!pip install -U langchain langchain-community huggingface\_hub faiss-cpu sentence-transformers langchain-huggingface transformers

```
Fr Requirement already satisfied: langchain in /usr/local/lib/python3.12/dist-packages (0.3.27)
    Collecting langchain-community
      Downloading langchain_community-0.3.27-py3-none-any.whl.metadata (2.9 kB)
    Requirement already satisfied: huggingface_hub in /usr/local/lib/python3.12/dist-packages (0.34.4)
    Collecting faiss-cpu
      Downloading \ faiss\_cpu-1.12.0-cp312-cp312-manylinux\_2\_27\_x86\_64.manylinux\_2\_28\_x86\_64.whl.metadata \ (5.1 kB)
    Requirement already satisfied: sentence-transformers in /usr/local/lib/python3.12/dist-packages (5.1.0)
    Collecting langchain-huggingface
      Downloading langchain huggingface-0.3.1-py3-none-any.whl.metadata (996 bytes)
    Requirement already satisfied: transformers in /usr/local/lib/python3.12/dist-packages (4.55.2)
    Collecting transformers
      Downloading transformers-4.55.3-py3-none-any.whl.metadata (41 kB)
                                                   42.0/42.0 kB 1.7 MB/s eta 0:00:00
    Requirement already satisfied: torch in /usr/local/lib/python3.12/dist-packages (2.8.0+cu126)
    Requirement already satisfied: accelerate in /usr/local/lib/python3.12/dist-packages (1.10.0)
    Collecting bitsandbytes
      Downloading bitsandbytes-0.47.0-py3-none-manylinux_2_24_x86_64.whl.metadata (11 kB)
    Requirement already satisfied: langchain-core<1.0.0,>=0.3.72 in /usr/local/lib/python3.12/dist-packages (from langchain) (@
    Requirement already satisfied: langchain-text-splitters<1.0.0,>=0.3.9 in /usr/local/lib/python3.12/dist-packages (from lang
    Requirement already satisfied: langsmith>=0.1.17 in /usr/local/lib/python3.12/dist-packages (from langchain) (0.4.14)
    Requirement already satisfied: pydantic<3.0.0,>=2.7.4 in /usr/local/lib/python3.12/dist-packages (from langchain) (2.11.7)
    Requirement already satisfied: SQLAlchemy<3,>=1.4 in /usr/local/lib/python3.12/dist-packages (from langchain) (2.0.43)
    Requirement already satisfied: requests<3,>=2 in /usr/local/lib/python3.12/dist-packages (from langchain) (2.32.4)
    Requirement already satisfied: PyYAML>=5.3 in /usr/local/lib/python3.12/dist-packages (from langchain) (6.0.2)
    Requirement already satisfied: aiohttp<4.0.0,>=3.8.3 in /usr/local/lib/python3.12/dist-packages (from langchain-community)
    Requirement already satisfied: tenacity!=8.4.0,<10,>=8.1.0 in /usr/local/lib/python3.12/dist-packages (from langchain-commu
    Collecting dataclasses-json<0.7,>=0.5.7 (from langchain-community)
      Downloading dataclasses_json-0.6.7-py3-none-any.whl.metadata (25 kB)
    Requirement already satisfied: pydantic-settings<3.0.0,>=2.4.0 in /usr/local/lib/python3.12/dist-packages (from langchain-c
    Requirement already satisfied: httpx-sse<1.0.0,>=0.4.0 in /usr/local/lib/python3.12/dist-packages (from langchain-community
    Requirement already satisfied: numpy>=1.26.2 in /usr/local/lib/python3.12/dist-packages (from langchain-community) (2.0.2)
    Requirement already satisfied: filelock in /usr/local/lib/python3.12/dist-packages (from huggingface_hub) (3.19.1)
    Requirement already satisfied: fsspec>=2023.5.0 in /usr/local/lib/python3.12/dist-packages (from huggingface_hub) (2025.3.0)
    Requirement already satisfied: packaging>=20.9 in /usr/local/lib/python3.12/dist-packages (from huggingface_hub) (25.0)
    Requirement already satisfied: tqdm>=4.42.1 in /usr/local/lib/python3.12/dist-packages (from huggingface_hub) (4.67.1)
    Requirement already satisfied: typing-extensions>=3.7.4.3 in /usr/local/lib/python3.12/dist-packages (from huggingface_hub)
    Requirement already satisfied: hf-xet<2.0.0,>=1.1.3 in /usr/local/lib/python3.12/dist-packages (from huggingface_hub) (1.1.
