

In []:

```
!pip install langchain_community langchainhub chromadb langchain langchain-openai
```

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Requirement already satisfied: langchain_community in /usr/local/lib/python3.11/dist-packages (0.3.21)
Requirement already satisfied: langchainhub in /usr/local/lib/python3.11/dist-packages (0.1.21)
Requirement already satisfied: chromadb in /usr/local/lib/python3.11/dist-packages (1.0.0)
Requirement already satisfied: langchain in /usr/local/lib/python3.11/dist-packages (0.3.23)
Requirement already satisfied: langchain-openai in /usr/local/lib/python3.11/dist-packages (0.3.12)
Requirement already satisfied: langchain-core<1.0.0,>=0.3.51 in /usr/local/lib/python3.11/dist-packages (from langchain_community) (0.3.51)
Requirement already satisfied: SQLAlchemy<3,>=1.4 in /usr/local/lib/python3.11/dist-packages (from langchain_community) (2.0.40)
Requirement already satisfied: requests<3,>=2 in /usr/local/lib/python3.11/dist-packages (from langchain_community) (2.32.3)
Requirement already satisfied: PyYAML<=5.3 in /usr/local/lib/python3.11/dist-packages (from langchain_community) (6.0.2)
Requirement already satisfied: aiohttp<4.0.0,>=3.8.3 in /usr/local/lib/python3.11/dist-packages (from langchain_community) (3.11.15)
Requirement already satisfied: tenacity!=8.4.0,<10,>=8.1.0 in /usr/local/lib/python3.11/dist-packages (from langchain_community) (9.1.2)
Requirement already satisfied: dataclasses-json<0.7,>=0.5.7 in /usr/local/lib/python3.11/dist-packages (from langchain_community) (0.6.7)
Requirement already satisfied: pydantic-settings<3.0.0,>=2.4.0 in /usr/local/lib/python3.11/dist-packages (from langchain_community) (2.8.1)
Requirement already satisfied: langsmith<0.4,>=0.1.125 in /usr/local/lib/python3.11/dist-packages (from langchain_community) (0.3.22)
Requirement already satisfied: httpx-sse<1.0.0,>=0.4.0 in /usr/local/lib/python3.11/dist-packages (from langchain_community) (0.4.0)
Requirement already satisfied: numpy<3,>=1.26.2 in /usr/local/lib/python3.11/dist-packages (from langchain_community) (2.0.2)
Requirement already satisfied: packaging<25,>=23.2 in /usr/local/lib/python3.11/dist-packages (from langchainhub) (24.2)
Requirement already satisfied: types-requests<3.0.0.0,>=2.31.0.2 in /usr/local/lib/python3.11/dist-packages (from langchainhub) (2.32.0.20250328)
Requirement already satisfied: build<=1.0.3 in /usr/local/lib/python3.11/dist-packages (from chromadb) (1.2.2.post1)
Requirement already satisfied: pydantic<=1.9 in /usr/local/lib/python3.11/dist-packages (from chromadb) (2.11.1)
Requirement already satisfied: chroma-hnswlib<=0.7.6 in /usr/local/lib/python3.11/dist-packages (from chromadb) (0.7.6)
Requirement already satisfied: fastapi<=0.115.9 in /usr/local/lib/python3.11/dist-packages (from chromadb) (0.115.9)
Requirement already satisfied: uvicorn<=0.18.3 in /usr/local/lib/python3.11/dist-packages (from uvicorn[standard]>=0.18.3->chromadb) (0.34.0)
Requirement already satisfied: posthog<=2.4.0 in /usr/local/lib/python3.11/dist-packages (from chromadb) (3.23.0)
Requirement already satisfied: typing-extensions<=4.5.0 in /usr/local/lib/python3.11/dist-packages (from chromadb) (4.13.0)
Requirement already satisfied: onnxruntime<=1.14.1 in /usr/local/lib/python3.11/dist-packages (from chromadb) (1.21.0)
Requirement already satisfied: opentelemetry-api<=1.2.0 in /usr/local/lib/python3.11/dist-packages (from chromadb) (1.31.1)
Requirement already satisfied: opentelemetry-exporter-otlp-proto-grpc<=1.2.0 in /usr/local/lib/python3.11/dist-packages (from chromadb) (1.31.1)
Requirement already satisfied: opentelemetry-instrumentation-fastapi<=0.41b0 in /usr/local/lib/python3.11/dist-packages (from chromadb) (0.52b1)
Requirement already satisfied: opentelemetry-sdk<=1.2.0 in /usr/local/lib/python3.11/dist-packages (from chromadb) (1.31.1)
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Requirement already satisfied: tokenizers>=0.13.2 in /usr/local/lib/python3.11/dist-packages (from chromadb) (0.21.1)

Requirement already satisfied: pypika>=0.48.9 in /usr/local/lib/python3.11/dist-packages (from chromadb) (0.48.9)

Requirement already satisfied: tqdm>=4.65.0 in /usr/local/lib/python3.11/dist-packages (from chromadb) (4.67.1)

Requirement already satisfied: overrides>=7.3.1 in /usr/local/lib/python3.11/dist-packages (from chromadb) (7.7.0)

Requirement already satisfied: importlib-resources in /usr/local/lib/python3.11/dist-packages (from chromadb) (6.5.2)

Requirement already satisfied: grpcio>=1.58.0 in /usr/local/lib/python3.11/dist-packages (from chromadb) (1.71.0)

Requirement already satisfied: bcrypt>=4.0.1 in /usr/local/lib/python3.11/dist-packages (from chromadb) (4.3.0)

