Implement Generative AI engineering with Azure Databricks (DP-3028-A) Training

Duration: **1 Day**

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Overview

Generative AI is significantly changing the way organisations develop intelligent applications.**Implement Generative AI Engineering with Azure Databricks (DP-3028-A)** explores how Azure Databricks can provide a scalable foundation for designing, building, and operating generative AI solutions.

Throughout the course, participants examine the engineering processes behind large language model (LLM) solutions. Key areas such as Retrieval-Augmented Generation (RAG), model fine-tuning, evaluation techniques, and measuring the performance of generative AI applications are explored from a practical perspective.

The course focuses on real-world scenarios where human and machine intelligence work together, supported by Spark-based data processing, modern machine learning workflows, and production-ready AI practices. By the end of the training, learners will understand how to progress from AI experimentation to operational deployment and manage generative AI solutions on Azure Databricks using **LLMOps** practices.

Prerequisites

Participants should have:

- Familiarity with fundamental artificial intelligence and machine learning concepts,
- Experience working in Azure Databricks environments,
- An understanding of data engineering or data science workflows,
- Basic exposure to Python or a similar programming language.

Who Should Attend

This course is designed for:

- Data scientists developing advanced AI models,
- Machine learning engineers responsible for operationalising AI systems,
- AI engineers building generative AI applications,
- Technical professionals who want to scale AI solutions with Azure Databricks.

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What You Will Learn

By the end of this course, participants will be able to:

- Explain the core concepts of generative AI engineering within Azure Databricks,
- Design and implement Retrieval-Augmented Generation architectures,
- Apply multi-stage and agent-based reasoning techniques within AI workflows,
- Fine-tune large language models for domain-specific requirements and tasks,
- Evaluate generative AI systems using modern performance and quality metrics,
- Apply Responsible AI principles to support ethical and compliant AI solutions,
- Manage and operationalise generative AI solutions using LLMOps practices.

Outline

Fundamentals of Generative AI and Large Language Models

This section introduces the role of generative AI within modern AI platforms and examines the fundamental concepts behind large language models.

- Overview of generative AI and its role in modern AI platforms
- Understand large language models and transformer architectures
- Explore common enterprise use cases for generative AI
- Identify key challenges associated with deploying generative AI systems at scale

Using Azure Databricks for Generative AI Workloads

Explore how Azure Databricks supports the data processing and machine learning workflows required for generative AI applications.

- Introduction to Azure Databricks as a unified analytics platform
- Use Apache Spark for distributed AI workloads
- Manage data pipelines for generative AI applications
- Integrate Databricks with Azure AI services

Retrieval-Augmented Generation Architectures

This section examines how RAG can connect large language models with external sources of knowledge.

- Understand the principles of Retrieval-Augmented Generation
- Combine vector search with language models
- Design pipelines for contextual data retrieval
- Improve response accuracy and relevance by incorporating external knowledge sources

Multi-Stage and Agent-Style Reasoning Patterns

Explore multi-step and agent-based approaches for developing more sophisticated generative AI workflows.

- Understand multi-step reasoning within generative AI systems
- Design agent-based workflows using large language models
- Orchestrate tools and APIs within AI pipelines

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- Improve decision-making through chained reasoning approaches

Fine-Tuning Large Language Models

Learn how large language models can be adapted for particular domains and specialised tasks.

- Overview of fine-tuning methods and approaches
- Prepare datasets for supervised fine-tuning
- Explore parameter-efficient tuning techniques
- Evaluate improvements achieved through fine-tuned models

Evaluating Generative AI Systems

This section focuses on measuring the performance and output quality of LLM-based solutions.

- Key evaluation metrics for large language models
- Automated and human-in-the-loop evaluation strategies
- Identify bias, hallucinations, and model drift
- Apply benchmarking and continual improvement practices

Responsible AI and Governance Considerations

Explore considerations for developing generative AI solutions in a responsible, ethical, and compliant manner.

- Responsible AI principles for generative systems
- Manage risk, bias, and ethical concerns
- Support compliance with organisational and regulatory standards
- Implement governance frameworks for AI solutions

Managing Generative AI Solutions with LLMOps

The final section examines how generative AI solutions can move from experimentation into production and be managed throughout their lifecycle.

- Introduction to Large Language Model Operations (LLMOps)
- Model versioning, monitoring, and lifecycle management
- Deploy generative AI applications into production environments
- Scale and maintain AI systems using Azure Databricks