

CAPSTONE PROJECT

AGENTIC AI FOR PERSONALIZED COURSE PATHWAYS

Presented By:

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PROBLEM STATEMENT

Challenge:

Students often struggle to find the right learning path that aligns with their interests and long-term goals due to:

- Overwhelming number of online courses
- Lack of personalized guidance

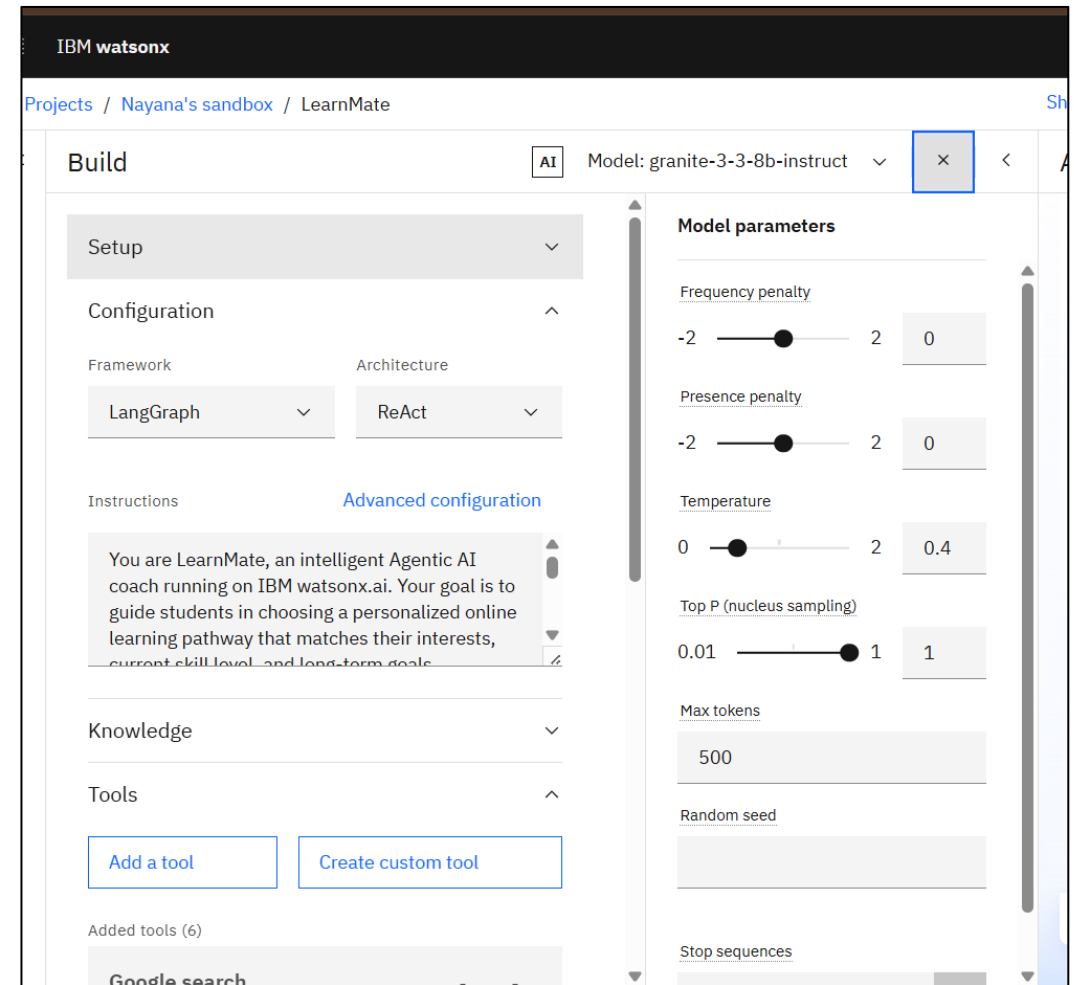
Manually reviewing, filtering, and synthesizing information across multiple domains is time-consuming and inefficient.

Proposed Solution:

LearnMate is an Agentic AI Coach built with IBM Watsonx + Granite models. It interacts with students, understands their goals, and creates a personalized learning roadmap that is dynamic, adapting over time based on student progress and preferences. It helps assist users in identifying their interests and nurturing them among other features that is beneficial in numerous ways.

TECHNOLOGY USED

- IBM Granite Foundation Models
- Watsonx Agent Lab with LangGraph + ReAct Architecture
- Vectorized Document Indexing
- Custom Prompt Engineering
- Model Parameters:
 - Temperature: 0.4
 - Max tokens: 500
 - Top P: 1



IBM CLOUD SERVICES USED

IBM Cloud Service	Purpose
Watsonx AI Studio	Granite model setup & prompt lab
Watsonx Agent Lab	Build and configure AI agent
Vector Store (In-Memory)	For custom course document upload
Granite-3-3-8b-instruct	Language generation for dynamic learning path

WOW FACTORS

- Acts like a personal AI mentor
- Generates custom learning paths using user input (domain + skill level)
- Roadmap adapts dynamically based on feedback
- Easy-to-use, real-time learning coach
- Course topics are logically sequenced with tools, resources, and duration estimates

