Problem Statement

Introduction to Gen AI and Simple LLM Inference On CPU and fine-tuning of LLM Model to create a Custom Chatbot

Unique Idea Brief (Solution)

UNIQUE IDEA: Personalized Learning Companion Chatbot

CONCEPT: Develop a chatbot that serves as a personalized learning assistant,providing tailored educational content, answering questions, assisting with homework, and offering motivational support.

STEPS:

1.Data Collection: Gather educational resources and student interaction data.

2. Preprocessing: Format and annotate data by subject, difficulty, and learning style.
3. Model Selection: Use a base LLM like GPT-4.
4. Fine-tuning: Train the model on educational datasets with feedback from educators.
5. Personalization: Track student progress and adapt responses to individual learning styles.
6. Safety and Evaluation: Ensure content accuracy and appropriateness.
7. Deployment: Launch on web and mobile platforms.

8Continuous Improvement: Regularly update content and incorporate feedback.

Features offered

Features of the Personalized Learning Companion Chatbot

1. Interactive Learning
2. Homework Assistance
3. Progress Tracking

4. Motivational Support

5. 24/7 Availability

6. Tailored Learning Paths

7. Interactive Quizzes and Games

8. Support for Multiple Subjects

9. Communication Skills Enhancement

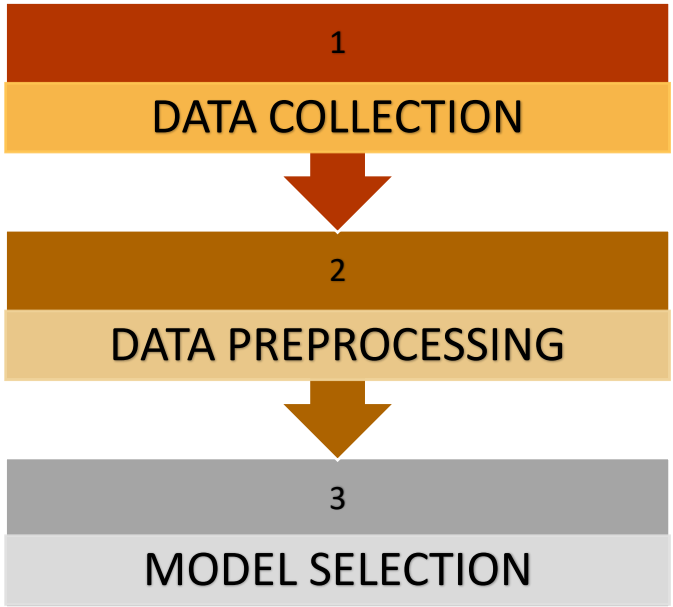
Process flow

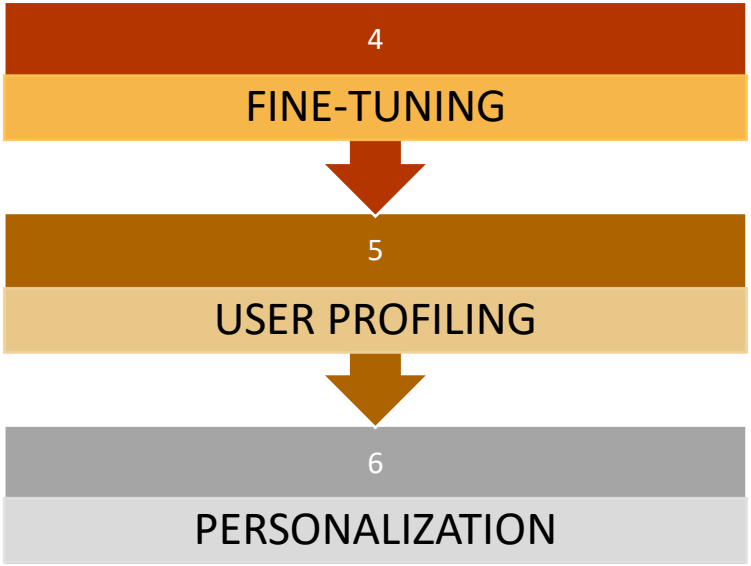
1. **Data Collection**: Gather educational resources and student interaction data from various subjects and grade levels.
2. **Data Preprocessing:** Tokenize and annotate data, categorizing It by subject, difficulty, and learning style.
3. **Model Selection:** Choose a base LLM such as GPT-4 for its comprehensive language capabilities.

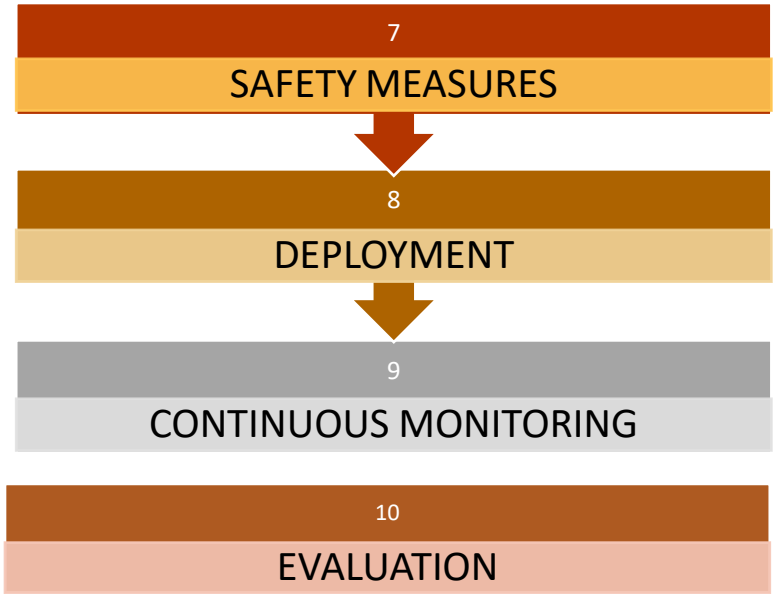
4. **Fine-tuning:** Train the model using the pre-processed Education and dataset with feedback from educators.
5. **User Profiling:** Implement a system to track student progress, learning preferences, and performance.
6. **Personalization:** Adapt the chatbot's responses and recommendations based on individual student profiles.
7. **Safety Measures:** Ensure the chatbot provides accurate, appropriate, and supportive content.

8. **Deployment:** Launch the chatbot on scalable web and mobile platforms.
9. **Continuous Monitoring:** Regularly update the model with new data and incorporate user feedback.
10. **Evaluation:** Continuously assess the chatbot's performance and make improvements based on educator and student feedback.

Architecture Diagram




4
FINE-TUNING
5
USER PROFILING
6
PERSONALIZATION


7
SAFETY MEASURES
8
DEPLOYMENT
9
CONTINUOUS MONITORING
10
EVALUATION

Technologies use

1.Python: Core programming language for developing the chatbot and handling data processing tasks.

2.Transformers (Hugging Face): Library for working with pre-trained language models like GPT-4.

3.PyTorch: Deep learning framework for fine-tuning and deploying the language model.

4.TensorFlow: Alternative deep learning framework, potentially used for model training and evaluation.

5.NLP Libraries: Tools such as spaCy and NLTK for data preprocessing, tokenization, and annotation.

6.Web Technologies: HTML, CSS, JavaScript, and frameworks like React for building the user interface.

7.Mobile Technologies: Flutter or React Native for creating mobile applications.

8.Database Systems: SQL or NoSQL databases for storing user profiles, interaction data, and progress tracking.

9.Cloud Services: AWS, Google Cloud, or Azure for scalable deployment, storage, and computational resources.

10.Monitoring and Analytics: Tools like Prometheus and Grafana for continuous monitoring and performance evaluation

Team members and contribution:

This is a solo project presented by:

Praveen Kumar

Reg no:- 3502210582

From:- Aarupadai Veedu Institute Of Technology, Chennai

B.E-CSE, III YEAR, V SEM, SEC-B.

Contribution:-

In the solo-managed project "Introduction to Gen AI and Simple LLM Inference on

CPU and Fine-tuning of LLM Model to Create a Custom Chatbot," my contributions encompassed the full spectrum of AI development. I began by thoroughly exploring the principles of generative AI and large language models (LLMs). I implemented LLM inference on a CPU, demonstrating efficient AI usage on standard hardware. Additionally, I fine-tuned an LLM to create a customized chatbot tailored to specific conversational needs. This project highlights my dedication to AI innovation and showcases the potential of personalized AI solutions.

Conclusion

The Personalized Learning Companion Chatbot, powered by Intel Unnati, revolutionizes education through advanced AI and machine learning. It offers personalized learning experiences, including interactive lessons, homework assistance, and motivational support, tailored to each student's needs. Using technologies like GPT-4, cloud services, and real-time analytics, the chatbot ensures scalability and adaptability. With a focus

on safety and content accuracy, it creates a reliable learning environment. Supported by Intel Unnati, this project bridges educational gaps, promotes continuous learning, and empowers students to excel, setting a new standard for accessible, quality education.

Thank you.