Requirement already satisfied: typer>=0.9.0 in /usr/local/lib/python3.11/dist-packages (from chromadb) (0.15.2)

Requirement already satisfied: kubernetes>=28.1.0 in /usr/local/lib/python3.11/dist-packages (from chromadb) (32.0.1)

Requirement already satisfied: mmh3>=4.0.1 in /usr/local/lib/python3.11/dist-packages (from chromadb) (5.1.0)

Requirement already satisfied: orjson>=3.9.12 in /usr/local/lib/python3.11/dist-packages (from chromadb) (3.10.16)

Requirement already satisfied: httpx>=0.27.0 in /usr/local/lib/python3.11/dist-packages (from chromadb) (0.28.1)

Requirement already satisfied: rich>=10.11.0 in /usr/local/lib/python3.11/dist-packages (from chromadb) (13.9.4)

Requirement already satisfied: jsonschema>=4.19.0 in /usr/local/lib/python3.11/dist-packages (from chromadb) (4.23.0)

Requirement already satisfied: starlette<0.46.0,>=0.40.0 in /usr/local/lib/python3.11/dist-packages (from fastapi==0.115.9->chromadb) (0.45.3)

Requirement already satisfied: langchain-text-splitters<1.0.0,>=0.3.8 in /usr/local/lib/python3.11/dist-packages (from langchain) (0.3.8)

Requirement already satisfied: openai<2.0.0,>=1.68.2 in /usr/local/lib/python3.11/dist-packages (from langchain-openai) (1.70.0)

Requirement already satisfied: tiktoken<1,>=0.7 in /usr/local/lib/python3.11/dist-packages (from langchain-openai) (0.9.0)

Requirement already satisfied: aiohappyeyeballs>=2.3.0 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain_community) (2.6.1)

Requirement already satisfied: aiosignal>=1.1.2 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain_community) (1.3.2)

Requirement already satisfied: attrs>=17.3.0 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain_community) (25.3.0)

Requirement already satisfied: frozenlist>=1.1.1 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain_community) (1.5.0)

Requirement already satisfied: multidict<7.0,>=4.5 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain_community) (6.3.1)

Requirement already satisfied: propcache>=0.2.0 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain_community) (0.3.1)

Requirement already satisfied: yarl<2.0,>=1.17.0 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.8.3->langchain_community) (1.18.3)

Requirement already satisfied: pyproject_hooks in /usr/local/lib/python3.11/dist-packages (from build>=1.0.3->chromadb) (1.2.0)

Requirement already satisfied: marshmallow<4.0.0,>=3.18.0 in /usr/local/lib/python3.11/dist-packages (from dataclasses-json<0.7,>=0.5.7->langchain_community) (3.26.1)

Requirement already satisfied: typing-inspect<1,>=0.4.0 in /usr/local/lib/python3.11/dist-packages (from dataclasses-json<0.7,>=0.5.7->langchain_community) (0.9.0)

Requirement already satisfied: anyio in /usr/local/lib/python3.11/dist-packages (from httpx>=0.27.0->chromadb) (4.9.0)

Requirement already satisfied: certifi in /usr/local/lib/python3.11/dist-packages (from httpx>=0.27.0->chromadb) (2025.1.31)

Requirement already satisfied: httpcore==1.* in /usr/local/lib/python3.11/dist-packages (from httpx>=0.27.0->chromadb) (1.0.7)

Requirement already satisfied: idna in /usr/local/lib/python3.11/dist-packages (from httpx>=0.27.0->chromadb) (3.10)

Requirement already satisfied: h11<0.15,>=0.13 in /usr/local/lib/python3.11/dist-packages (from httpcore==1.*->httpx>=0.27.0->chromadb) (0.14.0)

Requirement already satisfied: jsonschema-specifications>=2023.03.6 in /usr/local/lib/python3.11/dist-packages (from jsonschema>=4.19.0->chromadb) (2024.10.1)

Requirement already satisfied: referencing>=0.28.4 in /usr/local/lib/python3.11/dist-packages (from jsonschema>=4.19.0->chromadb) (0.36.2)

Requirement already satisfied: rpds-py>=0.7.1 in /usr/local/lib/python3.11/dist-packages (from jsonschema>=4.19.0->chromadb) (0.24.0)

Requirement already satisfied: six>=1.9.0 in /usr/local/lib/python3.11/dist-packages (from kubernetes>=28.1.0->chromadb) (1.17.0)

Requirement already satisfied: python-dateutil>=2.5.3 in /usr/local/lib/python3.11/dist-packages (from kubernetes>=28.1.0->chromadb) (2.8.2)

Requirement already satisfied: google-auth>=1.0.1 in /usr/local/lib/python3.11/dist-packages (from kubernetes>=28.1.0->chromadb) (2.38.0)

Requirement already satisfied: websocket-client!=0.40.0,!0.41.*,!0.42.*,>=0.32.0 in /usr/local/lib/python3.11/dist-packages (from kubernetes>=28.1.0->chromadb) (1.8.0)

Requirement already satisfied: requests-oauthlib in /usr/local/lib/python3.11/dist-packages (from kubernetes>=28.1.0->chromadb) (2.0.0)

Requirement already satisfied: oauthlib>=3.2.2 in /usr/local/lib/python3.11/dist-packages (from kubernetes>=28.1.0->chromadb) (3.2.2)

Requirement already satisfied: urllib3>=1.24.2 in /usr/local/lib/python3.11/dist-packages (from kubernetes>=28.1.0->chromadb) (2.3.0)

