Introduction to Generative AI

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1. Generative AI

Generative AI is a branch of artificial intelligence that focuses on **creating new content** rather than only analyzing or classifying existing data. The content generated can include **text, images, audio, video, code, and synthetic data**.

Common generative models include:

- Large Language Models (LLMs) - like Llama via Groq
- Generative Adversarial Networks (GANs)
- Variational Autoencoders (VAEs)
- Diffusion models

2. Definition and Significance of Generative AI

Generative AI is defined as: A class of artificial intelligence models that can generate new and original content by learning patterns from large volumes of training data.

Significance:

- Automates content creation at scale
- Enhances human productivity and creativity
- Enables natural, human-like interaction with machines
- Reduces time and cost for complex tasks

3. Overview of Applications Across Industries

Healthcare:

- Medical report generation
- Clinical documentation
- Virtual health assistants

Finance:

- Automated financial reports
- Fraud detection
- Conversational banking

Education:

- Personalized learning
- Question generation
- Tutoring systems

Retail:

- Product descriptions
- Customer support chatbots
- Marketing content

4. Basics of Natural Language Generation

Modern NLG uses **transformer-based models** such as Llama (via Groq), Mixtral, and similar architectures.

Summary

Generative AI represents a major advancement in AI by enabling machines to create meaningful content.