

wmwvqfqu2

May 26, 2024

## 0.1 # Project: LLMs in Education (CrewAI)

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In this notebook we explore the application of large language models (LLMs) in education, focusing on how CrewAI, utilizing OpenAI as its base model, performs in generating responses for different educational prompts by creating an Agent that acts as an AI tutor for students. We analyze the quality and relevance of the outputs across three specific prompts.

## 0.2 Installing & Importing Libraries

```
[ ]: !pip install crewai==0.28.8 crewai_tools==0.1.6 langchain_community==0.0.29
!pip install utils

from crewai import Agent, Task, Crew
import os
```

Collecting crewai==0.28.8

Downloading crewai-0.28.8-py3-none-any.whl (61 kB)  
61.6/61.6 kB

1.8 MB/s eta 0:00:00

Collecting crewai\_tools==0.1.6

Downloading crewai\_tools-0.1.6-py3-none-any.whl (47 kB)  
47.7/47.7 kB

3.5 MB/s eta 0:00:00

Collecting langchain\_community==0.0.29

Downloading langchain\_community-0.0.29-py3-none-any.whl (1.8 MB)  
1.8/1.8 MB

10.9 MB/s eta 0:00:00

Collecting appdirs<2.0.0,>=1.4.4 (from crewai==0.28.8)

Downloading appdirs-1.4.4-py2.py3-none-any.whl (9.6 kB)

Requirement already satisfied: click<9.0.0,>=8.1.7 in  
/usr/local/lib/python3.10/dist-packages (from crewai==0.28.8) (8.1.7)

Collecting embedchain<0.2.0,>=0.1.98 (from crewai==0.28.8)

Downloading embedchain-0.1.104-py3-none-any.whl (194 kB)  
194.8/194.8

kB 6.1 MB/s eta 0:00:00

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Collecting instructor<0.6.0,>=0.5.2 (from crewai==0.28.8)
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Collecting langchain<0.2.0,>=0.1.10 (from crewai==0.28.8)
  Downloading langchain-0.1.20-py3-none-any.whl (1.0 MB)
    1.0/1.0 MB
11.6 MB/s eta 0:00:00
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  Downloading openai-1.30.2-py3-none-any.whl (320 kB)
    320.7/320.7
kB 9.4 MB/s eta 0:00:00
Collecting opentelemetry-api<2.0.0,>=1.22.0 (from crewai==0.28.8)
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    60.1/60.1 kB
3.8 MB/s eta 0:00:00
Collecting opentelemetry-exporter-otlp-proto-http<2.0.0,>=1.22.0 (from
crewai==0.28.8)
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kB)
Collecting opentelemetry-sdk<2.0.0,>=1.22.0 (from crewai==0.28.8)
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    106.1/106.1
kB 11.2 MB/s eta 0:00:00
Requirement already satisfied: pydantic<3.0.0,>=2.4.2 in
/usr/local/lib/python3.10/dist-packages (from crewai==0.28.8) (2.7.1)
Collecting python-dotenv==1.0.0 (from crewai==0.28.8)
  Downloading python_dotenv-1.0.0-py3-none-any.whl (19 kB)
Requirement already satisfied: regex<2024.0.0,>=2023.12.25 in
/usr/local/lib/python3.10/dist-packages (from crewai==0.28.8) (2023.12.25)
Requirement already satisfied: beautifulsoup4<5.0.0,>=4.12.3 in
/usr/local/lib/python3.10/dist-packages (from crewai_tools==0.1.6) (4.12.3)
Collecting chromadb<0.5.0,>=0.4.22 (from crewai_tools==0.1.6)
  Downloading chromadb-0.4.24-py3-none-any.whl (525 kB)
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kB 18.0 MB/s eta 0:00:00
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  Downloading lancedb-0.5.7-py3-none-any.whl (115 kB)
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Collecting pytest<9.0.0,>=8.0.0 (from crewai_tools==0.1.6)
  Downloading pytest-8.2.1-py3-none-any.whl (339 kB)
    339.6/339.6
kB 10.2 MB/s eta 0:00:00
Collecting pytube<16.0.0,>=15.0.0 (from crewai_tools==0.1.6)

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Downloading pytube-15.0.0-py3-none-any.whl (57 kB)
57.6/57.6 kB
5.6 MB/s eta 0:00:00
Requirement already satisfied: requests<3.0.0,>=2.31.0 in
/usr/local/lib/python3.10/dist-packages (from crewai_tools==0.1.6) (2.31.0)
Collecting selenium<5.0.0,>=4.18.1 (from crewai_tools==0.1.6)
  Downloading selenium-4.21.0-py3-none-any.whl (9.5 MB)
9.5/9.5 MB
39.7 MB/s eta 0:00:00
Requirement already satisfied: PyYAML>=5.3 in
/usr/local/lib/python3.10/dist-packages (from langchain_community==0.0.29)
(6.0.1)
Requirement already satisfied: SQLAlchemy<3,>=1.4 in
/usr/local/lib/python3.10/dist-packages (from langchain_community==0.0.29)
(2.0.30)
Requirement already satisfied: aiohttp<4.0.0,>=3.8.3 in
/usr/local/lib/python3.10/dist-packages (from langchain_community==0.0.29)
(3.9.5)
Collecting dataclasses-json<0.7,>=0.5.7 (from langchain_community==0.0.29)
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Collecting langchain-core<0.2.0,>=0.1.33 (from langchain_community==0.0.29)
  Downloading langchain_core-0.1.52-py3-none-any.whl (302 kB)
302.9/302.9
kB 21.3 MB/s eta 0:00:00
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  Downloading langsmith-0.1.63-py3-none-any.whl (122 kB)
122.8/122.8
kB 9.2 MB/s eta 0:00:00
Requirement already satisfied: numpy<2,>=1 in
/usr/local/lib/python3.10/dist-packages (from langchain_community==0.0.29)
(1.25.2)
Requirement already satisfied: tenacity<9.0.0,>=8.1.0 in
/usr/local/lib/python3.10/dist-packages (from langchain_community==0.0.29)
(8.3.0)
Requirement already satisfied: aiosignal>=1.1.2 in
/usr/local/lib/python3.10/dist-packages (from
aiohttp<4.0.0,>=3.8.3->langchain_community==0.0.29) (1.3.1)
Requirement already satisfied: attrs>=17.3.0 in /usr/local/lib/python3.10/dist-
packages (from aiohttp<4.0.0,>=3.8.3->langchain_community==0.0.29) (23.2.0)
Requirement already satisfied: frozenlist>=1.1.1 in
/usr/local/lib/python3.10/dist-packages (from
aiohttp<4.0.0,>=3.8.3->langchain_community==0.0.29) (1.4.1)
Requirement already satisfied: multidict<7.0,>=4.5 in
/usr/local/lib/python3.10/dist-packages (from
aiohttp<4.0.0,>=3.8.3->langchain_community==0.0.29) (6.0.5)
Requirement already satisfied: yarl<2.0,>=1.0 in /usr/local/lib/python3.10/dist-

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packages (from aiohttp<4.0.0,>=3.8.3->langchain_community==0.0.29) (1.9.4)
Requirement already satisfied: async-timeout<5.0,>=4.0 in
/usr/local/lib/python3.10/dist-packages (from
aiohttp<4.0.0,>=3.8.3->langchain_community==0.0.29) (4.0.3)
Requirement already satisfied: soupsieve>1.2 in /usr/local/lib/python3.10/dist-
packages (from beautifulsoup4<5.0.0,>=4.12.3->crewai_tools==0.1.6) (2.5)
Requirement already satisfied: build>=1.0.3 in /usr/local/lib/python3.10/dist-
packages (from chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6) (1.2.1)
Collecting chroma-hnswlib==0.7.3 (from
chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading
chroma_hnswlib-0.7.3-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl
(2.4 MB)
                                2.4/2.4 MB
44.9 MB/s eta 0:00:00
Collecting fastapi>=0.95.2 (from
chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading fastapi-0.111.0-py3-none-any.whl (91 kB)
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6.3 MB/s eta 0:00:00
Collecting uvicorn[standard]>=0.18.3 (from
chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading uvicorn-0.29.0-py3-none-any.whl (60 kB)
                                60.8/60.8 kB
4.5 MB/s eta 0:00:00
Collecting posthog>=2.4.0 (from
chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
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3.9 MB/s eta 0:00:00
Requirement already satisfied: typing-extensions>=4.5.0 in
/usr/local/lib/python3.10/dist-packages (from
chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6) (4.11.0)
Collecting pulsar-client>=3.1.0 (from
chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading
pulsar_client-3.5.0-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl
(5.4 MB)
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43.3 MB/s eta 0:00:00
Collecting onnxruntime>=1.14.1 (from
chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
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onnxruntime-1.18.0-cp310-cp310-manylinux_2_27_x86_64.manylinux_2_28_x86_64.whl
(6.8 MB)
                                6.8/6.8 MB
46.7 MB/s eta 0:00:00
Collecting opentelemetry-exporter-otlp-proto-grpc>=1.2.0 (from

