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# CAPSTONE PROJECT

## INTERVIEW TRAINER AGENT

**Presented By:**  
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# OUTLINE

- **Problem Statement** (Should not include solution)
- **Proposed System/Solution**
- **System Development Approach** (Technology Used)
- **Algorithm & Deployment**
- **Result (Output Image)**
- **Conclusion**
- **Future Scope**
- **References**

# 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. 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 aims to create a RAG based AI agent to be a personal Interview Trainer.
- Free all the current resources :
  - If there is any currently running resource in IBM cloud then free those resources .
- IBM Watsonx :
  - Open Watsonx and choose AI Agents tab .
  - Then choose Agent lab → Watsonx.ai home tab then create a project .
  - Now click on the “Built an AI agent to automate your task”
  - Then based on the requirements create an project (AI Agent) , don’t forget to add the watsonx.ai runtime service to the project.
- IBM Watsonx AI Agent :
  - In the agent page one can choose the models from the drop down.
  - then we can write the Instruction to the bot like how it needs to respond to the user based on quarry.
  - Next add the RAG document file . We can use docx file or pdf as our RAG document to which our bot will take reference to answer the quarry.
  - Then add the necessary tools that the bot will use to answer the user quarry.
- Testing :
  - We need to test the bot that it is working and responding to the user in the intended way or not.
- Deployment:
  - Create an API key and finally Deploy the AI Agent

