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# CAPSTONE PROJECT

## INTERVIEW TRAINER AGENT

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# OUTLINE

- **Problem Statement** (Should not include solution)
- **Proposed System/Solution**
- **System Development Approach** (Technology Used)
- **Algorithm & Deployment**
- **Result (Output Image)**
- **Conclusion**
- **Future Scope**
- **References**

# PROBLEM STATEMENT

An Interview Trainer Agent, powered by Retrieval-Augmented Generation (RAG), helps users prepare for job interviews by generating personalized question sets and preparation strategies based on their name, experience level, and job role. It retrieves role-specific interview questions, industry expectations, behavioral scenarios, and HR guidelines from recruitment platforms, professional networks, and company interview databases. By allowing users to input their resume or job title, the agent delivers targeted questions, model answers, and improvement tips covering both technical and soft skills. This AI-driven assistant enhances user confidence, refines their responses, and improves success rates in competitive hiring environments.

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# PROPOSED SOLUTION

The proposed solution is an AI-powered Interview Trainer Agent that helps users prepare for job interviews. It creates customized question sets, answer strategies, and improvement tips. It uses IBM Watsonx.ai's Prompt Lab and the Granite-3-3-8B foundation model to generate responses based on the user's job role and experience level.

## **Prompt Design and Use Cases:**

You can design custom prompts to take inputs like job role (for example, Software Developer or Data Analyst) and experience level (such as Fresher or 1 Year Experienced). The tool will generate 4 to 5 interview questions specific to each field, along with short tips or example answers for each question.

## **Foundation Model (Granite-3-3-8B):**

Use the Granite-3-3-8B chat model in Watsonx.ai to create human-like, context-aware interview questions. Apply prompt engineering to improve and tailor responses for different job categories.

## **Platform Setup:**

Set up Watsonx.ai Runtime and create a Prompt Lab environment using IBM Cloud's Lite plan. Organize prompts in "Chat" mode and test different versions based on role and experience.

## **User Experience:**

Users interact with the tool through a simple text-based input in Prompt Lab or within a basic app interface. The assistant offers specific technical and behavioral questions along with suggestions for framing answers.

## **Evaluation and Refinement:**

Manually check the accuracy and relevance of prompt outputs. Adjust prompts based on feedback and requirements specific to each role to enhance personalization.

# SYSTEM APPROACH

- The project uses **IBM Watsonx.ai** to build an AI-powered Interview Trainer.
- Users enter their **job role** and **experience level** as input.
- Using **Prompt Lab** and the **Granite-3-3-8B** model, the system generates:
  - Role-specific interview questions
  - Answer tips and preparation guidance
- No programming libraries are needed — everything runs on **IBM Cloud**.
- The system is tested in **chat mode**, ensuring dynamic and human-like responses.
- This approach helps create a scalable, cloud-based interview preparation tool.

# ALGORITHM & DEPLOYMENT

## Algorithm Selection:

The Interview Trainer Agent uses IBM's Granite-3-3-8B, a powerful large language model (LLM) from Watsonx.ai, chosen for its ability to understand natural language and generate human-like responses. Unlike traditional ML models, it doesn't require separate training for this use case.

## Data Input:

User inputs such as **job role** and **experience level** are used to create structured prompts. These prompts act as dynamic inputs guiding the model to produce context-specific interview questions.

## Training Process:

The Granite-3-3-8B model is already pre-trained by IBM on massive datasets. No manual training or dataset labeling is needed. Instead, **prompt engineering** is applied to control the model's output.

## Prediction Process:

When a user submits a prompt, the model uses its pre-trained knowledge to generate **role-specific interview questions and answer tips** instantly. It responds in a conversational, real-time manner — simulating an interactive interview trainer.

# RESULT

The screenshot displays the IBM watsonx Prompt Lab interface in a web browser. The URL bar shows the address: `datapatform.cloud.ibm.com/wx/prompts?context=wx&project_id=ad99a07f-c5fc-443c-9528-a1335654e4d6`. The interface includes a top navigation bar with the IBM watsonx logo, an 'Upgrade' button, a help icon, a notification bell, and user account information for 'Vithyaa.C.K's Account' in 'Dallas'. Below the navigation bar, the breadcrumb path is 'Projects / interview\_trainer\_ai / Prompt Lab'. The main interface has a 'Chat' tab selected, with 'Structured' and 'Freeform' options. The chat area shows a conversation with the model 'granite-3-3-8b-instruct'. The user's prompt is: 'Act as an expert HR interviewer. I am a fresher applying for the role of a Software Developer. Based on current industry expectations, generate 5 commonly asked interview questions specifically for this role. For each question, provide a brief explanation of why it is asked, what a good answer should include, and a sample response that demonstrates the ideal approach.' The model's response includes the first question: '1. Question: Can you describe a project you've worked on, highlighting your role and the technologies you used?'. It also provides a 'Why it's asked' explanation, a 'Good answer' guideline, and a 'Sample response' about a web-based budgeting application. The second question is partially visible: '2. Question: How do you approach learning a new programming language or technology?'. At the bottom, there is a text input field with the placeholder 'type something...' and a 'Send' button.

dataplatform.cloud.ibm.com/wx/prompts?context=wx&project\_id=ad99a07f-c5fc-443c-9528-a1335654e4d6

IBM watsonx Upgrade ? Vithyaa.C.K's Account Dallas VC

Projects / interview\_trainer\_ai / Prompt Lab AI guardrails on Unsaved New prompt + Deploy

Chat Structured Freeform AI Model: granite-3-3-8b-instruct

V2 You: 12:04 PM

Act as an expert HR interviewer. I am a fresher applying for the role of a Software Developer. Based on current industry expectations, generate 5 commonly asked interview questions specifically for this role. For each question, provide a brief explanation of why it is asked, what a good answer should include, and a sample response that demonstrates the ideal approach.

watsonx 12:04 PM

1. **Question:** Can you describe a project you've worked on, highlighting your role and the technologies you used?

**Why it's asked:** This question assesses your practical experience, technical skills, and ability to work on a project from start to finish. It also gives insight into your problem-solving skills and familiarity with various programming languages and tools.

**Good answer:** Discuss a personal or academic project, outlining your responsibilities, the technologies involved (programming languages, frameworks, databases), and the problem you aimed to solve. Emphasize your contributions and the outcomes.

**Sample response:** "In my final year of college, I led a team of three to develop a web-based budgeting application using React for the frontend, Node.js and Express for the backend, and MongoDB as our database. My role included designing the application architecture, implementing user authentication, and creating RESTful APIs. We successfully launched the app, which received positive feedback from users and helped me hone my full-stack development skills."

2. **Question:** How do you approach learning a new programming language or technology?

type something...

# RESULT

The screenshot displays the IBM watsonx web application interface. The browser address bar shows the URL: `dataplatfrom.cloud.ibm.com/wx/prompts?context=wx&project_id=ad99a07f-c5fc-443c-9528-a1335654e4d6`. The page header includes the IBM watsonx logo, an 'Upgrade' button, a help icon, a notification bell, and user account information for 'Vithyaa.C.K's Account' in the 'Dallas' region. The main navigation bar shows 'Projects / interview\_trainer\_ai / Prompt Lab'. A toolbar at the top right indicates 'AI guardrails on', 'Unsaved' status, and buttons for 'New prompt +' and 'Deploy'. The interface is divided into three tabs: 'Chat' (selected), 'Structured', and 'Freeform'. The 'Chat' tab shows a conversation with the AI model 'granite-3-3-8b-instruct'. The chat history includes a previous message about clean, maintainable, and testable code, followed by a 'Good answer' and a 'Sample response' discussing code reviews and unit testing. The current message is a question about debugging a complex issue, followed by a 'Why it's asked' explanation and a 'Good answer' and 'Sample response' discussing debugging techniques and tools. The chat input field at the bottom contains the placeholder text 'Type something...'. The IBM watsonx logo and a green circular icon with a white 'G' are visible in the bottom right corner.

clean, maintainable, and testable code.

**Good answer:** Discuss your experience with code reviews, static code analysis, unit testing, and adhering to coding standards or style guides.

**Sample response:** "To ensure code quality, I follow a disciplined approach that includes writing clean, modular, and well-documented code. I regularly perform code reviews with my peers to catch potential issues early. Additionally, I write unit tests for critical functionalities using frameworks like Jest or Mocha, depending on the project. I also make sure to keep up-to-date with the latest coding standards and best practices for the languages I use."

5. **Question:** Can you describe a time when you had to debug a complex issue in your code? What steps did you take to identify and resolve the problem?

**Why it's asked:** This question evaluates your problem-solving skills, debugging techniques, and ability to think critically under pressure.

**Good answer:** Share a specific example of a challenging bug you encountered, explaining the steps you took to diagnose and fix it. Focus on your analytical thinking, systematic approach, and use of debugging tools.

**Sample response:** "During a personal project, I faced an intermittent issue where user authentication was failing sporadically. To debug this, I started by reproducing the problem consistently using logging statements. I then narrowed down the issue to a specific API endpoint that was occasionally returning a 500 error. By examining server logs and using a debugger, I identified a race condition in my asynchronous code. I refactored the affected section, implemented proper error handling, and added unit tests to prevent similar issues in the future."

Type something...



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# CONCLUSION

The Interview Trainer Agent project successfully demonstrates the use of IBM Watsonx.ai and the Granite-3-3-8B foundation model to provide personalized interview preparation. By leveraging prompt engineering, the system generates role-specific interview questions and response tips based on the user's input, such as job role and experience level. This approach eliminates the need for manual training while delivering accurate, human-like outputs. The AI-driven assistant enhances the user's confidence and readiness by simulating realistic interview scenarios. Overall, the project highlights the potential of large language models in building smart, scalable, and practical solutions for career guidance and professional development.

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## FUTURE SCOPE

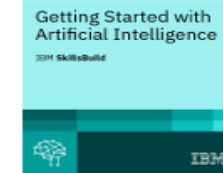
In the future, the Interview Trainer Agent can be expanded into a mobile or web-based platform to enhance accessibility. It can support voice input and multiple languages to cater to diverse users. Advanced features like resume analysis and feedback using NLP can be integrated. Ultimately, the system has the potential to evolve into a comprehensive career guidance and real-time AI coaching solution.

# REFERENCES

- IBM Watsonx.ai Documentation – <https://www.ibm.com/docs/en/watsonx>
- IBM Research: Granite Models – <https://research.ibm.com/blog/ibm-granite-models>
- Brown, T. et al. (2020). *Language Models are Few-Shot Learners*, NeurIPS.
- Liu, P. et al. (2023). *Prompt Engineering for Large Language Models*, arXiv.
- OpenAI (2023). *Prompt Engineering Best Practices*  
– <https://platform.openai.com/docs/guides/prompt-engineering>

# IBM CERTIFICATIONS

In recognition of the commitment to achieve  
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Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



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# IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to  
**VITHYAA C K 23CS209**

for the completion of

**Lab: Retrieval Augmented Generation with  
LangChain**

(ALM-COURSE\_3824998)

According to the Adobe Learning Manager system of record

**Completion date:** 26 Jul 2025 (GMT)

**Learning hours:** 20 mins



# THANK YOU