backend and facilitates data retrieval from the database.

- **Search Algorithm**: Filters and processes user queries to display relevant college results.

- **Security Layer**: Ensures safe data transmission and user data protection.

5.2 Structure and Relationships