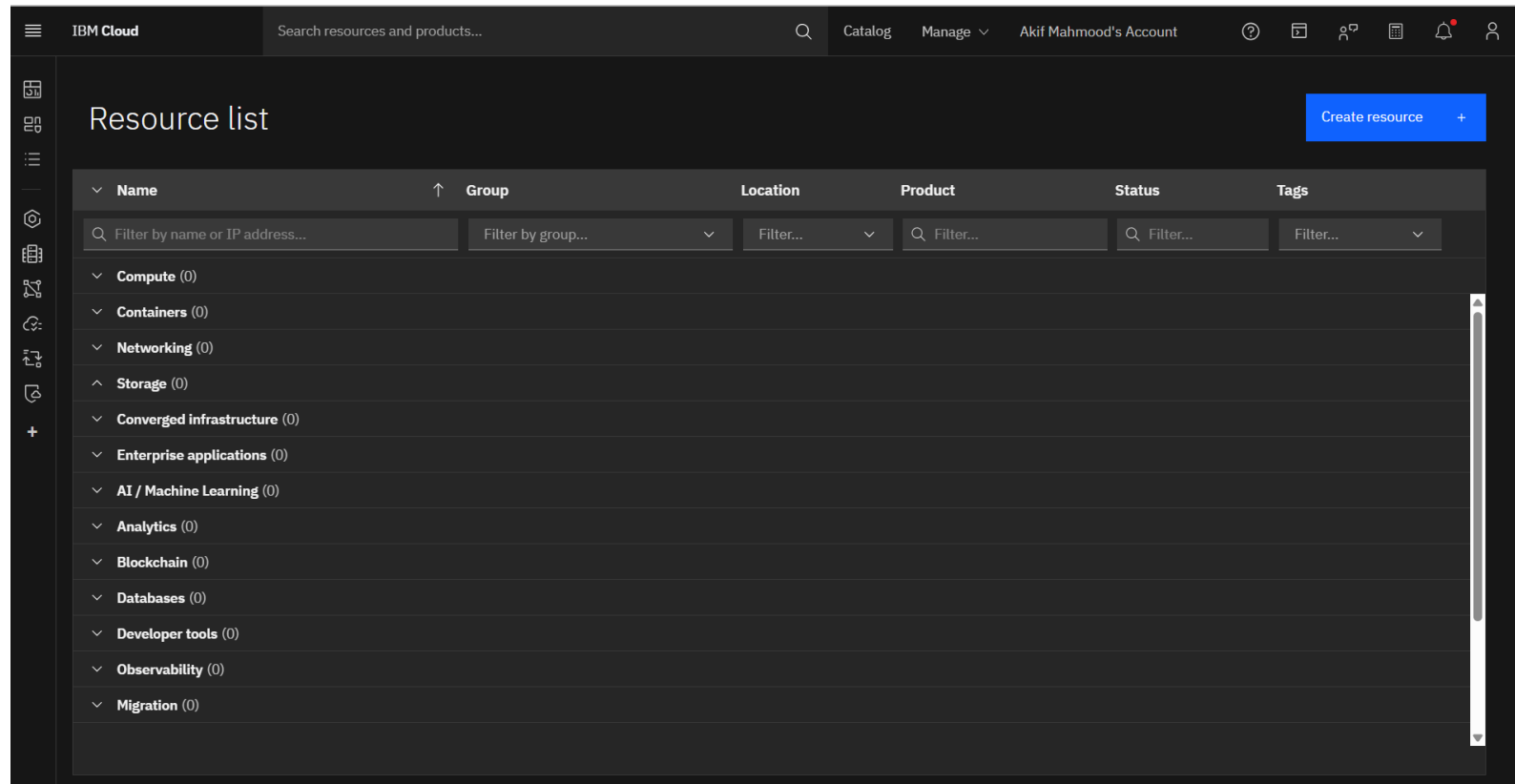
# SYSTEM APPROACH

## ❖ Requirements –:

- Browser
- Internet Connection
- IBM cloud Free tier

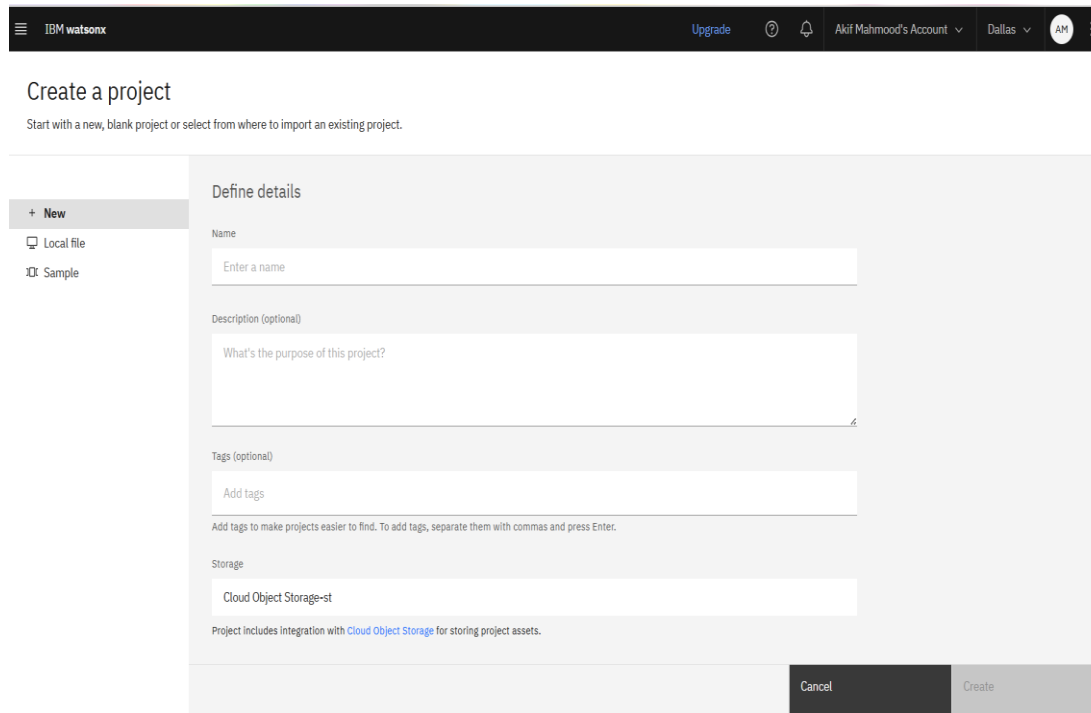
# ALGORITHM & DEPLOYMENT

- **Free all the current resources:** Before starting a new project, it's best practice to de-provision any unused resources to avoid unnecessary costs. This ensures your cloud environment is clean and optimized for your new project.