Requirement already satisfied: durationpy>=0.7 in /usr/local/lib/python3.11/dist-packages (from kubernetes>=28.1.0->chromadb) (0.9)

Requirement already satisfied: jsonpatch<2.0,>=1.33 in /usr/local/lib/python3.11/dist-packages (from langchain-core<1.0.0,>=0.3.51->langchain_community) (1.33)

Requirement already satisfied: requests-toolbelt<2.0.0,>=1.0.0 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.4,>=0.1.125->langchain_community) (1.0.0)

Requirement already satisfied: zstandard<0.24.0,>=0.23.0 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.4,>=0.1.125->langchain_community) (0.23.0)

Requirement already satisfied: coloredlogs in /usr/local/lib/python3.11/dist-packages (from onnxruntime>=1.14.1->chromadb) (15.0.1)

Requirement already satisfied: flatbuffers in /usr/local/lib/python3.11/dist-packages (from onnxruntime>=1.14.1->chromadb) (25.2.10)

Requirement already satisfied: protobuf in /usr/local/lib/python3.11/dist-packages (from onnxruntime>=1.14.1->chromadb) (5.29.4)

Requirement already satisfied: sympy in /usr/local/lib/python3.11/dist-packages (from onnxruntime>=1.14.1->chromadb) (1.13.1)

Requirement already satisfied: distro<2,>=1.7.0 in /usr/local/lib/python3.11/dist-packages (from openai<2.0.0,>=1.68.2->langchain-openai) (1.9.0)

Requirement already satisfied: jiter<1,>=0.4.0 in /usr/local/lib/python3.11/dist-packages (from openai<2.0.0,>=1.68.2->langchain-openai) (0.9.0)

Requirement already satisfied: sniffio in /usr/local/lib/python3.11/dist-packages (from openai<2.0.0,>=1.68.2->langchain-openai) (1.3.1)

Requirement already satisfied: deprecated>=1.2.6 in /usr/local/lib/python3.11/dist-packages (from opentelemetry-api>=1.2.0->chromadb) (1.2.18)

Requirement already satisfied: importlib-metadata<8.7.0,>=6.0 in /usr/local/lib/python3.11/dist-packages (from opentelemetry-api>=1.2.0->chromadb) (8.6.1)

Requirement already satisfied: googleapis-common-protos~=1.52 in /usr/local/lib/python3.11/dist-packages (from opentelemetry-exporter-otlp-proto-grpc>=1.2.0->chromadb) (1.69.2)

Requirement already satisfied: opentelemetry-exporter-otlp-proto-common==1.31.1 in /usr/local/lib/python3.11/dist-packages (from opentelemetry-exporter-otlp-proto-grpc>=1.2.0->chromadb) (1.31.1)

Requirement already satisfied: opentelemetry-proto==1.31.1 in /usr/local/lib/python3.11/dist-packages (from opentelemetry-exporter-otlp-proto-grpc>=1.2.0->chromadb) (1.31.1)

Requirement already satisfied: opentelemetry-instrumentation-asgi==0.52b1 in /usr/local/lib/python3.11/dist-packages (from opentelemetry-instrumentation-fastapi>=0.41b0->chromadb) (0.52b1)

Requirement already satisfied: opentelemetry-instrumentation==0.52b1 in /usr/local/lib/python3.11/dist-packages (from opentelemetry-instrumentation-fastapi>=0.41b0->chromadb) (0.52b1)

Requirement already satisfied: opentelemetry-semantic-conventions==0.52b1 in /usr/loc

al/lib/python3.11/dist-packages (from opentelemetry-instrumentation-fastapi>=0.41b0->chromadb) (0.52b1)

Requirement already satisfied: opentelemetry-util-http==0.52b1 in /usr/local/lib/python3.11/dist-packages (from opentelemetry-instrumentation-fastapi>=0.41b0->chromadb) (0.52b1)

Requirement already satisfied: wrapt<2.0.0,>=1.0.0 in /usr/local/lib/python3.11/dist-packages (from opentelemetry-instrumentation==0.52b1->opentelemetry-instrumentation-fastapi>=0.41b0->chromadb) (1.17.2)

Requirement already satisfied: asgiref~>3.0 in /usr/local/lib/python3.11/dist-packages (from opentelemetry-instrumentation-asgi==0.52b1->opentelemetry-instrumentation-fastapi>=0.41b0->chromadb) (3.8.1)

Requirement already satisfied: monotonic>=1.5 in /usr/local/lib/python3.11/dist-packages (from posthog>=2.4.0->chromadb) (1.6)

Requirement already satisfied: backoff>=1.10.0 in /usr/local/lib/python3.11/dist-packages (from posthog>=2.4.0->chromadb) (2.2.1)

Requirement already satisfied: annotated-types>=0.6.0 in /usr/local/lib/python3.11/dist-packages (from pydantic>=1.9->chromadb) (0.7.0)

Requirement already satisfied: pydantic-core==2.33.0 in /usr/local/lib/python3.11/dist-packages (from pydantic>=1.9->chromadb) (2.33.0)

Requirement already satisfied: typing-inspection>=0.4.0 in /usr/local/lib/python3.11/dist-packages (from pydantic>=1.9->chromadb) (0.4.0)

Requirement already satisfied: python-dotenv>=0.21.0 in /usr/local/lib/python3.11/dist-packages (from pydantic-settings<3.0.0,>=2.4.0->langchain_community) (1.1.0)

Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2->langchain_community) (3.4.1)

Requirement already satisfied: markdown-it-py>=2.2.0 in /usr/local/lib/python3.11/dist-packages (from rich>=10.11.0->chromadb) (3.0.0)

