

---

# **CAPSTONE PROJECT**

## **AGENTIC AI FOR PERSONALIZED COURSE PATHWAYS**

**Presented By:**

**1. Parkkavi S – Anjalai Ammal Mahalingam Engineering College - CSE**

# 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

Example: In today's fast-paced learning environment, students often struggle to find personalized course recommendations that align with their specific interests, existing skills, and long-term goals. Most current systems offer generalized suggestions that do not adapt to each learner's journey, leading to confusion, inefficiency, and disengagement. Without personalized guidance, students may take irrelevant courses, miss key learning opportunities, or feel overwhelmed by the available content. There is a need for an intelligent system that can understand a student's profile and recommend the most effective learning pathway.

# PROPOSED SOLUTION

The proposed solution is an Agentic AI-based personalized learning pathway recommender system designed to guide students toward the most suitable courses based on their goals, skills, and learning behavior.

The system will:

- Collect user data such as interests, academic background, skill level, and career goals
- Analyze the data using AI algorithms to understand the learner's profile
- Generate a personalized sequence of courses and learning resources
- Continuously refine suggestions based on user feedback and progress

This intelligent approach ensures that each student receives a tailored and adaptive learning experience.

# SYSTEM DEVELOPMENT APPROACH

The project was developed using IBM Watsonx.ai and Agentic Lab on IBM Cloud.

- IBM Cloud: Platform used for hosting and managing the AI project
- Watsonx.ai: Used to build, configure, and deploy AI agents
- Foundation Model: Selected "mistral-large" model to power the agent
- Agentic Lab: Provided interface to define tools, prompts, and deploy agents
- Deployment Space: Created runtime environment and deployment for the agent
- API Integration: API key generated for deploying and accessing the agent securely

The system was built entirely on cloud, with no manual coding required.

# ALGORITHM & DEPLOYMENT

## Foundation Model:

- Selected “Mistral-large” model from the Watsonx.ai library, known for its advanced reasoning and language capabilities.

## Agent Configuration:

- Used Agentic Lab to define agent behavior, add tools, and structure input/output prompts.

## No-code Implementation:

- No traditional machine learning algorithm was coded manually. Configuration and logic were designed using IBM’s interface.

## Deployment:

- The agent was deployed using a Watsonx.ai runtime service in IBM Cloud.
- API keys and deployment space were created to manage access and functionality.

## Output Testing:

- The agent was tested with sample prompts, and responses were generated instantly through the preview interface.

# RESULT

IBM watsonx

Upgrade

Parkkavi Senthilkumar's Ac... ▾

Dallas ▾

PS

[Deployment spaces](#) / [SkillMate](#) / [SkillPilot! 🚀](#) /

SkillPilot! 🚀

✓ Deployed

Online

API reference

Test

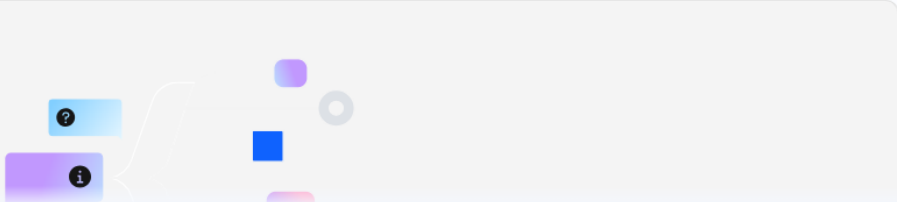
Preview

New chat +

SkillPilot! 🚀 08:05 PM

Welcome to SkillPilot! 🚀


I'm SkillPilot — your AI copilot for smart, personalized learning. Let's find the right path to you.






Type something...


➤


# RESULT








 IBM watsonx



Upgrade

Parkkavi Senthilkumar's Ac...

Dallas

PS

Deployment spaces / SkillMate / SkillPilot! /

SkillPilot! Deployed Online


API referenceTestPreview




New chat +

P


You 08:11 PM

to became an software developer its necessary to learn DSA

SkillPilot! 08:11 PM


  Yes, that's correct! To become a software developer, it's highly recommended to learn Data Structures and Algorithms (DSA). 



DSA is a fundamental concept in computer science that helps you write efficient, scalable, and maintainable code. It's a crucial skill for any software developer as it enables you to:


Type something...





# RESULT


 IBM watsonx







Upgrade



Parkkavi Senthilkumar's Ac...

Dallas

PS

Deployment spaces / SkillMate / SkillPilot!  /




SkillPilot!   Deployed Online

API referenceTestPreview


New chat +



Some essential DSA concepts to learn include:


1. **Arrays:** Understanding how to work with arrays, including indexing, sorting, and searching.
2. **Linked Lists:** Learning about linked lists, including insertion, deletion, and traversal.
3. **Stacks and Queues:** Understanding how to implement stacks and queues, including push, pop, and peek operations.
4. **Trees:** Learning about tree data structures, including binary trees, AVL trees, and BSTs.
5. **Graphs:** Understanding graph theory, including graph traversal, shortest paths, and network flow.
6. **Sorting and Searching:** Learning various sorting algorithms (e.g., Bubble Sort, Quick Sort) and searching algorithms (e.g., Linear Search, Binary Search).


Type something... 


# RESULT








 IBM watsonx



Upgrade

Parkkavi Senthilkumar's Ac...

Dallas

PS






Deployment spaces / SkillMate / SkillPilot!  /


SkillPilot!  Deployed Online

API referenceTestPreview

New chat +

P You 08:12 PM  
thank you

SkillPilot!  08:12 PM  
  You're welcome! It was my pleasure to help. I hope you found our conversation helpful and informative. If you have any more questions or need further guidance, don't hesitate to ask. 😊  
  
Remember, learning is a continuous process, and it's okay to take it one step at a time. Stay curious, keep learning, and have fun with your journey in AI and software development!  

|type something... 

# CONCLUSION

- This project showcased how Agentic AI can be used to build a smart, interactive learning assistant using IBM Watsonx.
- The deployed AI agent, SkillPilot!, provides real-time, personalized course guidance based on user inputs.
- By using IBM Cloud and Watsonx.ai, we explored the capabilities of no-code AI agent development.
- The experience strengthened my understanding of AI deployment workflows and cloud-based solutions.
- Overall, the project demonstrated a practical application of AI in personalized education.

---

# FUTURE SCOPE

- Enhance the agent's intelligence by integrating user feedback into future responses.
- Include adaptive learning plans that update automatically as the user progresses.
- Add voice-based interaction for more accessibility and engagement.
- Expand the platform to support school, college, and working professionals.
- Integrate with job platforms to suggest courses aligned with trending skills and job roles.

---

# REFERENCES

- IBM Watsonx.ai official documentation and user guides
- IBM Cloud Platform – <https://cloud.ibm.com>
- Agentic Lab resources and in-platform tutorials
- Mistral-large model details from IBM Foundation Model Library
- IBM SkillBuild internship modules and project brief
- Screenshots and outputs generated from my personal project workspace on IBM Cloud

# IBM CERTIFICATIONS

In recognition of the commitment to achieve  
professional excellence



Parkkavi S

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



Issued on: Jul 16, 2025  
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/5ba84654-4499-40db-b8c7-cb588ba2a3f0>



# IBM CERTIFICATIONS

In recognition of the commitment to achieve  
professional excellence



Parkkavi S

Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution



Issued on: Jul 17, 2025  
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/2058be89-b883-403f-a12a-5d7a5ae95f41>



# IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

**Parkkavi S**

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**