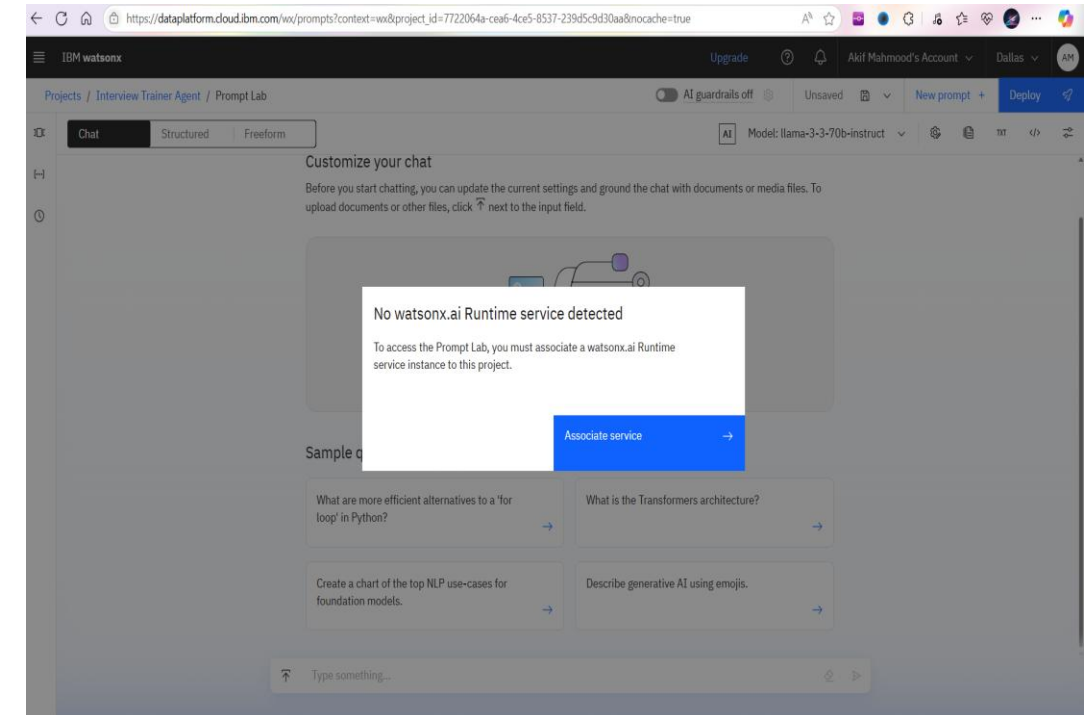


# ALGORITHM & DEPLOYMENT

**IBM Watsonx:** Open the Watsonx platform and navigate to the AI Agents tab to begin your project. Create a new project, which serves as a container for all your agent's resources, including the watsonx.ai runtime service.



The screenshot shows the 'Create a project' interface in the IBM Watsonx platform. The header includes the 'IBM watsonx' logo, an 'Upgrade' button, and user account information for 'Akif Mahmood's Account' in 'Dallas'. The main heading is 'Create a project' with a subtext: 'Start with a new, blank project or select from where to import an existing project.' On the left, there is a sidebar with '+ New', 'Local file', and 'Sample'. The main form area is titled 'Define details' and contains several input fields: 'Name' (with placeholder 'Enter a name'), 'Description (optional)' (with placeholder 'What's the purpose of this project?'), 'Tags (optional)' (with placeholder 'Add tags'), and 'Storage' (with a dropdown menu showing 'Cloud Object Storage-st'). A note at the bottom states: 'Project includes integration with [Cloud Object Storage](#) for storing project assets.' At the bottom right, there are 'Cancel' and 'Create' buttons.



# ALGORITHM & DEPLOYMENT

**IBM Watsonx AI Agent:** Select a foundation model from the dropdown that best suits the agent's task, such as a model from the IBM Granite family for instruction-following. In the Instructions section, define the agent's persona and how it should respond to user queries, setting clear guidelines for its behavior.

The screenshot displays the IBM Watsonx AI Agent interface. The top navigation bar includes the IBM Watsonx logo, an Upgrade button, a help icon, a notification bell, and user account information (Akif Mahmood's Account, Dallas, AM). The main interface is divided into two primary sections: 'Build' and 'Agent preview'.

**Build Section:**

- Model:** Llama-3-3-70b-instruct
- Framework:** LangGraph
- Architecture:** ReAct
- Instructions:** 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:** Vector index (Select or create vector index)
- Tools:** Add tool, Create custom tool

