

The screenshot shows a Jupyter Notebook interface with the following details:

- Title Bar:** AI_Powered_Financial_Analysis.ipynb
- Toolbar:** File, Edit, View, Insert, Runtime, Tools, Help, Share, Gemini, RAM Disk.
- Header:** Commands, Code, Text.
- Code Cell 1:** StructField("url", StringType(), True),
StructField("title", StringType(), True),
StructField("date", StringType(), True),
StructField("content", StringType(), True),
})
- Code Cell 2:** article_dataframe= session.createDataFrame(filtered_articles_rdd, schema=article_structure)
- Text Cell:** article_dataframe.show(truncate=10)
article_dataframe.write.mode("overwrite").json("output/realtime_financial_data")
- Output:** A list of URLs from cnbc.com, followed by a summary of market moves and a headline about American Express' credit card jitters.
- Bottom Status Bar:** showing top 20 rows.

AI_Powered_Financial_Analysis.ipynb

File Edit View Insert Runtime Tools Help

Commands Code Test

```
df_without_changing = ingest_file(input_path, sqlcontext)

print("Sample of raw data:")
df_without_changing.show(truncate=False)
print("Schema of raw data:")
df_without_changing.printSchema()
```

Successfully ingested SEC Filings.csv. Total rows: 2622

Sample of raw data:

Tickers Name	Sector	Asset Class	Market Value	Weight (%)	Motional Value	Quantity	Price	location	Exchange	Currency	FX Ratio	Market Currency	Accrual Date
AAPL [APPLE INC]	Information Technology	Equity	\$59,365,151.11	15.16	\$59,365,151.11	4,385,127.08	\$129.93	United States	NASDAQ	USD	1	USD	-
AMZN [AMAZON PROP T CORP]	Information Technology	Equity	\$10,163,450.00	3.00	\$10,163,450.00	750,000.00	\$129.93	United States	NASDAQ	USD	1	USD	-
AMZN [AMAZON CORP INC]	Consumer Discretionary	Equity	\$213,823,526.00	1.97	\$213,823,506.00	2,545,519.00	\$84.00	United States	NASDAQ	USD	1	USD	-
BKNG [BETTER HATHAWAY INC CLASS A]	Financials	Equity	\$359,603,687.00	1.47	\$359,603,687.00	514,684.00	\$808.00	United States	New York Stock Exchange Inc.	USD	1	USD	-
GOOGL [ALPHABET INC CLASS A]	Communication	Equity	\$151,996,826.75	1.4	\$151,996,826.75	11,722,225.00	\$180.23	United States	NASDAQ	USD	1	USD	-
GOOGL [ALPHABET INC]	Health Care	Equity	\$10,163,450.00	1.00	\$10,163,450.00	750,000.00	\$129.93	United States	NASDAQ	USD	1	USD	-
GOOG [ALPHABET INC CLASS C]	Communication	Equity	\$135,557,878.01	1.25	\$135,557,878.01	1,527,757.00	\$80.71	United States	NASDAQ	USD	1	USD	-
JNBN [JOHNSON & JOHNSON]	Health Care	Equity	\$133,147,817.78	1.2	\$133,147,817.78	753,738.00	\$176.65	United States	New York Stock Exchange Inc.	USD	1	USD	-
KRML [KRISPY KREME CO]	Food	Equity	\$10,163,450.00	1.00	\$10,163,450.00	750,000.00	\$129.93	United States	NASDAQ	USD	1	USD	-
PG [PROCTER & GAMBLE]	Consumer Staples	Equity	\$182,458,349.00	0.95	\$182,458,349.00	674,825.00	\$151.56	United States	New York Stock Exchange Inc.	USD	1	USD	-
NVIDIA [NVIDIA CORP]	Information Technology	Equity	\$100,792,173.44	0.93	\$100,792,173.44	680,496.00	\$146.00	United States	NASDAQ	USD	1	USD	-
TXCO [TEXACO INC]	Energy	Equity	\$9,975,931.36	0.90	\$9,975,931.36	649,491.00	\$100.00	United States	New York Stock Exchange Inc.	USD	1	USD	-
V [VISA INC CLASS A]	Information Technology	Equity	\$97,955,931.36	0.9	\$97,955,931.36	471,496.00	\$297.76	United States	New York Stock Exchange Inc.	USD	1	USD	-
HD [HOMEDepot INC]	Consumer Discretionary	Equity	\$93,465,816.76	0.86	\$93,465,816.76	295,000.00	\$315.86	United States	New York Stock Exchange Inc.	USD	1	USD	-
TSLA [TESLA INC]	Consumer Discretionary	Equity	\$91,176,481.00	0.84	\$91,176,481.00	746,000.00	\$123.18	United States	NASDAQ	USD	1	USD	-
LULY [LULU]	Health Care	Equity	\$80,420,845.00	0.82	\$80,420,845.00	632,000.00	\$129.93	United States	New York Stock Exchange Inc.	USD	1	USD	-
MASTERCard [MASTERCard INC CLASS A]	Information Technology	Equity	\$64,738,671.43	0.78	\$64,738,671.43	423,601.00	\$347.73	United States	New York Stock Exchange Inc.	USD	1	USD	-
PFE [PFIZER INC]	Health Care	Equity	\$82,940,884.52	0.77	\$82,940,884.52	511,246.00	\$161.61	United States	New York Stock Exchange Inc.	USD	1	USD	-
MRKV [MORVIE INC]	Health Care	Equity	\$81,797,931.84	0.76	\$81,797,931.84	506,144.00	\$161.61	United States	New York Stock Exchange Inc.	USD	1	USD	-