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chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading opentelemetry_exporter_otlp_proto_grpc-1.24.0-py3-none-any.whl (18
kB)
Collecting opentelemetry-instrumentation-fastapi>=0.41b0 (from
chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading opentelemetry_instrumentation_fastapi-0.45b0-py3-none-any.whl (11
kB)
Requirement already satisfied: tokenizers>=0.13.2 in
/usr/local/lib/python3.10/dist-packages (from
chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6) (0.19.1)
Collecting pypika>=0.48.9 (from chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading PyPika-0.48.9.tar.gz (67 kB)
                                67.3/67.3 kB
6.9 MB/s eta 0:00:00
  Installing build dependencies ... done
  Getting requirements to build wheel ... done
  Preparing metadata (pyproject.toml) ... done
Requirement already satisfied: tqdm>=4.65.0 in /usr/local/lib/python3.10/dist-
packages (from chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6) (4.66.4)
Collecting overrides>=7.3.1 (from chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading overrides-7.7.0-py3-none-any.whl (17 kB)
Requirement already satisfied: importlib-resources in
/usr/local/lib/python3.10/dist-packages (from
chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6) (6.4.0)
Requirement already satisfied: grpcio>=1.58.0 in /usr/local/lib/python3.10/dist-
packages (from chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6) (1.64.0)
Collecting bcrypt>=4.0.1 (from chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading bcrypt-4.1.3-cp39-abi3-manylinux_2_28_x86_64.whl (283 kB)
                                283.7/283.7
kB 25.8 MB/s eta 0:00:00
Requirement already satisfied: typer>=0.9.0 in
/usr/local/lib/python3.10/dist-packages (from
chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6) (0.9.4)
Collecting kubernetes>=28.1.0 (from
chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading kubernetes-29.0.0-py2.py3-none-any.whl (1.6 MB)
                                1.6/1.6 MB
57.2 MB/s eta 0:00:00
Collecting mmh3>=4.0.1 (from chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading mmh3-4.1.0-cp310-cp310-manylinux_2_5_x86_64.manylinux1_x86_64.many
linux_2_17_x86_64.manylinux2014_x86_64.whl (67 kB)
                                67.6/67.6 kB
9.6 MB/s eta 0:00:00
Collecting orjson>=3.9.12 (from
chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading
orjson-3.10.3-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (142

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kB)

142.5/142.5

kB 19.8 MB/s eta 0:00:00

Collecting marshmallow<4.0.0,>=3.18.0 (from dataclasses-  
json<0.7,>=0.5.7->langchain\_community==0.0.29)

Downloading marshmallow-3.21.2-py3-none-any.whl (49 kB)

49.3/49.3 kB

7.2 MB/s eta 0:00:00

Collecting typing-inspect<1,>=0.4.0 (from dataclasses-  
json<0.7,>=0.5.7->langchain\_community==0.0.29)

Downloading typing\_inspect-0.9.0-py3-none-any.whl (8.8 kB)

Collecting alembic<2.0.0,>=1.13.1 (from  
embedchain<0.2.0,>=0.1.98->crewai==0.28.8)

Downloading alembic-1.13.1-py3-none-any.whl (233 kB)

233.4/233.4

kB 28.7 MB/s eta 0:00:00

INFO: pip is looking at multiple versions of embedchain to determine which  
version is compatible with other requirements. This could take a while.

Collecting embedchain<0.2.0,>=0.1.98 (from crewai==0.28.8)

Downloading embedchain-0.1.103-py3-none-any.whl (194 kB)

194.4/194.4

kB 27.1 MB/s eta 0:00:00

Downloading embedchain-0.1.102-py3-none-any.whl (192 kB)

192.7/192.7

kB 24.7 MB/s eta 0:00:00

Requirement already satisfied: google-cloud-aiplatform<2.0.0,>=1.26.1 in  
/usr/local/lib/python3.10/dist-packages (from  
embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (1.52.0)

Collecting gptcache<0.2.0,>=0.1.43 (from  
embedchain<0.2.0,>=0.1.98->crewai==0.28.8)

Downloading gptcache-0.1.43-py3-none-any.whl (131 kB)

131.5/131.5

kB 18.8 MB/s eta 0:00:00

Collecting langchain-openai<0.0.6,>=0.0.5 (from  
embedchain<0.2.0,>=0.1.98->crewai==0.28.8)

Downloading langchain\_openai-0.0.5-py3-none-any.whl (29 kB)

Collecting pypdf<4.0.0,>=3.11.0 (from embedchain<0.2.0,>=0.1.98->crewai==0.28.8)

Downloading pypdf-3.17.4-py3-none-any.whl (278 kB)

278.2/278.2

kB 34.4 MB/s eta 0:00:00

Collecting pysbd<0.4.0,>=0.3.4 (from  
embedchain<0.2.0,>=0.1.98->crewai==0.28.8)

Downloading pysbd-0.3.4-py3-none-any.whl (71 kB)

71.1/71.1 kB

11.4 MB/s eta 0:00:00

Requirement already satisfied: rich<14.0.0,>=13.7.0 in  
/usr/local/lib/python3.10/dist-packages (from  
embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (13.7.1)  
Collecting schema<0.8.0,>=0.7.5 (from embedchain<0.2.0,>=0.1.98->crewai==0.28.8)  
 Downloading schema-0.7.7-py2.py3-none-any.whl (18 kB)  
Collecting tiktoken<0.6.0,>=0.5.2 (from  
embedchain<0.2.0,>=0.1.98->crewai==0.28.8)  
 Downloading  
tiktoken-0.5.2-cp310-cp310-manylinux\_2\_17\_x86\_64.manylinux2014\_x86\_64.whl (2.0  
MB)

2.0/2.0 MB

83.7 MB/s eta 0:00:00

INFO: pip is looking at multiple versions of embedchain[github,youtube] to  
determine which version is compatible with other requirements. This could take a  
while.  
Collecting youtube-transcript-api<0.7.0,>=0.6.1 (from  
embedchain<0.2.0,>=0.1.98->crewai==0.28.8)  
 Downloading youtube\_transcript\_api-0.6.2-py3-none-any.whl (24 kB)  
Collecting yt\_dlp<2024.0.0,>=2023.11.14 (from  
embedchain<0.2.0,>=0.1.98->crewai==0.28.8)  
 Downloading yt\_dlp-2023.12.30-py2.py3-none-any.whl (3.0 MB)

3.0/3.0 MB

85.1 MB/s eta 0:00:00

Collecting PyGithub<2.0.0,>=1.59.1 (from  
embedchain<0.2.0,>=0.1.98->crewai==0.28.8)  
 Downloading PyGithub-1.59.1-py3-none-any.whl (342 kB)

342.2/342.2

kB 42.7 MB/s eta 0:00:00

Collecting gitpython<4.0.0,>=3.1.38 (from  
embedchain<0.2.0,>=0.1.98->crewai==0.28.8)  
 Downloading GitPython-3.1.43-py3-none-any.whl (207 kB)

207.3/207.3

kB 17.6 MB/s eta 0:00:00

Collecting docstring-parser<0.16,>=0.15 (from  
instructor<0.6.0,>=0.5.2->crewai==0.28.8)  
 Downloading docstring\_parser-0.15-py3-none-any.whl (36 kB)  
Collecting deprecation (from lancedb<0.6.0,>=0.5.4->crewai\_tools==0.1.6)  
 Downloading deprecation-2.1.0-py2.py3-none-any.whl (11 kB)  
Collecting pylance==0.9.18 (from lancedb<0.6.0,>=0.5.4->crewai\_tools==0.1.6)  
 Downloading  
pylance-0.9.18-cp38-abi3-manylinux\_2\_17\_x86\_64.manylinux2014\_x86\_64.whl (21.6  
MB)

21.6/21.6 MB

42.8 MB/s eta 0:00:00

Collecting ratelimiter~=1.0 (from

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lancedb<0.6.0,>=0.5.4->crewai_tools==0.1.6)
  Downloading ratelimiter-1.2.0.post0-py3-none-any.whl (6.6 kB)
Collecting retry>=0.9.2 (from lancedb<0.6.0,>=0.5.4->crewai_tools==0.1.6)
  Downloading retry-0.9.2-py2.py3-none-any.whl (8.0 kB)
Collecting semver>=3.0 (from lancedb<0.6.0,>=0.5.4->crewai_tools==0.1.6)
  Downloading semver-3.0.2-py3-none-any.whl (17 kB)
Requirement already satisfied: cachetools in /usr/local/lib/python3.10/dist-
packages (from lancedb<0.6.0,>=0.5.4->crewai_tools==0.1.6) (5.3.3)
Requirement already satisfied: pyarrow>=12 in /usr/local/lib/python3.10/dist-
packages (from pylance==0.9.18->lancedb<0.6.0,>=0.5.4->crewai_tools==0.1.6)
(14.0.2)
INFO: pip is looking at multiple versions of langchain to determine which
version is compatible with other requirements. This could take a while.
Collecting langchain<0.2.0,>=0.1.10 (from crewai==0.28.8)
  Downloading langchain-0.1.19-py3-none-any.whl (1.0 MB)
                                1.0/1.0 MB
70.6 MB/s eta 0:00:00
  Downloading langchain-0.1.17-py3-none-any.whl (867 kB)
                                867.6/867.6

kB 67.4 MB/s eta 0:00:00
Collecting jsonpatch<2.0,>=1.33 (from
langchain<0.2.0,>=0.1.10->crewai==0.28.8)
  Downloading jsonpatch-1.33-py2.py3-none-any.whl (12 kB)
Collecting langchain<0.2.0,>=0.1.10 (from crewai==0.28.8)
  Downloading langchain-0.1.16-py3-none-any.whl (817 kB)
                                817.7/817.7

kB 62.3 MB/s eta 0:00:00
  Downloading langchain-0.1.15-py3-none-any.whl (814 kB)
                                814.5/814.5

kB 66.1 MB/s eta 0:00:00
  Downloading langchain-0.1.14-py3-none-any.whl (812 kB)
                                812.8/812.8

kB 59.2 MB/s eta 0:00:00
  Downloading langchain-0.1.13-py3-none-any.whl (810 kB)
                                810.5/810.5

kB 66.2 MB/s eta 0:00:00
Collecting langchain-text-splitters<0.1,>=0.0.1 (from
langchain<0.2.0,>=0.1.10->crewai==0.28.8)
  Downloading langchain_text_splitters-0.0.2-py3-none-any.whl (23 kB)
Collecting packaging<24.0,>=23.2 (from langchain-
core<0.2.0,>=0.1.33->langchain_community==0.0.29)
  Downloading packaging-23.2-py3-none-any.whl (53 kB)
                                53.0/53.0 kB
8.5 MB/s eta 0:00:00
Requirement already satisfied: anyio<5,>=3.5.0 in