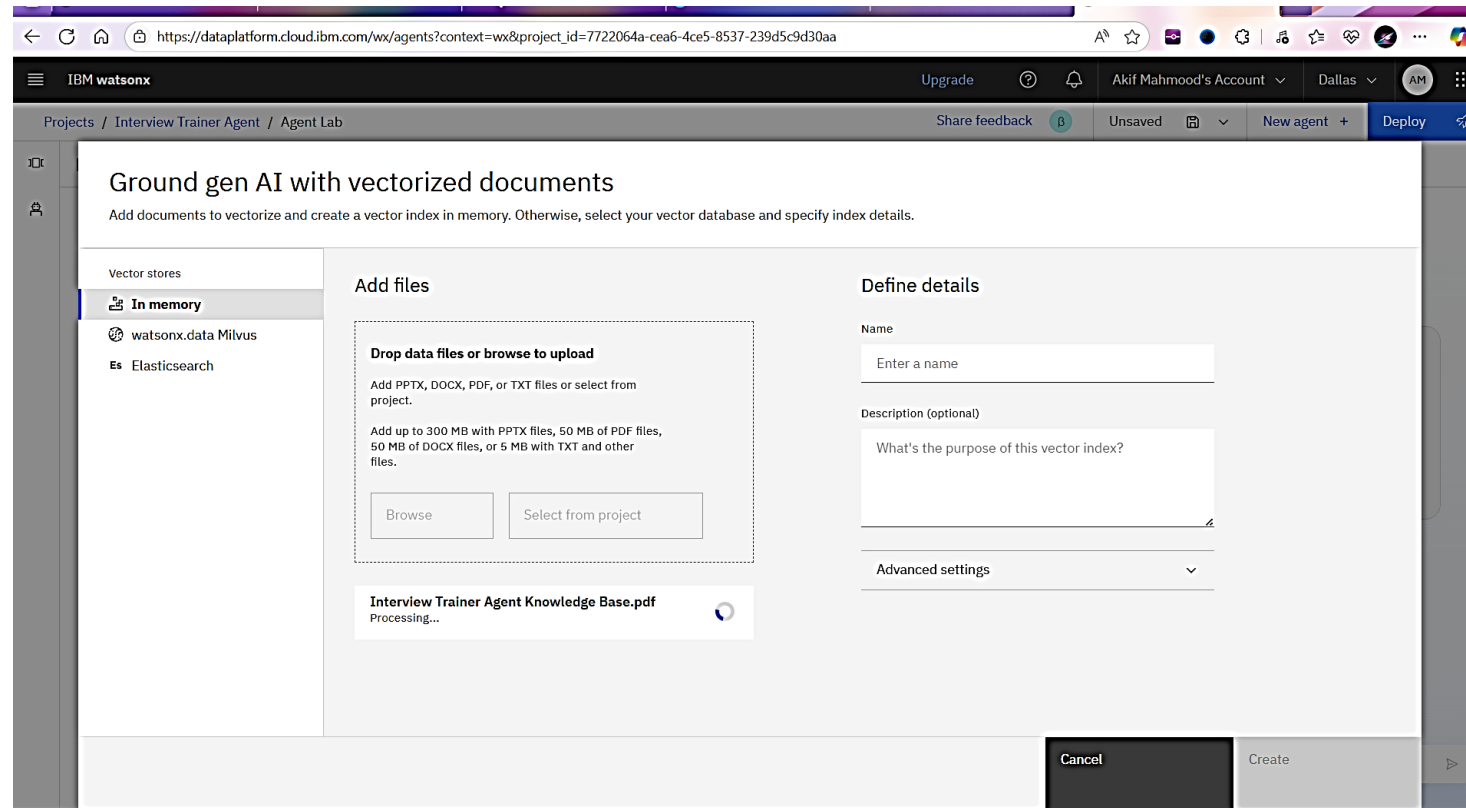
**Agent preview Section:**

- watsonx Agent 12:25 PM**
- Welcome to watsonx Agent**
- Change this description to reflect your particular agent**
- Visual Representation:** A diagram showing a network of nodes and connections, with a magnifying glass highlighting a specific node.
- Input Field:** Type something...