Requirement already satisfied: pygments<3.0.0,>=2.13.0 in /usr/local/lib/python3.11/dist-packages (from rich>=10.11.0->chromadb) (2.18.0)

Requirement already satisfied: greenlet>=1 in /usr/local/lib/python3.11/dist-packages (from SQLAlchemy<3,>=1.4->langchain_community) (3.1.1)

Requirement already satisfied: regex>=2022.1.18 in /usr/local/lib/python3.11/dist-packages (from tiktoken<1,>=0.7->langchain-openai) (2024.11.6)

Requirement already satisfied: huggingface-hub<1.0,>=0.16.4 in /usr/local/lib/python3.11/dist-packages (from tokenizers>=0.13.2->chromadb) (0.30.1)

Requirement already satisfied: click>=8.0.0 in /usr/local/lib/python3.11/dist-packages (from typer>=0.9.0->chromadb) (8.1.8)

Requirement already satisfied: shellingham>=1.3.0 in /usr/local/lib/python3.11/dist-packages (from typer>=0.9.0->chromadb) (1.5.4)

Requirement already satisfied: httpxtools>=0.6.3 in /usr/local/lib/python3.11/dist-packages (from uvicorn[standard]>=0.18.3->chromadb) (0.6.4)

Requirement already satisfied: uvloop!=0.15.0,!0.15.1,>=0.14.0 in /usr/local/lib/python3.11/dist-packages (from uvicorn[standard]>=0.18.3->chromadb) (0.21.0)

Requirement already satisfied: watchfiles>=0.13 in /usr/local/lib/python3.11/dist-packages (from uvicorn[standard]>=0.18.3->chromadb) (1.0.4)

Requirement already satisfied: websockets>=10.4 in /usr/local/lib/python3.11/dist-packages (from uvicorn[standard]>=0.18.3->chromadb) (15.0.1)

Requirement already satisfied: cachetools<6.0,>=2.0.0 in /usr/local/lib/python3.11/dist-packages (from google-auth>=1.0.1->kubernetes>=28.1.0->chromadb) (5.5.2)

Requirement already satisfied: pyasn1-modules>=0.2.1 in /usr/local/lib/python3.11/dist-packages (from google-auth>=1.0.1->kubernetes>=28.1.0->chromadb) (0.4.2)

Requirement already satisfied: rsa<5,>=3.1.4 in /usr/local/lib/python3.11/dist-packages (from google-auth>=1.0.1->kubernetes>=28.1.0->chromadb) (4.9)

Requirement already satisfied: filelock in /usr/local/lib/python3.11/dist-packages (from huggingface-hub<1.0,>=0.16.4->tokenizers>=0.13.2->chromadb) (3.18.0)

Requirement already satisfied: fsspec>=2023.5.0 in /usr/local/lib/python3.11/dist-packages (from huggingface-hub<1.0,>=0.16.4->tokenizers>=0.13.2->chromadb) (2025.3.2)

Requirement already satisfied: zipp>=3.20 in /usr/local/lib/python3.11/dist-packages (from importlib-metadata<8.7.0,>=6.0->opentelemetry-api>=1.2.0->chromadb) (3.21.0)

Requirement already satisfied: jsonpointer>=1.9 in /usr/local/lib/python3.11/dist-packages (from jsonpatch<2.0,>=1.33->langchain-core<1.0.0,>=0.3.51->langchain_community) (3.0.0)

Requirement already satisfied: mdurl~>0.1 in /usr/local/lib/python3.11/dist-packages (from markdown-it-py>=2.2.0->rich>=10.11.0->chromadb) (0.1.2)

Requirement already satisfied: mypy-extensions>=0.3.0 in /usr/local/lib/python3.11/dist-packages (from typing-inspect<1,>=0.4.0->dataclasses-json<0.7,>=0.5.7->langchain_community) (1.0.0)

Requirement already satisfied: humanfriendly>=9.1 in /usr/local/lib/python3.11/dist-packages (from coloredlogs->onnxruntime>=1.14.1->chromadb) (10.0)

Requirement already satisfied: mpmath<1.4,>=1.1.0 in /usr/local/lib/python3.11/dist-packages (from sympy->onnxruntime>=1.14.1->chromadb) (1.3.0)

Requirement already satisfied: pyasn1<0.7.0,>=0.6.1 in /usr/local/lib/python3.11/dist-packages (from pyasn1-modules>=0.2.1->google-auth>=1.0.1->kubernetes>=28.1.0->chromadb) (0.6.1)

In []:

```
from google.colab import userdata
import os
os.environ['OPENAI_API_KEY'] = userdata.get('openAIYtKey')
```

In []:

```
from langchain_community.document_loaders import WebBaseLoader

loader = WebBaseLoader(web_paths=["https://www.educosys.com/course/genai"])

docs = loader.load()
print(docs)
```

WARNING:langchain_community.utils.user_agent:USER_AGENT environment variable not set, consider setting it to identify your requests.