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/usr/local/lib/python3.10/dist-packages (from
openai<2.0.0,>=1.13.3->crewai==0.28.8) (3.7.1)
Requirement already satisfied: distro<2,>=1.7.0 in /usr/lib/python3/dist-
packages (from openai<2.0.0,>=1.13.3->crewai==0.28.8) (1.7.0)
Collecting httpx<1,>=0.23.0 (from openai<2.0.0,>=1.13.3->crewai==0.28.8)
  Downloading httpx-0.27.0-py3-none-any.whl (75 kB)
      75.6/75.6 kB
11.8 MB/s eta 0:00:00
Requirement already satisfied: sniffio in /usr/local/lib/python3.10/dist-
packages (from openai<2.0.0,>=1.13.3->crewai==0.28.8) (1.3.1)
Collecting deprecated>=1.2.6 (from opentelemetry-
api<2.0.0,>=1.22.0->crewai==0.28.8)
  Downloading Deprecated-1.2.14-py2.py3-none-any.whl (9.6 kB)
Collecting importlib-metadata<=7.0,>=6.0 (from opentelemetry-
api<2.0.0,>=1.22.0->crewai==0.28.8)
  Downloading importlib_metadata-7.0.0-py3-none-any.whl (23 kB)
Requirement already satisfied: googleapis-common-protos~=1.52 in
/usr/local/lib/python3.10/dist-packages (from opentelemetry-exporter-otlp-proto-
http<2.0.0,>=1.22.0->crewai==0.28.8) (1.63.0)
Collecting opentelemetry-exporter-otlp-proto-common==1.24.0 (from opentelemetry-
exporter-otlp-proto-http<2.0.0,>=1.22.0->crewai==0.28.8)
  Downloading opentelemetry_exporter_otlp_proto_common-1.24.0-py3-none-any.whl
(17 kB)
Collecting opentelemetry-proto==1.24.0 (from opentelemetry-exporter-otlp-proto-
http<2.0.0,>=1.22.0->crewai==0.28.8)
  Downloading opentelemetry_proto-1.24.0-py3-none-any.whl (50 kB)
      50.8/50.8 kB
7.6 MB/s eta 0:00:00
Requirement already satisfied: protobuf<5.0,>=3.19 in
/usr/local/lib/python3.10/dist-packages (from opentelemetry-
proto==1.24.0->opentelemetry-exporter-otlp-proto-
http<2.0.0,>=1.22.0->crewai==0.28.8) (3.20.3)
Collecting opentelemetry-semantic-conventions==0.45b0 (from opentelemetry-
sdk<2.0.0,>=1.22.0->crewai==0.28.8)
  Downloading opentelemetry_semantic_conventions-0.45b0-py3-none-any.whl (36 kB)
Requirement already satisfied: annotated-types>=0.4.0 in
/usr/local/lib/python3.10/dist-packages (from
pydantic<3.0.0,>=2.4.2->crewai==0.28.8) (0.7.0)
Requirement already satisfied: pydantic-core==2.18.2 in
/usr/local/lib/python3.10/dist-packages (from
pydantic<3.0.0,>=2.4.2->crewai==0.28.8) (2.18.2)
Collecting nodeenv>=1.6.0 (from pyright<2.0.0,>=1.1.350->crewai_tools==0.1.6)
  Downloading nodeenv-1.8.0-py2.py3-none-any.whl (22 kB)
Requirement already satisfied: iniconfig in /usr/local/lib/python3.10/dist-
packages (from pytest<9.0.0,>=8.0.0->crewai_tools==0.1.6) (2.0.0)
Requirement already satisfied: pluggy<2.0,>=1.5 in
/usr/local/lib/python3.10/dist-packages (from
pytest<9.0.0,>=8.0.0->crewai_tools==0.1.6) (1.5.0)

```

Requirement already satisfied: exceptiongroup>=1.0.0rc8 in /usr/local/lib/python3.10/dist-packages (from pytest<9.0.0,>=8.0.0->crewai\_tools==0.1.6) (1.2.1)  
Requirement already satisfied: tomli>=1 in /usr/local/lib/python3.10/dist-packages (from pytest<9.0.0,>=8.0.0->crewai\_tools==0.1.6) (2.0.1)  
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests<3.0.0,>=2.31.0->crewai\_tools==0.1.6) (3.3.2)  
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests<3.0.0,>=2.31.0->crewai\_tools==0.1.6) (3.7)  
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests<3.0.0,>=2.31.0->crewai\_tools==0.1.6) (2.0.7)  
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests<3.0.0,>=2.31.0->crewai\_tools==0.1.6) (2024.2.2)  
Collecting trio~=0.17 (from selenium<5.0.0,>=4.18.1->crewai\_tools==0.1.6)  
 Downloading trio-0.25.1-py3-none-any.whl (467 kB)  
 467.7/467.7

kB 50.2 MB/s eta 0:00:00

Collecting trio-websocket~=0.9 (from selenium<5.0.0,>=4.18.1->crewai\_tools==0.1.6)  
 Downloading trio\_websocket-0.11.1-py3-none-any.whl (17 kB)  
Requirement already satisfied: greenlet!=0.4.17 in /usr/local/lib/python3.10/dist-packages (from SQLAlchemy<3,>=1.4->langchain\_community==0.0.29) (3.0.3)  
Collecting Mako (from alembic<2.0.0,>=1.13.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8)  
 Downloading Mako-1.3.5-py3-none-any.whl (78 kB)  
 78.6/78.6 kB

12.1 MB/s eta 0:00:00

Requirement already satisfied: pyproject\_hooks in /usr/local/lib/python3.10/dist-packages (from build>=1.0.3->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6) (1.1.0)  
Requirement already satisfied: wrapt<2,>=1.10 in /usr/local/lib/python3.10/dist-packages (from deprecated>=1.2.6->opentelemetry-api<2.0.0,>=1.22.0->crewai==0.28.8) (1.14.1)  
Collecting starlette<0.38.0,>=0.37.2 (from fastapi>=0.95.2->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)  
 Downloading starlette-0.37.2-py3-none-any.whl (71 kB)  
 71.9/71.9 kB

11.0 MB/s eta 0:00:00

Collecting fastapi-cli>=0.0.2 (from fastapi>=0.95.2->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)  
 Downloading fastapi\_cli-0.0.4-py3-none-any.whl (9.5 kB)  
Requirement already satisfied: jinja2>=2.11.2 in /usr/local/lib/python3.10/dist-packages (from fastapi>=0.95.2->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)

(3.1.4)

Collecting python-multipart>=0.0.7 (from  
fastapi>=0.95.2->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)

Downloading python\_multipart-0.0.9-py3-none-any.whl (22 kB)

Collecting ujson!=4.0.2,!4.1.0,!4.2.0,!4.3.0,!5.0.0,!5.1.0,>=4.0.1 (from  
fastapi>=0.95.2->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)

Downloading

ujson-5.10.0-cp310-cp310-manylinux\_2\_17\_x86\_64.manylinux2014\_x86\_64.whl (53 kB)  
53.6/53.6 kB

7.7 MB/s eta 0:00:00

Collecting email\_validator>=2.0.0 (from  
fastapi>=0.95.2->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)

Downloading email\_validator-2.1.1-py3-none-any.whl (30 kB)

Collecting gitdb<5,>=4.0.1 (from  
gitpython<4.0.0,>=3.1.38->embedchain<0.2.0,>=0.1.98->crewai==0.28.8)

Downloading gitdb-4.0.11-py3-none-any.whl (62 kB)

62.7/62.7 kB

8.5 MB/s eta 0:00:00

Requirement already satisfied: google-api-core[grpc]!=2.0.\*,!=2.1.\*,!=2.2.  
\*,!=2.3.\*,!=2.4.\*,!=2.5.\*,!=2.6.\*,!=2.7.\*,<3.0.0dev,>=1.34.1 in

/usr/local/lib/python3.10/dist-packages (from google-cloud-  
aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (2.11.1)

Requirement already satisfied: google-auth<3.0.0dev,>=2.14.1 in

/usr/local/lib/python3.10/dist-packages (from google-cloud-  
aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (2.27.0)

Requirement already satisfied: proto-plus<2.0.0dev,>=1.22.0 in

/usr/local/lib/python3.10/dist-packages (from google-cloud-  
aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (1.23.0)

Requirement already satisfied: google-cloud-storage<3.0.0dev,>=1.32.0 in

/usr/local/lib/python3.10/dist-packages (from google-cloud-  
aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (2.8.0)

Requirement already satisfied: google-cloud-bigquery!=3.20.0,<4.0.0dev,>=1.15.0  
in /usr/local/lib/python3.10/dist-packages (from google-cloud-  
aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (3.21.0)

Requirement already satisfied: google-cloud-resource-manager<3.0.0dev,>=1.3.3 in  
/usr/local/lib/python3.10/dist-packages (from google-cloud-  
aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (1.12.3)

Requirement already satisfied: shapely<3.0.0dev in

/usr/local/lib/python3.10/dist-packages (from google-cloud-  
aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (2.0.4)

Collecting httpcore==1.\* (from  
httpx<1,>=0.23.0->openai<2.0.0,>=1.13.3->crewai==0.28.8)

Downloading httpcore-1.0.5-py3-none-any.whl (77 kB)

77.9/77.9 kB

11.2 MB/s eta 0:00:00

Collecting h11<0.15,>=0.13 (from

httpcore==1.\*->httpx<1,>=0.23.0->openai<2.0.0,>=1.13.3->crewai==0.28.8)

Downloading h11-0.14.0-py3-none-any.whl (58 kB)

58.3/58.3 kB

9.5 MB/s eta 0:00:00

Requirement already satisfied: zipp>=0.5 in  
/usr/local/lib/python3.10/dist-packages (from importlib-  
metadata<=7.0,>=6.0->opentelemetry-api<2.0.0,>=1.22.0->crewai==0.28.8) (3.18.2)  
Collecting jsonpointer>=1.9 (from  
jsonpatch<2.0,>=1.33->langchain<0.2.0,>=0.1.10->crewai==0.28.8)  
 Downloading jsonpointer-2.4-py2.py3-none-any.whl (7.8 kB)  
Requirement already satisfied: six>=1.9.0 in /usr/local/lib/python3.10/dist-  
packages (from kubernetes>=28.1.0->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)  
(1.16.0)  
Requirement already satisfied: python-dateutil>=2.5.3 in  
/usr/local/lib/python3.10/dist-packages (from  
kubernetes>=28.1.0->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6) (2.8.2)  
Requirement already satisfied: websocket-  
client!=0.40.0,!0.41.\*,!0.42.\*,>=0.32.0 in /usr/local/lib/python3.10/dist-  
packages (from kubernetes>=28.1.0->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)  
(1.8.0)  
Requirement already satisfied: requests-oauthlib in  
/usr/local/lib/python3.10/dist-packages (from  
kubernetes>=28.1.0->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6) (1.3.1)  
Requirement already satisfied: oauthlib>=3.2.2 in  
/usr/local/lib/python3.10/dist-packages (from  
kubernetes>=28.1.0->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6) (3.2.2)  
Requirement already satisfied: setuptools in /usr/local/lib/python3.10/dist-  
packages (from nodeenv>=1.6.0->pyright<2.0.0,>=1.1.350->crewai\_tools==0.1.6)  
(67.7.2)  
Collecting coloredlogs (from  
onnxruntime>=1.14.1->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)  
 Downloading coloredlogs-15.0.1-py2.py3-none-any.whl (46 kB)

46.0/46.0 kB

7.1 MB/s eta 0:00:00

Requirement already satisfied: flatbuffers in  
/usr/local/lib/python3.10/dist-packages (from  
onnxruntime>=1.14.1->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6) (24.3.25)  
Requirement already satisfied: sympy in /usr/local/lib/python3.10/dist-packages  
(from onnxruntime>=1.14.1->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6) (1.12)  
Collecting opentelemetry-instrumentation-asgi==0.45b0 (from opentelemetry-  
instrumentation-fastapi>=0.41b0->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)  
 Downloading opentelemetry\_instrumentation\_asgi-0.45b0-py3-none-any.whl (14 kB)  
Collecting opentelemetry-instrumentation==0.45b0 (from opentelemetry-  
instrumentation-fastapi>=0.41b0->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)  
 Downloading opentelemetry\_instrumentation-0.45b0-py3-none-any.whl (28 kB)  
Collecting opentelemetry-util-http==0.45b0 (from opentelemetry-instrumentation-  
fastapi>=0.41b0->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)  
 Downloading opentelemetry\_util\_http-0.45b0-py3-none-any.whl (6.9 kB)  
Collecting asgiref~3.0 (from opentelemetry-instrumentation-  
asgi==0.45b0->opentelemetry-instrumentation-

