
CAPSTONE PROJECT

AGENTIC AI FOR PERSONALIZED COURSE PATHWAYS

Presented By

Student name : Nawaz Sarif

**College Name & Department : Krishna Kanta Handiqui State
Open University (Computer Science Dept.)**

AICTE Student ID: STU685bf05910a741750855769

OUTLINE

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PROBLEM STATEMENT

Students often struggle to identify the right learning path that aligns with their interests and long-term goals due to the overwhelming number of online courses and a lack of personalized guidance. Skill Pilot aims to solve this by acting as an Agentic AI coach that interacts with students, understands their interests (like Frontend Development, Cybersecurity, UI/UX Design, etc.), assesses their current skill level, and dynamically builds a personalized course roadmap that adapts over time based on progress and preferences.

Proposed Solution:

Skill Pilot is an AI-powered learning coach built using IBM Cloud Lite services. It uses Natural Language Processing (NLP) to understand user interests, the IBM Granite model to generate personalized learning roadmaps, and Retrieval-Augmented Generation (RAG) with web crawling and search capabilities to fetch the most relevant and up-to-date learning content. The roadmap adapts over time based on the learner's progress, feedback, and evolving goals, enabling a truly personalized learning experience.

TECHNOLOGY USED

IBM cloud lite services

Natural Language Processing (NLP)

Retrieval Augmented Generation (RAG)

IBM Granite model

IBM CLOUD SERVICES USED

- IBM Cloud Watsonx AI Studio
- IBM Cloud Watsonx AI runtime
- IBM Cloud Agent Lab
- IBM Granite foundation model

WOW FACTORS

This agent dramatically reduces the time spent choosing the right learning resources, improves learning outcomes through personalized roadmaps, empowers beginners to confidently navigate tech careers, and fosters continuous growth by adapting to individual goals and progress.

Unique Features:

Semantic understanding of user goals through natural conversation

Dynamic roadmap generation based on skill level, interests, and time commitment

Real-time content retrieval from trusted sources using RAG and web search

Auto-curated learning modules with links to hands-on tutorials, articles, and projects

Progress-aware roadmap updates that evolve with user performance and feedback


Project suggestions aligned with industry expectations


Goal-focused content delivery, whether it's job-readiness, skill expansion, or portfolio building



END USERS


- Students & College Graduates
- Early-Career Professionals
- Self-Learners & Hobbyists
- Academic Institutions & Training Centers
- Anyone Overwhelmed by Learning Choices
- Learners who want to skip the research and jump straight into a tailored, evolving plan

RESULTS

 IBM watsonx


Upgrade ?  Nawaz Sarif's Account Dallas NS

  New chat +

 Skill Pilot 05:48 PM

Welcome to Skill Pilot

Skill Pilot guides your tech journey with personalized roadmaps and real, hands-on learning.




Quick start samples

How do I become a full-stack developer? →

I have 2 hours a day — what can I learn? →


Can you build me a roadmap? →



Help me choose between frontend and backend. →

Type something... 


Activate Windows
Go to Settings to activate Windows.

RESULTS


 IBM watsonx

Upgrade ?  Nawaz Sarif's Account ▾ Dallas ▾ 

New chat +

 You 05:46 PM


I have 2 hours a day — what can I learn?

 Skill Pilot 05:46 PM


That's a great amount of time to dedicate to learning! To help you make the most of it, I'd like to know which area of tech you're most interested in. Here are some options:


- Frontend Development
- Backend Development
- Cloud Computing
- AI & Machine Learning
- Cybersecurity
- UI/UX Design
- Competitive Programming
- DevOps

Please let me know which one you'd like to focus on, and I can create a personalized learning roadmap for you.

 You 05:47 PM


I am interested in AI ML



 Skill Pilot 05:47 PM



Type something... 


Activate Windows
Go to Settings to activate Windows.

RESULTS

 IBM watsonx

Upgrade ?  Nawaz Sarif's Account ▾ Dallas ▾  NS

  New chat +

 Skill Pilot 05:47 PM

That's fantastic! AI and Machine Learning are exciting and rapidly growing fields. With your 2 hours a day, we can create a structured learning plan. Here's a preliminary roadmap to get you started:

Weeks 1-2: Basics of Python Programming

- Python is widely used in AI and ML. Start with the basics.
- Resource: [W3Schools Python Tutorial](#)
- Mini-project: Write small scripts to solve simple problems, like calculating the area of a circle or sorting a list of numbers.

