AI & CODE SPHERE

STEP 1

Understand the CBC Requirements

- Review official documentation, guidelines, and resources provided by KICD
- Understand the objectives, and structure of the CBC its focus on competencies, creativity, and innovation.
- Identify all CBC subjects, grade levels/marking style, and learning areas covered and what is expected at each subject.
- Taxonomize the identified competencies and objectives for machine learning model understanding

STEP 2

Data Collection and Preprocessing

- Educational materials, including textbooks, lesson plans, worksheets, past exams, quizzes, and supplementary resources like non KICD text books
- Clean the data by removing irrelevant information, formatting inconsistencies, and noise.
- Standardize the format of the data to facilitate analysis and modeling.
- Organize the data into structured datasets, categorizing them by subject, grade level, exams, quizzes, examples etc
- Preprocess and transform the raw educational data into formats suitable for model training and evaluation using Pandas, Scikit-Learn, and TensorFlow

STEP 3

Designing the Machine Learning Model

- Provide personalized learning recommendations
- Generating notes, CATs, Quizzes, examples, Marking sheets etc
- Assisting in lesson planning.

Algorithms for text analysis

- Natural Language Processing (NLP): TF-IDF, Word Embeddings (Word2Vec, GloVe), BERT, GPT (like GPT-3)
- Recommendation Algorithms: Collaborative Filtering, Content-Based Filtering, or Hybrid approaches
- Implement and train the algorithms on the cleaned and structured datasets.
- Optimize model performance through hyperparameters tuning, feature engineering and cross validation with other model architecture
- Handle imbalanced data via oversampling, undersampling, or using class weights.

Evaluation Metrics

- Define appropriate evaluation metrics to assess the performance of your model.
- Accuracy, precision, recall, and F1-score for Classification
- Precision@k, recall@k, and mean average precision (MAP) for Recommendation

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STEP 4

Implementation and Deployment

User Interface (UI)

- User-friendly interface for accessing and interacting with the model's functionalities targeting students, teachers, administrations
- Include a sign-up option for subscriptions
- Limit the model accessibility for free version and paid version

Model with UI

- Implement the backend logic of your model and integrate it with the UI frontend.
- Ensure smooth communication between the UI components and the model's functionalities

Testing

- Comprehensive testing to verify the correctness and usability of the model and UI.
- Perform unit tests, integration tests, and user acceptance tests to identify and address any issues or bugs.

Deployment

- Deploy your model and UI either locally or on a cloud platform. We will decide which one is suitable

- Continuous monitoring and maintenance of the deployed system.

STEP 5

Skills Required

- **Data Science**
- Proficiency in data collection, preprocessing, analysis, and modeling. Hadoop for handling big data
- **Machine Learning**
- Knowledge of machine learning algorithms(Classification, NLT, Recommendation, Reinforcement), model development, and evaluation techniques.
- **Programming**
- Proficiency in Python programming and relevant libraries like pandas, Matplotlib, TensorFlow, scikit-learn, and NLTK.
- **Natural Language Processing (NLP)**
- Understanding of NLP techniques for text analysis and processing.
- **Software Engineering**
- Skills in software development, including designing scalable systems and building user interfaces.

Considerations

- **Ethical and Privacy Concerns**: Compliance with data privacy regulations and ethical guidelines when handling educational data. Kenya Data Privacy Police guidelines to be considered
- **Accessibility**
- Design the model and interface to be accessible to users with diverse needs and abilities. Consider persons with disabilities
- **Scalability**
- Consider the scalability of the system to accommodate potentially large user base and increasing volumes of educational content.

ADDITIONAL USEFUL INFORMATION

GitHub Account for collaborative work

https://github.com/AI-CODESPHERE/AI-MODEL

Gmail Account for our organization

Name: AI CODE SPHERE

DOB: 01/01/2024

Account: aicodesphere@gmail.com

Password: AI&CODE6Sphere