```

fastapi>=0.41b0->chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading asgiref-3.8.1-py3-none-any.whl (23 kB)
Collecting monotonic>=1.5 (from
posthog>=2.4.0->chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading monotonic-1.6-py2.py3-none-any.whl (8.2 kB)
Collecting backoff>=1.10.0 (from
posthog>=2.4.0->chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading backoff-2.2.1-py3-none-any.whl (15 kB)
Collecting pyjwt[crypto]>=2.4.0 (from
PyGithub<2.0.0,>=1.59.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8)
  Downloading PyJWT-2.8.0-py3-none-any.whl (22 kB)
Collecting pynacl>=1.4.0 (from
PyGithub<2.0.0,>=1.59.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8)
  Downloading PyNaCl-1.5.0-cp36-abi3-manylinux_2_17_x86_64.manylinux2014_x86_64.
manylinux_2_24_x86_64.whl (856 kB)

```

856.7/856.7

kB 66.8 MB/s eta 0:00:00

```

Requirement already satisfied: decorator>=3.4.2 in
/usr/local/lib/python3.10/dist-packages (from
retry>=0.9.2->lancedb<0.6.0,>=0.5.4->crewai_tools==0.1.6) (4.4.2)
Collecting py<2.0.0,>=1.4.26 (from
retry>=0.9.2->lancedb<0.6.0,>=0.5.4->crewai_tools==0.1.6)
  Downloading py-1.11.0-py2.py3-none-any.whl (98 kB)

```

98.7/98.7 kB

13.5 MB/s eta 0:00:00

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Requirement already satisfied: markdown-it-py>=2.2.0 in
/usr/local/lib/python3.10/dist-packages (from
rich<14.0.0,>=13.7.0->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (3.0.0)
Requirement already satisfied: pygments<3.0.0,>=2.13.0 in
/usr/local/lib/python3.10/dist-packages (from
rich<14.0.0,>=13.7.0->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (2.16.1)
Requirement already satisfied: huggingface-hub<1.0,>=0.16.4 in
/usr/local/lib/python3.10/dist-packages (from
tokenizers>=0.13.2->chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6) (0.23.1)
Requirement already satisfied: sortedcontainers in
/usr/local/lib/python3.10/dist-packages (from
trio~=0.17->selenium<5.0.0,>=4.18.1->crewai_tools==0.1.6) (2.4.0)
Collecting outcome (from
trio~=0.17->selenium<5.0.0,>=4.18.1->crewai_tools==0.1.6)
  Downloading outcome-1.3.0.post0-py2.py3-none-any.whl (10 kB)
Collecting wsproto>=0.14 (from trio-
websocket~=0.9->selenium<5.0.0,>=4.18.1->crewai_tools==0.1.6)
  Downloading wsproto-1.2.0-py3-none-any.whl (24 kB)
Collecting mypy_extensions>=0.3.0 (from typing-inspect<1,>=0.4.0->dataclasses-
json<0.7,>=0.5.7->langchain_community==0.0.29)
  Downloading mypy_extensions-1.0.0-py3-none-any.whl (4.7 kB)
Requirement already satisfied: pysocks!=1.5.7,<2.0,>=1.5.6 in

```

```

/usr/local/lib/python3.10/dist-packages (from
urllib3<3,>=1.21.1->requests<3.0.0,>=2.31.0->crewai_tools==0.1.6) (1.7.1)
Collecting httptools>=0.5.0 (from
uvicorn[standard]>=0.18.3->chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading httptools-0.6.1-cp310-cp310-manylinux_2_5_x86_64.manylinux1_x86_64
.manylinux_2_17_x86_64.manylinux2014_x86_64.whl (341 kB)
341.4/341.4

kB 20.9 MB/s eta 0:00:00
Collecting uvloop!=0.15.0,!0.15.1,>=0.14.0 (from
uvicorn[standard]>=0.18.3->chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading
uvloop-0.19.0-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (3.4
MB)
3.4/3.4 MB

70.2 MB/s eta 0:00:00
Collecting watchfiles>=0.13 (from
uvicorn[standard]>=0.18.3->chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading
watchfiles-0.21.0-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl
(1.3 MB)
1.3/1.3 MB

59.6 MB/s eta 0:00:00
Collecting websockets>=10.4 (from
uvicorn[standard]>=0.18.3->chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading websockets-12.0-cp310-cp310-manylinux_2_5_x86_64.manylinux1_x86_64
.manylinux_2_17_x86_64.manylinux2014_x86_64.whl (130 kB)
130.2/130.2

kB 19.7 MB/s eta 0:00:00
Collecting mutagen (from
yt_dlp<2024.0.0,>=2023.11.14->embedchain<0.2.0,>=0.1.98->crewai==0.28.8)
  Downloading mutagen-1.47.0-py3-none-any.whl (194 kB)
194.4/194.4

kB 27.5 MB/s eta 0:00:00
Collecting pycryptodomex (from
yt_dlp<2024.0.0,>=2023.11.14->embedchain<0.2.0,>=0.1.98->crewai==0.28.8)
  Downloading
pycryptodomex-3.20.0-cp35-abi3-manylinux_2_17_x86_64.manylinux2014_x86_64.whl
(2.1 MB)
2.1/2.1 MB

92.6 MB/s eta 0:00:00
Collecting brotli (from
yt_dlp<2024.0.0,>=2023.11.14->embedchain<0.2.0,>=0.1.98->crewai==0.28.8)
  Downloading Brotli-1.1.0-cp310-cp310-manylinux_2_5_x86_64.manylinux1_x86_64.ma
nylinux_2_12_x86_64.manylinux2010_x86_64.whl (3.0 MB)
3.0/3.0 MB

71.5 MB/s eta 0:00:00

```



Collecting dnspython>=2.0.0 (from email\_validator>=2.0.0->fastapi>=0.95.2->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)

Downloading dnspython-2.6.1-py3-none-any.whl (307 kB)

307.7/307.7

kB 35.6 MB/s eta 0:00:00

INFO: pip is looking at multiple versions of fastapi-cli to determine which version is compatible with other requirements. This could take a while.