[Document(metadata={'source': 'https://www.educosys.com/course/genai', 'title': 'Hands-on Generative AI Course', 'description': 'Hands-on Generative AI Course', 'language': 'en'}, page_content="Hands-on Generative AI Course CoursesBundle CoursesMentorFree ContentTestimonialsFAQLogin Signup Hands-on Generative AI CourseLearn, Build, Deploy and Apply Generative AI7 Weeks CourseAccess all Live BatchesLifetime access of RecordingsAccess Discord CommunityCode availableBuild ProjectsLearn Future-Ready TechEnroll 1Week 1Foundations of Generative AI Introduction to AI Mathematical Foundations for AI Probability, Statistics, and Linear Algebra Basics of Neural Networks Gradient Descent and Optimization Basics Architectures: Feedforward, RNN, and CNN Mini Project - Build a Simple Neural Network Using TensorFlow Mini Project - Train an Autoencoder on the MNIST Dataset2Week 2Deep Generative Models Discriminative and Generative models Generative Adversarial Networks (GANs) Variational Autoencoders (VAEs) Probabilistic Data Generation Using VAEs Four Mini Projects using TensorFlow Metrics Visualization using TensorBoard Mini Project - Implement a GAN to Generate Handwritten Digits Mini Project - Train a VAE to Generate Faces Using the CelebA Dataset3Week 3Transformers and Large Language Models RNN, LSTM Transformers Architecture Attention Mechanism: Self-Attention and Positional Encoding Major Project - Code Transformer from scratch Encoder-Decoder Framework Pretraining objectives: MLM, CLM GPT, BERT Mini Project - Sentiment Analysis Using BERT4Week 4Fine-Tuning, LangChain, LangGraph Pretraining and Fine-Tuning LoRA, QLoRA Hugging Face Fine-tuning for Tasks Like Summarization, QA LangChain Installation and Basic Setup Overview of LangChain: Prompts, Memory, Chains, Agents LangGraph: Nodes, State, StateGraph, Workflows AI Agents Mini Project - Simple Q&A Application Using LangChain5Week 5Vector Databases, RAG Vector Databases ChromaDB Applications of RAG Building RAG Pipelines with LangChain Building Frontend using Streamlit Major Project - Build End to End Chatbot like ChatGPT using Streamlit, LangGraph, ChromaDB, WebSearch Tools, Memory with LLMs Project - Build an App using Streamlit for Image Generation, Image Caption Generation, Video Caption Generation6Week 6Trending Topics MCP - Model Context Protocol Ollama Projects - Fine-Tuning using Unsloth Mixture of Experts Chain of Thoughts Deepseek Architecture7Week 7Projects, Trending Topics Distillation Diffusion Models Vision Transformers Multimodal Models CLIP Prompt EngineeringTestimonialsWe've a large community of talentsVoices of Delight: Discover what our students say about their learning journey. Real stories, real satisfaction—explore testimonials that reflect the quality, dedication, and excellence we strive to deliver.Sahitya Raj ACo-founderSreeal TechnologiesI attended Educosys live Generative AI online course, and despite not being a beginner in the field, I found it incredibly valuable for learners at all levels. The curriculum was well-structured, covering everything from basic neural networks to advanced frameworks and architectures. One of the highlights was the transformer architecture, which was covered in remarkable depth

with absolute clarity—no confusion, just a seamless understanding of self-attention, positional encoding, and how these models scale. And the way Keerti delivered it leaves a lasting impact—truly unmatched and unforgettable! Beyond the structured content, they also stretched beyond to cover the absolute latest - DeepSeek. Concepts that once felt intimidating now feel second nature. An added bonus was the notes, which removed the overhead of excessive note-taking and allowed for more focused learning. The balance between theory and hands-on learning was perfect, making it easy to apply new knowledge in real-world projects. By the end of the course, I feel a significant boost in my confidence—whether at work, workshops, meetups, discussions, projects, or analyzing cutting-edge AI advancements. This course is truly for everyone, whether you're getting started or deepening your expertise in Generative AI. Highly recommended! Kudos to Keerti and Amit for their incredible efforts in designing and delivering this course so beautifully, and for the vast amount of knowledge they have gathered and shared with us!

Read more: Ashish Upreti, Lead SDE at Intel. I really enjoyed the GenAI course. Coming from someone with zero knowledge on the topic, after seven weeks, I'm able to understand the magic behind GenAI. I also liked the quality of the content and how you broke down such a complex topic for easy understanding. I appreciate your patience and eagerness to clarify all the doubts. I have already enrolled in the LLD and HLD courses and am looking forward to it.

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Read more: Raman Sharma, Principal Software Engineer at Oracle. I found the course very helpful and well structured. It started with the very basics of neural networks, it even touched upon the maths to get a proper understanding of what's going on under the hood. Gradually progressing towards more advanced models like CNN, RNN, and then transformers was done in a steady and helpful way. The intuitions Keerti provided were very useful and make a lasting impression in your mind regarding the topic. I haven't found such intuitions and easy to understand explanations elsewhere. Taking this course has increased my confidence towards GenAI and it has given me a solid platform from where I can read more AI related blogs, whitepapers, etc. without feeling overwhelmed. It has even helped me demonstrate a POC within my team that was well received. I recommend this course to anyone starting out with GenAI.

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Read more: Syed I, Information Security Officer at Form3. A real game changer of a course especially when it comes to real world applications. Keerti is an amazing mentor and gets to the crux of the learning without any frills. Highly recommend.

Ruthira Sekar: I'm Database developer/DBA, Completing the Generative AI course was an insightful experience, deepening my knowledge of Machine Learning. Keerti's passion for teaching made complex topics easy to grasp. I highly recommend this course to anyone interested in AI and ML!

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```
In [ ]: from langchain.text_splitter import RecursiveCharacterTextSplitter

text_splitter = RecursiveCharacterTextSplitter(chunk_size = 1000, chunk_overlap = 20
splits = text_splitter.split_documents(docs)
```

```
In [ ]: print(splits[0])
print(splits[1])
print(splits[2])
```

page_content='Hands-on Generative AI CourseCoursesBundle CoursesMentorFree ContentTestimonialsFAQLogin Signup Hands-on Generative AI CourseLearn, Build, Deploy and Apply Generative AI7 Weeks CourseAccess all Live BatchesLifetime access of RecordingsAccess Discord CommunityCode availableBuild ProjectsLearn Future-Ready TechEnroll 1Week 1Foundations of Generative AI Introduction to AI Mathematical Foundations for AI Probability, Statistics, and Linear Algebra Basics of Neural Networks Gradient Descent and Optimization Basics Architectures: Feedforward, RNN, and CNN Mini Project - Build a Simple Neural Network Using TensorFlow Mini Project - Train an Autoencoder on the MNIST Dataset2Week 2Deep Generative Models Discriminative and Generative models Generative Adversarial Networks (GANs) Variational Autoencoders (VAEs) Probabilistic Data Generation Using VAEs Four Mini Projects using TensorFlow Metrics Visualization using TensorBoard Mini Project - Implement a GAN to Generate Handwritten Digits Mini' metadata={'source': 'https://www.educosys.com/course/genai', 'title': 'Hands-on Generative AI Course', 'description': 'Hands-on Generative AI Course', 'language': 'en'}

page_content='(VAEs) Probabilistic Data Generation Using VAEs Four Mini Projects using TensorFlow Metrics Visualization using TensorBoard Mini Project - Implement a GAN to Generate Handwritten Digits Mini Project - Train a VAE to Generate Faces Using the CelebA Dataset3Week 3Transformers and Large Language Models RNN, LSTM Transformers Architecture Attention Mechanism: Self-Attention and Positional Encoding Major Project - Code Transformer from scratch Encoder-Decoder Framework Pretraining objectives: MLM, CLM GPT, BERT Mini Project - Sentiment Analysis Using BERT4Week 4Fine-Tuning, LangChain, LangGraph Pretraining and Fine-Tuning LoRA, QLoRA Hugging Face Fine-tuning for Tasks Like Summarization, QA LangChain Installation and Basic Setup Overview of LangChain: Prompts, Memory, Chains, Agents LangGraph: Nodes, State, StateGraph, Workflows AI Agents Mini Project - Simple Q&A Application Using LangChain5Week 5Vector Databases, RAG Vector Databases ChromaDB Applications of RAG Building RAG Pipelines' metadata={'source': 'https://www.educosys.com/course/genai', 'title': 'Hands-on Generative AI Course', 'description': 'Hands-on Generative AI Course', 'language': 'en'}

page_content='Nodes, State, StateGraph, Workflows AI Agents Mini Project - Simple Q&A Application Using LangChain5Week 5Vector Databases, RAG Vector Databases ChromaDB Applications of RAG Building RAG Pipelines with LangChain Building Frontend using Streamlit Major Project - Build End to End Chatbot like ChatGPT using Streamlit, LangGraph, ChromaDB, WebSearch Tools, Memory with LLMs Project - Build an App using Streamlit for Image Generation, Image Caption Generation, Video Caption Generation6Week 6Trending Topics MCP - Model Context Protocol Ollama Projects - Fine-Tuning using Unsloth Mixture of Experts Chain of Thoughts Deepseek Architecture7Week 7Projects, Trending Topics Distillation Diffusion Models Vision Transformers Multimodal Models CLIP Prompt EngineeringTestimonialsWe've a large community of talentsVoices of Delight: Discover what our students say about their learning journey. Real stories, real satisfaction-explore testimonials that reflect the quality, dedication, and excellence we' metadata={'source': 'https://www.educosys.com/course/genai', 'title': 'Hands-on Generative AI Course', 'description': 'Hands-on Generative AI Course', 'language': 'en'}

```
In [ ]: print(len(splits))
```

11

```
In [ ]: from langchain.embeddings.openai import OpenAIEmbeddings
from langchain.vectorstores import Chroma

vectorstore = Chroma.from_documents(documents=splits, embedding=OpenAIEmbeddings())
```



```
<ipython-input-7-f24fa4352e95>:4: LangChainDeprecationWarning: The class `OpenAIEmbeddings` was deprecated in LangChain 0.0.9 and will be removed in 1.0. An updated version of the class exists in the :class:`~langchain-openai` package and should be used instead. To use it run `pip install -U :class:`~langchain-openai` and import as `from :class:`~langchain_openai import OpenAIEmbeddings``.
vectorstore = Chroma.from_documents(documents=splits, embedding=OpenAIEmbeddings())
```

```
In [ ]: print(vectorstore._collection.count())
```

```
11
```

```
In [ ]: print(vectorstore._collection.get())
```

```
{'ids': ['3a550eec-2fab-40a1-8b74-ea1a26fb34c2', '905a995d-6fd2-46f2-ae97-2cc010f00cd e', 'f5109d13-0b7b-421e-885d-f558c24411f4', '0cfc1adc-df88-49bf-97fb-f7ba67446ed5', '7f6bd9a7-d0ec-4bc7-9d05-92494a58ea6a', '9d0a15be-0703-467a-a545-b6693907d57a', 'c439 1c01-9197-47e5-956d-b9015b1254e3', '67cda503-9d23-4194-87ec-8ed147e74761', '7918a708- 4338-4ec6-9e18-c5263e6c31ed', 'f7fba231-bdca-45d7-8b9c-b2cb2b2a4e55', 'e633bd60-84d0- 44fe-8ea1-deb586d69ede'], 'embeddings': None, 'documents': ['Hands-on Generative AI C ourseCoursesBundle CoursesMentorFree ContentTestimonialsFAQLogin Signup Hands-on Gene rative AI CourseLearn, Build, Deploy and Apply Generative AI7 Weeks CourseAccess all Live BatchesLifetime access of RecordingsAccess Discord CommunityCode availableBuild ProjectsLearn Future-Ready TechEnroll 1Week 1Foundations of Generative AI Introductio n to AI Mathematical Foundations for AI Probability, Statistics, and Linear Algebra B asics of Neural Networks Gradient Descent and Optimization Basics Architectures: Feed forward, RNN, and CNN Mini Project - Build a Simple Neural Network Using TensorFlow M ini Project - Train an Autoencoder on the MNIST Dataset2Week 2Deep Generative Models Discriminative and Generative models Generative Adversarial Networks (GANs) Variation al Autoencoders (VAEs) Probabilistic Data Generation Using VAEs Four Mini Projects us ing TensorFlow Metrics Visualization using TensorBoard Mini Project - Implement a GAN to Generate Handwritten Digits Mini', '(VAEs) Probabilistic Data Generation Using VAE s Four Mini Projects using TensorFlow Metrics Visualization using TensorBoard Mini Pr oject - Implement a GAN to Generate Handwritten Digits Mini Project - Train a VAE to Generate Faces Using the CelebA Dataset3Week 3Transformers and Large Language Models RNN, LSTM Transformers Architecture Attention Mechanism: Self-Attention and Positiona l Encoding Major Project - Code Transformer from scratch Encoder-Decoder Framework Pr etraining objectives: MLM, CLM GPT, BERT Mini Project - Sentiment Analysis Using BERT 4Week 4Fine-Tuning, LangChain, LangGraph Pretraining and Fine-Tuning LoRA, QLoRA Hugg ing Face Fine-tuning for Tasks Like Summarization, QA LangChain Installation and Basi c Setup Overview of LangChain: Prompts, Memory, Chains, Agents LangGraph: Nodes, Stat e, StateGraph, Workflows AI Agents Mini Project - Simple Q&A Application Using LangCh ain5Week 5Vector Databases, RAG Vector Databases ChromaDB Applications of RAG Buildin g RAG Pipelines', 'Nodes, State, StateGraph, Workflows AI Agents Mini Project - Simpl e Q&A Application Using LangChain5Week 5Vector Databases, RAG Vector Databases Chroma DB Applications of RAG Building RAG Pipelines with LangChain Building Frontend using Streamlit Major Project - Build End to End Chatbot like ChatGPT using Streamlit, Lang Graph, ChromaDB, WebSearch Tools, Memory with LLMs Project - Build an App using Strea mlit for Image Generation, Image Caption Generation, Video Caption Generation6Week 6T rending Topics MCP - Model Context Protocol Ollama Projects - Fine-Tuning using Unslo th Mixture of Experts Chain of Thoughts Deepseek Architecture7Week 7Projects, Trendin g Topics Distillation Diffusion Models Vision Transformers Multimodal Models CLIP Pro mpt EngineeringTestimonialsWe've a large community of talentsVoices of Delight: Disco ver what our students say about their learning journey. Real stories, real satisfacti on-explore testimonials that reflect the quality, dedication, and excellence we", 'of talentsVoices of Delight: Discover what our students say about their learning journe y. Real stories, real satisfaction-explore testimonials that reflect the quality, ded ication, and excellence we strive to deliver.Sahitya Raj ACo-founderSreeal Technologi esI attended Educosys live Generative AI online course, and despite not being a begin ner in the field, I found it incredibly valuable for learners at all levels. The curr iculum was well-structured, covering everything from basic neural networks to advance d frameworks and architectures. One of the highlights was the transformer architectu re, which was covered in remarkable depth with absolute clarity-no confusion, just a
```


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```
In [ ]: print("\nCollection 1 - ", vectorstore._collection.get(ids=['28651d9a-ab51-41f8-ab83
print("\nCollection 2 - ", vectorstore._collection.get(ids=['054dee19-19ed-4574-bc51
print("\nCollection 3 - ", vectorstore._collection.get(ids=['2fd71cb4-835a-43c5-b920
```

```
Collection 1 - {'ids': [], 'embeddings': array([], dtype=float64), 'documents': [],
'uris': None, 'included': ['embeddings', 'documents'], 'data': None, 'metadatas': None}
```

```
Collection 2 - {'ids': [], 'embeddings': array([], dtype=float64), 'documents': [],
'uris': None, 'included': ['embeddings', 'documents'], 'data': None, 'metadatas': None}
```

```
Collection 3 - {'ids': [], 'embeddings': array([], dtype=float64), 'documents': [],
'uris': None, 'included': ['embeddings', 'documents'], 'data': None, 'metadatas': None}
```

```
In [ ]: retriever = vectorstore.as_retriever()
```

```
In [ ]: from langchain import hub
prompt = hub.pull("rlm/rag-prompt")
```

```
/usr/local/lib/python3.11/dist-packages/langsmith/client.py:278: LangSmithMissingAPIKeyWarning: API key must be provided when using hosted LangSmith API
warnings.warn(
```

```
In [ ]: from langchain_openai import ChatOpenAI
llm = ChatOpenAI()
```

```
In [ ]: from langchain_core.runnables import RunnablePassthrough
from langchain_core.output_parsers import StrOutputParser
```

```
In [ ]: def format_docs(docs):
        return "\n".join(doc.page_content for doc in docs)
```

```
In [ ]: rag_chain = ({ "context" : retriever | format_docs, "question" : RunnablePassthrough(
    | prompt
    | llm
    | StrOutputParser())
```

```
In [ ]: rag_chain.invoke("Are the recordings of the course available? For how long?")
```

```
Out[ ]: 'Yes, the recordings of the course are available for lifetime access.'
```

```
In [ ]: rag_chain.invoke("Are the testimonials for the course available? Name the students w
```

```
Out[ ]: 'Yes, testimonials for the course are available on the website. Students who have sha
red testimonials are Sahitya Raj, Manika Kaushik, Ashish Upreti, and Sathish Krishn
a.'
```

```
In [ ]: rag_chain.invoke("Are the certificates for the course provided?")
```

```
Out[ ]: 'Yes, certificates are provided for the course.'
```

```
In [ ]: rag_chain.invoke("What all projects are covered in the course?")
```

```
Out[ ]: 'The projects covered in the course include implementing GANs to generate handwritten
digits, training a VAE to generate faces using the CelebA dataset, building a transfo
rmer from scratch, and performing sentiment analysis using BERT. The course also cove
rs topics such as attention mechanisms, transformers, fine-tuning techniques, and vec
tor databases. It offers hands-on learning experiences and allows participants to wor
k on mini and major projects to enhance their skills in generative AI.'
```

```
In [ ]: from langchain_core.runnables import RunnableLambda
```

```
In [ ]: def print_prompt(prompt_text):
        print("Prompt - ", prompt_text)
        return prompt_text
```

```
In [ ]: rag_chain_with_print = ({ "context" : retriever | format_docs, "question" : RunnableP
    | prompt
    | RunnableLambda(print_prompt)
    | llm
    | StrOutputParser())
```