only showing top 20 rows

Scheme of raw data:

```
root
|-- Ticker: string (nullable = true)
|-- Sector: string (nullable = true)
|-- Asset Class: string (nullable = true)
|-- Market Value: string (nullable = true)
|-- Weight (%): string (nullable = true)
|-- Motional Value: string (nullable = true)
|-- Quantity: string (nullable = true)
|-- Price: string (nullable = true)
|-- location: string (nullable = true)
|-- Exchange: string (nullable = true)
|-- Currency: string (nullable = true)
|-- Net Currency: string (nullable = true)
|-- Accrual Date: string (nullable = true)
```

File Edit View Insert Runtime Tools Help

Commands + Code + Text

closed_df.show(truncate=False)

print("Schema of cleaned data: ")

closed_df.printSchema()

Data closed. Total rows after cleaning: 2622

Sample of cleaned data:

Ticker Name	Sector	Asset Class	Market Value	Weight (%)	Motional Value	Quantity	Price	Location	Exchange	Currency	FX Rate	Market Currency	Accrual Date	Market Value	Weight
lowlab inc 1250 vesting prvt	health care	Equity	\$0.82	0	0.0	null	\$0.0	United States	NO MARKET (E.G. UNLISTED)	USD	1	USD	-	\$0.02	0.0
lowlab inc 1550 vesting prvt	health care	Equity	\$0.07	0	0.02	null	\$0.0	United States	NO MARKET (E.G. UNLISTED)	USD	1	USD	-	\$0.02	0.0
la la industries technologies inc	industrials	Equity	\$12,726,488.79	0.12	12,726,488.79	null	\$1,060.00	United States	New York Stock Exchange Inc.	USD	1	USD	-	\$1,060.00	0.12
la la industries technologies inc	materials	Equity	\$2,384,922.44	0.02	2,384,922.44	null	\$45.47	United States	New York Stock Exchange Inc.	USD	1	USD	-	\$45.47	0.02
lam american airlines group inc	industrials	Equity	\$2,396,638.80	0.02	2,396,638.80	null	\$12.72	United States	NASDAQ	USD	1	USD	-	\$12.72	0.02
lamers company inc	consumer discretionary	Equity	\$117,779.28	0	117,779.28	null	\$11.95	United States	New York Stock Exchange Inc.	USD	1	USD	-	\$11.95	0.0
lamers company inc	consumer discretionary	Equity	\$117,779.28	0	117,779.28	null	\$11.95	United States	New York Stock Exchange Inc.	USD	1	USD	-	\$11.95	0.0
lamp advance auto parts inc	consumer discretionary	Equity	\$2,611,105.77	0.02	2,611,105.77	null	\$147.03	United States	New York Stock Exchange Inc.	USD	1	USD	-	\$147.03	0.02
lamp apple inc	information technology	Equity	\$59,365,151.11	0.16	59,365,151.11	null	\$129.93	United States	NASDAQ	USD	1	USD	-	\$129.93	0.16
lamp assets trust reit inc	industrials	Equity	\$99,455.00	0	99,455.00	null	\$0.26	United States	New York Stock Exchange Inc.	USD	1	USD	-	\$0.26	0.0
lamp atlantic air worldwide holdings inc	industrials	Equity	\$86,275.20	0.01	86,275.20	null	\$100.8	United States	NASDAQ	USD	1	USD	-	\$100.80	0.01
labb abbvie inc	health care	Equity	\$81,797,931.84	0.76	81,797,931.84	null	\$161.61	United States	New York Stock Exchange Inc.	USD	1	USD	-	\$161.61	0.76
abc american leisure corp	health care	Equity	\$7,346,124.45	0.07	7,346,124.45	null	\$165.71	United States	New York Stock Exchange Inc.	USD	1	USD	-	\$165.71	0.07
abc abc	financials	Equity	\$7,346,124.45	0.07	7,346,124.45	null	\$165.71	United States	New York Stock Exchange Inc.	USD	1	USD	-	\$165.71	0.07
abc abcilles biologics inc	health care	Equity	\$34,366.86	0.01	34,366.86	null	\$10.13	Canada	NASDAQ	USD	1	USD	-	\$10.13	0.01
abc absbury automotive group inc	consumer discretionary	Equity	\$1,152,577.59	0.01	1,152,577.59	null	\$179.25	United States	New York Stock Exchange Inc.	USD	1	USD	-	\$179.25	0.01
abc abciles biologics inc	industrials	Equity	\$89,999.00	0.01	89,999.00	null	\$44.42	United States	New York Stock Exchange Inc.	USD	1	USD	-	\$44.42	0.01
abc abcilabs inc	consumer discretionary	Equity	\$19,183,551.50	0.02	19,183,551.50	null	\$20.00	United States	NASDAQ	USD	1	USD	-	\$20.00	0.02
abc arbor realty trust reit inc	financials	Equity	\$593,365.34	0.01	593,365.34	null	\$13.19	United States	New York Stock Exchange Inc.	USD	1	USD	-	\$13.19	0.01
abc abbott laboratories	health care	Equity	\$53,916,551.52	0.5	53,916,551.52	null	\$109.79	United States	New York Stock Exchange Inc.	USD	1	USD	-	\$109.79	0.5