Collecting fastapi-cli>=0.0.2 (from fastapi>=0.95.2->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)

Downloading fastapi\_cli-0.0.3-py3-none-any.whl (9.2 kB)

Downloading fastapi\_cli-0.0.2-py3-none-any.whl (9.1 kB)

Collecting fastapi>=0.95.2 (from chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6)

Downloading fastapi-0.110.3-py3-none-any.whl (91 kB)

91.8/91.8 kB

14.4 MB/s eta 0:00:00

Collecting smmap<6,>=3.0.1 (from gitdb<5,>=4.0.1->gitpython<4.0.0,>=3.1.38->embedchain<0.2.0,>=0.1.98->crewai==0.28.8)

Downloading smmap-5.0.1-py3-none-any.whl (24 kB)

Requirement already satisfied: grpcio-status<2.0.dev0,>=1.33.2 in /usr/local/lib/python3.10/dist-packages (from google-api-core[grpc]!=2.0.\*,!=2.1.\*,!=2.2.\*,!=2.3.\*,!=2.4.\*,!=2.5.\*,!=2.6.\*,!=2.7.\*,<3.0.0dev,>=1.34.1->google-cloud-aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (1.48.2)

Requirement already satisfied: pyasn1-modules>=0.2.1 in /usr/local/lib/python3.10/dist-packages (from google-auth<3.0.0dev,>=2.14.1->google-cloud-aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (0.4.0)

Requirement already satisfied: rsa<5,>=3.1.4 in /usr/local/lib/python3.10/dist-packages (from google-auth<3.0.0dev,>=2.14.1->google-cloud-aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (4.9)

Requirement already satisfied: google-cloud-core<3.0.0dev,>=1.6.0 in /usr/local/lib/python3.10/dist-packages (from google-cloud-bigquery!=3.20.0,<4.0.0dev,>=1.15.0->google-cloud-aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (2.3.3)

Requirement already satisfied: google-resumable-media<3.0dev,>=0.6.0 in /usr/local/lib/python3.10/dist-packages (from google-cloud-bigquery!=3.20.0,<4.0.0dev,>=1.15.0->google-cloud-aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (2.7.0)

Requirement already satisfied: grpc-google-iam-v1<1.0.0dev,>=0.12.4 in /usr/local/lib/python3.10/dist-packages (from google-cloud-resource-manager<3.0.0dev,>=1.3.3->google-cloud-aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (0.13.0)

Requirement already satisfied: filelock in /usr/local/lib/python3.10/dist-packages (from huggingface-hub<1.0,>=0.16.4->tokenizers>=0.13.2->chromadb<0.5.0,>=0.4.22->crewai\_tools==0.1.6) (3.14.0)

Requirement already satisfied: fsspec>=2023.5.0 in /usr/local/lib/python3.10/dist-packages (from huggingface-hub<1.0,>=0.16.4->toke

```

nizers>=0.13.2->chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6) (2023.6.0)
Requirement already satisfied: mdurl~=0.1 in /usr/local/lib/python3.10/dist-
packages (from markdown-it-
py>=2.2.0->rich<14.0.0,>=13.7.0->embedchain<0.2.0,>=0.1.98->crewai==0.28.8)
(0.1.2)
Requirement already satisfied: cryptography>=3.4.0 in
/usr/local/lib/python3.10/dist-packages (from pyjwt[crypto]>=2.4.0->PyGithub<2.0
.0,>=1.59.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (42.0.7)
Requirement already satisfied: cffi>=1.4.1 in /usr/local/lib/python3.10/dist-
packages (from pynacl>=1.4.0->PyGithub<2.0.0,>=1.59.1->embedchain<0.2.0,>=0.1.98
->crewai==0.28.8) (1.16.0)
Collecting humanfriendly>=9.1 (from
coloredlogs->onnxruntime>=1.14.1->chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
  Downloading humanfriendly-10.0-py2.py3-none-any.whl (86 kB)
      86.8/86.8 kB
12.1 MB/s eta 0:00:00
Requirement already satisfied: MarkupSafe>=0.9.2 in
/usr/local/lib/python3.10/dist-packages (from
Mako->alembic<2.0.0,>=1.13.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (2.1.5)
Requirement already satisfied: mpmath>=0.19 in /usr/local/lib/python3.10/dist-
packages (from
sympy->onnxruntime>=1.14.1->chromadb<0.5.0,>=0.4.22->crewai_tools==0.1.6)
(1.3.0)
Requirement already satisfied: pycparser in /usr/local/lib/python3.10/dist-
packages (from cffi>=1.4.1->pynacl>=1.4.0->PyGithub<2.0.0,>=1.59.1->embedchain<0
.2.0,>=0.1.98->crewai==0.28.8) (2.22)
Requirement already satisfied: google-crc32c<2.0dev,>=1.0 in
/usr/local/lib/python3.10/dist-packages (from google-resumable-
media<3.0dev,>=0.6.0->google-cloud-bigquery!=3.20.0,<4.0.0dev,>=1.15.0->google-
cloud-aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8)
(1.5.0)
Requirement already satisfied: pyasn1<0.7.0,>=0.4.6 in
/usr/local/lib/python3.10/dist-packages (from pyasn1-modules>=0.2.1->google-
auth<3.0.0dev,>=2.14.1->google-cloud-
aiplatform<2.0.0,>=1.26.1->embedchain<0.2.0,>=0.1.98->crewai==0.28.8) (0.6.0)
Building wheels for collected packages: pypika
  Building wheel for pypika (pyproject.toml) ... done
  Created wheel for pypika: filename=PyPika-0.48.9-py2.py3-none-any.whl
size=53724
sha256=0687362e4f6abd91f00a492ad85e905e73abf9e7a370db33650ab13b7c0d3c77
  Stored in directory: /root/.cache/pip/wheels/e1/26/51/d0bffb3d2fd82256676d7ad3
003faea3bd6dddc9577af665f4
Successfully built pypika
Installing collected packages: schema, ratelimiter, pypika, monotonic, mmh3,
brothli, appdirs, websockets, uvloop, smmap, semver, pytube, python-dotenv,
pysbd, pypdf, pyjwt, pycryptodomex, py, pulsar-client, packaging, overrides,
outcome, orjson, opentelemetry-util-http, opentelemetry-semantic-conventions,
opentelemetry-proto, nodeenv, mypy-extensions, mutagen, Mako, jsonpointer,

```



importlib-metadata, humanfriendly, httptools, h11, docstring-parser, deprecated, chroma-hnswlib, bcrypt, backoff, asgiref, yt\_dlp, youtube-transcript-api, wsproto, watchfiles, uvicorn, typing-inspect, trio, tiktoken, starlette, retry, pytest, pyright, pynacl, pylance, posthog, opentelemetry-exporter-otlp-proto-common, opentelemetry-api, marshmallow, jsonpatch, httpcore, gptcache, gitdb, deprecation, coloredlogs, alembic, trio-websocket, opentelemetry-sdk, opentelemetry-instrumentation, onnxruntime, langsmith, lancedb, kubernetes, httpx, gitpython, fastapi, dataclasses-json, selenium, PyGithub, opentelemetry-instrumentation-asgi, opentelemetry-exporter-otlp-proto-http, opentelemetry-exporter-otlp-proto-grpc, openai, langchain-core, opentelemetry-instrumentation-fastapi, langchain-text-splitters, langchain-openai, langchain\_community, instructor, langchain, chromadb, embedchain, crewai, crewai\_tools

Attempting uninstall: pyjwt

Found existing installation: PyJWT 2.3.0

Uninstalling PyJWT-2.3.0:

Successfully uninstalled PyJWT-2.3.0

Attempting uninstall: packaging

Found existing installation: packaging 24.0

Uninstalling packaging-24.0:

Successfully uninstalled packaging-24.0

Attempting uninstall: importlib-metadata

Found existing installation: importlib\_metadata 7.1.0

Uninstalling importlib\_metadata-7.1.0:

Successfully uninstalled importlib\_metadata-7.1.0

Attempting uninstall: docstring-parser

Found existing installation: docstring\_parser 0.16

Uninstalling docstring\_parser-0.16:

Successfully uninstalled docstring\_parser-0.16

Attempting uninstall: pytest

Found existing installation: pytest 7.4.4

Uninstalling pytest-7.4.4:

Successfully uninstalled pytest-7.4.4

Successfully installed Mako-1.3.5 PyGithub-1.59.1 alembic-1.13.1 appdirs-1.4.4 asgiref-3.8.1 backoff-2.2.1 bcrypt-4.1.3 brotli-1.1.0 chroma-hnswlib-0.7.3 chromadb-0.4.24 coloredlogs-15.0.1 crewai-0.28.8 crewai\_tools-0.1.6 dataclasses-json-0.6.6 deprecated-1.2.14 deprecation-2.1.0 docstring-parser-0.15 embedchain-0.1.102 fastapi-0.110.3 gitdb-4.0.11 gitpython-3.1.43 gptcache-0.1.43 h11-0.14.0 httpcore-1.0.5 httptools-0.6.1 httpx-0.27.0 humanfriendly-10.0 importlib-metadata-7.0.0 instructor-0.5.2 jsonpatch-1.33 jsonpointer-2.4 kubernetes-29.0.0 lancedb-0.5.7 langchain-0.1.13 langchain-core-0.1.52 langchain-openai-0.0.5 langchain-text-splitters-0.0.2 langchain\_community-0.0.29 langsmith-0.1.63 marshmallow-3.21.2 mmh3-4.1.0 monotonic-1.6 mutagen-1.47.0 mypy-extensions-1.0.0 nodeenv-1.8.0 onnxruntime-1.18.0 openai-1.30.2 opentelemetry-api-1.24.0 opentelemetry-exporter-otlp-proto-common-1.24.0 opentelemetry-exporter-otlp-proto-grpc-1.24.0 opentelemetry-exporter-otlp-proto-http-1.24.0 opentelemetry-instrumentation-0.45b0 opentelemetry-instrumentation-asgi-0.45b0 opentelemetry-instrumentation-fastapi-0.45b0 opentelemetry-proto-1.24.0 opentelemetry-sdk-1.24.0 opentelemetry-semantic-conventions-0.45b0

```

opentelemetry-util-http-0.45b0 orjson-3.10.3 outcome-1.3.0.post0 overrides-7.7.0
packaging-23.2 posthog-3.5.0 pulsar-client-3.5.0 py-1.11.0 pycryptodomex-3.20.0
pyjwt-2.8.0 pylance-0.9.18 pynacl-1.5.0 pypdf-3.17.4 pypika-0.48.9
pyright-1.1.364 pysbd-0.3.4 pytest-8.2.1 python-dotenv-1.0.0 pytube-15.0.0
ratelimiter-1.2.0.post0 retry-0.9.2 schema-0.7.7 selenium-4.21.0 semver-3.0.2
smmap-5.0.1 starlette-0.37.2 tiktoken-0.5.2 trio-0.25.1 trio-websocket-0.11.1
typing-inspect-0.9.0 uvicorn-0.29.0 uvloop-0.19.0 watchfiles-0.21.0
websockets-12.0 wsproto-1.2.0 youtube-transcript-api-0.6.2 yt_dlp-2023.12.30
Collecting utils
  Downloading utils-1.0.2.tar.gz (13 kB)
  Preparing metadata (setup.py) ... done
Building wheels for collected packages: utils
  Building wheel for utils (setup.py) ... done
  Created wheel for utils: filename=utils-1.0.2-py2.py3-none-any.whl size=13906
sha256=c02d719975c307b1d7a21848396acf507373bba3c4a541cf6afb98d4edc46d7a
  Stored in directory: /root/.cache/pip/wheels/b8/39/f5/9d0ca31dba85773ecec0a7f
5469f18810e1c8a8ed9da28ca7
Successfully built utils
Installing collected packages: utils
Successfully installed utils-1.0.2

```

### 0.3 Connecting to OpenAI API

```
[ ]: openai_api_key = "sk-proj-wiJGDVcx4GBxhJZE6TeQT3B1bkFJWme6obU4IGODPvEy6xSZ"
os.environ["OPENAI_API_KEY"] = openai_api_key
os.environ["OPENAI_MODEL_NAME"] = 'gpt-3.5-turbo'
```

### 0.4 ## CrewAI Agentic LLM

In this model, we define three distinct agents, each with their own specific roles, goals, and tasks. These agents work collaboratively to enhance the learning experience by collecting contextual information, specifying relevant subjects, and providing detailed assistance on specific topics. Below are the descriptions of each agent:

- **Agent 1:** Student Context Collector is responsible for gathering comprehensive information about the student's current context. This includes understanding their educational background, learning preferences, and current knowledge gaps.
- **Agent 2:** Subject Topic Specifier is tasked with defining the subjects and topics that are relevant to the student's current educational needs. This agent uses the information collected by the Student Context Collector to tailor the learning material.
- **Agent 3:** Topic Helper provides detailed assistance on specific topics identified by the Subject Topic Specifier. This agent is responsible for delivering educational content, answering questions, and offering explanations to facilitate learning.

```
[ ]: # Creating Agents
student_context_collector = Agent(
    role='Collect Student Context from {subject_topic}',
```

```

    goal='Ask the student about their education level, learning disabilities,
    ↪and any specific needs related to their study of {subject_topic}',
    backstory=(
        'You are a friendly and understanding tutor. '
        'You will ask the student about their educational background, any
        ↪learning disabilities, and specific needs '
        'to better understand how to assist them with their studies in the
        ↪given subject topic.'
    ),
    allow_delegation=False,
    verbose=True
)

subject_topic_specifier = Agent(
    role='Specify Subject Topic act as a tutor for the specified subject from
    ↪{subject_topic}',
    goal='Determine the specific area within the subject of {subject_topic}
    ↪that the student needs help with',
    backstory=(
        'You are a knowledgeable tutor. '
        'You will ask the student to specify the particular area within the
        ↪subject topic they need help with, '
        'ensuring a focused and effective tutoring session.'
    ),
    allow_delegation=False,
    verbose=True
)

topic_helper = Agent(
    role='Provide Help on Specific Topic as a tutor from {subject_topic}',
    goal='Provide detailed assistance on the specific {subject_topic} area
    ↪based on the student\'s context and needs',
    backstory=(
        'You are an expert tutor in the specified subject area. '
        'Based on the student\'s educational background and specific needs, '
        'you will provide tailored assistance and explanations to help them
        ↪understand and excel in the specific area they are struggling with.'
    ),
    allow_delegation=False,
    verbose=True
)

# Creating Tasks
collect_context = Task(
    description=(
        '1. Ask the student about their education level.\n'

```

```

        '2. Inquire about any learning disabilities or specific needs they
        ↪might have.\n'
        '3. Understand the context to provide better-targeted assistance.'
    ),
    expected_output='Student\'s education level, learning disabilities, and
    ↪specific needs',
    agent=student_context_collector
)

specify_topic = Task(
    description=(
        '1. Ask the student to specify the particular area within the subject
        ↪topic they need help with.\n'
        '2. Ensure the area is clearly defined to provide focused assistance.'
    ),
    expected_output='The specific area within the subject topic that the
    ↪student needs help with',
    agent=subject_topic_specifier
)

provide_help = Task(
    description=(
        '1. Provide detailed assistance on the specific subject area based on
        ↪the student\'s context and needs.\n'
        '2. Offer explanations, examples, and any additional resources to aid
        ↪understanding.\n'
        '3. Tailor the assistance to the student\'s educational background and
        ↪specific requirements.'
    ),
    expected_output='Detailed assistance and explanations for the specified
    ↪subject area',
    agent=topic_helper
)

crew = Crew(
    agents=[student_context_collector, subject_topic_specifier, topic_helper],
    tasks=[collect_context, specify_topic, provide_help],
    verbose=2
)

```

WARNING:opentelemetry.trace:Overriding of current TracerProvider is not allowed

## 0.5 ## Prompt 1

**Topic:** Accounting Principles

```
[ ]: # Define the inputs with correct structure
inputs = {
    'subject_topic': 'accounting principles',
    'education_prompt': """
Plan a detailed study assistance session for a student needing help with
↳accounting principles.
The student is currently in their second year of college and has a learning
↳disability affecting their ability to understand complex mathematical
↳concepts.
The session should cover basic accounting principles and include examples to
↳aid understanding.
"""
}

# Use the Crew to process the education prompt
result = crew.kickoff(inputs=inputs)

# Print the resulting assistance plan
print("Your study assistance plan is ready:")
print(result)
```

```
[DEBUG]: == Working Agent: Collect Student Context from accounting
principles
[INFO]: == Starting Task: 1. Ask the student about their education
level.
2. Inquire about any learning disabilities or specific needs they might have.
3. Understand the context to provide better-targeted assistance.
```

```
> Entering new CrewAgentExecutor chain...
```

I now can give a great answer

Final Answer:

Student's education level: I would like to know more about your educational background. Can you tell me about your current level of education and any previous experience you have with accounting principles?

Learning disabilities and specific needs: Do you have any learning disabilities or specific needs that I should be aware of in order to better assist you with your studies in accounting principles?

By understanding your education level, learning disabilities, and specific needs, I will be able to provide you with targeted assistance and support to help you succeed in your study of accounting principles.

> Finished chain.

[DEBUG]: == [Collect Student Context from accounting principles] Task  
output: Student's education level: I would like to know more about your educational background. Can you tell me about your current level of education and any previous experience you have with accounting principles?  
Learning disabilities and specific needs: Do you have any learning disabilities or specific needs that I should be aware of in order to better assist you with your studies in accounting principles?  
By understanding your education level, learning disabilities, and specific needs, I will be able to provide you with targeted assistance and support to help you succeed in your study of accounting principles.

[DEBUG]: == Working Agent: Specify Subject Topic act as a tutor for the specified subject from accounting principles

[INFO]: == Starting Task: 1. Ask the student to specify the particular area within the subject topic they need help with.

2. Ensure the area is clearly defined to provide focused assistance.

> Entering new CrewAgentExecutor chain...

I now can give a great answer

Final Answer: What specific area within the subject of accounting principles do you need help with? Please provide me with details so that I can offer you focused assistance in that particular area.

> Finished chain.

[DEBUG]: == [Specify Subject Topic act as a tutor for the specified subject from accounting principles] Task output: What specific area within the subject of accounting principles do you need help with? Please provide me with details so that I can offer you focused assistance in that particular area.

[DEBUG]: == Working Agent: Provide Help on Specific Topic as a tutor from accounting principles

[INFO]: == Starting Task: 1. Provide detailed assistance on the specific subject area based on the student's context and needs.

2. Offer explanations, examples, and any additional resources to aid understanding.

3. Tailor the assistance to the student's educational background and specific requirements.

> Entering new CrewAgentExecutor chain...

I now can give a great answer

Final Answer:

For the specific area within the subject of accounting principles that you need help with, I will provide detailed assistance and explanations tailored to your educational background and specific requirements.

If you are struggling with understanding the concept of double-entry accounting, I can explain that it is a fundamental accounting principle that states that for every debit entry, there must be an equal and corresponding credit entry. This ensures that the accounting equation ( $\text{Assets} = \text{Liabilities} + \text{Equity}$ ) remains balanced.

To aid your understanding, I can provide examples of how double-entry accounting works in practice. For instance, when a company purchases inventory for \$500, there will be a debit entry to increase the Inventory account by \$500 and a credit entry to decrease the Cash account by \$500. This maintains the balance in the accounting equation.

Additionally, I can offer resources such as practice exercises or online tutorials to further reinforce your understanding of double-entry accounting. By breaking down the concept into manageable parts and providing real-world examples, I aim to help you excel in this specific area of accounting principles.

> Finished chain.



[DEBUG]: == [Provide Help on Specific Topic as a tutor from accounting principles] Task output: For the specific area within the subject of accounting principles that you need help with, I will provide detailed assistance and explanations tailored to your educational background and specific requirements. If you are struggling with understanding the concept of double-entry accounting, I can explain that it is a fundamental accounting principle that states that for every debit entry, there must be an equal and corresponding credit entry. This ensures that the accounting equation ( $\text{Assets} = \text{Liabilities} + \text{Equity}$ ) remains balanced.

To aid your understanding, I can provide examples of how double-entry accounting works in practice. For instance, when a company purchases inventory for \$500, there will be a debit entry to increase the Inventory account by \$500 and a credit entry to decrease the Cash account by \$500. This maintains the balance in the accounting equation.

Additionally, I can offer resources such as practice exercises or online tutorials to further reinforce your understanding of double-entry accounting. By breaking down the concept into manageable parts and providing real-world examples, I aim to help you excel in this specific area of accounting principles.

Your study assistance plan is ready:

For the specific area within the subject of accounting principles that you need help with, I will provide detailed assistance and explanations tailored to your educational background and specific requirements.

If you are struggling with understanding the concept of double-entry accounting, I can explain that it is a fundamental accounting principle that states that for every debit entry, there must be an equal and corresponding credit entry. This ensures that the accounting equation ( $\text{Assets} = \text{Liabilities} + \text{Equity}$ ) remains balanced.

To aid your understanding, I can provide examples of how double-entry accounting works in practice. For instance, when a company purchases inventory for \$500, there will be a debit entry to increase the Inventory account by \$500 and a credit entry to decrease the Cash account by \$500. This maintains the balance in the accounting equation.

Additionally, I can offer resources such as practice exercises or online

tutorials to further reinforce your understanding of double-entry accounting. By breaking down the concept into manageable parts and providing real-world examples, I aim to help you excel in this specific area of accounting principles.

### 0.5.1 Insights

The LLM's response was exceptionally well-targeted, focusing on a specific accounting principle and providing practical examples that are crucial for understanding these concepts in a real-world context. The generated content closely matched the requirements of the prompt, demonstrating excellent alignment with the specified needs. The assistance plan was both detailed and specific, ensuring that it effectively addressed the student's requirements. By incorporating clear and practical examples, the LLM not only provided comprehensive information but also made it accessible and applicable, thereby significantly enhancing the student's understanding of the accounting principles discussed. This detailed and focused approach made the assistance plan particularly effective for the student's learning objectives.

## 0.6 ## Prompt 2

**Topic:** War in Ukraine

```
[ ]: inputs = {
    'subject_topic': 'current affairs about the war in Ukraine',
    'education_prompt': """
Plan a detailed study assistance session for a student needing help with
↳ understanding current affairs about the war in Ukraine.
The student is currently in their second year of college and has a learning
↳ disability affecting their ability to understand complex political and
↳ historical concepts.
The session should cover the historical background, key events, major players,
↳ and the impact of the conflict on global politics and economy, using
↳ simplified explanations and relevant examples to aid understanding.
"""
}

# Use the Crew to process the education prompt
result = crew.kickoff(inputs=inputs)

# Print the resulting assistance plan
print("Your study assistance plan is ready:")
print(result)
```

```

[DEBUG]: == Working Agent: Collect Student Context from current
affairs about the war in Ukraine
[INFO]: == Starting Task: 1. Ask the student about their education
level.

2. Inquire about any learning disabilities or specific needs they might have.
3. Understand the context to provide better-targeted assistance.

> Entering new CrewAgentExecutor chain...
I now can give a great answer

Final Answer:

In order to provide the best assistance with your studies on the current affairs
about the war in Ukraine, I would like to understand more about your educational
background. Can you please share with me your education level? Additionally, it
would be helpful for me to know if you have any learning disabilities or
specific needs that I should be aware of in order to better support you in this
subject area. Thank you for sharing this information with me so that I can
tailor my assistance to meet your individual needs.

> Finished chain.
[DEBUG]: == [Collect Student Context from current affairs about the
war in Ukraine] Task output: In order to provide the best assistance with your
studies on the current affairs about the war in Ukraine, I would like to
understand more about your educational background. Can you please share with me
your education level? Additionally, it would be helpful for me to know if you
have any learning disabilities or specific needs that I should be aware of in
order to better support you in this subject area. Thank you for sharing this
information with me so that I can tailor my assistance to meet your individual
needs.

[DEBUG]: == Working Agent: Specify Subject Topic act as a tutor for
the specified subject from current affairs about the war in Ukraine
[INFO]: == Starting Task: 1. Ask the student to specify the particular
area within the subject topic they need help with.

2. Ensure the area is clearly defined to provide focused assistance.

```

> Entering new CrewAgentExecutor chain...

I now can give a great answer

Final Answer:

Based on the information provided, please specify the particular area within the subject of current affairs about the war in Ukraine that you need help with.

This will allow me to provide focused and effective assistance tailored to your individual needs and educational background. Thank you for sharing this information with me.

> Finished chain.

[DEBUG]: == [Specify Subject Topic act as a tutor for the specified subject from current affairs about the war in Ukraine] Task output: Based on the information provided, please specify the particular area within the subject of current affairs about the war in Ukraine that you need help with. This will allow me to provide focused and effective assistance tailored to your individual needs and educational background. Thank you for sharing this information with me.

[DEBUG]: == Working Agent: Provide Help on Specific Topic as a tutor from current affairs about the war in Ukraine

[INFO]: == Starting Task: 1. Provide detailed assistance on the specific subject area based on the student's context and needs.

2. Offer explanations, examples, and any additional resources to aid understanding.

3. Tailor the assistance to the student's educational background and specific requirements.

> Entering new CrewAgentExecutor chain...

I now can give a great answer

Final Answer:

Based on the information you provided, it seems like you are looking for detailed assistance on the current affairs related to the war in Ukraine. To help you understand this complex subject better, I will provide explanations, examples, and additional resources tailored to your educational background and specific requirements.

The war in Ukraine started in 2014 when Russia annexed Crimea and supported separatist movements in eastern Ukraine. This conflict has resulted in thousands of deaths, displacement of civilians, and ongoing tensions between Ukraine and Russia. To understand the dynamics of this war, it is important to consider the historical context, geopolitical interests, and impact on the local population. One key aspect to focus on is the Minsk agreements, which were signed in 2014 and 2015 to establish a ceasefire and political solution to the conflict.

However, the implementation of these agreements has been challenging, with continued violations and lack of progress towards a lasting peace.

To delve deeper into this topic, I recommend reading reports from reputable sources such as the United Nations, Human Rights Watch, and the International Crisis Group. These organizations provide in-depth analysis, statistics, and insights into the war in Ukraine, which can help you gain a comprehensive understanding of the situation.

In addition, following news updates from reliable news outlets like BBC, The New York Times, and Al Jazeera can keep you informed about the latest developments in the conflict. Watching documentaries or listening to podcasts on the war in Ukraine can also provide a different perspective and enrich your knowledge on this subject.