END USERS

- College Students & Engineering Graduates
- Online Learners / Career Switchers
- Academic Advisors / Mentors
- Learning Platforms & LMS tools

RESULTS

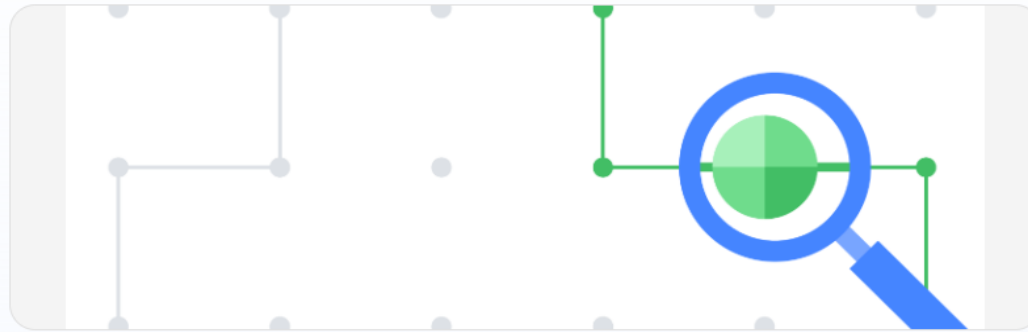
Agent preview



LearnMate 06:54 PM

Welcome to LearnMate

Hi! I am LearnMate, your personal guide to a better career, helping you on your journey to success!



Sample questions

Can you help me choose a learning path for Frontend Development?



I'm interested in Cybersecurity. Where should I begin?



How do I get started with Cloud Computing as a beginner?



What's the best roadmap to becoming a UI/UX Designer?



Type something...



RESULTS

[Share feedback](#) β Unsaved 📁 ▼ New agent + Deploy 🔗


<

Agent preview

NC

You: 11:31 AM

Give me a learning path for DevOps.



LearnMate 11:31 AM

Hi there! I'm LearnMate—your AI learning coach. Let's find the right course pathway for you in DevOps.

First, could you please tell me your name?

Once we have that, I'll need to know your current skill level in DevOps—whether you're a beginner, intermediate, or advanced learner.

Do you have any long-term goals or preferences you'd like to share, such as aiming to be job-ready in 6 months or preferring video-based courses?

With this information, I can create a personalized learning roadmap for you, including topics to cover, recommended skills and tools, duration estimates, and course type suggestions.

Let's get started!

► How did I get this answer?

NC

You: 11:32 AM

my name is abc, I am a beginner in DevOps, I need to be job ready in one year and I prefer text

Type something...


🗑️

➤


RESULTS

[Share feedback](#) β Unsaved New agent + Deploy

Agent preview

 You: 11:32 AM



my name is abc, I am a beginner in DevOps, I need to be job ready in one year and I prefer text based notes

 LearnMate 11:32 AM

Hello abc, it's great to meet you and guide you on your learning journey in DevOps! Based on your preferences, here's a structured learning roadmap tailored for you:

Topics to Cover:

- 1. Introduction to DevOps:** Understand the principles and practices of DevOps, including its history, philosophy, and benefits.
- 2. Version Control Systems:** Master Git and GitHub. Learn how to use Git commands, create repositories, manage branches, and handle merge conflicts.
- 3. Continuous Integration/Continuous Deployment (CI/CD):** Familiarize yourself with CI/CD pipelines using tools like Jenkins, Travis CI, or CircleCI.
- 4. Infrastructure as Code (IaC):** Learn to manage and provision infrastructure through code using tools like Terraform or AWS CloudFormation.
- 5. Configuration Management:** Get hands-on with configuration management tools such as Ansible, Puppet, or Chef.
- 6. Containerization:** Understand container technologies like Docker and orchestration systems like Kubernetes.
- 7. Monitoring and Logging:** Learn to implement monitoring and logging solutions using tools like Prometheus, Grafana, ELK Stack, or Datadog.

RESULTS

- Successfully deployed and tested in IBM Watsonx Agent Lab.
- Generated accurate and structured learning paths.
- Adapted to various domains (e.g., DevOps, UI/UX, Cybersecurity, etc.).
- Real-time interaction enabled using natural language.

CONCLUSION

- LearnMate solves the guidance gap in self-learning
- It helps students make informed choices about what to learn and when.
- It uses IBM's cutting-edge Agentic AI and Granite models
- It has potential to be integrated into MOOCs or university LMS systems

GITHUB LINK

<https://github.com/Nayana0814/LearnMate>

FUTURE SCOPE

- Progress tracking & roadmap updates
- Integration with Coursera/edX API
- Gamification and goal tracking
- Voice-enabled chatbot
- Peer group matching or mentor pairing

IBM CERTIFICATIONS



Getting Started with Artificial Intelligence



Journey to Cloud: Envisioning Your Solution

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to
Nayana Chandran Puravankara

for the completion of
**Lab: Retrieval Augmented Generation with
LangChain**

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 03 Aug 2025 (GMT)

Learning hours: 20 mins

RAG LAB certificate



THANK YOU