Generative AI: Concepts, Applications, & Integration

Duration
1 Day

Program Objective
- Understand the fundamentals of Generative AI.
- Learn how to build Applications with foundation models.
- Prompt Engineering, Tools, RAG, Agents

Target Audience
Technology Professionals, Developers and Managers who are interested in gaining a comprehensive understanding of Generative AI

Prerequisites
- Basic programming knowledge (React, Typescript, Python)
- Web Application Knowhow
- Basic SQL knowhow
- Tools awareness: VS code, GitHub
- Developer Laptop (Windows/Mac) with good internet connection

Delivery Method
Online Instructor-led with hands-on exercises

Contents

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<tr><td colspan="2">Module 1: Introduction to Generative AI &LLMs</td></tr>
<tr><td colspan="2">Learn: Understanding what Generative AI is and how Large Language Models (LLMs) work</td></tr>
<tr><td>Topics Covered:
History and evolution of AI & machine learning
What is Generative AI?
Generative AI vs. Traditional AI
Key concepts: LLMs, training, inference
Real-world applications</td><td>Activities:
Live demonstration of text/image generation</td></tr>
<tr><td colspan="2">Module 2: Prompt Engineering & Model Interaction</td></tr>
<tr><td colspan="2">Learn: Hands-on Prompt Engineering, Best Practices</td></tr>
<tr><td>Topics Covered:
Basics of prompt engineering
Best practices for writing effective prompts
Handling ambiguity and bias in prompts</td><td>Hands-on Practice:
Experimenting with Gemini models using Playground</td></tr>
<tr><td colspan="2">Module 3: LLM Integration (Option 1)</td></tr>
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Objective: Learn how to use APIs of Generative AI Models using Google Colab and Python	
Topics Covered: - Overview of OpenAI, Gemini APIs - Using Groq API with models like Gemini, Llama etc - Multi-modal interaction with LLM (Image, Audio input) - PDF Summarization - Using HuggingFace Open-source models with Google Colab	**Hands-on Practice:** API calls and response handling using Python and Google Colab
Module 3: LLM Integration (Option 2)	
Objective: Learn how to integrate Generative AI into applications using React, Next, Vercel	
Topics Covered: - Introduction to Vercel AI SDK - Building simple AI-powered Chatbot application using Vercel AI SDK and Gemini APIs - Writing a prompt to generate SQL statement - Building simple AI-powered chatbot application to accept NLP query from user and show its output by using Vercel AI SDK, Gemini APIs, SQLlite database	**Hands-on Practice:** Basic AI-powered application development chatbot using React, Next, Vercel AI SDK and Gemini APIs
Module 4: Integrating with function calling	
Objective: Learn how to write a function and integrate it with application	
Topics Covered: What is a function calling? Why does one need it in GenAI application? - Write a function to get current weather of a city	**Hands-on Practice:** Python Or React based tutorial
Module 5: Retrieval-Augmented Generation (RAG)	
Objective: Improve AI responses with external knowledge / unstructured database	
Topics Covered: - Concept of RAG and why it's important - Vector databases (Pinecone) and Embeddings - Implementing RAG in real-world applications	**Hands-on Practice:** - Create Pinecone vector database and load it with a PDF file - Building simple AI-powered chatbot application to accept a query, perform similarity search and use LLMto build response
Module 6: Agentic AI & Automation	
Objective: Automate tasks using AI agents	
Topics Covered:	**Hands-on Practice:**

▪ What are AI Agents? ▪ Practical applications of Agents in Sales, Content Creation, Recruitment, Trip Planning etc	Code-along session for implementing simple Agents usingLangGraph(or Autogenor LangGraph)
Module 7: Fine-Tuning	
Objective: The what, when and how of fine-tuning LLMs	
Topics Covered: ▪ When to fine-tune vs. use out-of-the-box models ▪ Data preparation for fine-tuning ▪ Running fine-tuning with open-source models	**Demo:** Demo of Fine-tuning a small language model with domainspecific data