

IBM AICTE PROJECT

LEARNMATE – AGENTIC AI FOR PERSONALIZED COURSE PATHWAYS

Presented By :

Student name : Alzaim Ahmed Ansari

**College Name & Department : Noida Institute of Engineering & Technology,
Computer Science & Engineering(3rd Year)**

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PROBLEM STATEMENT

Students and early-career professionals 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. With an overwhelming number of online courses and limited personalized guidance, learners struggle to make informed decisions about skill development and career direction.

Proposed Solution:

LearnMate is an AI-powered academic advisor that leverages Natural Language Processing (NLP) and Large Language Models (LLMs) on IBM watsonx to guide users in building personalized course pathways. The agent interacts with students, understands their interests and current skill levels, and dynamically generates a tailored learning roadmap. It evolves based on user progress and preferences — offering a consistent, adaptive, and career-focused learning experience.

TECHNOLOGY USED

- **IBM cloud lite services:** Provides the platform to host and run AI services with zero cost, ideal for lightweight academic projects.
- **Natural Language Processing (NLP):** Enables the agent to understand user input, extract intent, and interact in natural language.
- **Large Language Models(LLM):** Powers the agent's ability to generate personalized learning plans and meaningful academic guidance.
- **IBM Granite model:** A state-of-the-art multilingual LLM hosted on IBM watsonx.ai, used for generating structured, adaptive course roadmaps tailored to the learner's goals and skill level.

IBM CLOUD SERVICES USED

- **IBM Cloud Watsonx AI Studio:** Provides an intuitive environment to build, test, and manage AI workflows — used for prompt creation and evaluation.
- **IBM Cloud Watsonx AI runtime:** Executes and deploys prompts in real-time using the configured model parameters, ensuring consistent agent performance.
- **IBM Cloud Agent Lab:** Enables the creation of agentic workflows where the AI acts autonomously to handle multi-step tasks like course planning and student assessment.
- **IBM Granite foundation model:** A powerful Large Language Model (LLM) used to understand student input, assess learning needs, and generate personalized course roadmaps using natural language.

WOW FACTORS

LearnMate helps students quickly identify the right courses aligned with their interests and career goals. It reduces the time spent on manual research and delivers adaptive learning paths that evolve with the learner's progress, ensuring focused and goal-driven education.

Unique features:

- Personalized Course Roadmaps based on user interest and goals.
- Skill-level Detection through natural conversation.
- Dynamic Path Adjustment as the learner processes.
- Smart Course & Certificate Suggestion.
- Career Oriented Path Mapping

END USERS

- **Students and Early-Career Learners:** seeking personalized guidance in choosing and following the right learning path
- **Academic Advisors and Educators:** to support curriculum planning and individualized student mentoring
- **Universities and Training Institutes:** aiming to offer AI-driven academic assistance to enhance learner engagement
- **EdTech Platforms:** integrating personalized AI agents to scale guidance for a large user base

RESULTS

The screenshot displays the IBM watsonx Agent Lab interface in a web browser. The browser's address bar shows the URL: `dataplatfom.cloud.ibm.com/wx/agents/context=wx/project_id=4d5Rca7-59ff-4714-b453-4efa53952cb2`. The interface is divided into two main panels: 'Build' and 'Agent preview'.

Build Panel:

- Setup:** A dropdown menu is open, showing 'Setup'.
- Name:** The text 'LearnMate' is entered in the input field.
- Description:** The text 'I am LearnMate — your academic advisor, here to guide you with a personalized learning roadmap' is entered. A character count '94/100' is visible.
- Icon:** A selection of icons is shown, with a robot head icon selected.
- Placeholder image:** A preview of the agent's visual representation, showing a stylized robot head and a bar chart.
- Quick start questions:** A text input field with the placeholder 'Add up to 4 quick start questions that your users can select.' and a '+' button.
- Configuration:** A section at the bottom of the build panel.

Agent preview Panel:

- LearnMate 12:55 AM:** A timestamp indicating the agent's activity.
- Welcome to LearnMate:** A greeting message.
- I am LearnMate — your academic advisor, here to guide you with a personalized learning roadmap:** A message describing the agent's role.
- Visual Representation:** A 3D isometric illustration of a robot head, a bar chart, and a document, representing the agent's capabilities.
- Input Field:** A text input field with the placeholder 'Type something...' and a send button.

RESULTS

The screenshot displays the IBM Watsonx Agent Lab interface. The top navigation bar includes the IBM Watsonx logo, an 'Upgrade' button, a user profile for 'Alzaim Ahmed's Account', and a location dropdown for 'Dallas'. The main interface is divided into two primary sections: 'Build' on the left and 'Agent preview' on the right.

Build Section:

- Model:** Set to 'granite-3-3-8b-instruct'.
- Quick start questions:** A section for adding up to 4 quick start questions for users.
- Configuration:**
 - Framework:** Set to 'LangGraph'.
 - Architecture:** Set to 'ReAct'.
- Instructions:** A text area containing instructions for the agent, such as 'based on the topic and skill level, generate a "personalized learning roadmap" of 3-7 steps' and 'Each step should include a course/module name, duration, and learning outcome'.
- Knowledge:** A section for adding knowledge to the agent.

