

# IBM AICTE PROJECT

## LEARN-MATE

**Presented By:**

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**College Name & Department : Jaipur Engineering College and  
Research Centre, CSE(AI)**

# OUTLINE

- Problem Statement
- Technology used
- Wow factor
- End users
- Result
- Conclusion
- Git-hub Link
- Future scope
- IBM Certifications

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# PROBLEM STATEMENT

Students struggle to find the right learning path that matches their interests and goals because there are too many online courses and not enough personalized guidance. Without clear direction, many students lose motivation or fail to reach their full potential, highlighting the real need for effective, individualized learning support.

## Proposed Solution:

LearnMate is an AI-powered personalized learning coach that interacts with students to understand their interests and current skills. It dynamically builds and continually adapts a tailored course roadmap, guiding learners step-by-step with relevant resources and projects. By providing ongoing, individualized support, LearnMate helps students stay focused, motivated, and confident on the path to achieving their educational and career goals.

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# TECHNOLOGY USED

IBM cloud lite services

Natural Language Processing (NLP)

Retrieval Augmented Generation (RAG)

IBM Granite model

Agentic ai frameworks

# IBM CLOUD SERVICES USED

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

# WOW FACTORS

LearnMate will dramatically simplify the journey of finding the right learning path, boost student motivation, and enhance skill development by providing truly personalized, adaptive educational guidance.

## Unique features:

- Engages students in natural AI conversations to discover interests and goals.
- Creates and adapts a personalized, step-by-step learning roadmap.
- Uses RAG to combine real-time course retrieval with AI guidance
- Continuously assesses skills and tracks progress dynamically.
- Provides motivational coaching with milestone celebrations.
- Offers inclusive, responsive support allowing learners to adjust paths anytime.

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## END USERS

- Students of all levels
- Learners exploring tech fields
- Professional certification candidates
- Educators and tutors

# RESULTS

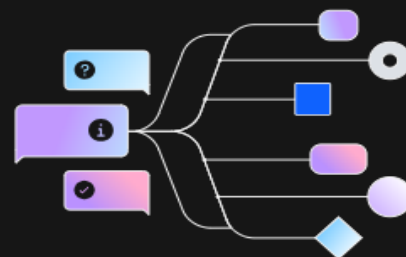
## Agent preview



LearnMate 02:51 AM

### Welcome to LearnMate

I'm your personal AI learning coach, here to help you find the perfect learning path.



### Sample questions

hey!



AI Engineer Roadmap



DevOps Engineer  
Roadmap



Cloud computing  
Roadmap



Type something...





# RESULTS

## Agent preview

**NP** You: 02:53 AM

give me complete roadmap for becoming ai engineer 2025

**LearnMate** 02:53 AM

As an AI learning path coach, I'm excited to help you outline a roadmap to become an AI Engineer by 2025. Here's a suggested path, keeping in mind that the field is rapidly evolving, so continuous learning and adaptation are key:

### 1. Foundational Knowledge (Year 1)

#### Mathematics:

- Linear Algebra
- Calculus (single and multivariable)
- Probability and Statistics

#### Programming:

- Python (master the basics, data structures, and object-oriented programming)
- Data manipulation libraries: Pandas, NumPy

#### Computer Science Fundamentals:

#### Learning Resources:

- Coursera's "Mathematics for Machine Learning" by Imperial College London
- "Python for Everybody" specialization on Coursera by University of Michigan
- "Algorithms, Part I & II" by Princeton University on Coursera

### 2. Machine Learning Basics (Year 1-2)

#### Machine Learning Concepts:

- Supervised vs. Unsupervised Learning
- Model Training, Validation, and Testing
- Bias-Variance Tradeoff

#### Tools and Libraries:

- Scikit-learn
- TensorFlow or PyTorch

#### Projects:

- Implement basic machine learning algorithms from scratch to understand the underlying principles.
- Work on datasets from Kaggle or UCI Machine Learning Repository to

### 3. Deep Learning and Neural Networks (Year 2-3)

#### Advanced Machine Learning:

- Convolutional Neural Networks (CNNs)
- Recurrent Neural Networks (RNNs) and Long Short-Term Memory (LSTM)
- Generative Adversarial Networks (GANs)

#### Reinforcement Learning:

- Basics of reinforcement learning and Q-learning
- Deep Q-Networks (DQN)

#### Natural Language Processing (NLP):

- Text preprocessing and tokenization
- Word embeddings (Word2Vec, GloVe)
- Transformer models (BERT, T5)

#### Learning Resources:

- "Deep Learning Specialization" by Andrew Ng on Coursera
- Fast.ai's "Practical Deep Learning for Coders"
- "Natural Language Processing in TensorFlow" by Laurence Moroney on Coursera

# RESULTS

## Agent preview



You: 02:59 AM

how do i start preparing dsa, in short



LearnMate 02:59 AM

To start preparing for Data Structures and Algorithms (DSA), follow this short roadmap:

1. **Learn Python** (or your chosen language) using resources like Codecademy, "Learn Python the Hard Way," or "Python Crash Course."
2. **Brush up on Mathematics** with Khan Academy or "Discrete Mathematics and Its Applications" by Kenneth Rosen.
3. **Study Core Data Structures:** Understand arrays, linked lists, stacks, queues, trees, heaps, hash tables, tries, and graphs using "Introduction to Algorithms" by Cormen et al. and Coursera's "Algorithms, Part I."
4. **Master Key Algorithms:** Learn sorting, searching, graph traversal, dynamic programming, and backtracking from "Introduction to Algorithms" and "Cracking the Coding Interview."
5. **Practice Regularly** on LeetCode, HackerRank, and CodeSignal, starting with easier problems and analyzing complexity.
6. **Optional System Design:** Explore scalability, databases, and distributed systems with "Designing Data-Intensive Applications" by Martin Kleppmann.
7. **Stay Updated:** Follow DSA blogs, YouTube channels, and engage with

Type something...



# RESULTS

## Deployed AI Agent

The screenshot displays the IBM Watsonx interface for the LearnMate AI agent. The top navigation bar includes the IBM Watsonx logo, an 'Upgrade' button, and user account information for Nisha Parashar. The main header shows the deployment path: 'Deployment spaces / LearnMate1 / LearnMate /'. Below this, the 'LearnMate' agent is shown with a 'Deployed' status and an 'Online' indicator. The 'Preview' tab is selected, showing a chat history. The chat begins with a user message: 'Python programming'. The AI agent responds with a friendly greeting and a structured plan for a career and learning path. The plan includes four main sections: 1. Discovery through Dialogue (with three bullet points about experience, interests, and goals), 2. Skill Assessment (with one bullet point about interactive questions), 3. Personalized Roadmap Generation (with three bullet points about creating a roadmap, starting with specific courses, and exploring advanced topics), and 4. Continuous Adaptation (with two bullet points about reviewing progress and adjusting the roadmap). A text input field at the bottom is labeled 'Type something...'. A 'New chat' button is visible in the top right corner of the chat area.

IBM watsonx Upgrade ⓘ 🔔 Nisha Parashar's Account Dallas NP

Deployment spaces / LearnMate1 / LearnMate /

LearnMate ✓ Deployed Online

API reference Test Evaluations **Preview**

New chat +

**N** You 03:01 AM  
Python programming

**S** LearnMate 03:01 AM  
As a career and learning path coach, I'm excited to help you explore Python programming! Let's start by understanding your current skill level and career aspirations related to Python.

**1. Discovery through Dialogue:**

- What is your current experience with Python? Are you a beginner, intermediate, or advanced learner?
- What aspects of Python programming are you most interested in? (e.g., web development, data science, automation, etc.)
- What are your long-term career goals? Do you envision yourself as a software developer, data analyst, or in another role that utilizes Python?

**2. Skill Assessment:**

- To gauge your current proficiency, I can suggest some interactive questions or light assessments. For instance, we could evaluate your understanding of Python syntax, control structures, data types, and basic libraries.

**3. Personalized Roadmap Generation:**

- Based on your responses, I'll create a tailored learning roadmap. This will include recommended courses, resources, and hands-on projects to help you build a strong foundation in Python.
- For example, if you're a beginner, we might start with "Automate the Boring Stuff with Python" by Al Sweigart or "Python Crash Course" by Eric Matthes.
- As you progress, we could explore more advanced topics like web frameworks (Django or Flask), data analysis with libraries such as Pandas and NumPy, or machine learning with Scikit-learn.

**4. Continuous Adaptation:**

- We'll regularly review your progress and adjust the roadmap as needed. If you're excelling, we can introduce more challenging projects or delve into specialized areas like Python for cybersecurity.
- If you find certain topics difficult, I can suggest alternative resources or adjust the pace of learning.

Type something... ➤

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## CONCLUSION

- LearnMate acts as a personalized AI coach, guiding students in discovering interests, assessing skills, and building adaptive learning roadmaps.
- It saves time by automating learning path selection, resource discovery, and ongoing skill assessment.
- LearnMate enhances motivation, confidence, and learning outcomes through dynamic feedback, personalized support, and real-time progress tracking.

## GITHUB LINK

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

# FUTURE SCOPE

- Multilingual Learning Support
- Voice-Enabled Learning Coach
- Real-Time Peer Collaboration Features
- Automated Skill Gap & Career Pathway Analysis
- Integration with Online Certification Platforms
- AI-Assisted Portfolio and Resume Building

# IBM CERTIFICATIONS

In recognition of the commitment to achieve  
professional excellence



## Nisha Parashar

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/d44dfcc9-23dd-4bd1-88c4-6a3f02277e07>



IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Nisha Parashar

for the completion of

# Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE\_3824998)

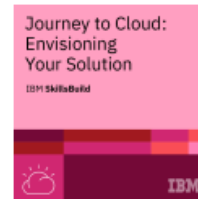
According to the Adobe Learning Manager system of record

**Completion date:** 24 Jul 2025 (GMT)

**Learning hours:** 20 mins



In recognition of the commitment to achieve  
professional excellence



# Nisha Parashar

Has successfully satisfied the requirements for:

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## Journey to Cloud: Envisioning Your Solution

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Issued on: Jul 21, 2025

Issued by: IBM SkillsBuild

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**THANK YOU**