VIT Vidyalankar Institute of Technology Accredited A+ by NAAC	DEPARTMENT OF COMPUTER ENGINEERING

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Problem Statement: EduSmart: Crafting Your Learning Journey

Objective: To develop an intelligent web based-application that suggests courses to students from diverse career fields based on their chat history with the EduBot. The system will utilize a chatbot for data collection, store information securely using blockchain technology, process inputs with natural language processing (NLP), and provide personalized course suggestions using machine learning (ML). Additionally, the application will employ big data technologies for handling and analyzing large datasets related to course suggestions, ensuring an enhanced and tailored learning experience for each student.

Requirements:

1. **Data Collection:**
    - User Data: Collect data on user academic history, career field, course preferences, and existing skills.
    - Educational Content: Gather information on available courses, learning materials, and resources.
    - Feedback and Ratings: Collect user feedback and ratings on various educational content.

2. **Infrastructure:**
    - Computing Resources: High-performance computing resources for data processing and model training.
    - Storage Solutions: Secure storage solutions for handling large datasets, including cloud storage options.
    - Network Connectivity: Reliable network infrastructure to ensure seamless integration and data transfer.

3. **Software and Tools:**

    - NL**P** Libraries: spaCy, NLTK, Transformers (Hugging Face)
    - Blockchain Platform: Ethereum
    - Machine Learning Libraries: Scikit-learn, TensorFlow, PyTorch
    - Big Data Analytics Framework: Apache Spark, Hadoop
    - Frontend Framework: React.js
    - Backend Framework: Node.js (Express)

Processing Steps:

1. **Data Ingestion and Preprocessing**
    - Ingest data from various sources and preprocess it to handle missing values, normalize data, and perform feature extraction.
    - Use big data tools for processing large datasets efficiently.
2. **Blockchain Integration**
    - Develop and deploy smart contracts to handle secure storage and retrieval of student data.
    - Implement blockchain features to ensure data privacy and integrity.
3. **Feature Engineering**
    - Extract relevant features from the data using NLP techniques.
    - Create features that capture student preferences, performance trends, and course characteristics.
4. **Model Development**
    - Develop machine learning models for course recommendations using collaborative filtering, content-based filtering, or hybrid approaches.
    - Train and validate models to ensure accuracy and relevance of recommendations.
5. **System Integration**
    - Integrate the chatbot interface with the recommendation engine and blockchain system.
    - Ensure seamless data flow and communication between different components of the system.

Expected Outcomes:

1. **Personalized Recommendations:**

    - **Accuracy:** High accuracy in recommending relevant courses based on user data.
    - **Relevance:** Recommendations tailored to individual student needs and history.

2. **Secure Data Handling:**

    - **Data Integrity:** Secure and immutable storage of user information.
    - **Privacy:** Ensure user data privacy through blockchain technology.

Deliverables:

1. **EduSmart System**
    - The final product, which includes all components of the course recommendation system.
2. **Technical Documentation**
    - Provides detailed information on system design, implementation, and usage.
