
CAPSTONE PROJECT

INTERVIEW TRAINER AGENT

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OUTLINE

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PROBLEM STATEMENT

Example: An Interview Trainer Agent, powered by RAG (Retrieval-Augmented Generation), 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, behavioural scenarios, and HR guidelines from recruitment portals, professional networks, and company interview databases. Users can input their resume or job title, and the agent provides targeted questions, model answers, and improvement tips. It supports both technical and soft skill assessment, ensuring a comprehensive interview prep experience. This AI-driven assistant builds user confidence, sharpens responses, and increases success rates in competitive hiring environments.

PROPOSED SOLUTION

The proposed system is an AI-powered Interview Trainer Agent using RAG and IBM Granite to simulate personalized interview preparation. It generates role specific technical, behavioral, and HR questions based on the user's resume or job input. The system provides model answers, improvement tips, and feedback on soft skills and communication. Deployed on IBM Cloud Lite, it offers an interactive platform to boost confidence and interview success rates.

- **Data Collection:** Gather interview questions, industry expectations, behavioral questions, and HR guidelines from recruitment portals, professional networks, and interview databases.
- **Data Preprocessing:** Clean and structure the text data, remove duplicates, classify questions by domain and difficulty, and embed job profiles using NLP techniques.
- **Machine Learning Algorithm:** RAG (Retrieval-Augmented Generation) for generating contextual questions and answers, clustering for grouping similar job roles and questions, sentiment or tone analysis to assess user responses.
- **Deployment:** Deploy the solution on IBM Cloud Lite using IBM Granite foundation models with a web interface or chatbot front-end for user interaction.
- **Evaluation:** Evaluate the system based on accuracy of question relevance, user feedback, and response improvement over iterations. Measure success rates through user satisfaction, engagement metrics, and simulated interview scoring.

SYSTEM APPROACH

Hardware (User Machine):

- RAM: 8 GB or more
- Processor: Intel i5/i7 or equivalent
- Internet: Stable connection for cloud access

Software & Platform Tools:

- IBM Cloud Lite Account
- Watson Studio (for model development)
- Watsonx.ai (for advanced AI model building, including large language models like Granite)
- IBM Cloud Object Storage (for storing datasets and models)
- IBM Watsonx Runtime (to deploy and serve AI models)
- Google Search & Wikipedia API (as external data sources for Retrieval-Augmented Generation)

ALGORITHM & DEPLOYMENT

- **Algorithm Selection** : Provide a brief overview of the chosen approach — using Large Language Models (LLMs) for dynamic interview Q&A generation
- **Example models**: Granite-3-3-8b-instruct or Mistral-7b-instruct, chosen for their fine-tuned instruction-following capability.
- **Data Input** : User provides job role details or uploads resume information. The prompt is structured based on user inputs to guide the LLM for relevant question generation.
- **Training Process** : The model (Granite/Mistral) is pre-trained on vast instruction datasets. For this agent, prompt engineering and optional Retrieval-Augmented Generation (RAG) techniques are used to enhance responses with real-time data (e.g., Wikipedia/Google search).
- **Prediction Process** : When a user inputs their job role, the model generates customized interview questions, sample answers, and improvement tips. The system may retrieve fresh data (optional) and deliver a conversational experience through a web interface.
- **Deployment Process** : The solution is deployed on IBM Watsonx.ai (Lite Plan). Prompts and model parameters are configured in Watsonx.prompt lab, and deployment is done via Watsonx.runtime into a Deployment Space. The agent runs in a browser, allowing live interaction.

RESULT

The screenshot displays the IBM watsonx Agent Lab interface in a web browser. The browser's address bar shows the URL `dataplatfom.cloud.ibm.com/wx/agents?context=wx&project_id=59c79381-a82f-4f57-a0cb-59778169e84a`. The page header includes the IBM watsonx logo, an 'Upgrade' button, and user information for Nithya Sivakumar. The main navigation bar shows the path 'Projects / interview agent / Agent Lab' and buttons for 'Share feedback', 'Unsaved', 'New agent', and 'Deploy'.

The interface is divided into two main panels:

- Build Panel:** This panel is used to configure the agent. It includes a section for 'Instructions' with the text: "You are a helpful assistant that uses tools to answer questions in detail. When greeted, say 'Hi, I am watsonx.ai agent. How can I help you?'". Below this is a 'Knowledge' section and a 'Tools' section. The 'Tools' section contains two buttons: 'Add a tool' and 'Create custom tool'. Underneath, a list of 'Added tools (5)' is shown, including 'Google search' (with a description: 'Retrieve information from the internet with the Google search engine.') and 'DuckDuckGo search'.
- Agent preview Panel:** This panel shows a simulated conversation with the agent. The conversation history includes:
 - You:** 12:14 AM, "tips for aptitude questions"
 - watsonx Agent:** 12:14 AM, "Sure, I can help with that. Could you please provide more details about the specific aptitude questions you need tips for?"
 - You:** 12:14 AM, "quantitative"
 - watsonx Agent:** 12:14 AM, "Here are some tips for quantitative aptitude questions:

1. **Start from the Basics:** Make sure you have a solid understanding of the fundamental concepts in mathematics. This includes topics like arithmetic, algebra, geometry, and statistics."

The bottom of the screen shows a Windows taskbar with various application icons and a system clock indicating 12:15 AM on 8/1/2025.

Agent Lab (beta) — Docs | IBM w x

Agent Lab — interview agent | IB x

interview agent — Projects | IBM x

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☰ IBM watsonx

Upgrade ? 🔔

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Projects / interview agent / Agent Lab

Share feedback β

Unsaved 📄 ▾

New agent +

Deploy 🚀

Build

AI Model: mistral-large ⚠️ ▾

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Instructions

[Advanced configuration](#)

You are a helpful assistant that uses tools to answer questions in detail.
When greeted, say "Hi, I am watsonx.ai agent. How can I help you?"

Knowledge

▾

Tools

▴

Add a tool

Create custom tool

Added tools (5)

Google search

Retrieve information from the internet with the Google search engine.

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DuckDuckGo search

⚙️ 🗑️

Agent preview

👤 watsonx Agent 12:14 AM

Here are some tips for quantitative aptitude questions:

1. **Start from the Basics:** Make sure you have a solid understanding of the fundamental concepts in mathematics. This includes topics like arithmetic, algebra, geometry, and statistics.

2. **Focus on Rare Problems:** While practicing, pay special attention to problems that you find challenging or unusual. These can help you improve your problem-solving skills and prepare you for a wider range of questions.

3. **Check Up on Your Speed:** Quantitative aptitude tests often have time limits. Practice solving problems quickly and efficiently to improve your speed.

4. **Focus on Your Weaker Areas:** Identify the areas where you struggle the most and spend more time practicing those types of problems. This will help you improve your overall performance.

5. **Use the Options Given to Solve:** Sometimes, the options provided in multiple-

Type something...

Activate Windows

Go to PC settings to activate Windows.

🔍 ▶

Windows taskbar with icons for Start, Edge, File Explorer, Teams, Speaker, Yandex, Opera, Firefox, and Chrome.

12:15 AM

8/1/2025

interview_agent ✓ Deployed Online

API reference Test **Preview**

New chat +

Here are some of the most commonly asked interview questions in TCS.

1. General Questions:

- Tell me something about yourself.
- Why do you want to join TCS?
- Why should we hire you?
- Explain your career goals.
- What are your strengths and weaknesses?
- How do you handle stress and pressure?

2. Technical Questions:

- Difference between local and instance variable.
- Write a code to reverse a string.

Type something...

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Go to PC settings to activate Windows.

Agent Lab (beta) — Docs | IBM

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(40) WhatsApp

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Upgrade

Nithya Sivakumar's Account

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Deployed

Online

API reference

Test

Preview

New chat +

4. Situational Questions:

How would you handle a difficult client?

What would you do if you realized you made a mistake in your work?

How do you prioritize your tasks when you have multiple deadlines?

5. Company-specific Questions:

What do you know about TCS?

Why do you want to work for TCS?

How do you see yourself contributing to TCS's goals?

Type something...

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Go to PC settings to activate Windows.

Windows Taskbar

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interview_agent ✓ Deployed Online

API reference Test **Preview**

New chat +

Preparing for these questions can help you feel more confident and ready for your TCS interview. Good luck!

N You 12:25 AM
how can i introduce myself in interview

interview_agent 12:25 AM
Introducing yourself effectively in an interview is crucial as it sets the tone for the rest of the conversation. Here are some tips and a sample introduction to help you make a strong first impression:

Tips for Introducing Yourself:

Type something...

Activate Windows
Go to PC settings to activate Windows.



interview_agent ✓ Deployed Online

[API reference](#) [Test](#) [Preview](#)

[New chat](#) +

Sample Introduction:

"Good morning/afternoon, I'm [Your Name]. I have a degree in [Your Degree] from [Your University]. I have [X] years of experience in [Your Field], where I have worked on various projects related to [Specific Skills or Projects]. I am particularly interested in this role at [Company Name] because [Reason for Interest]. I am excited about the opportunity to contribute to your team and look forward to discussing how my background and skills align with your needs."

Example:

"Good morning, I'm John Doe. I have a Bachelor's degree in Computer Science from XYZ University. I have three years of experience in software development, where I have worked on various projects related to web development and mobile applications. I am particularly interested in this role at TCS because of the company's reputation for innovation and its commitment to employee growth. I am excited about the opportunity to contribute to your team and look forward to discussing how my background and skills align with your needs."

Additional Tips:

Type something...

Activate Windows
Go to PC settings to activate Windows.

CONCLUSION

- Interview Trainer Agent project successfully leverages AI and Retrieval-Augmented Generation (RAG) to create a smart, personalized interview preparation system. By integrating IBM Watsonx, Watson Studio, and external knowledge sources like Google and Wikipedia, the system delivers targeted questions, model answers, and feedback based on user profiles, experience levels, and job roles.
- This solution enhances interview readiness by simulating real-world interview scenarios, supporting both technical and behavioral assessments. It boosts user confidence, sharpens communication, and increases the chances of success in competitive hiring environments. Overall, the project demonstrates the powerful application of AI in career readiness and skill development.

FUTURE SCOPE

- **Resume and Cover Letter Feedback:**

Add modules to analyze and give suggestions on user-uploaded resumes and cover letters using NLP techniques.

- **Gamified Learning and Scoring:**

Implement badges, scores, and mock test levels to keep users engaged and track improvement.

- **Real-Time Feedback with AI Coaches:**

Incorporate chatbot-based interview coaches to give instant tips and corrections after each response.

- **Interview Recordings & Analytics:**

Allow users to record mock interviews and provide analytics on speaking time, clarity, and filler word usage.

- **Integration with IBM Watson Orchestrate and HR Tools:**

Extend functionality to assist HR teams in screening or training candidates based on AI-simulated interviews.

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IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Nithya Sivakumar

for the completion of

Getting Started with Artificial Intelligence

(PLAN-E624C2604060)

According to the Your Learning Builder - Plans system of record

Completion date: 17 Jul 2025 (GMT)

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THANK YOU