Agent preview Section:

- LearnMate 12:56 AM:** 'Excellent choice! Cloud computing and Machine Learning are in high demand. To create a personalized learning roadmap, could you please specify your current skill level in both areas - Beginner, Intermediate, or Advanced?'
 - 1. For Cloud Computing
 - 2. For Machine Learning
- You: 12:56 AM:** 'Beginner'
- LearnMate 12:56 AM:** 'Thank you for providing your current skill level. Here's a beginner-friendly, 2-week learning roadmap for both Cloud Computing and Machine Learning:'
 - Cloud Computing:**
 - 1. Introduction to Cloud Computing (Coursera) - 3 days
 - Learning outcome: Understand the fundamentals of cloud computing, its architecture, and service models.
 - 2. Google Cloud Platform Fundamentals (Qwiklabs) - 2 days

RESULTS

The screenshot displays the IBM watsonx Agent Lab interface. The top navigation bar includes the IBM watsonx logo, a 'Projects / LearnMate / Agent Lab' breadcrumb, and user account information (Alzaim Ahmed's Account, Dallas). The main interface is divided into two panels: 'Build' and 'Agent preview'.

Build Panel:

- Model:** granite-3-3-8b-instruct
- Quick start questions:** A section to add up to 4 quick start questions that your users can select.
- Configuration:**
 - Framework:** LangGraph
 - Architecture:** ReAct
- Instructions:**
 - based on the topic and skill level, generate a "personalized learning roadmap" of 3-7 steps
 - Each step should include a course/module name, duration, and learning outcome
 - End with a motivational note: "Let's get started with your learning journey!"
- Knowledge:** A section for adding knowledge.

Agent preview Panel:

LearnMate 12:56 AM
Excellent choice! Cloud computing and Machine Learning are in high demand. To create a personalized learning roadmap, could you please specify your current skill level in both areas - Beginner, Intermediate, or Advanced?

1. For Cloud Computing
2. For Machine Learning

Please let me know so I can tailor the plan to your needs.

► How did I get this answer?

You: 12:56 AM
Beginner

LearnMate 12:56 AM
Thank you for providing your current skill level. Here's a beginner-friendly, 2-week learning roadmap for both Cloud Computing and Machine Learning:

Cloud Computing:

1. Introduction to Cloud Computing (Coursera) - 3 days

- Learning outcome: Understand the fundamentals of cloud computing, its architecture, and service models.

2. Google Cloud Platform Fundamentals (Qwiklabs) - 2 days

Type something...

RESULTS

Deployed AI Agent

The screenshot shows the IBM Watsonx deployment interface for the 'LearnMate' AI agent. The browser address bar indicates the deployment URL: `dataplatform.cloud.ibm.com/ml-runtime/deployments/63fa76a1-5a3b-4b49-af1a-d500ecf8efed/chat?space_id=3c16cd98-53bf-459e-b7e2-6d387a8a...`. The interface includes a navigation bar with 'API reference', 'Test', and 'Preview' tabs. The 'Preview' tab is active, showing a chat interface with a welcome message from 'LearnMate' at 02:30 AM: 'Welcome to LearnMate. I am LearnMate — your academic advisor, here to guide you with a personalized learning roadmap.' Below the message is a 3D illustration of a computer monitor displaying a learning roadmap, surrounded by books and a smartphone. At the bottom of the chat area, a text input field contains the message: 'Hi! I want to learn fullstack web development. I am Beginner and don't know anything. I have 6 months for my placements'. On the right side, a sidebar titled 'About this deployment' provides details: Name (LearnMate), Description (I am LearnMate — your academic advisor, here to guide you with a personalized learning roadmap), Deployment Details (Deployment ID: 63fa76a1-5a3b-4b..., 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 (LearnMate), and Last modified (7 minutes ago).

CONCLUSION

- LearnMate generates structured learning reports and personalized study plans for each user.
- It suggests relevant learning goals based on the learner's interests and current skill level.
- It continuously updates the learning roadmap as the user progresses, ensuring adaptability.
- LearnMate enhances learning efficiency, accuracy, and engagement through intelligent AI-driven support.
- It serves both individual learners and educational institutions by providing personalized and scalable academic guidance.

GITHUB LINK

- <https://github.com/zaeim007/LearnMate>

FUTURE SCOPE

- LearnMate can be expanded to support multiple languages for global accessibility.
- Integration with learning platforms (e.g., Coursera, edX, IBM SkillsBuild) can offer real-time course enrollment and tracking.
- AI-driven mentorship matching could connect students with relevant mentors or industry experts.
- The agent can be enhanced to recommend career paths and job opportunities based on learning history.
- Offline functionality can be developed to make LearnMate accessible in low-connectivity environments
- Support for group learning and peer collaboration can be introduced for a more social learning experience.

IBM CERTIFICATIONS

- Getting Started with Artificial Intelligence



Lab: Retrieval Augmented Generation with LangChain

IBM SkillsBuild

Completion Certificate



This certificate is presented to

Alzaim Ahmed Ansari

for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 25 Jul 2025 (GMT)

Learning hours: 20 mins

THANK YOU