Day88_Introduction_to_Generative_and_Agentic_AI

September 24, 2025

Generative and Agentic AI

1 Introduction

Welcome to **Day 88** of our AI journey! Today, we explore **Generative AI** and **Agentic AI** and also get hands-on with some practical exercises.

AI is no longer just about predictions — it can now **create content, make autonomous decisions, and solve complex real-world problems**.

This notebook has two sections:

1. **Theory** – What is Generative and Agentic AI, key differences, applications, and steps to build.
2. **Hands-On Exercises** – Practice using Generative AI tools and refine your AI-engineering skills.

2 What is Generative AI?

Generative AI refers to **AI systems designed to generate new content** instead of only analyzing existing data.

Content Types and Examples:

Content Type	Example Models
Text	GPT, LLaMA, Claude
Images	DALL-E, Stable Diffusion
Audio	MusicLM, AudioGen
Video	SORA

Key Idea: Generative AI **creates novel outputs** that are often indistinguishable from human-made content.

Takeaways:

- Focused on **creation, not just prediction**.
- Requires **large datasets and deep learning models**.

3 Traditional AI vs Generative AI

Aspect	Traditional AI	Generative AI
Objective	Predict, classify, or analyze	Generate new content
Data Usage	Structured or labeled	Large unstructured datasets
Examples	Spam detection, recommendation systems	ChatGPT, DALL-E, MusicLM
Outcome	Predictive/analytical	Creative/novel outputs

Explanation:

- Traditional AI **analyzes** existing data.
- Generative AI **creates** new data similar to its training examples.

Takeaways:

- Generative AI is an **evolution of traditional AI**, focusing on **creativity**.

4 AI Agents and Agentic AI

4.1 AI Agents

An **AI agent** is an autonomous entity that **perceives its environment, makes decisions, and acts to achieve goals**.

Examples:

- Autonomous robots
- Virtual assistants (Siri, Alexa)
- Recommendation systems

4.2 Agentic AI

Agentic AI is a more advanced form where AI agents can **plan, decide, and execute tasks independently**.

Differences from traditional AI agents:

- Traditional agents follow **predefined rules**.
- Agentic AI **plans, learns, and acts autonomously**.

Takeaways:

- Agentic AI is essential for **complex, multi-step problem solving**.

5 Real-World Applications

5.1 Generative AI

- **Content Creation**: Blog posts, reports
- **Image Generation**: Product designs, AI art
- **Audio & Music**: AI-generated songs

- **Video Creation**: Short animated clips
- **Code Generation**: AI-assisted programming

5.2 Agentic AI

- **Autonomous Vehicles**: Self-driving cars
- **Robotics**: Industrial robots performing tasks
- **AI Project Managers**: Automating workflows
- **Smart Assistants**: Booking travel, handling emails
- **Healthcare Agents**: Recommending treatment plans

6 Steps to Build Generative and Agentic AI Applications

1. **Define the Problem** – Identify if you need generation or autonomy.
2. **Data Collection** – Unstructured data for Generative AI; environment/interaction data for Agentic AI.
3. **Model Selection** – GPT, DALL-E for Generative; reinforcement learning or multi-agent systems for Agentic AI.
4. **Training** – Use quality and diverse datasets.
5. **Evaluation** – Creativity and fidelity for Generative; task completion and adaptability for Agentic.
6. **Deployment** – Integrate into apps, platforms, or robots.
7. **Iteration & Improvement** – Update models and incorporate feedback.

7 Assignment: Exploring Generative AI – Image Creation

Objective: Understand how **Generative AI** works by creating images from text prompts.

Scenario:
You are a game designer who wants to create **fantasy creatures, magical landscapes, or futuristic objects**. Instead of drawing manually, you can use **AI tools** to generate creative images from your ideas.

Step 1: AI Tool Interface

Below is the DALL · E interface where you write a prompt to generate an image.

Create an image of a fantasy creature combining real animals and mythical features.
Example: "A dragon with the wings of a butterfly and the tail of a lion."

Step 2: Generated Image

Here is the fantasy creature generated from the prompt:

Instructions

1. **Choose a Generative AI Model**
   You can use any AI image generation tool such as:
   - **DALL · E** (OpenAI)
   - **Google Gemini**
   - **MidJourney**
   - **Stable Diffusion**
2. **Write a Prompt**
   Think of a creative concept for your image. Example prompt used above:
   > "A dragon with butterfly wings and a lion's tail, fantasy art, colorful and magical style"
3. **Generate the Image**
   - Paste your prompt into the AI tool.
   - Adjust **style, colors, or details** if the tool allows it.
   - Generate the image and **observe how the AI interprets your idea**.
4. **Experiment**
   Try changing your prompt to explore:
   - Different animals or objects
   - Artistic styles (cartoon, realistic, abstract)
   - Environments (space, forest, underwater)

7.1 Reflection / Takeaways

- Generative AI **creates new content from your ideas**.
- **Prompting** is the key: the more descriptive and creative your prompt, the more interesting the output.
- This exercise demonstrates how AI can **assist in creative tasks** like concept art, marketing visuals, or game design.

Optional Challenge:
Write a prompt to generate a **magical cityscape at sunset with flying ships** or a **futuristic car in neon lights**.