only showing top 20 rows

Schema of cleaned data:

```
root
 |-- Ticker: string (nullable = true)
 |-- Name: string (nullable = true)
 |-- Sector: string (nullable = true)
 |-- Asset Class: string (nullable = true)
 |-- Market Value: string (nullable = true)
 |-- Weight (%): string (nullable = true)
 |-- Motional Value: string (nullable = true)
 |-- Quantity: integer (nullable = true)
 |-- Price: float (nullable = true)
 |-- Location: string (nullable = true)
 |-- Exchange: string (nullable = true)
 |-- Currency: string (nullable = true)
 |-- FX Rate: string (nullable = true)
 |-- Market Currency: string (nullable = true)
 |-- Accrual Date: date (nullable = true)
 |-- Market Value: float (nullable = true)
 |-- Weight: float (nullable = true)
```

AI_Powered_Financial_Analysis.ipynb

```
[24] print("Sample of metadata:")
extracted_metadata.show(truncate=False)
print("Schema of metadata:")
extracted_metadata.printSchema()

Metadata extracted successfully.
Sample of metadata:
+-----+-----+-----+-----+-----+-----+-----+
|ticker|company_name|sector|market_value|weight_percent|shares_quantity|share_price|country|stock_exchange|accrual_date|record_id|
+-----+-----+-----+-----+-----+-----+-----+
|- commlab inc 1250 vesting prvt|health care|[0.02|[0.0|[null|[0.0|[United States|NO MARKET (E.G. UNLISTED)|[null|[null|
|- commlab inc 1500 vesting prvt|health care|[0.02|[0.0|[null|[0.0|[United States|NO MARKET (E.G. UNLISTED)|[null|[null|
|a agilent technologies inc|health care|[null|[0.12|[null|[149.65|[United States|New York Stock Exchange Inc.|[null|[null|
|as alcoa corp|materials|[null|[0.03|[null|[45.47|[United States|New York Stock Exchange Inc.|[null|[null|
|atl atlantic airlines group inc|industrials|[null|[0.02|[null|[11.72|[United States|NO MARKET (E.G. UNLISTED)|[null|[null|
|aaron's company inc|consumer discretionary|[null|[0.08|[null|[11.95|[United States|New York Stock Exchange Inc.|[null|[null|
|aeon aeon inc|industrials|[null|[0.01|[null|[75.32|[United States|NO MARKET (E.G. UNLISTED)|[null|[null|
|asp asp industries inc|consumer discretionary|[null|[0.01|[null|[147.03|[United States|New York Stock Exchange Inc.|[null|[null|
|abv abv inc class a|information technology|[null|[0.16|[null|[129.93|[United States|NASDAQ|[null|[null|
|abt airbnb inc class a|information technology|[null|[0.16|[null|[26.5|[United States|New York Stock Exchange Inc.|[null|[null|
|atet american assets trust inc|real estate|[null|[0.0|[null|[26.5|[United States|New York Stock Exchange Inc.|[Jan 01, 1970]|null|
|aaww atlas air worldwide holdings inc|industrials|[null|[0.01|[null|[100.8|[United States|NASDAQ|[null|[null|
|abcb american biogen corp|industrials|[null|[0.25|[null|[123.53|[United States|New York Stock Exchange Inc.|[null|[null|
|abcl abcellera biologics inc|biotechnology|[null|[0.07|[null|[165.71|[United States|New York Stock Exchange Inc.|[null|[null|
|abcr american dairy group inc|consumer discretionary|[null|[0.01|[null|[10.13|[Canada|NASDAQ|[null|[null|
|abeb airbnb inc class a|consumer discretionary|[null|[0.01|[null|[85.5|[United States|NASDAQ|[null|[null|
|abfr airbnb inc class a|consumer discretionary|[null|[0.08|[null|[13.19|[United States|New York Stock Exchange Inc.|[null|[null|
|abt airbnb laboratories|health care|[null|[0.5|[null|[189.79|[United States|New York Stock Exchange Inc.|[null|[null|
+-----+
only showing top 20 rows

Schema of metadata:
root
 |-- ticker: string (nullable = true)
 |-- company_name: string (nullable = true)
 |-- sector: string (nullable = true)
 |-- market_value: double (nullable = true)
 |-- weight_percent: float (nullable = true)
 |-- shares_quantity: integer (nullable = true)
 |-- share_price: float (nullable = true)
 |-- country: string (nullable = true)
 |-- stock_exchange: string (nullable = true)
 |-- accrual_date: string (nullable = true)
 |-- record_id: double (nullable = true)

[25] def data_storing(df, output_path):
    try:
        df.coalesce(1).write.mode("overwrite").option("header", "true").csv(output_path)
```

