# Advanced Techniques in

# Large Language Model Development and Deployment

# Duration: 03 days

# Module 01: Data Preprocessing for LLM Training (Theory + Labs)

- \*\*Tokenization\*\*: Breaks text into smaller units like words or subwords for model input.

- \*\*Text Embedding\*\*: Maps words or phrases to continuous vectors for semantic understanding.

- \*\*Image Embedding\*\*: Represents images as vectors to incorporate visual information.

# Module 02: Responsible AI and GenAI (Theory & Use Case)

- \*\*Fairness\*\*: Mitigates bias in models to ensure equitable outcomes.

- \*\*Transparency\*\*: Makes AI decision-making understandable for users.

- \*\*Accountability\*\*: Establishes frameworks for AI system responsibility.

#### Module 03: Security Perspectives in GenAI (Theory + lab)

- \*\*Challenges\*\*: Identifies unique security risks in AI systems.

- \*\*Measures\*\*: Implements strategies like robustness training and privacy protection.

### Module 04: Model Optimization Techniques for GenAl models (Theory + Lab)

- \*\*Pruning\*\*: Removes unnecessary parameters to reduce model size.

- \*\*Quantization\*\*: Reduces numerical precision for faster inference.

- \*\*Compression\*\*: Shrinks model size through techniques like weight sharing.

### Module 05: Model Monitoring After Deployment (Theory + Use Cases)

- \*\*Monitoring Systems\*\*: Continuously checks model performance post-deployment.

- \*\*Drift Detection\*\*: Identifies changes in data distribution over time.

- \*\*Issue Resolution\*\*: Diagnoses and resolves issues in deployed models.

### Module 06: Deployment on Cloud Platforms (Theory + Use Cases)

- \*\*Azure Deployment\*\*: Deploys models on Microsoft Azure cloud infrastructure.

- Topics may include setting up infrastructure and managing scalability.