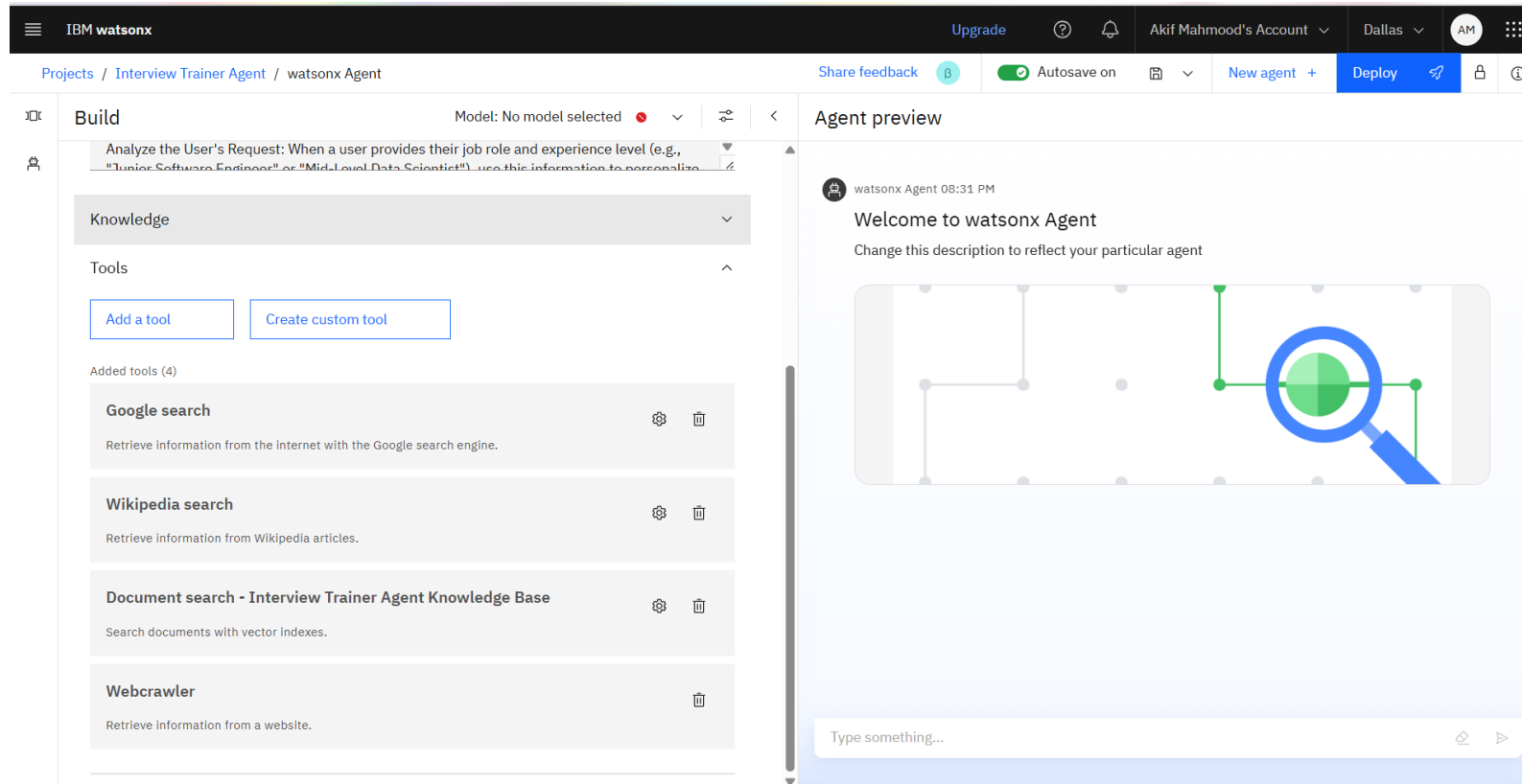
# ALGORITHM & DEPLOYMENT

**Next add the RAG document file:** Upload your PDF or DOCX file to a vector index, which the agent will use as its knowledge base for RAG. This file provides the specific context and information needed to generate tailored answers for interview training.



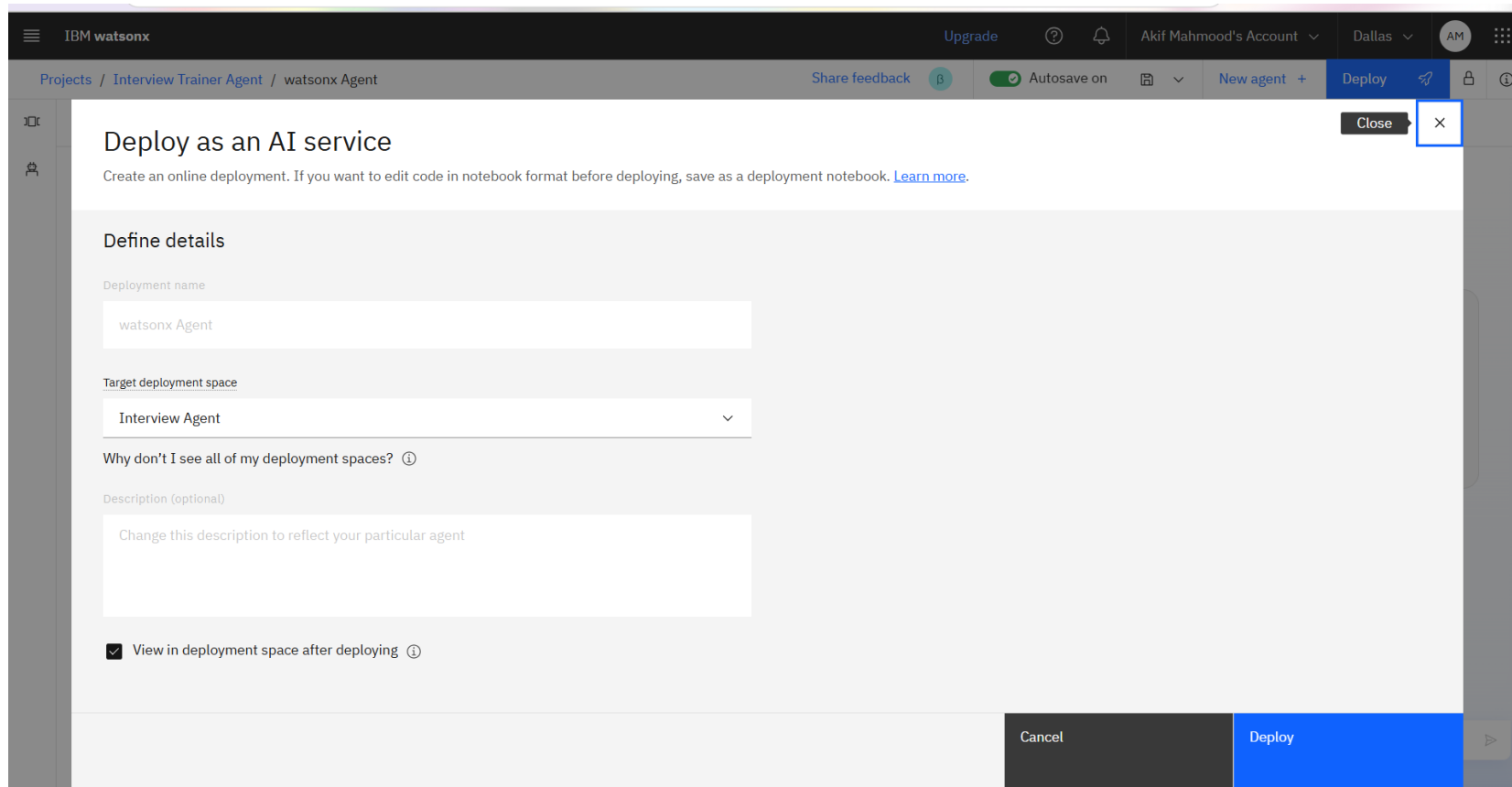
# ALGORITHM & DEPLOYMENT

Then add the necessary tools that the bot will use to answer the user query: Tools extend the agent's capabilities beyond its core knowledge base, allowing it to perform actions like searching the web or integrating with other services. For this project, you would add a search tool if the agent needed to look for information outside of your RAG document.



# ALGORITHM & DEPLOYMENT

**Deployment** is the final and crucial step in making your Interview Trainer Agent available for use. Once you have built and tested the agent, you will deploy it to create an endpoint that can be integrated into an application.



The screenshot shows the 'Deploy as an AI service' dialog box in the IBM watsonx interface. The dialog is titled 'Deploy as an AI service' and includes a 'Close' button in the top right corner. Below the title, there is a brief instruction: 'Create an online deployment. If you want to edit code in notebook format before deploying, save as a deployment notebook. [Learn more.](#)'. The main section is titled 'Define details' and contains the following fields:

- Deployment name:** A text input field containing 'watsonx Agent'.
- Target deployment space:** A dropdown menu with 'Interview Agent' selected.
- Description (optional):** A text input field with the placeholder text 'Change this description to reflect your particular agent'.
- View in deployment space after deploying:** A checkbox that is checked.

At the bottom right of the dialog, there are two buttons: 'Cancel' and 'Deploy'.

# RESULT

## ❖ Initial Agent page

The screenshot displays the IBM watsonx Agent Lab interface. The top navigation bar includes the IBM watsonx logo, an 'Upgrade' button, a help icon, a notification bell, and user account information for 'Akif Mahmood's Account' in 'Dallas'. The main breadcrumb trail reads 'Projects / Interview Trainer Agent / Agent Lab'. On the right side of the header, there are buttons for 'Share feedback', 'Unsaved', 'New agent +', and 'Deploy'.