    Requirement already satisfied: scikit-learn in /usr/local/lib/python3.12/dist-packages (from sentence-transformers) (1.6.1)
    Requirement already satisfied: scipy in /usr/local/lib/python3.12/dist-packages (from sentence-transformers) (1.16.1)
    Requirement already satisfied: Pillow in /usr/local/lib/python3.12/dist-packages (from sentence-transformers) (11.3.0)
    Requirement already satisfied: tokenizers>=0.19.1 in /usr/local/lib/python3.12/dist-packages (from langchain-huggingface)
    Requirement already satisfied: regex!=2019.12.17 in /usr/local/lib/python3.12/dist-packages (from transformers) (2024.11.6)
    Requirement already satisfied: safetensors>=0.4.3 in /usr/local/lib/python3.12/dist-packages (from transformers) (0.6.2)
    Requirement already satisfied: setuptools in /usr/local/lib/python3.12/dist-packages (from torch) (75.2.0)
    Requirement already satisfied: sympy>=1.13.3 in /usr/local/lib/python3.12/dist-packages (from torch) (1.13.3)
    Requirement already satisfied: networkx in /usr/local/lib/python3.12/dist-packages (from torch) (3.5)
    Requirement already satisfied: jinja2 in /usr/local/lib/python3.12/dist-packages (from torch) (3.1.6)
    Requirement already satisfied: nvidia-cuda-nvrtc-cu12==12.6.77 in /usr/local/lib/python3.12/dist-packages (from torch) (12.
    Requirement already satisfied: nvidia-cuda-runtime-cu12==12.6.77 in /usr/local/lib/python3.12/dist-packages (from torch) (1
    Requirement already satisfied: nvidia-cuda-cupti-cu12==12.6.80 in /usr/local/lib/python3.12/dist-packages (from torch) (12.
    Requirement already satisfied: nvidia-cudnn-cu12==9.10.2.21 in /usr/local/lib/python3.12/dist-packages (from torch) (9.10.2
    Requirement already satisfied: nvidia-cublas-cu12==12.6.4.1 in /usr/local/lib/python3.12/dist-packages (from torch) (12.6.4
    Requirement already satisfied: nvidia-cufft-cu12==11.3.0.4 in /usr/local/lib/python3.12/dist-packages (from torch) (11.3.0.
    Requirement already satisfied: nvidia-curand-cu12==10.3.7.77 in /usr/local/lib/python3.12/dist-packages (from torch) (10.3.
    Requirement already satisfied: nvidia-cusolver-cu12==11.7.1.2 in /usr/local/lib/python3.12/dist-packages (from torch) (11.7.1.2 in /usr/local/lib/python3.12/dist-packages (from torch)
    Requirement already satisfied: nvidia-cusparse-cu12==12.5.4.2 in /usr/local/lib/python3.12/dist-packages (from torch) (12.5.4.2 in /usr/local/lib/python3.12/dist-packages (from torch)
    Requirement already satisfied: nvidia-cusparselt-cu12==0.7.1 in /usr/local/lib/python3.12/dist-packages (from torch) (0.7.1
    Requirement already catisfied: nyidia-nccl-cul2==2 27 3 in /usr/local/lih/nython3 12/dist-nackages (from torch) (2 27 3)
import gc
import torch
# Clear any existing models from memory
gc.collect()
if torch.cuda.is_available():
    torch.cuda.empty_cache()
    print(f"GPU available: {torch.cuda.get_device_name()}")
    print(f"GPU memory: {torch.cuda.get_device_properties(0).total_memory / 1e9:.1f} GB")
    print("Using CPU only")
# Check system RAM
import psutil
ram_gb = psutil.virtual_memory().total / (1024**3)
print(f"System RAM: {ram_gb:.1f} GB")
```

```
if ram_gb < 8:
   print("Warning: Less than 8GB RAM detected. Consider using smaller models.")
elif ram_gb < 16:
    print("Sufficient RAM for quantized models (8-16GB)")
else:
    print("Excellent RAM for larger models (16GB+)")

→ Using CPU only

     System RAM: 12.7 GB
     Sufficient RAM for quantized models (8-16GB)
import os
import warnings
warnings.filterwarnings('ignore')
# Set your HuggingFace API token
os.environ["HUGGINGFACEHUB_API_TOKEN"] = "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"
# Basic imports
from langchain.docstore.document import Document
from langchain.text_splitter import RecursiveCharacterTextSplitter
print(" Environment setup complete!")