AI_Powered_Financial_Analysis.ipynb

```
[25] output_path = "processed_sec_filings"
data_storing(extracted_metadata, output_path)

Data successfully saved to processed_sec_filings
Verification: Read back 2622 rows from processed_sec_filings
Sample of stored data:
+-----+-----+-----+-----+-----+-----+-----+
|ticker|company_name|sector|market_value|weight_percent|shares_quantity|share_price|country|stock_exchange|accrual_date|record_id|
+-----+-----+-----+-----+-----+-----+-----+
|- commlab inc 1250 vesting prvt|health care|[0.02|[0.0|[null|[0.0|[United States|NO MARKET (E.G. UNLISTED)|[null|[null|
|- commlab inc 1500 vesting prvt|health care|[0.02|[0.0|[null|[0.0|[United States|NO MARKET (E.G. UNLISTED)|[null|[null|
|a agilent technologies inc|health care|[null|[0.12|[null|[149.65|[United States|New York Stock Exchange Inc.|[null|[null|
|as alcoa corp|materials|[null|[0.03|[null|[45.47|[United States|New York Stock Exchange Inc.|[null|[null|
|atl atlantic airlines group inc|industrials|[null|[0.02|[null|[11.72|[United States|NO MARKET (E.G. UNLISTED)|[null|[null|
|aaron's company inc|consumer discretionary|[null|[0.08|[null|[11.95|[United States|New York Stock Exchange Inc.|[null|[null|
|aeon aeon inc|industrials|[null|[0.01|[null|[75.32|[United States|NO MARKET (E.G. UNLISTED)|[null|[null|
|asp asp industries inc|consumer discretionary|[null|[0.01|[null|[147.03|[United States|New York Stock Exchange Inc.|[null|[null|
|abv abv inc class a|information technology|[null|[0.16|[null|[26.5|[United States|New York Stock Exchange Inc.|[null|[null|
|atet american assets trust inc|real estate|[null|[0.0|[null|[10.13|[Canada|NASDAQ|[null|[null|
|aaww atlas air worldwide holdings inc|industrials|[null|[0.01|[null|[100.8|[United States|NASDAQ|[null|[null|
|abcb american biogen corp|industrials|[null|[0.25|[null|[123.53|[United States|New York Stock Exchange Inc.|[null|[null|
|abcl abcellera biologics inc|biotechnology|[null|[0.07|[null|[165.71|[United States|New York Stock Exchange Inc.|[null|[null|
|abcr american dairy group inc|consumer discretionary|[null|[0.01|[null|[85.5|[United States|NASDAQ|[null|[null|
|abeb airbnb inc class a|consumer discretionary|[null|[0.08|[null|[13.19|[United States|New York Stock Exchange Inc.|[null|[null|
|abfr airbnb inc class a|consumer discretionary|[null|[0.01|[null|[189.79|[United States|New York Stock Exchange Inc.|[null|[null|
+-----+
only showing top 20 rows

[26] !pip install -q pyspark==3.4.1 spark-nlp==5.1.3
!pip install faiss-cpu

Requirement already satisfied: faiss-cpu in /usr/local/lib/python3.11/dist-packages (1.10.0)
Requirement already satisfied: numpy<3.0,>=1.25.0 in /usr/local/lib/python3.11/dist-packages (from faiss-cpu) (2.0.2)
Requirement already satisfied: packaging in /usr/local/lib/python3.11/dist-packages (from faiss-cpu) (24.2)

[27] from pyspark.sql import SparkSession
spark_session = SparkSession.getActiveSession()
if spark_session:
    spark_session.stop()

[28] import sparknlp
```

```
AI_Powered_Financial_Analysis.ipynb  ☆  ◊
File Edit View Insert Runtime Tools Help
Q Commands + Code + Text
[33] In [33]: INDEX = pd.read_csv('WIKIINFO.csv')
embedding_matrix = np.vstack(combined['embedding'].values)
INDEX.add(embedding_matrix)
```

```
[34] In [34]: def search_similar(query, k=3):
    q_embed = model.encode(query)
    distances, indices = index.search(np.array(q_embed), k)
    return combined.iloc[indices[0]][["title", "text", "url"]]
```

```
[35] In [35]: results = search_similar("what's the impact of Trump's tariffs on inflation")
print(results)
```

```
[35] Out [35]: title \