Overall, by exploring different sources, analyzing key events, and staying updated on the latest news, you can deepen your understanding of the war in Ukraine and its implications on a global scale. Stay curious, keep learning, and never hesitate to ask questions or seek further clarification on any aspect of this topic.

> Finished chain.

[DEBUG]: == [Provide Help on Specific Topic as a tutor from current affairs about the war in Ukraine] Task output: Based on the information you provided, it seems like you are looking for detailed assistance on the current affairs related to the war in Ukraine. To help you understand this complex subject better, I will provide explanations, examples, and additional resources tailored to your educational background and specific requirements.

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Overall, by exploring different sources, analyzing key events, and staying updated on the latest news, you can deepen your understanding of the war in Ukraine and its implications on a global scale. Stay curious, keep learning, and never hesitate to ask questions or seek further clarification on any aspect of this topic.

Your study assistance plan is ready:

Based on the information you provided, it seems like you are looking for detailed assistance on the current affairs related to the war in Ukraine. To help you understand this complex subject better, I will provide explanations, examples, and additional resources tailored to your educational background and specific requirements.

The war in Ukraine started in 2014 when Russia annexed Crimea and supported separatist movements in eastern Ukraine. This conflict has resulted in thousands of deaths, displacement of civilians, and ongoing tensions between Ukraine and Russia. To understand the dynamics of this war, it is important to consider the historical context, geopolitical interests, and impact on the local population.

One key aspect to focus on is the Minsk agreements, which were signed in 2014 and 2015 to establish a ceasefire and political solution to the conflict. However, the implementation of these agreements has been challenging, with continued violations and lack of progress towards a lasting peace.

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### 0.6.1 Insights

The LLM successfully provided a comprehensive overview, addressing all aspects of the prompt in a broad and detailed manner. The study assistance plan was well-aligned with the specified requirements, ensuring that it met the needs outlined in the prompt. The response was both extensive and thorough, effectively covering the complexity of the topic. By encompassing the full scope of the prompt, the LLM demonstrated a robust understanding and delivered a well-rounded and detailed analysis, making the assistance plan highly effective and relevant.

## 0.7 ## Prompt 3

**Topic:** Fundamentals of Environmental Science

```
[ ]: inputs = {
    'subject_topic': 'the fundamentals of environmental science',
    'education_prompt': """
Plan a detailed study assistance session for a student needing help with
    ↳ understanding the fundamentals of environmental science.
The student is currently in high school.
The session should cover the basic principles of environmental science,
    ↳ including ecosystems, biodiversity, pollution, and sustainable practices,
    ↳ using simplified explanations and relevant examples to aid understanding.
    """
}

# Use the Crew to process the education prompt
result = crew.kickoff(inputs=inputs)

# Print the resulting assistance plan
print("Your study assistance plan is ready:")
print(result)
```

```
[DEBUG]: == Working Agent: Collect Student Context from the
fundamentals of environmental science
[INFO]: == Starting Task: 1. Ask the student about their education
level.
2. Inquire about any learning disabilities or specific needs they might have.
3. Understand the context to provide better-targeted assistance.
```

```
> Entering new CrewAgentExecutor chain...
I now can give a great answer
```

Final Answer:

For the fundamentals of environmental science, I would like to start by asking you about your education level. Can you please share with me your current educational background?

Additionally, I would like to inquire if you have any learning disabilities or specific needs that I should be aware of to better assist you in your studies of environmental science. Understanding these factors will help me provide more targeted and effective support to help you succeed in this subject.

```
> Finished chain.
```



[DEBUG]: == [Collect Student Context from the fundamentals of environmental science] Task output: For the fundamentals of environmental science, I would like to start by asking you about your education level. Can you please share with me your current educational background? Additionally, I would like to inquire if you have any learning disabilities or specific needs that I should be aware of to better assist you in your studies of environmental science. Understanding these factors will help me provide more targeted and effective support to help you succeed in this subject.

[DEBUG]: == Working Agent: Specify Subject Topic act as a tutor for the specified subject from the fundamentals of environmental science  
[INFO]: == Starting Task: 1. Ask the student to specify the particular area within the subject topic they need help with.  
2. Ensure the area is clearly defined to provide focused assistance.

> Entering new CrewAgentExecutor chain...

I now can give a great answer

Final Answer:

To better assist you in your studies of environmental science, can you please specify the particular area within the subject topic that you need help with? Is it related to environmental policy, ecosystems, climate change, biodiversity, pollution, or any other specific aspect of environmental science? By clearly defining the area you are struggling with, I can provide more focused and targeted assistance to help you succeed in this subject.

> Finished chain.

[DEBUG]: == [Specify Subject Topic act as a tutor for the specified subject from the fundamentals of environmental science] Task output: To better assist you in your studies of environmental science, can you please specify the particular area within the subject topic that you need help with? Is it related to environmental policy, ecosystems, climate change, biodiversity, pollution, or any other specific aspect of environmental science? By clearly defining the area you are struggling with, I can provide more focused and targeted assistance to help you succeed in this subject.

[DEBUG]: == Working Agent: Provide Help on Specific Topic as a tutor from the fundamentals of environmental science

[INFO]: == Starting Task: 1. Provide detailed assistance on the specific subject area based on the student's context and needs.

2. Offer explanations, examples, and any additional resources to aid understanding.

3. Tailor the assistance to the student's educational background and specific requirements.

> Entering new CrewAgentExecutor chain...

I now can give a great answer

Final Answer:

Thank you for specifying the particular area within environmental science that you need help with. Based on your request, I will provide detailed assistance on the topic of climate change. Climate change is a critical aspect of environmental science that involves the long-term alteration of temperature and typical weather patterns in a place. It is primarily driven by human activities such as the burning of fossil fuels, deforestation, and industrial processes, leading to an increase in greenhouse gas emissions and global warming.

To better understand climate change, it is essential to grasp the concept of the greenhouse effect, where certain gases in the Earth's atmosphere trap heat and prevent it from escaping into space, resulting in a warming effect. The main greenhouse gases include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and fluorinated gases. Human activities, particularly the burning of fossil fuels for energy production and transportation, are the primary contributors to the increased levels of greenhouse gases in the atmosphere. Climate change has significant impacts on the environment, including rising sea levels, more frequent and severe natural disasters, changes in precipitation patterns, and disruptions to ecosystems and biodiversity. It is crucial to address climate change through mitigation efforts such as reducing greenhouse gas emissions, transitioning to renewable energy sources, and implementing sustainable practices in various sectors.

To aid your understanding of climate change, I recommend exploring reputable sources such as the Intergovernmental Panel on Climate Change (IPCC) reports, NASA's climate change resources, and scientific journals focusing on environmental science. Additionally, studying case studies of regions or communities affected by climate change can provide valuable insights into the real-world implications of this global issue.

I hope this detailed assistance on climate change in environmental science helps clarify the topic for you and supports your academic endeavors. Please feel free to reach out if you have any further questions or need additional guidance on this subject area.

> Finished chain.

[DEBUG]: == [Provide Help on Specific Topic as a tutor from the fundamentals of environmental science] Task output: Thank you for specifying the particular area within environmental science that you need help with. Based on your request, I will provide detailed assistance on the topic of climate change. Climate change is a critical aspect of environmental science that involves the long-term alteration of temperature and typical weather patterns in a place. It is primarily driven by human activities such as the burning of fossil fuels, deforestation, and industrial processes, leading to an increase in greenhouse gas emissions and global warming.

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I hope this detailed assistance on climate change in environmental science helps clarify the topic for you and supports your academic endeavors. Please feel free to reach out if you have any further questions or need additional guidance on this subject area.

Your study assistance plan is ready:

Thank you for specifying the particular area within environmental science that you need help with. Based on your request, I will provide detailed assistance on the topic of climate change. Climate change is a critical aspect of environmental science that involves the long-term alteration of temperature and typical weather patterns in a place. It is primarily driven by human activities such as the burning of fossil fuels, deforestation, and industrial processes, leading to an increase in greenhouse gas emissions and global warming.

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I hope this detailed assistance on climate change in environmental science helps clarify the topic for you and supports your academic endeavors. Please feel free to reach out if you have any further questions or need additional guidance on this subject area.

### **0.7.1 Insights**

The LLM provided comprehensive content on climate change, but it did not fully cover all the requested topics, leading to partial alignment with the overall objectives. While the information on climate change was thorough and detailed, it did not encompass the broader range of environmental topics specified in the original prompt. This resulted in a focused but narrow scope that limited the LLM's ability to fully address the entire spectrum of environmental issues. Although the depth of information on climate change was impressive and demonstrated a solid understanding of that particular topic, the lack of breadth meant that other important environmental subjects were not adequately covered. Consequently, while the LLM excelled in providing detailed insights into climate change, it fell short in offering a comprehensive overview of the broader environmental context.

## 0.8 ## Conclusion

Comparing the quality of outputs for the three prompts reveals distinct differences in performance. CrewAI with OpenAI as the base model delivered the best results for the accounting principles prompt, providing a well-targeted, detailed, and practical response that closely matched the prompt's requirements. The moderate result was seen in the war in Ukraine prompt, where the response was thorough but lacked breadth, leading to partial alignment with the specified needs. The least effective performance was observed in the environmental science prompt, which, despite being broad and detailed, lacked the necessary depth in certain areas to fully address the complexity of the topic. Overall, the model excelled in delivering focused and practical assistance for accounting principles but struggled to provide comprehensive coverage for broader and more complex environmental topics.