    Environment setup complete!
# Sample legal documents with GDPR content
docs = [
    """This contract is subject to GDPR compliance.
     All personal data must be processed lawfully, fairly, and transparently.
     Data subjects have the right to access, rectify, and erase their personal data.
    """The agreement includes clauses for termination and arbitration.
     GDPR requires data deletion upon request by the user.
     Data controllers must implement appropriate technical and organizational measures.
    """This is a confidentiality clause. Information shared must not be disclosed
     without prior written consent, except as required by GDPR or applicable law.
     Personal data breaches must be reported within 72 hours under GDPR.
]
# Document objects
documents = [Document(page_content=doc.strip()) for doc in docs]
print(f" Created {len(documents)} documents")
# Display the documents
for i, doc in enumerate(documents, 1):
    print(f"\nDocument {i}:")
    print(doc.page_content)
    Created 3 documents
     Document 1:
     This contract is subject to GDPR compliance.
         All personal data must be processed lawfully, fairly, and transparently.
         Data subjects have the right to access, rectify, and erase their personal data.
     Document 2:
     The agreement includes clauses for termination and arbitration.
         GDPR requires data deletion upon request by the user.
         Data controllers must implement appropriate technical and organizational measures.
     Document 3:
     This is a confidentiality clause. Information shared must not be disclosed
         without prior written consent, except as required by GDPR or applicable law.
         Personal data breaches must be reported within 72 hours under GDPR.
# Initialize text splitter
splitter = RecursiveCharacterTextSplitter(
    chunk_size=300,
    chunk_overlap=50,
    separators=["\n\n", "\n", ".", "!", "?", ",", " "]
```

```
# Split documents
chunks = splitter.split_documents(documents)
print(f"Created {len(chunks)} chunks")
# Display chunks
for i, chunk in enumerate(chunks, 1):
    print(f"\nChunk {i}:")
    print(f"Content: {chunk.page_content}")
    print(f"Length: {len(chunk.page_content)} characters")
→ Created 3 chunks
    Chunk 1:
     Content: This contract is subject to GDPR compliance.
         All personal data must be processed lawfully, fairly, and transparently.
         Data subjects have the right to access, rectify, and erase their personal data.
     Length: 207 characters
     Chunk 2:
     Content: The agreement includes clauses for termination and arbitration.
         GDPR requires data deletion upon request by the user.
         Data controllers must implement appropriate technical and organizational measures.
     Length: 210 characters
     Chunk 3:
     Content: This is a confidentiality clause. Information shared must not be disclosed
         without prior written consent, except as required by GDPR or applicable law.
         Personal data breaches must be reported within 72 hours under GDPR.
     Length: 229 characters
from langchain_community.embeddings import HuggingFaceEmbeddings
from langchain_community.vectorstores import FAISS
print("Creating embeddings...")
    # Initialize embeddings
    embedding = HuggingFaceEmbeddings(
        model_name="sentence-transformers/all-mpnet-base-v2",
        model_kwargs={'device': 'cpu'}
    print("☑ Embeddings initialized successfully!")
    # Test embedding
    test_text = "GDPR compliance test"
    test_embedding = embedding.embed_query(test_text)
    print(f" Test embedding created, dimension: {len(test_embedding)}")
except Exception as e:
    print(f" Error with embeddings: {e}")
    raise
```

```
/tmp/ipython-input-3507374516.py:8: LangChainDeprecationWarning: The class `HuggingFaceEmbeddings` was deprecated in LangCha
       embedding = HuggingFaceEmbeddings(
                                                            349/349 [00:00<00:00, 30.4kB/s]
     modules.json: 100%
     config_sentence_transformers.json: 100%
                                                                             116/116 [00:00<00:00, 10.5kB/s]
     README.md:
                    11.6k/? [00:00<00:00, 618kB/s]
     sentence_bert_config.json: 100%
                                                                      53.0/53.0 [00:00<00:00, 4.93kB/s]
     config.json: 100%
                                                          571/571 [00:00<00:00, 37.7kB/s]
     model.safetensors: 100%
                                                                438M/438M [00:05<00:00, 76.0MB/s]
     tokenizer_config.json: 100%
                                                                  363/363 [00:00<00:00, 39.1kB/s]
                 232k/? [00:00<00:00, 4.52MB/s]
     vocab.txt:
     tokenizer.json:
                    466k/? [00:00<00:00, 19.2MB/s]
                                                                     239/239 [00:00<00:00, 18.4kB/s]
     special_tokens_map.json: 100%
     config.json: 100%
                                                           190/190 [00:00<00:00, 14.3kB/s]
     Embeddings initialized successfully!
     Test embedding created, dimension: 768
try:
    print("Building vector store...")
    # Create FAISS vector store
    vectorstore = FAISS.from_documents(chunks, embedding)
    print("Vector store created successfully!")
    # Create retriever
    retriever = vectorstore.as_retriever(
        search_type="similarity",
         search_kwargs={"k": 3}
    print("Retriever configured!")
    # Test retrieval
    test_query = "GDPR"
    test_docs = retriever.get_relevant_documents(test_query)
    print(f"Test retrieval successful: found {len(test_docs)} relevant documents")
except Exception as e:
    print(f"Error creating vector store: {e}")
    raise

→ Building vector store...

     Vector store created successfully!
     Retriever configured!
     Test retrieval successful: found 3 relevant documents
def test_search(query):
    print(f"\nQ Testing search for: '{query}'")
        docs = retriever.get relevant documents(guery)
        print(f"Found {len(docs)} relevant documents:")
         for i, doc in enumerate(docs, 1):
             print(f"\n--- Result {i} ---")
             print(doc.page_content.strip())
        return docs
    except Exception as e:
        print(f" Search error: {e}")
         return []
# Test searches
test_search("GDPR compliance")
test_search("data deletion")
```

```
test_search("personal data")
```

# Test the LLM

```
-- kesull I -
The agreement includes clauses for termination and arbitration.
         GDPR requires data deletion upon request by the user.
         Data controllers must implement appropriate technical and organizational measures.
     --- Result 2 ---
    This contract is subject to GDPR compliance.
         All personal data must be processed lawfully, fairly, and transparently.
         Data subjects have the right to access, rectify, and erase their personal data.
    --- Result 3 --
    This is a confidentiality clause. Information shared must not be disclosed
         without prior written consent, except as required by GDPR or applicable law.
         Personal data breaches must be reported within 72 hours under GDPR.
    Testing search for: 'data deletion'
    Found 3 relevant documents:
    The agreement includes clauses for termination and arbitration.
         GDPR requires data deletion upon request by the user.
         Data controllers must implement appropriate technical and organizational measures.
    This contract is subject to GDPR compliance.
         All personal data must be processed lawfully, fairly, and transparently.
         Data subjects have the right to access, rectify, and erase their personal data.
      - Result 3 -
    This is a confidentiality clause. Information shared must not be disclosed
         without prior written consent, except as required by GDPR or applicable law.
         Personal data breaches must be reported within 72 hours under GDPR.
    🔍 Testing search for: 'personal data'
    Found 3 relevant documents:
    --- Result 1 ---
    This contract is subject to GDPR compliance.
         All personal data must be processed lawfully, fairly, and transparently.
         Data subjects have the right to access, rectify, and erase their personal data.
    --- Result 2 ---
    This is a confidentiality clause. Information shared must not be disclosed
         without prior written consent, except as required by GDPR or applicable law.
         Personal data breaches must be reported within 72 hours under GDPR.
     -- Result 3 --
    The agreement includes clauses for termination and arbitration.
         GDPR requires data deletion upon request by the user.
         Data controllers must implement appropriate technical and organizational measures.
    [Document(id='ba4148b2-d6eb-442c-9b63-77ef48f8af58', metadata={}}, page_content='This contract is subject to GDPR
                     All personal data must be processed lawfully, fairly, and transparently.\n
    compliance.\n
                                                                                                     Data subjects have the
    right to access, rectify, and erase their personal data.'),
     Document (id='a2e4481d-7889-42d7-8fa0-ece9f107f3a9', metadata=\{\}, page\_content='This is a confidentiality clause.
    Information shared must not be disclosed\n
                                                  without prior written consent, except as required by GDPR or applicable
               Personal data breaches must be reported within 72 hours under GDPR.'),
     Document(id='e19fc5b1-a3d5-492f-9507-98b288a3ddcb', metadata={}, page_content='The agreement includes clauses for
    termination and arbitration.\n
                                     GDPR requires data deletion upon request by the user.\n
                                                                                                   Data controllers must
    implement appropriate technical and organizational measures.')]
llm method = None
if llm method is None:
   print("Trying alternative LLM method...")
   try:
       from transformers import pipeline
        from langchain.llms import HuggingFacePipeline
        # Create local pipeline
       hf_pipeline = pipeline(
            "text2text-generation",
            model="google/flan-t5-small",
            max new tokens=256,
            temperature=0.1
        # Wrap in LangChain
        llm = HuggingFacePipeline(pipeline=hf_pipeline)
```

```
test response = llm.invoke("What is GDPR?")
        print("LLM Method 2 (Local Pipeline) successful!")
        print(f"Test response: {test_response}")
        llm_method = "local"
    except Exception as e:
        print(f"Method 2 also failed: {e}")
        llm_method = None

    Trying alternative LLM method...

     config.json:
                 1.40k/? [00:00<00:00, 25.1kB/s]
                                                               308M/308M [00:14<00:00, 26.0MB/s]
     model.safetensors: 100%
     generation_config.json: 100%
                                                                  147/147 [00:00<00:00, 2.06kB/s]
     tokenizer_config.json:
                         2.54k/? [00:00<00:00, 28.7kB/s]
     spiece.model: 100%
                                                           792k/792k [00:00<00:00, 240kB/s]
     tokenizer.json:
                    2.42M/? [00:00<00:00, 52.0MB/s]
     special_tokens_map.json:
                            2.20k/? [00:00<00:00, 129kB/s]
     Device set to use cpu
     The following generation flags are not valid and may be ignored: ['temperature']. Set `TRANSFORMERS_VERBOSITY=info` for more
     /tmp/ipython-input-1690579610.py:18: LangChainDeprecationWarning: The class `HuggingFacePipeline` was deprecated in LangChai
       llm = HuggingFacePipeline(pipeline=hf_pipeline)
     The following generation flags are not valid and may be ignored: ['temperature']. Set `TRANSFORMERS_VERBOSITY=info` for more
     LLM Method 2 (Local Pipeline) successful!
     Test response: GDPR
from langchain.chains import RetrievalQA
try:
    print("Creating QA Chain...")
    if llm_method in ["endpoint", "local"]:
        qa_chain = RetrievalQA.from_chain_type(
            llm=llm,
             chain_type="stuff",
             retriever=retriever,
             return_source_documents=True
        print("QA Chain created successfully!")
    else:
        # Custom QA for fallback method
        class SimpleQAChain:
             def __init__(self, retriever, llm):
                 self.retriever = retriever
                 self.llm = llm
             def invoke(self, query_dict):
                 query = query_dict["query"]
                 # Get relevant documents
                 source_docs = self.retriever.get_relevant_documents(query)
                 # Create context from documents
                 context = "\n\n".join([doc.page_content for doc in source_docs])
                 # Generate response
                 prompt = f"Based on this context: {context}\n\nQuestion: {query}\nAnswer:"
                 result = self.llm.invoke(prompt)
                 return {
                     "result": result.
                     "source_documents": source_docs
        qa_chain = SimpleQAChain(retriever, llm)
        print("Custom QA Chain created!")
except Exception as e:
    print(f" Error creating QA chain: {e}")
```

```
qa_chain = None
QA Chain created successfully!
def query_legal_documents(query):
   """Query the legal documents with comprehensive error handling"""
   print(f"\n{'='*60}")
   print(f" Query: {query}")
   print(f"{'='*60}")
   try:
       if qa_chain is not None:
           # Use QA chain
           response = qa_chain.invoke({"query": query})
           print("\n
   ANSWER:")
           print("-" * 40)
           print(response["result"])
           print("\n SOURCE DOCUMENTS:")
           print("-" * 40)
           for i, doc in enumerate(response["source_documents"], 1):
               print(f"\nSource {i}:")
               print(doc.page_content.strip())
           return response
       else:
           # Fallback to direct search
           print("Using fallback search method...")
