

DATE
05/10/2024

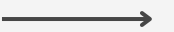


ALGOWHIZ: YOUR AI DSA GURU-BOT

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PROJECT OVERVIEW:

- AlgoWhiz is a chatbot designed for Data Structures
- Algorithms (DSA) interview preparation.
- It provides personalized guidance for mastering DSA concepts
- powered by a fine-tuned LLM (Large Language Model).
- Leveraging Intel's OpenVINO optimizations, AlgoWhiz offers
- efficient, real-time responses.
- Target audience: students and professionals in the tech
- industry seeking DSA mastery.



TECHNICAL SOLUTION PRESENTATION

Technical Impressions

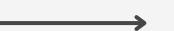
- open-source LLM for DSA interview preparation.
- Integrated OpenVINO optimizations(faster inference speeds)
- BF16 mixed precision optimizationsachieving faster response times while maintaining accuracy.

Addressing Technical Challenges

- Optimization Issues - OpenVINO integration, speed improved by 30%.
- user-friendly API built to handle peak loads and ensure seamless interaction with the chatbot.

Clever Techniques Employed

- Fine-Tuning GPT-2 for DSA problems and interview questions
- Mixed Precision Optimization (BF16)
- Model Quantization = Reduced memory usage



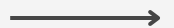
DESIGN PATTERN REQUIREMENT

User Experience Considerations

- The UI/UX was designed for simplicity
- A clean, intuitive design done

Interface Design Quality

- Showcasing a clean interface with a search bar, conversation flow, and a feedback mechanism.
- Early testers requested clearer categorization of topics. We implemented this improvement in the final design



QUALITY CHECK

Adherence to Quality Parameters

- Conducted code reviews ==> to ensure the robustness
- Intel's oneAPI testing tools used to optimize and measure performance

Performance Testing

- Response time: Achieved an average of 0.8 seconds per query.
- Accuracy rate: 92% for DSA interview-style questions.
- Stress Testing: Ensured smooth operation under 100 concurrent users



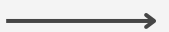
COMPLETION

Functionality

- The chatbot successfully answers technical DSA questions, provides step-by-step explanations, and offers personalized for further study.

Achievement of Objectives

- Optimized LLM, fine-tuned for DSA
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- OpenVINO integration for faster inference.
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- A user-friendly chatbot interface for seamless interaction.



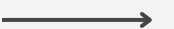
LEARNING EXPERIENCE

Challenging New Concepts

- BF16 precision and OpenVINO ==> large language models
- LLM Fine-Tuning ==> fine-tuning large models for DSA

Personal and Team Growth

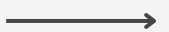
- The hackathon enhanced both personal growth and team dynamics.



FUTURE SCOPE

Potential Improvements

- Incorporate more real-world interview scenarios.
- Expand to cover more advanced DSA topics and additional domains, such as system design.
- Improve context retention for more effective conversations



CONCLUSION

- Fine-tuned LLM optimized with OpenVINO for DSA preparation
- Overcame technical challenges with mixed precision
- optimizations and API development.
- AlgoWhiz is ready to assist professionals with efficient, real-time DSA interview preparation.