In []:

```
rag_chain_with_print.invoke("What all projects are covered in the course?")
```

Prompt - messages=[HumanMessage(content="You are an assistant for question-answering tasks. Use the following pieces of retrieved context to answer the question. If you don't know the answer, just say that you don't know. Use three sentences maximum and keep the answer concise.\nQuestion: What all projects are covered in the course? \nContext: course be taught in?Do you have a mobile application?Can I watch the class recordings or go through notes offline?Do you provide certificate for the course?Can I get invoices for reimbursement?I have more questions, how can I reach out to you?© 2025 Copyright Educosys. All rights reserved.\ninterested in AI and ML!Read moreManika Kau shikSenior Software EngineerOptum-United HealthGroupKeerti explains everything in such simple and creative manner, even difficult and huge topics became easy to understand.Frequently asked questionsIs this a Live or Recorded Course?When will the next Live batch be launched?What if I am interested in learning Live only?What are the prerequisites for the course?Is Machine Learning pre-requisite for the course?How many projects will we work on? Can I add these to resume?Is this course for freshers or for experienced people?How will you be able to cover so much in 7 weeks?What languages do we use to build the projects?Can I watch the classes only on the phone without a Laptop?Will you provide the code?Where can I ask you doubts?What language will the course be taught in?Do you have a mobile application?Can I watch the class recordings or go through notes offline?Do you provide certificate for the course?Can I get invoices for reimbursement?I have\n(VAEs) Probabilistic Data Generation Using VAEs Four Mini Projects using TensorFlow Metrics Visualization using TensorBoard Mini Project - Implement a GAN to Generate Handwritten Digits Mini Project - Train a VAE to Generate Faces Using the CelebA Dataset3Week 3Transformers and Large Language Models RNN, LSTM Transformers Architecture Attention Mechanism: Self-Attention and Positional Encoding Major Project - Code Transformer from scratch Encoder-Decoder Framework Pretraining objectives: MLM, CLM GPT, BERT Mini Project - Sentiment Analysis Using BERT4Week 4Fine-Tuning, LangChain, LangGraph Pretraining and Fine-Tuning LoRA, QLoRA Hugging Face Fine-tuning for Tasks Like Summarization, QA LangChain Installation and Basic Setup Overview of LangChain: Prompts, Memory, Chains, Agents LangGraph: Nodes, State, StateGraph, Workflows AI Agents Mini Project - Simple Q&A Application Using LangChain5Week 5Vector Databases, RAG Vector Databases ChromaDB Applications of RAG Building RAG Pipelines\nHands-on Generative AI CourseCoursesBundle CoursesMentorFree ContentTestimonialsFAQLogin Signup Hands-on Generative AI CourseLearn, Build, Deploy and Apply Generative AI7 Weeks CourseAccess all Live BatchesLifetime access of RecordingsAccess Discord CommunityCode availableBuild ProjectsLearn Future-Ready TechEnroll 1Week 1Foundations of Generative AI Introduction to AI Mathematical Foundations for AI Probability, Statistics, and Linear Algebra Basics of Neural Networks Gradient Descent and Optimization Basics Architectures: Feedforward, RNN, and CNN Mini Project - Build a Simple Neural Network Using TensorFlow Mini Project - Train an Autoencoder on the MNIST Dataset2Week 2 Deep Generative Models Discriminative and Generative models Generative Adversarial Networks (GANs) Variational Autoencoders (VAEs) Probabilistic Data Generation Using VAEs Four Mini Projects using TensorFlow Metrics Visualization using TensorBoard Mini Project - Implement a GAN to Generate Handwritten Digits Mini \nAnswer:", additional_kwargs={}, response_metadata={})]

Out[]:

'The projects covered in the course include implementing a GAN to generate handwritten digits, training a VAE to generate faces using the CelebA dataset, code Transformer from scratch, and sentiment analysis using BERT. There are also mini-projects related to TensorFlow, TensorBoard, and various deep generative models. The course covers a range of topics related to generative AI and provides hands-on learning opportunities.'

In []: