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# CAPSTONE PROJECT

## Interview Trainer Agent Using IBM Cloud

**Presented By:**

**1. Bhavana Mythri M-Bannari Amman Institute of  
Technology-Information Science and Engineering**

# OUTLINE

- **Problem Statement**
- **Proposed System/Solution**
- **System Development Approach**
- **Algorithm & Deployment**
- **Result**
- **Conclusion**
- **Future Scope**
- **References**

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# PROBLEM STATEMENT

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, behavioral scenarios, and HR guidelines from recruitment portals, professional networks, and company interview databases.

# PROPOSED SOLUTION

## **Proposed Solution (Interview Trainer Agent):**

The proposed system addresses the challenge of interview preparation by providing personalized, AI-powered mock interview experiences. It uses Retrieval-Augmented Generation (RAG) and IBM Cloud foundation models to generate context-aware questions and preparation tips. The solution includes the following components:

### **Data Collection:**

- Accept user inputs like job role, resume, and experience level.
- Retrieve relevant interview questions and resources from trusted platforms.

### **Data Preprocessing:**

- Extract and organize job-specific data.
- Clean and format content to suit different domains.

### **AI Model (RAG + Foundation Model):**

- Use RAG to fetch relevant interview content.
- Generate questions and suggestions using models like Mistral-Large or Granite.
- Cover both technical and behavioral areas.

### **Deployment:**

- Deploy the agent via IBM Watsonx.ai sandbox.
- Provide a web-based interface for user interaction.

### **Evaluation:**

- Use feedback and relevance metrics to assess quality.
- Continuously refine outputs based on usage.

### **Result:**

A functional AI agent delivering tailored interview questions, answers, and tips—accessible through IBM Cloud’s Watsonx interface.

# SYSTEM APPROACH

## System Requirements:

- IBM Cloud Lite account
- Watsonx.ai access with Agentic Lab enabled
- Stable internet connection
- Basic web browser (Chrome/Firefox)

## Libraries/Tools Required:

- IBM Watsonx.ai Agent Builder
- Foundation Model: Granite/Mistral
- RAG (Retrieval-Augmented Generation) architecture
- Python (for any custom integration, if needed)
- Jupyter Notebook (optional for testing and prototyping)

# ALGORITHM & DEPLOYMENT

## **Algorithm Selection:**

Uses RAG with Granite or Mistral-Large on IBM Watsonx.ai for generating personalized, role-based interview questions.

## **Data Input:**

- Job title, resume, experience level
- Interview questions, HR guidelines, role-based skills
- Curated interview datasets for retrieval

## **Training Process:**

- Foundation models are pre-trained
- Fine-tune retrieval with job-specific content
- Use prompt templates and few-shot examples

## **Prediction Process:**

- Retrieves relevant content based on user input
- Generates questions and answers using the model
- Supports real-time feedback and refinement

# RESULT

The screenshot displays the IBM watsonx Agent Lab interface. The browser address bar shows the URL: `datapatform.cloud.ibm.com/wx/agents/cdcfb36a-edce-4067-a7ec-be2408b53c84?project_id=8835fce0-1e07-4046-b092-b79e352168b9&context=wx`. The page header includes the IBM watsonx logo, an 'Upgrade' button, and user information for 'bhavana mythri murali's Ac...'. The main navigation bar shows 'Projects / Interview Trainer / watsonx Agent' and a 'Share feedback' button. The 'Build' section on the left includes a sidebar with icons for 'Build' and 'Agent preview'. The 'Build' panel has tabs for 'Setup', 'Configuration', 'Instructions', 'Knowledge', and 'Tools'. The 'Configuration' tab is active, showing 'Framework' set to 'LangGraph' and 'Architecture' set to 'ReAct'. The 'Instructions' tab shows a text area with the following content: 'age, preferred job designation, qualifications, key skills, years of experience, and any certifications. After collecting this information, retrieve or generate interview questions that are specific to the user's chosen job designation and experience level. Provide a mix of technical and behavioral questions, along with sample answers and improvement'. The 'Agent preview' section on the right shows a chat history with a user (BM) and the watsonx Agent. The user's message is: 'You: 08:25 PM I am 20 years old, applying for a Data Analyst role. I have a B.E. in computer science and engineering , 0 years of experience, and skills in Python, SQL, Data Visualization, Tableau, and Excel. I also hold an IBM Data Analyst Professional Certificate and a Google Data Analytics Certificate. Ask me mixed set of questions that would be asked in the interview'. The agent's response is: 'Here are some mixed questions that may be asked in a Data Analyst interview: 1. Can you explain the concept of data visualization and how it is used in data analysis? 2. How do you handle missing or incomplete data in a dataset? 3. What is the difference between a histogram and a bar chart, and when would you use each? 4. Can you write a SQL query to extract data from a database? 5. How do you approach data analysis when working with a large dataset?'. The input field at the bottom of the chat area contains the text 'Type something...'.

Agent Lab (beta) — Docs | IBM x watsonx Agent — Interview Trai x +

← → ↺ `datapatform.cloud.ibm.com/wx/agents/cdcfb36a-edce-4067-a7ec-be2408b53c84?project_id=8835fce0-1e07-4046-b092-b79e352168b9&context=wx` ☆ 🌐 ⋮

☰ IBM watsonx Upgrade ⓘ 🔔 bhavana mythri murali's Ac... ▾ Dallas ▾ BM

Projects / Interview Trainer / watsonx Agent Share feedback β Autosaved 8:26 PM 📁 ▾ New agent + Deploy 🔗 🔒 ⓘ

🏠 Build AI Model: llama-3-3-70b-instruct ⚙️ <

🤖

Setup ▾

Configuration ▴

Framework Architecture

LangGraph ▾ ReAct ▾

Instructions [Advanced configuration](#)

age, preferred job designation, qualifications, key skills, years of experience, and any certifications. After collecting this information, retrieve or generate interview questions that are specific to the user's chosen job designation and experience level. Provide a mix of technical and behavioral questions, along with sample answers and improvement

Knowledge ▾

Tools ▴

Agent preview

BM You: 08:26 PM

You: 08:25 PM I am 20 years old, applying for a Data Analyst role. I have a B.E. in computer science and engineering , 0 years of experience, and skills in Python, SQL, Data Visualization, Tableau, and Excel. I also hold an IBM Data Analyst Professional Certificate and a Google Data Analytics Certificate. Ask me mixed set of questions that would be asked in the interview

🤖 watsonx Agent 08:26 PM

Here are some mixed questions that may be asked in a Data Analyst interview:

1. Can you explain the concept of data visualization and how it is used in data analysis?
2. How do you handle missing or incomplete data in a dataset?
3. What is the difference between a histogram and a bar chart, and when would you use each?
4. Can you write a SQL query to extract data from a database?
5. How do you approach data analysis when working with a large dataset?

Type something... 🔍 ➤

# RESULT

The screenshot displays the IBM watsonx Agent deployment page in a web browser. The browser's address bar shows the URL: `datapatform.cloud.ibm.com/ml-runtime/deployments/88e387e6-f6ce-470c-b234-006cf428fc5d/chat?space_id=18a58517-31bb-4232-b900-5a48ebc88fc7&co...`. The page header includes the IBM watsonx logo, an 'Upgrade' button, and user information for 'bhavana mythri murali's Ac...'. The breadcrumb trail indicates the path: 'Deployment spaces / Interview Trainer / watsonx Agent /'. The main content area shows the 'watsonx Agent' deployment status as 'Deployed' and 'Online'. Below this, there are tabs for 'API reference', 'Test', and 'Preview', with the 'Preview' tab currently selected. A 'New chat +' button is located to the right of the tabs. The chat interface shows a conversation where a user asks for interview questions, and the watsonx Agent responds with a list of questions. At the bottom, there is a text input field with the placeholder 'Type something...'. On the right side, a sidebar titled 'About this deployment' provides details about the deployment, including its name, description, and various specifications.

Deployment spaces / Interview Trainer / watsonx Agent /

**watsonx Agent** ✓ Deployed Online

API reference Test **Preview**

New chat +

**You** 08:54 PM

i am a 21 years old fresh graduate who has a keen interest in cloud and ai . i have a bachelor's in engineering in computer science and engineering i have cloud certification on ibm and google cloud . Give me some mixed set of questions that i could practice for my interview

**watsonx Agent** 08:54 PM

Here are some mixed set of questions that you could practice for your interview:

1. What are the benefits and drawbacks of using cloud computing, and how do you think it will impact the future of technology?
2. How do you stay current with the latest developments in AI and machine learning, and what resources do you use to

Type something...

**About this deployment**

**Name**  
watsonx Agent

**Description**  
Change this description to reflect your particular agent

**Deployment Details**

Deployment ID: 88e387e6-f6ce-47...

Serving name:  
No serving name.

Software specification:  
[runtime-24.1-py3.11](#)

Hardware specification:  
Extra extra small: 1 CPU and 2 GB RAM

Copies:  
1

**Tags**  
wx-agent



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# CONCLUSION

- The Interview Trainer Agent effectively uses RAG and foundation models to generate personalized, role-based questions. It enhances interview readiness through real-time, interactive guidance. Minor challenges included prompt tuning and domain relevance. With improvements like voice support, the system shows strong potential in transforming interview preparation using AI.

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# FUTURE SCOPE

The system can be enhanced by integrating additional data sources such as company-specific interview trends and real-time job market data. Future improvements may include optimizing prompt strategies, enabling multilingual and voice-based interactions, and expanding to support more job roles and industries. Incorporating emerging technologies like speech recognition and emotion analysis can further improve the user experience, making the agent more interactive and adaptive to individual needs.

# REFERENCES

- <https://www.ibm.com/cloud/watsonx>
- <https://www.ibm.com/blogs/research/2023/09/granite-models-watsonx/>
- BM SkillsBuild for Academia – Agentic AI Problem Statements 2025
- RAG (Retrieval-Augmented Generation) – Lewis, Patrick, et al.  
"Retrieval-Augmented Generation for Knowledge-Intensive NLP Tasks." *NeurIPS* 2020
- IBM Cloud – <https://cloud.ibm.com>
-

# IBM CERTIFICATIONS

In recognition of the commitment to achieve  
professional excellence



## Bhavana Mythri Murali

Has successfully satisfied the requirements for:

### Getting Started with Artificial Intelligence



Issued on: Jul 18, 2025  
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/901ebe4c-34e9-4eaf-a9b1-84f7d5770346>



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# IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to  
**Bhavana Mythri Murali**

for the completion of

**Lab: Retrieval Augmented Generation with  
LangChain**

(ALM-COURSE\_3824998)

According to the Adobe Learning Manager system of record

**Completion date:** 25 Jul 2025 (GMT)

**Learning hours:** 20 mins



**THANK YOU**