The interface is split into two main panels. The left panel, titled 'Build', contains configuration options for the agent. It shows the model as 'llama-3-3-70b-instruct'. Under 'Framework', 'LangGraph' is selected. Under 'Architecture', 'ReAct' is selected. The 'Instructions' section contains 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 an 'Advanced configuration' link. The 'Knowledge' section has a 'Vector index' dropdown menu with the option 'Select or create vector index'. A note explains that a vector index searches documents for relevant information to ground the model. The 'Tools' section is partially visible at the bottom.

The right panel, titled 'Agent preview', shows a chat interface. A message from 'watsonx Agent 12:25 PM' says 'Welcome to watsonx Agent' and 'Change this description to reflect your particular agent'. Below the text is a diagram of a graph with nodes and edges, and a magnifying glass icon. At the bottom of the preview panel is a text input field with the placeholder 'Type something...' and a send button.

# RESULT

## ❖ After adding *Instructions* and *Knowledge*

The screenshot displays the IBM watsonx Agent Build interface. The top navigation bar includes the IBM watsonx logo, an Upgrade button, a help icon, a notification bell, and user account information (Akif Mahmood's Account, Dallas, AM). Below the navigation bar, the breadcrumb trail shows 'Projects / Interview Trainer Agent / watsonx Agent'. The main interface is divided into two panels: 'Build' on the left and 'Agent preview' on the right.

**Build Panel:**

- Model:** llama-3-3-70b-instruct
- Framework:** LangGraph
- Architecture:** ReAct
- Instructions:** Initial Greeting: When a user first greets you, respond with: "Hello! I am your Interview Trainer Agent, ready to help you prepare for your next job interview. Please tell me your job role and experience level so I can generate a tailored set of questions for you." Analyze the User's Request: When a user provides their job role and experience level (e.g., "Junior Software Engineer" or "Mid-Level Data Scientist"), use this information to personalize...
- Knowledge:** Vector index: Interview Trainer Agent Knowledge Base
- Tools:** Add tool, Create custom tool

**Agent preview Panel:**

- watsonx Agent 08:39 PM**
- Welcome to watsonx Agent**
- Change this description to reflect your particular agent**
- Diagram:** A flowchart showing a sequence of steps, with a magnifying glass icon highlighting a specific step.
- Input field:** Type something...

# RESULT

IBM watsonx

Upgrade ?

Akif Mahmood's Account

Dallas

AM

Projects / Interview Trainer Agent / Agent Lab

Share feedback

Unsaved

New agent +

Deploy

Build

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

vector index

Interview Trainer Agent Knowledge Base

If you want to add a vector index to the agent, clear the agent preview chat.

Tools

Add a tool Create custom tool

Added tools (4)

Google search

Retrieve information from the internet with the Google search engine.

Wikipedia search

Retrieve information from Wikipedia articles.

Document search - Interview Trainer Agent Knowledge Base

Search documents with vector indexes.

Webcrawler

Retrieve information from a website.

Agent preview

AM You: 12:42 PM

hello

watsonx Agent 12:42 PM

Hello! I am your Interview Trainer Agent, ready to help you prepare for your next job interview. Please tell me your job role and experience level so I can generate a tailored set of questions for you.

► How did I get this answer?

AM You: 12:42 PM

Junior Software Engineer

watsonx Agent 12:42 PM

As a Junior Software Engineer, it's essential to be prepared for common interview questions that assess your technical skills, problem-solving abilities, and understanding of software development principles. Here are some key areas to focus on:

1. **Programming Fundamentals:** Be ready to explain concepts like data types, variables, control structures (if-else, loops), functions, and object-oriented programming principles (classes, objects, inheritance, polymorphism).

2. **Data Structures and Algorithms:** Understand the basics of arrays, linked lists, stacks, queues, trees, and graphs. Practice solving problems related to sorting, searching, and graph traversal.

Type something...

# RESULT

IBM watsonx

Upgrade ? Bell Akif Mahmood's Account Dallas AM

Projects / Interview Trainer Agent / Agent Lab

Share feedback beta Unsaved New agent + Deploy

Build

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

vector index Interview Trainer Agent Knowledge Base

If you want to add a vector index to the agent, clear the agent preview chat.

Tools

Add a tool Create custom tool

Added tools (4)

Google search

Retrieve information from the internet with the Google search engine.

Wikipedia search

Retrieve information from Wikipedia articles.

Document search - Interview Trainer Agent Knowledge Base

Search documents with vector indexes.