Weeks 3-4: Understanding Mathematics for Machine Learning

- Familiarize yourself with Linear Algebra, Probability, and Calculus as they form the foundation of ML algorithms.
- Resource: [Khan Academy Linear Algebra](#)
- Mini-project: Solve a set of linear algebra problems from Khan Academy.

Weeks 5-6: Introduction to Machine Learning

- Learn about supervised vs. unsupervised learning, regression, classification, clustering, etc.
- Resource: [Machine Learning by Andrew Ng on Coursera](#) (Note: This is a more in-depth course, you can start with the basics and revisit later if needed)
- Mini-project: Implement a simple linear regression model using Python's scikit-learn library on a small dataset.

Weeks 7-8: Deep Learning Basics

- Dive into neural networks and understand the basics of deep learning.
- Resource: [Deep Learning Specialization by Andrew Ng on Coursera](#)

Type something...

Activate Windows
Go to Settings to activate Windows.

RESULTS

Deployed AI Agent

The screenshot displays the IBM Watsonx Skill Pilot deployment page. The top navigation bar includes the IBM Watsonx logo, an 'Upgrade' button, and user account information for 'Nawaz Sarif's Account' in 'Dallas'. The breadcrumb trail shows the path: 'Deployment spaces / Skillpilot deployment space / Skill Pilot /'. The main content area features a 'Skill Pilot' header with 'Deployed' and 'Online' status indicators. Below this are tabs for 'API reference', 'Test', and 'Preview', with 'Preview' being the active tab. A 'New chat +' button is located on the right. The chat interface shows a welcome message from 'Skill Pilot' at 05:50 PM, stating 'Welcome to Skill Pilot' and 'Skill Pilot guides your tech journey with personalized roadmaps and real, hands-on learning.' Below the message is a diagram illustrating the Skill Pilot architecture, which includes a central 'Skill Pilot' box connected to various components like 'API', 'UI', 'Data', and 'Model'. Under the 'Quick start samples' section, there are four buttons with sample queries: 'How do I become a full-stack developer?', 'I have 2 hours a day — what can I learn?', 'Can you build me a roadmap?', and 'Help me choose between frontend and backend.' A text input field at the bottom is labeled 'Type something...'. On the right side, a sidebar titled 'About this deployment' provides details about the deployment, including its name, description, deployment ID, serving name, software and hardware specifications, and tags. The sidebar also shows the associated asset and the last modified and created dates.

IBM watsonx Upgrade ? 🔔 Nawaz Sarif's Account Dallas NS

Deployment spaces / Skillpilot deployment space / Skill Pilot /

Skill Pilot Deployed Online

API reference Test **Preview**

New chat +

Skill Pilot 05:50 PM

Welcome to Skill Pilot

Skill Pilot guides your tech journey with personalized roadmaps and real, hands-on learning.

Quick start samples

How do I become a full-stack developer? →

I have 2 hours a day — what can I learn? →

Can you build me a roadmap? →

Help me choose between frontend and backend. →

Type something... ➤

About this deployment x

Name Skill Pilot

Description Skill Pilot guides your tech journey with personalized roadmaps and real, hands-on learning.

Deployment Details

Deployment ID: d097c555-1400-4d...

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

Associated asset Skill Pilot fd5f3312-61dd-4b12-a3ed-6a0e0835200

Last modified 5 minutes ago

Created on Aug 7, 2025

Activate Windows Go to Settings to activate Windows.

CONCLUSION

- The agent can generate personalized learning roadmaps, recommend curated resources, and even guide users through hands-on projects.
- It saves time by automating content discovery, skill assessment, and progress tracking across multiple domains.
- Skill Pilot enhances learning efficiency, confidence, and adaptability for students, professionals, and self-learners alike.

FUTURE SCOPE

- The agent can be enhanced with voice-based interaction, enabling hands-free, conversational learning.
- Integration with online coding platforms and learning management systems.
- Multilingual support will expand accessibility to diverse user bases across different regions.
- Over time, the agent can evolve into a collaborative hub, connecting learners with peers, mentors, and industry experts for guided growth.

IBM CERTIFICATIONS

In recognition of the commitment to achieve
professional excellence



Nawaz Sarif

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



Issued on: Jul 15, 2025
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/cefbe3cb-9aaf-40b3-a345-790287a1c747>



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Journey to Cloud: Envisioning Your Solution



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IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Nawaz Sarif

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

GITHUB LINK

https://github.com/Nawaz0119/Skill_pilot_AgenticAI.git



THANK YOU