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# **CAPSTONE PROJECT**

## **INTERVIEW TRAINER AGENT**

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# OUTLINE

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

# PROBLEM STATEMENT

- Preparing for technical interviews is often a challenging and stressful process for job seekers, especially in roles like **Data Scientist**, **Data Analyst**, and **Machine Learning Engineer**.  
Traditional preparation methods such as static question banks and video tutorials lack personalization, interactivity, and real-time feedback.  
Moreover, candidates struggle to find resources that simulate realistic interview scenarios or adapt to their specific skills, experience, or role-based expectations.
- There is a growing need for an intelligent, AI-powered system that can **simulate dynamic interviews**, **generate role-specific questions**, and **evaluate responses interactively** using **large language models (LLMs)**.
- This project aims to solve that problem by building an **Interview Trainer Agent** using **IBM Watsonx**, powered by **Granite LLMs**, that helps users practice interviews in a realistic and responsive environment.

# PROPOSED SOLUTION

- The proposed solution is an **AI-powered Interview Trainer Agent** built using **IBM Watsonx** and **Granite large language models**.

This agent simulates realistic mock interviews tailored to roles such as **Data Scientist**, **Data Analyst**, and **Machine Learning Engineer**.

- It uses **LangGraph** as the framework and **ReAct** as the architecture to enable intelligent decision-making and tool usage.

Users can interact with the agent by specifying a role or uploading a resume, and the agent will generate:

- Role-specific technical and behavioral questions
- Suggested sample answers
- Feedback and improvement tips

- The agent leverages **Granite instruct models** to ensure high-quality, context-aware question generation and response analysis.

This solution enhances the interview preparation experience by making it more interactive, personalized, and adaptive.

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Deploy

Build

AI

Model: llama-3-3-70b-instruct

Setup

Configuration

Framework

LangGraph

Architecture

ReAct

Instructions

Advanced configuration

You are an intelligent interview preparation assistant designed to help users get ready for technical and behavioral interviews. Your task is to provide role-specific interview questions, model answers, tips, and guidance for job seekers applying for positions like Data Scientist, Data Analyst, or Machine Learning Engineer.

Knowledge

Agent preview

SS You: 11:21 AM

Simulate a mock interview for a Data Scientist job-start asking

watsonx Agent 11:21 AM

Here's a question to start the mock interview:

Can you explain the difference between supervised and unsupervised learning?

Please respond as if you were in a real interview. I'll give you feedback and ask follow-up questions based on your response.

► How did I get this answer?

SS You: 11:22 AM

In supervised learning, the model is trained on a labeled dataset — meaning

Type something...

EUR/INR +1.17%

Search

ENG IN

11:25 02-08-2025

# SYSTEM DEVELOPMENT APPROACH

- The system was developed using **IBM Watsonx** and integrated with **Granite LLMs** through a modular agent architecture. Below is the step-by-step development approach and technologies used:
- **1. Platform:**
- IBM Watsonx Studio (for building and testing the agent)
- **2. Model Used:**
- Granite LLMs ( llama-3-70b-instruct)
- **3. Architecture & Framework:**
- **ReAct** architecture (Reasoning + Acting)
- **LangGraph** framework to define agent logic and flow
- **4. Functional Flow:**
- User enters job role.
- Agent uses prompt templates to generate:
  - Technical & HR interview questions
  - Suggested model answers
  - STAR-format behavioral questions
- **5. Testing & Interaction:**
- Agent tested interactively in Watsonx UI
- This agentic AI approach provides a dynamic, conversation-based learning experience using powerful foundation models.

# ALGORITHM & DEPLOYMENT

## ❑ Algorithm (Logic Flow):

The Interview Trainer Agent follows a **ReAct (Reasoning + Acting)** architecture using IBM Watsonx Granite models to simulate an interactive interview session.

### ■ 1. Input Handling:

User specifies job role (e.g., *Data Scientist*)

### ■ 2. Prompt Generation:

Agent generates a role-specific prompt (Example: "Generate 5 technical interview questions for a Data Analyst with 1 year of experience.")

### ■ 3. LLM Response Handling:

Model generates tailored questions, sample answers, or improvement suggestions(STAR-format questions are generated )

### ■ 4. Feedback Loop

User provides answers → agent offers tips or refinements

## ❑ Deployment:

■ The agent was built and deployed in **IBM Watsonx Studio**

■ Agent name: interview\_agent

■ Uses **LangGraph** state machine for controlled decision flow

■ Available as an interactive agent inside the Watsonx environment

■ This deployment ensures modularity, scalability, and real-time usability.

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Deploy as an AI service

Create an online deployment. If you want to edit code in notebook format before deploying, save as a deployment notebook. [Learn more.](#)

Define details

Deployment name

watsonx Agent

Target deployment space

interview\_agent▼

Why don't I see all of my deployment spaces? ⓘ

Description (optional)

Cancel

Deploy




# RESULT

- The Interview Trainer Agent was successfully developed and deployed using **IBM Watsonx Studio** with **Granite LLMs**. The results demonstrate the agent's ability to interact naturally with users and generate context-specific interview content.
- **Key Results:**
  - ☐ The agent responds intelligently to user queries like:  
*"What is the difference between supervised and unsupervised learning?"*
  - ☐ It generates role-specific questions and answers for positions like *Data Scientist*, *ML Engineer*, and *Data Analyst*.
  - ☐ The system provides sample answers, behavioral questions in **STAR format**, and real-time feedback.
  - ☐ Agent is deployed and testable in editable mode on Watsonx.

## Agent preview

**SS** You: 11:21 AM

Simulate a mock interview for a Data Scientist job-start asking

 watsonx Agent 11:21 AM

Here's a question to start the mock interview:

Can you explain the difference between supervised and unsupervised learning?

Please respond as if you were in a real interview. I'll give you feedback and ask follow-up questions based on your response.

► **How did I get this answer?**

**SS** You: 11:22 AM

In supervised learning, the model is trained on a labeled dataset — meaning

Type something...



## Agent preview

**SS** You: 11:22 AM

In supervised learning, the model is trained on a labeled dataset — meaning the input data comes with the correct output. The goal is for the model to learn the mapping between inputs and outputs so it can predict future outcomes. Examples include: classification (like spam detection) and regression (like predicting house prices).

In unsupervised learning, there are no labels provided. The model tries to find patterns, groupings, or structures in the input data on its own. Examples include: clustering (like customer segmentation) and dimensionality reduction

 watsonx Agent 11:22 AM

That's a great start! You've correctly explained the difference between supervised and unsupervised learning, and provided relevant examples for each.



Autosaved 11:23 AM



New agent +

Deploy



## Agent preview

However, to take it to the next level, you could also discuss some of the key challenges and considerations for each type of learning. For example, in supervised learning, you might talk about the importance of having high-quality labeled data, and the risk of overfitting if the model is too complex. In unsupervised learning, you could discuss the challenge of evaluating the model's performance, since there's no clear metric for success.

Additionally, you might want to mention some of the other types of learning that don't fit neatly into either category, such as semi-supervised learning or reinforcement learning.

Let's move on to the next question:

What are some common techniques you would use to handle missing data in a dataset, and how would you decide which technique to use?

Please respond as if you were in a real interview.

Next question will be based on your response.

Type something...



# CONCLUSION

- The **Interview Trainer Agent** successfully demonstrates how Agentic AI, powered by **IBM Watsonx** and **Granite LLMs**, can transform the interview preparation process into an interactive, personalized experience.
- The project simulates realistic interview scenarios by generating role-specific questions, sample answers, and feedback for positions like **Data Scientist**, **Data Analyst**, and **ML Engineer**.
- By leveraging **ReAct architecture** and **LangGraph framework**, the agent effectively combines reasoning with action-based decision-making.
- The use of **Granite instruct models** ensured that responses were contextually accurate, human-like, and relevant to job roles.
- This solution highlights the power of large language models in education, career development, and real-world AI deployment.

# FUTURE SCOPE

- The Interview Trainer Agent can be further enhanced to provide a more immersive, personalized, and scalable interview preparation experience. Potential future improvements include:
  - ☐ Resume Parsing & Role Detection
  - ☐ Voice Interaction Support
  - ☐ Multilingual Support
  - ☐ Scoring and Analytics Dashboard
  - ☐ Integration with Job Portals & LMS
  - ☐ Mobile App Deployment

# REFERENCES

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- ReAct Architecture (Reasoning + Acting)  
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<https://arxiv.org/abs/2210.03629>
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7/24/25, 11:01 AM

Completion Certificate | SkillsBuild

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Completion Certificate



This certificate is presented to

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for the completion of

**Lab: Retrieval Augmented Generation with LangChain**

(ALM-COURSE\_3824998)

According to the Adobe Learning Manager system of record

**Completion date:** 24 Jul 2025 (GMT)

**Learning hours:** 20 mins



**THANK YOU**