465    trampomomics big tariffs bigger deficits
136  powell indicates tariffs could pose a challenge...
24  Powell indicates tariffs could pose a challenge...
                                text \
465    trampomomics big tariffs bigger deficits
136  powell indicates tariffs could pose a challenge...
24  Powell indicates tariffs could pose a challenge...
                                url
465    https://www.cnbc.com/gallery/trump...
136  https://www.cnbc.com/2025/04/16/powell-indicat...
24  https://www.cnbc.com/2025/04/16/powell-indicat...
```

```
[36] In [36]: results = search_similar("Apple is acquiring a startup in New York.")
print(results)
```

```
[36] Out [36]: title \
293    had apple
7  Stocks making the biggest moves midday: Apple...
517  apple redirects iphone production to india am...
                                text \
293    had apple
7  Stocks making the biggest moves midday: Apple...
517  apple redirects iphone production to india am...
                                url
293    https://www.reddit.it/comment/h3ek5q
7  https://www.cnbc.com/2025/04/14/stocks-making...
517  https://www.reddit.com/r/wallstreetbets/commen...
```

```
[37] In [37]: import json
```

```
AI_Powered_Financial_Analysis.ipynb  ☆  ◊
File Edit View Insert Runtime Tools Help
Q Commands + Code + Text
[52] In [52]: print("Accuracy: " + str(eval_result['accuracy']))
print("Retrieved Documents (Top 3): \n" + doc[:100] + "..." for doc in retrieved_docs[:3]))"
```

```
[53] In [53]: print("Evaluation:")
print(" - Accuracy: " + str(eval_result['accuracy'])) (Score: " + str(eval_result['accuracy_score']) + ".2f"))
print(" - Clarity: " + str(eval_result['clarity'])) (Words: " + str(len(response.split()))))
print(" - Grounding: " + str(eval_result['grounding'])) (Score: " + str(eval_result['grounding_score']) + ".2f"))
```

```
[53] Out [53]: == Checking Accuracy, Clarity, and Grounding ==
Query: What are the risks of Amazon's $15B warehouse expansion?
Answer:
Even though there is still a huge downside risk for the US stock market, despite the exemption for electronics Amazon Cancels Inventory Orders From China After Tariffs ECB cuts rates again to help economy weather erratic U.S. trade policy
Retrieved Documents (Top 3):
['Amazon considers $15 billion warehouse expansion plan, Bloomberg News reports...', 'I think there is still a huge downside risk for the US stock market, despite the exemption for elect...', 'Amazon Cancels Inventory Orders From China After Tariffs...']
Evaluation:
- Accuracy: Low (Score: 0.33)
- Clarity: High (Words: 39)
- Grounding: Low (Score: 0.58)

[54] In [54]: with open("llm_evaluation.json", "w") as f:
    json.dump(eval_result, f, indent=2)
print("Evaluation saved to llm_evaluation.json")
```

```
[54] Out [54]: Evaluation saved to llm_evaluation.json
```

```
[55] In [55]: from pyspark.sql import SparkSession
from pyspark.sql.functions import col, lower, regexp_replace
from sparknlp.pretrained import SentenceTransformer
import pandas as pd
import numpy as np
import fasttext
from langchain.prompts import PromptTemplate
from langchain.chains.llm import HuggingFacePipeline
from transformers import AutoTokenizer, AutoModelForSeq2SeqLM, pipeline
from funktions import lru_cache
import time
import json
```

```
[55] In [55]: import sparknlp
spark = sparknlp.start()

def clean_text(df, col_name):
    return df.withColumn(col_name, lower(col(col_name))) \
        .withColumn(col_name, regexp_replace(col(col_name), '<.*>', '')) \
        .withColumn(col_name, regexp_replace(col(col_name), '^\u202e|\u2023|\u202c|\u202d|\u202b|\u202f', ''))
```

AI_Powered_Financial_Analysis.ipynb

```
[60]: print("==== Fine-Tuning Retrieval ===")
print("Retrieved (Top 3):[doc[:100] + '...' for doc in retrieved_docs[:3]])")
print("Latency: {latency:.2f}s")

print("==== Testing Diverse Financial Queries ===")
Device set to use cpu

Query: What are the risks of Amazon's $15B warehouse expansion?
Answer:
I think there is still a huge downside risk for the US stock market, despite the exemption for electronics Amazon Cancels Inventory Orders From China After Tariffs ECB cuts rates again to help economy weather erratic U.S. trade policy
Retrieved (Top 3):
['Amazon considers $15 billion warehouse expansion plan, Bloomberg News reports...', 'I think there is still a huge downside risk for the US stock market, despite the exemption for elect...', 'Amazon Cancels Inventory Orders From China After Tariffs...']
Device set to use cpu

Query: What is the impact of Trump's tariffs on inflation?
Answer:
controlling inflation and supporting economic growth.
Retrieved (Top 3):
['TRUMPOMICS: BIG TARIFFS, BIGGER DEFICITS...', 'Powell indicates tariffs could pose a challenge for the Fed between controlling inflation and suppor...', 'What is this gonna look like after 104% tariffs? ...']
Latency: 3.05s
Device set to use cpu

Query: Apple is acquiring a startup in New York.
Answer:
No.
Retrieved (Top 3):
['Apple redirects iPhone production to India amidst high China tariffs...', 'Bad Apple...', 'Apple is charting flights for 600 tons of iPhones from India...']
Latency: 1.66s

==== Fine-Tuning Retrieval ===
Device set to use cpu
Query: What are the risks of Amazon's $15B warehouse expansion?
Answer:
huge downside risk for the US stock market
Retrieved (Top 3):
['Amazon considers $15 billion warehouse expansion plan, Bloomberg News reports...', 'I think there is still a huge downside risk for the US stock market, despite the exemption for elect...', 'Amazon Cancels Inventory Orders From China After Tariffs...']
Latency: 1.66s

[61]: print("==== Optimize and Finalize ===")
nlist = 100
quantizer = faiss.IndexFlatIP(dimension)
```

AI_Powered_Financial_Analysis.ipynb

```
[61]: print("==== Optimize and Finalize ===")
nlist = 100
quantizer = faiss.IndexFlatIP(dimension)
optimized_index = faiss.IndexIVFFlat(quantizer, dimension, nlist, faiss.METRIC_INNER_PRODUCT)
optimized_index.train(embeddings)
optimized_index.add(embeddings)

response, retrieved_docs, latency = run_rag(query, optimized_index, processed_docs, model)
print("Query (Optimized): {query}")
print("Answer:\n{response}")
print("Latency: {latency:.2f}s")

==== Optimize and Finalize ===
Device set to use gpu
Query (Optimized): What are the risks of Amazon's $15B warehouse expansion?
Answer:
ECB cuts rates again to help economy weather erratic U.S. trade policy Companies with larger fixed USD debt?
Latency: 3.56s
```

Colab paid products - Cancel contracts here