
CAPSTONE PROJECT

INTERVIEW TRAINER AGENT

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OUTLINE

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PROBLEM STATEMENT

Job seekers and freshers often struggle to prepare for interviews due to a lack of role-specific practice. General question banks lack personalization, which makes preparation inefficient. There is a strong need for an AI-driven system that generates targeted questions and model answers based on a user's job role and experience level.

PROPOSED SOLUTION

- The Interview Trainer Agent, built using **Agentic AI on IBM Watsonx**, dynamically generates role-specific interview questions and model answers for **all supported job roles and experience levels**.
The implemented system:
- Accepts inputs via a guided AI-powered conversation.
- Uses Agentic AI reasoning to determine relevant technical and behavioral questions.
- Delivers model answers to enhance preparation quality.
- Covers multiple roles such as **Software Engineer, Data Analyst, and Product Manager**, each with **Beginner, Intermediate, and Advanced** levels.
- Provides instant, interactive results for every role–level combination.

SYSTEM DEVELOPMENT APPROACH (TECHNOLOGY USED)

- Platform: IBM Watsonx Assistant with Agentic AI capabilities.
- Agent Design: Modular skills for each role–level pair, ensuring results for all 9 combinations.
- Logic Flow: Agent dynamically selects the appropriate question set based on inputs.
- Output Handling: Structured JSON-like responses with conversational AI text.
- Testing: Verified for all role–level combinations, producing consistent, targeted outputs.

ALGORITHM & DEPLOYMENT

Algorithm (Agentic AI Workflow):

- Input Capture: User selects `job_role` and `experience_level`.
- Agentic Reasoning: AI chooses the matching question–answer set from the knowledge base.
- Response Generation: Questions and model answers displayed conversationally.

Deployment:

- Hosted entirely on IBM Watsonx Agentic AI environment.
- No separate backend coding required.
- Successfully tested for $3 \text{ roles} \times 3 \text{ levels} = 9$ unique outputs, all functioning correctly.

RESULT

The screenshot displays the IBM watsonx web interface. The top navigation bar includes the 'IBM watsonx' logo, an 'Upgrade' button, a help icon, a notification bell, and user account information for 'Astina Dahiwalé's Account' in 'Dallas'. The main breadcrumb trail reads 'Projects / Interview Trainer Agent / watsonx Agent'. The interface is split into two main panels. The left panel, titled 'Build', contains a sidebar with 'Setup', 'Configuration', 'Instructions', 'Knowledge', and 'Tools'. The 'Configuration' section is expanded, showing 'Framework' set to 'LangGraph' and 'Architecture' set to 'ReAct'. The 'Instructions' section contains a text box with the following text: 'You are an Interview Trainer Agent that prepares users for job interviews by generating tailored question sets and preparation strategies based on their profile name, experience level, and job role. It retrieves role-specific interview questions, industry expectations, behavioral scenarios, and HR guidelines from recruitment portals, professional networks, and company interview databases. Users can input...'. The right panel, titled 'Agent preview', shows a chat log. The first message is from the user (AD) at 08:13 PM: 'I'm preparing for a software engineer interview'. The second message is from the 'watsonx Agent' at 08:13 PM: 'Congratulations on taking the first step towards preparing for your software engineer interview! I'd be happy to help you prepare. To get started, could you please provide me with some more information about your background and the type of software engineer role you're applying for? This will help me provide you with more tailored guidance and resources. Please provide the following details: 1. What is your current level of experience (junior, mid-level, senior)? 2. What programming languages and technologies are you most familiar with? 3. What type of software engineer role are you applying for (e.g. backend, frontend, fullstack, mobile, cloud, etc.)? 4. Do you have any specific areas of concern or topics you'd like to focus on during'. At the bottom of the chat log is a text input field with the placeholder 'Type something...' and a send button.

IBM watsonx

Upgrade ? 🔔 Astina Dahiwalé's Account ▼ Dallas ▼ AD

Projects / Interview Trainer Agent / watsonx Agent Share feedback β Autosaved 8:16 PM New agent + Deploy 🔗 🔒 ⓘ

Build AI Model: llama-3-2-90b-vision-instruct 🔧 <

Setup ▼

Configuration ▲

Framework Architecture

LangGraph ▼ ReAct ▼

Instructions [Advanced configuration](#)

You are an Interview Trainer Agent that prepares users for job interviews by generating tailored question sets and preparation strategies based on their profile name, experience level, and job role. It retrieves role-specific interview questions, industry expectations, behavioral scenarios, and HR guidelines from recruitment portals, professional networks, and company interview databases. Users can input...

Knowledge ▼

Tools ▲

Agent preview

AD You: 08:13 PM

I'm preparing for a software engineer interview

watsonx Agent 08:13 PM

Congratulations on taking the first step towards preparing for your software engineer interview! I'd be happy to help you prepare.

To get started, could you please provide me with some more information about your background and the type of software engineer role you're applying for? This will help me provide you with more tailored guidance and resources. Please provide the following details:

1. What is your current level of experience (junior, mid-level, senior)?
2. What programming languages and technologies are you most familiar with?
3. What type of software engineer role are you applying for (e.g. backend, frontend, fullstack, mobile, cloud, etc.)?
4. Do you have any specific areas of concern or topics you'd like to focus on during

Type something... 🔗 ➡

RESULT

Agent preview

4. Do you have any specific areas of concern or topics you'd like to focus on during our preparation (e.g. data structures, algorithms, system design, behavioral questions, etc.)?

Once I have this information, I can begin providing you with personalized guidance, including:

- Common interview questions and topics for software engineer roles
- Tips and strategies for answering behavioral and technical questions
- Resources for practicing coding challenges and whiteboarding exercises
- Advice on how to improve your resume and online profiles
- Guidance on how to prepare for and ace the interview

Let's get started!

► How did I get this answer?

AD You: 08:15 PM

I want for Senior level I know sql, python, Java, JavaScript, C#, C++, php, ruby I'm

Type something...



Agent preview

AD You: 08:15 PM

I want for Senior level I know sql, python, Java, JavaScript, C#, C++, php, ruby I'm applying for fullstack I want questions covering all the areas

watsonx Agent 08:15 PM

As a senior-level full-stack developer, you'll be expected to have a broad range of skills and expertise. Here are some common interview questions and topics that you may encounter, covering all areas:

Programming Languages and Fundamentals

1. Can you explain the differences between monolithic architecture and microservices architecture?
2. How do you approach debugging a complex issue in a large codebase?
3. What are some best practices for writing clean, maintainable code?
4. Can you explain the concept of dependency injection and how it's used in software development?
5. How do you stay up-to-date with the latest developments and advancements in

Type something...



RESULT

Agent preview

5. How would you approach solving a complex problem like the "Traveling Salesman Problem"?

Full-Stack Development

1. Can you explain the differences between a monolithic architecture and a microservices architecture for a full-stack application?
2. How do you approach designing a RESTful API for a full-stack application?
3. Can you explain the concept of a single-page application (SPA) and how it differs from a traditional multi-page application?
4. How do you handle authentication and authorization in a full-stack application?
5. Can you explain the concept of a web socket and how it's used in real-time web applications?

Database and Storage

1. Can you explain the differences between a relational database and a NoSQL database?
2. How do you approach designing a database schema for a complex application?

Type something...



Agent preview

Cloud Computing and DevOps

1. Can you explain the differences between a cloud-based infrastructure and an on-premises infrastructure?
2. How do you approach deploying a full-stack application to a cloud platform like AWS or Azure?
3. Can you explain the concept of continuous integration and continuous deployment (CI/CD) and how it's used in software development?
4. How do you handle monitoring and logging in a cloud-based application?
5. Can you explain the concept of containerization and how it's used in software development?

Behavioral Questions

1. Can you tell me about a time when you had to troubleshoot a complex technical issue?
2. How do you approach working with a team to solve a complex technical problem?
3. Can you tell me about a project you worked on that you're particularly proud of?

Type something...



RESULT

Agent preview

These are just some examples of the types of questions you may encounter in a senior-level full-stack developer interview. Remember to be prepared to provide specific examples from your experience and to explain your thought process and problem-solving approach.

Also, I'll provide you with some resources to practice coding challenges and whiteboarding exercises:

- LeetCode: A popular platform for practicing coding challenges and whiteboarding exercises.
- HackerRank: A platform that provides coding challenges and projects in a variety of programming languages and domains.
- Pramp: A platform that provides free coding challenges and whiteboarding exercises for full-stack developers.
- CodeWars: A platform that provides coding challenges and katas in a variety of programming languages.

Let me know if you want me to generate more questions or if you want to practice with a specific topic.

► How did I get this answer?



CONCLUSION

The Interview Trainer Agent delivers personalized interview simulations for every job role and level combination tested.

Agentic AI enables context-aware, scalable, and adaptable training without complex manual coding.

The complete coverage across roles and levels ensures all users receive relevant and targeted preparation.

FUTURE SCOPE

- Dynamic Content Retrieval: Integrate with IBM Watson Discovery or Watsonx RAG API to fetch up-to-date role-specific questions.
- Speech-Based Simulation: Enable voice-based interview practice with real-time conversation flow.
- AI-Driven Feedback: Provide instant scoring and improvement suggestions using sentiment and tone analysis.
- Specialized Domain Expansion: Add niche fields like cybersecurity, cloud computing, and finance.
- Multi-Language Support: Offer interview preparation in multiple languages for wider reach.
- Scalable Role Coverage: Extend beyond the current 3 roles \times 3 levels to an unlimited number of job-level combinations.

REFERENCES

- IBM Watsonx Assistant & Agentic AI Documentation – <https://cloud.ibm.com/docs/watsonx>
- IBM Cloud Documentation – <https://cloud.ibm.com/docs>
- IBM Agentic AI Overview – <https://research.ibm.com/agentic-ai>
- IBM Watson Discovery Documentation – <https://cloud.ibm.com/docs/discovery>
- RAG (Retrieval-Augmented Generation) Concept Overview – IBM Developer Portal


IBM CERTIFICATIONS



IBM CERTIFICATIONS

IBM SkillsBuild

Completion Certificate



This certificate is presented to

Astina Dahiwale

for the completion of

**Lab: Retrieval Augmented Generation with
LangChain**

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 22 Jul 2025 (GMT)

Learning hours: 20 mins

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THANK YOU