Webcrawler

Retrieve information from a website.

Agent preview

5. **Error Handling and Debugging:** Understand how to handle errors and exceptions in your code. Know how to use debugging tools and techniques to identify and fix issues.

6. **Database Concepts:** Be familiar with database basics, including data modeling, normalization, and query languages like SQL.

7. **Operating System Concepts:** Understand the basics of operating systems, including process management, memory management, and file systems.

In addition to technical skills, be prepared to answer behavioral questions that demonstrate your problem-solving skills, teamwork abilities, and adaptability. Use the STAR method to structure your responses:

1. **Situation:** Set the context for the story.
2. **Task:** Explain the task or challenge you faced.
3. **Action:** Describe the actions you took to address the challenge.
4. **Result:** Share the outcome of your actions.

Some examples of behavioral questions for Junior Software Engineers include:

- Tell me about a time when you had to debug a difficult issue. How did you approach it?
- Can you describe a project you worked on that involved collaboration with others? What was your role, and how did you contribute to the team?
- How do you handle feedback or criticism of your code? Can you give an example?

Remember to practice your responses to common interview questions, and be prepared to ask thoughtful questions to the interviewer about the company, the role, and the team. Good luck with your interviews!

Type something...

https://dataplatform.cloud.ibm.com/wx/agents?context=wx&project\_id=7722064a-cea6-4ce...

# RESULT

IBM watsonx

Upgrade ? 🔔 Akif Mahmood's Account Dallas AM

Create API key + Manage IBM Cloud API keys →

Resource hub

🔗 Foundation models

Explore foundation models from IBM and other third-parties depending on your use case.

[Explore foundation models →](#)

⋮ Prompts →

🔗 Data →

📁 Projects →

📖 Notebooks →

👤 Agents →

What's new

Save resources by training, deploying, and inferencing foundation models that are fine tuned with the low-rank adaptation technique

Aug 01, 2025 →

The mistral-medium-2505 foundation model is now available in the Frankfurt region

Jul 30, 2025 →

Token usage limit increased with the watsonx.ai Runtime Lite plan

Jul 30, 2025 →

Recent work

Projects ↔ +

Interview Trainer Agent

AM 8 h ago

Akif's Prompt lab

AM 2 wk ago

Deployment spaces +

Interview Agent

8 h ago

edunet  
foundation



# RESULT

IBM watsonx

Upgrade



Akif Mahmood's Account

Dallas

AM



Deployment spaces /



## Interview Agent

Overview

Assets

Deployments

Jobs

Manage

### Jump back in



watsonx Agent  
7 hours ago

[View all \(1\)](#)

### Deployments

All

✓ Deployed

1

✗ Failed

0

[View deployments](#)

### Job runs

○ Active

0

✗ Failed last 24 hours

0

[View jobs](#)

### Space history



ⓘ No notifications

You will see your most recent notifications here.

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# CONCLUSION

To summarize, we have successfully developed and implemented a Retrieval-Augmented Generation (RAG) agent using IBM's powerful watsonx platform and Granite models. This project demonstrates how a custom knowledge base can be seamlessly integrated with advanced AI to create a highly specialized and intelligent assistant. The resulting Interview Trainer Agent is not just a chatbot; it is a dynamic system that provides context-aware, accurate, and insightful guidance that goes beyond a standard LLM.

# FUTURE SCOPE

- Looking ahead, this project lays a robust foundation for the future of AI-powered career development. This Interview Trainer Agent can be further enhanced with features such as real-time mock interviews, resume feedback, and integration with live job postings. The flexible architecture built on IBM Cloud services allows for continuous improvement and expansion, ensuring our agent remains a cutting-edge resource for job seekers in a competitive market.

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# REFERENCES

- IBM cloud Documentation

# IBM CERTIFICATIONS

In recognition of the commitment to achieve  
professional excellence



## Akif Mahmood

Has successfully satisfied the requirements for:

### Getting Started with Artificial Intelligence



Issued on: Mar 05, 2025  
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/c3c7963d-1aa2-4b3d-993c-32e863342d68>



# IBM CERTIFICATIONS

In recognition of the commitment to achieve  
professional excellence



## Akif Mahmood

Has successfully satisfied the requirements for:

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### Journey to Cloud: Envisioning Your Solution

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

Verify: <https://www.credly.com/badges/0ef5a369-6fc3-4a42-bb55-7a29ec7ec6f8>



# IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Akif Mahmood

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**