           docs = retriever.get_relevant_documents(query)
           print(f"\n RELEVANT DOCUMENTS ({len(docs)} found):")
           print("-" * 40)
           for i, doc in enumerate(docs, 1):
               print(f"\nDocument {i}:")
               print(doc.page_content.strip())
           return {"source_documents": docs, "result": "Search completed using fallback method."}
   except Exception as e:
       print(f"Query failed: {e}")
       return None
test_queries = [
    "What are the data processing requirements under GDPR?",
   "What happens when a user requests data deletion?",
   "What are the confidentiality requirements?",
   "What technical measures are required for GDPR compliance?",
   "What is the timeframe for reporting data breaches?"
]
for query in test_queries:
   query_legal_documents(query)
The following generation flags are not valid and may be ignored: ['temperature']. Set `TRANSFORMERS_VERBOSITY=info` for mon
    ______
    	riangle Query: What are the data processing requirements under GDPR?
    The following generation flags are not valid and may be ignored: ['temperature']. Set `TRANSFORMERS_VERBOSITY=info` for mon
    ANSWER:
    Data subjects have the right to access, rectify, and erase their personal data
    SOURCE DOCUMENTS:
    Source 1:
    The agreement includes clauses for termination and arbitration.
```

```
GDPR requires data deletion upon request by the user.
         Data controllers must implement appropriate technical and organizational measures.
    This contract is subject to GDPR compliance.
         All personal data must be processed lawfully, fairly, and transparently.
         Data subjects have the right to access, rectify, and erase their personal data.
    This is a confidentiality clause. Information shared must not be disclosed
         without prior written consent, except as required by GDPR or applicable law.
         Personal data breaches must be reported within 72 hours under GDPR.
    Query: What happens when a user requests data deletion?
    ______
    The following generation flags are not valid and may be ignored: ['temperature']. Set `TRANSFORMERS_VERBOSITY=info` for mon
    Data controllers must implement appropriate technical and organizational measures
    SOURCE DOCUMENTS:
    Source 1:
    The agreement includes clauses for termination and arbitration.
         GDPR requires data deletion upon request by the user.
         Data controllers must implement appropriate technical and organizational measures.
    This contract is subject to GDPR compliance.
         All personal data must be processed lawfully, fairly, and transparently.
         Data subjects have the right to access, rectify, and erase their personal data.
    This is a confidentiality clause. Information shared must not be disclosed
         without prior written consent, except as required by GDPR or applicable law.
         Personal data breaches must be reported within 72 hours under GDPR.
print("\n" + "="*60)
print(" SYSTEM STATUS SUMMARY")
print("="*60)
print(f" Documents loaded: {len(documents)}")
print(f" Chunks created: {len(chunks)}")
print(f" Embeddings: {' Working' if 'embedding' in locals() else ' Failed'}")
print(f" Vector Store: {' Working' if 'vectorstore' in locals() else ' Failed'}")
print(f" Retriever: {' Working' if 'retriever' in locals() else ' Failed'}")
print(f" LLM Method: {llm_method}")
print(f" QA Chain: {' Working' if qa_chain is not None else ' Failed'}")
print(f"\n System is ready for legal document queries!")
\overline{2}
     SYSTEM STATUS SUMMARY
     Documents loaded: 3
     Chunks created: 3
     Embeddings: Working
     Vector Store: Working
     Retriever: Working
     LLM Method: local
     QA Chain: Working
     System is ready for legal document queries!
while True:
     user_query = input("\n Enter your legal question (or 'quit' to exit): ")
     if user_query.lower() in ['quit', 'exit', 'q']:
     query_legal_documents(user_query)
₹
     Enter your legal question (or 'quit' to exit): what should be processed lawfully and fairly
    The following generation flags are not valid and may be ignored: ['temperature']. Set `TRANSFORMERS_VERBOSITY=info` for more
```

https://colab.research.google.com/drive/1AcETKg2oMVhqsm3n1NMpFy27Jp40iOY5?authuser=0#scrollTo=kJVXe-zryW1N&printMode=true

The agreement includes clauses for termination and arbitration.

GDPR requires data deletion upon request by the user.
Data controllers must implement appropriate technical and organizational measures.

Source 3: