CAPSTONE PROJECT

INTERVIEW TRAINER AGENT

Presented By:
N. Upender Goud-CMR Technical Campus-CSE(AI/ML)

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OUTLINE

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- **System Development Approach** (Technology Used)
- **Algorithm & Deployment**
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- **Future Scope**
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PROBLEM STATEMENT

Job seekers face challenges in interview preparation due to generic resources, lack of role-specific guidance, and difficulty in anticipating real hiring expectations. An AI-powered **Interview Trainer Agent** solves this by generating personalized questions, model answers, and feedback—helping candidates refine responses, boost confidence, and improve success rates in competitive job markets.

PROPOSED SOLUTION

- To deliver personalized and effective interview preparation, an AI-powered Interview Trainer Agent using RAG (Retrieval-Augmented Generation) is proposed. It dynamically tailors questions and strategies based on user profiles and real-world interview data.. **The solution will consist of the following components:**
- **Data Collection:**
  - Gather interview questions, HR guidelines, and role expectations from sources like LinkedIn, Glassdoor, and company databases.
  - Accept user input via uploaded resumes or job titles to guide personalized content generation.
- **Data Preprocessing:**
  - Parse resumes to extract key attributes like skills, education, and experience.
  - Clean and tag interview questions by role, skill type (technical/behavioral), and complexity using NLP techniques.
- **Machine Learning Algorithm:**
  - Use RAG to retrieve relevant questions and generate personalized answers and tips.
  - Implement additional models for resume classification and behavioral response analysis.
- **Deployment:**
  - **Develop a user-friendly interface or application that provides** deliver personalized and effective interview preparation.
  - Host backend APIs and models on cloud platforms (IBM cloud) with containerization for scalability.
- **Evaluation:**
  - Measure model quality using BLEU/ROUGE scores and feedback accuracy.
  - Use user feedback, mock interview scores, and confidence ratings to continuously improve the system.

SYSTEM APPROACH

The "System Approach" section outlines the overall strategy and methodology for developing and implementing An Interview Trainer Agent. Here's a suggested structure for this section:

- System requirements

- User inputs resume or job title through a web interface.
- Retrieves and stores interview data using APIs and a knowledge base

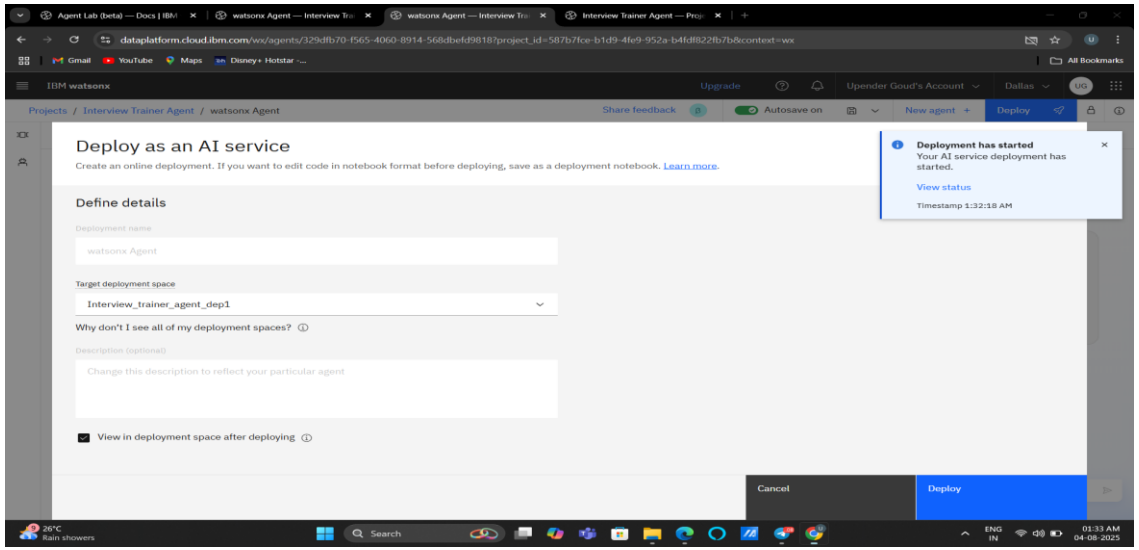
- Library required to build the model

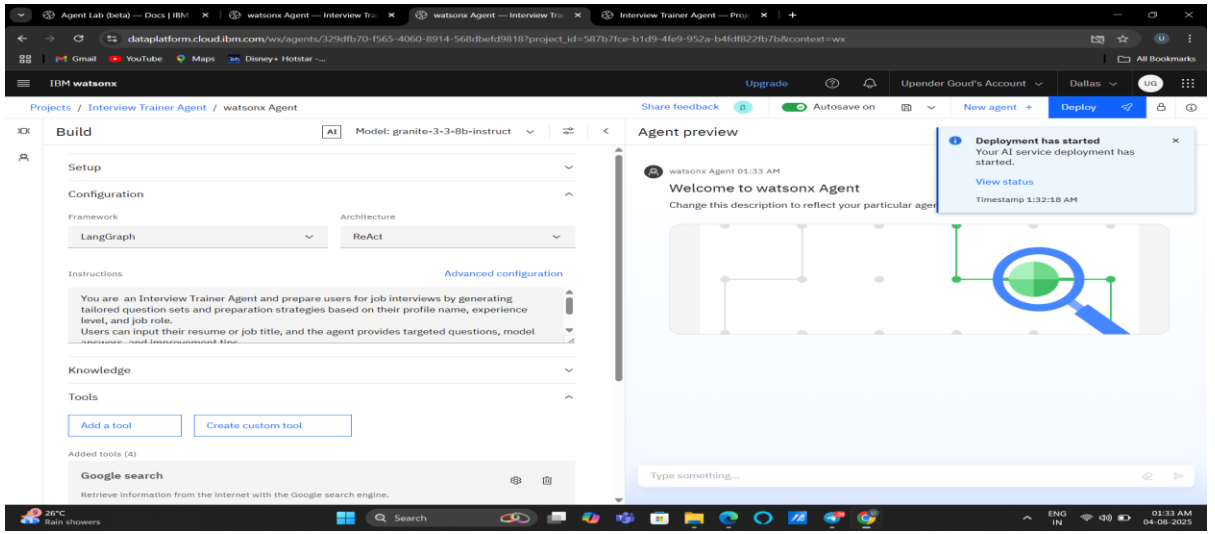
- **NLP & RAG Models:** Hugging Face Transformers, BERT, T5, FAISS.
- **Web & Deployment:** Flask, React, Docker, and cloud platforms like IBM cloud
- Parse input ⟶ Retrieve role-specific questions ⟶ Generate answers ⟶ Provide feedback.
- Deliver technical + soft skill evaluation with improvement tips.

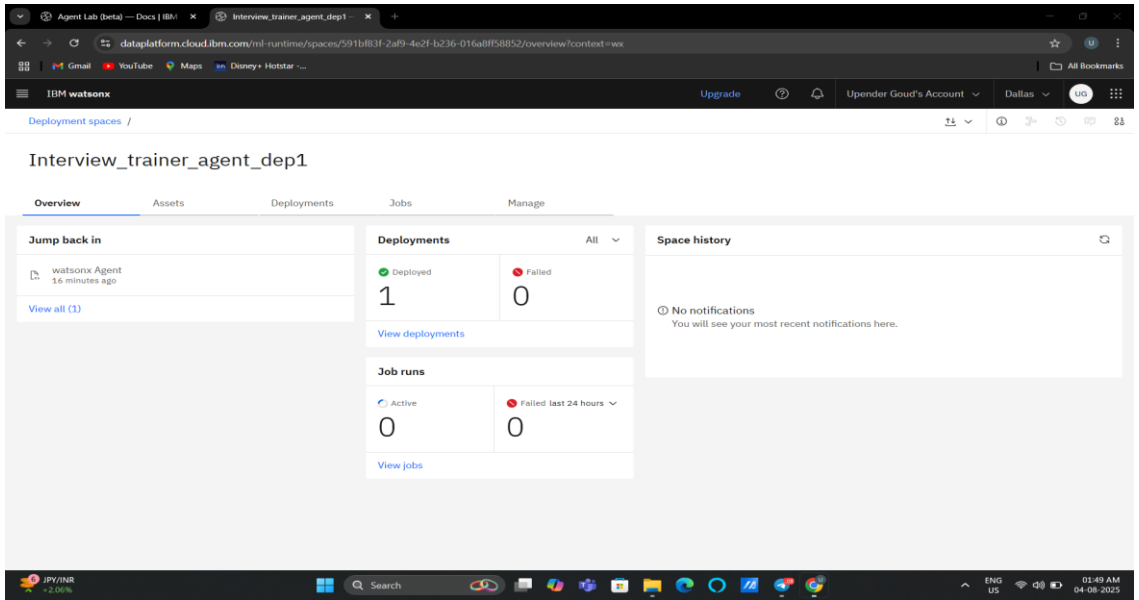
ALGORITHM & DEPLOYMENT

- In the Algorithm section, describe the machine learning algorithm chosen for interview trainer agent. Here's an example structure for this section:
- **Algorithm Selection:**
  - Uses **Retrieval-Augmented Generation (RAG)** combining DPR (retriever) with T5/BART (generator)
  - Suitable for generating personalized and context-aware interview questions and answers..
- **Data Input:**
  - Inputs include **user resume** or **job title**, parsed to extract role, skills, and experience level.
  - Embedded using BERT-based encoders for semantic similarity.
- **Training Process:**
  - Pre-trained models are fine-tuned on domain-specific interview questions and behavioral data.
  - Resume-tagged data and question-answer pairs help align generation with real-world expectations.
- **Prediction Process:**
  - The retriever fetches relevant content from the knowledge base.
  - The generator produces tailored interview questions, model answers, and improvement suggestions in real time.

DEPLOYMENT


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_trainer_agent_dep1
Why don't I see all of my deployment spaces?
Description (optional)
Change this description to reflect your particular agent
View in deployment space after deploying
Cancel
Deploy
Deployment has started
Your AI service deployment has started.
View status
Timestamp 1:32:18 AM


Build
Model: granite-3-3-8b-instruct
Setup
Configuration
Framework
LangGraph
Architecture
ReAct
Instructions
Advanced configuration
You are an Interview Trainer Agent and prepare users for job interviews by generating tailored question sets and preparation strategies based on their profile name, experience level, and job role.
Users can input their resume or job title, and the agent provides targeted questions, model
Knowledge
Tools
Add a tool
Create custom tool
Added tools (4)
Google search
Retrieve information from the internet with the Google search engine.
Agent preview
Welcome to watsonx Agent
Deployment has started
Your AI service deployment has started.
View status
Timestamp 1:32:18 AM
Type something...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Overview
Assets
Deployments
Jobs
Manage
Jump back in
watsonx Agent
16 minutes ago
View all (1)
Deployments
All
Deployed
1
Failed
0
View deployments
Job runs
Active
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Failed last 24 hours
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View jobs
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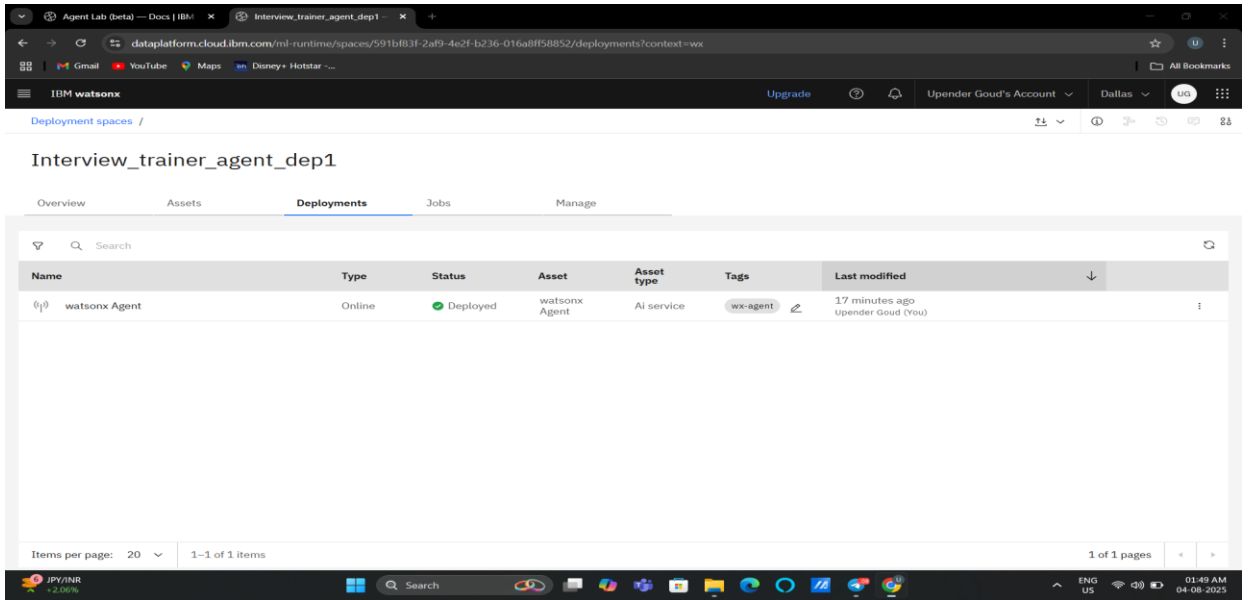
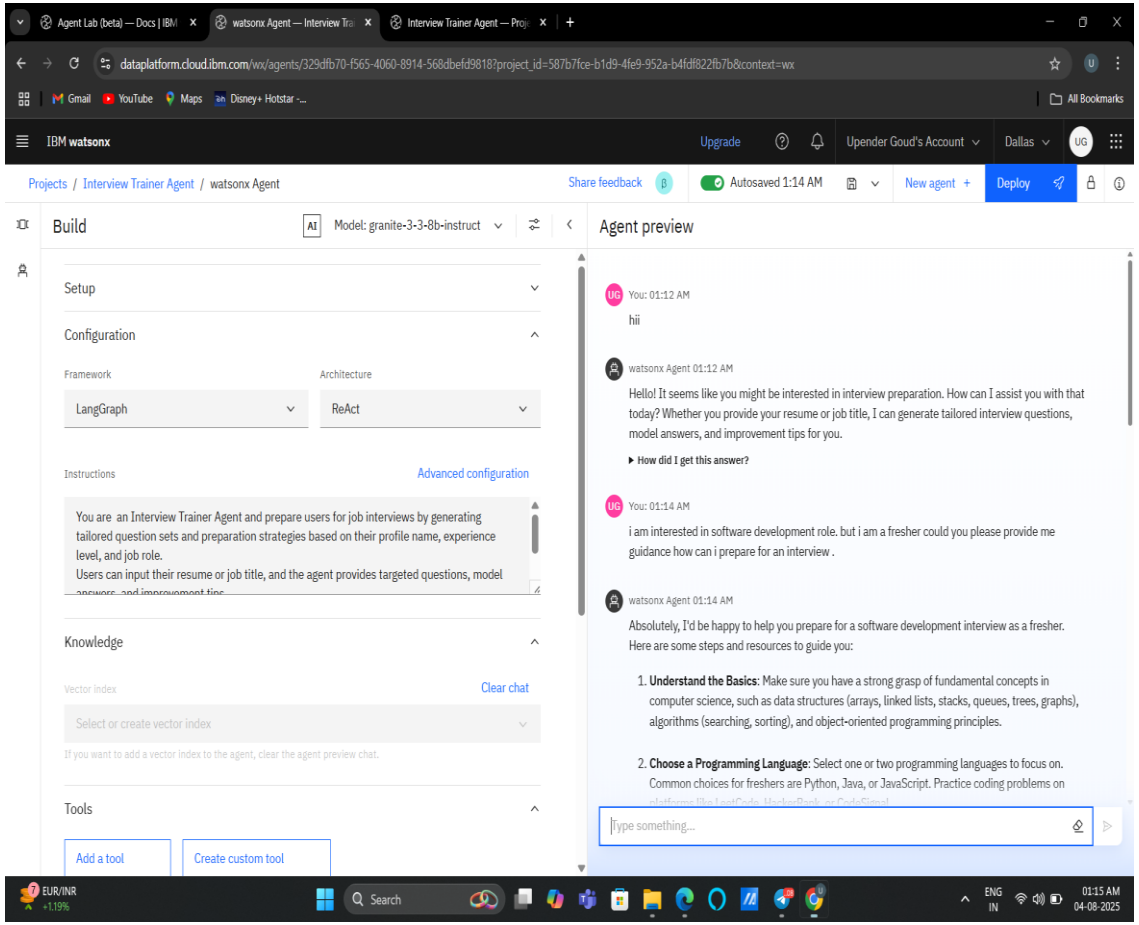
No notifications
You will see your most recent notifications here.

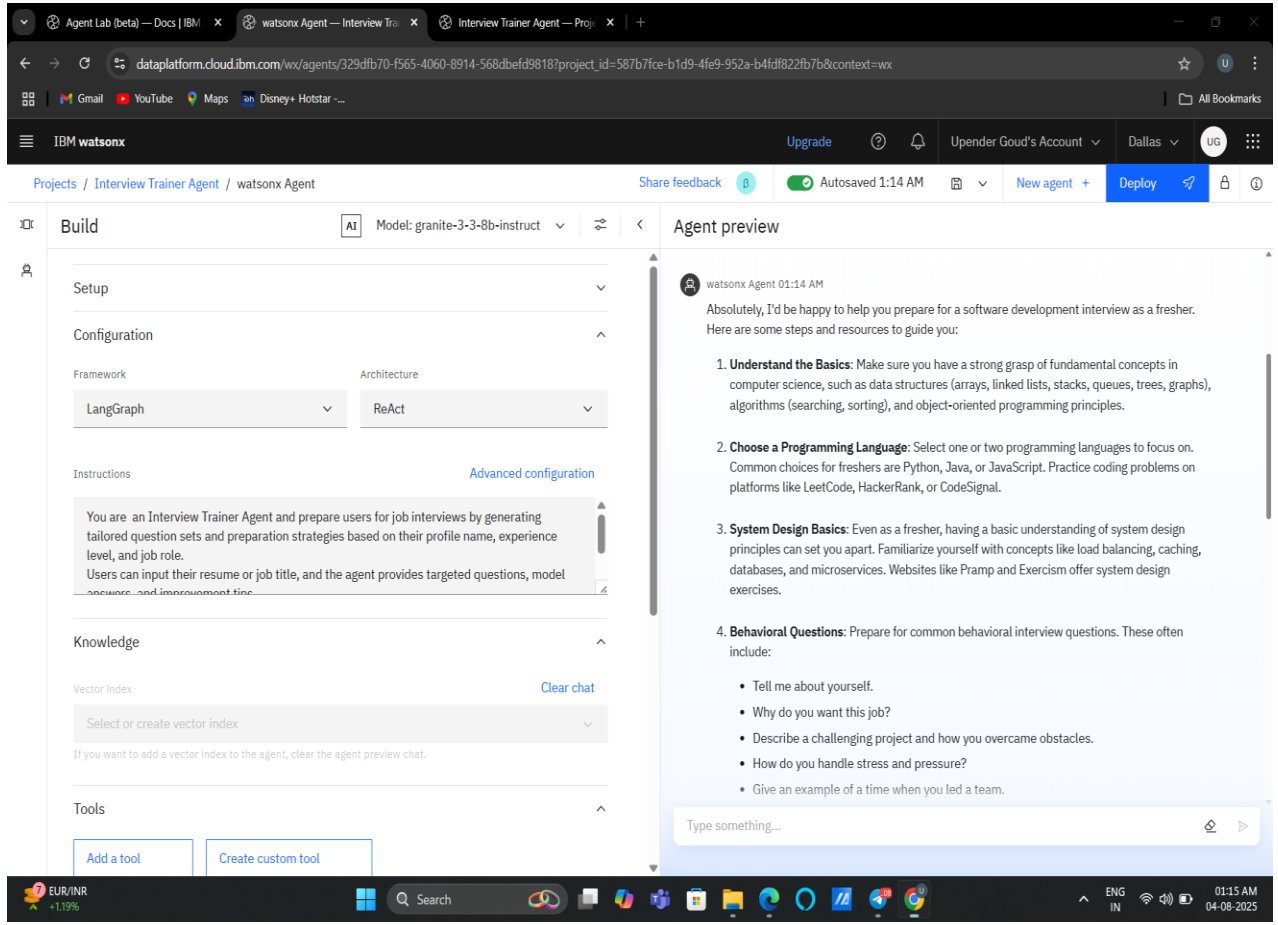

Interview_trainer_agent_dep1
Overview
Assets
Deployments
Jobs
Manage
Search
Name
Type
Status
Asset
Asset type
Tags
Last modified
watsonx Agent
Online
Deployed
watsonx Agent
Ai service
wx-agent
17 minutes ago
Upender Goud (You)
Items per page: 20
1–1 of 1 items
1 of 1 pages

RESULT

- The system successfully generates **personalized interview questions and model answers** based on user resumes or job titles.
- Users receive **real-time feedback** on both technical and soft skill responses, improving confidence and readiness for real interviews.

RESULT





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CONCLUSION

- The Interview Trainer Agent provides a smart, personalized solution for interview preparation by leveraging RAG and NLP. It tailors question sets, model answers, and feedback based on user profiles, effectively bridging the gap between generic prep tools and real-world interview expectations. This system enhances user confidence and significantly improves their chances of success in competitive hiring environments.

FUTURE SCOPE

- **Mock Interview Simulation:** Integrate AI-driven voice and video mock interviews with real-time feedback on tone, posture, and speech.
- **Multilingual Support & Expansion:** Support regional languages and expand question databases for diverse domains like healthcare, law, and finance.
- **Adaptive Learning:** Continuously update the model using user feedback and evolving industry trends for smarter, more relevant preparation.

REFERENCES

- This project is based on concepts and tools from Hugging Face Transformers, Retrieval-Augmented Generation (RAG) research, job-related insights from LinkedIn and Glassdoor, NLP techniques using spaCy, and semantic retrieval using FAISS. Additional support was taken from machine learning methodologies, resume parsing strategies, and real-world interview preparation practices.

IBM CERTIFICATIONS

IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence

Journey to Cloud: Envisioning Your Solution
IBM SkillsBuild
IBM

N Upender Goud

Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution

Issued on: Jul 19, 2025
Issued by: IBM SkillsBuild

Verify: https://www.credly.com/badges/c3f0cf2a-c46d-4b11-b803-edba25833286

IBM

IBM CERTIFICATIONS

IBM **SkillsBuild** Completion Certificate

This certificate is presented to

Upender Goud

for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 19 Jul 2025 (GMT) **Learning hours:** 20 mins

THANK YOU

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