Unit-1

Difference between Traditional ML, Generative AI and Agentic AI

Aspect	Traditional ML	Generative AI	Agentic AI
Definition	Learns patterns from data to make predictions or classifications	Generates new data (text, images, etc.) based on learned patterns	Uses AI agents that perceive, decide, act, and improve autonomously
Objective	Predict or classify based on historical data	Create novel content from learned data	Perform tasks or achieve goals through autonomous decision-making
Input Type	Structured data (numbers, tables)	Text, images, code, audio, etc.	Environment state, user goals, tool availability
Output Type	Labels, scores, predictions	Text, images, code, speech, etc.	Actions, plans, tool invocations, multi-step workflows
Model Behavior	Static—only does what it was trained for	Creative—can generate new variations	Dynamic—can reason, plan, and adapt based on context
Autonomy	Low – needs explicit input and fixed logic	Medium – creative but still reactive	High – proactive, goal-oriented, often multi-agent
Example Algorithms/Models	Linear regression, Decision trees, SVM	GPT, DALL·E, Stable Diffusion	CrewAI, LangGraph, AutoGPT, BabyAGI
Tools & Frameworks	Scikit-learn, XGBoost, TensorFlow	OpenAI, Hugging Face, Gemini	LangChain, CrewAI, Agno, ReAct, AutoGen
Interaction Style	Input → Prediction	Prompt → Response	Task → Strategy → Execution → Feedback loop
Real-world Use Cases	Credit scoring, churn prediction, fraud detection	Text/image generation, chatbots, creative writing	Legal doc review, research assistants, automated coding agents
Human Involvement	High – design, label, evaluate	Medium – prompts, tuning	Low to Medium – define goal, let agent plan and act
Learning Type	Supervised, Unsupervised, Reinforcement	Unsupervised (mostly) + few-shot/fine-tuning	Often uses LLMs + tool use + planning + memory