



Technology & Innovation skills pathway

AI Agents 101: A hands-on introduction for smarter investing

This notebook was created as companion material for the webinar presented on May 20, 2025 by [Carlos Salas](#) and organized by the [CFA Society UK](#).

Table of Contents

1. [Set Up](#)
2. [Single Agent Intro](#)
3. [Multi Agent Intro](#)
4. [Learning Resources](#)

```
In [9]: # Library Load
# Basic Libraries
import time
import json
import requests # for function calls like get_stock_price, if they use external
import warnings
import os
import requests
import asyncio
import configparser
import asyncio

# data analysis
import numpy as np
import pandas as pd

# financial libs
import yfinance as yf # terminal install -> pip install yfinance
import talib # terminal install -> pip install TA-Lib

# OpenAI Libs
import openai # terminal install -> pip install openai
from openai import OpenAI
from agents import Runner, Agent, function_tool, items # terminal install -> pip
from agents import (Agent, Runner, FunctionTool, InputGuardrail, GuardrailFunci
                    handoff, InputGuardrailTripwireTriggered, RunConfig, Models
from agents.exceptions import InputGuardrailTripwireTriggered
from agents.extensions import handoff_filters
from pydantic import BaseModel
```

1. Set Up

Check environment below if you come across any issues during the execution of this notebook:

In [2]: `! python --version`

Python 3.11.11

In [2]: `!conda list`

```
# packages in environment at C:\Users\Carlo\anaconda3\envs\quant_res_env_311:
```

```
#
```

# Name	Version	Build	Channel
aiohappyeyeballs	2.4.6	pyhd8ed1ab_0	conda-forge
aiohttp	3.11.12	py311h5082efb_0	conda-forge
aiosignal	1.3.2	pyhd8ed1ab_0	conda-forge
alembic	1.14.1	pypi_0	pypi
alpha_vantage	3.0.0	pyhd8ed1ab_0	conda-forge
alphalens-reloaded	0.4.5	pypi_0	pypi
annotated-types	0.7.0	pypi_0	pypi
anyio	4.8.0	pyhd8ed1ab_0	conda-forge
appdirs	1.4.4	pyhd8ed1ab_1	conda-forge
argon2-cffi	23.1.0	pyhd8ed1ab_1	conda-forge
argon2-cffi-bindings	21.2.0	py311he736701_5	conda-forge
arrow	1.3.0	pyhd8ed1ab_1	conda-forge
asttokens	3.0.0	pyhd8ed1ab_1	conda-forge
async-lru	2.0.4	pyhd8ed1ab_1	conda-forge
attrs	25.1.0	pyh71513ae_0	conda-forge
babel	2.17.0	pyhd8ed1ab_0	conda-forge
bcolz-zipline	1.2.12	pypi_0	pypi
beautifulsoup4	4.13.3	pyha770c72_0	conda-forge
blas	1.0	mk1	
bleach	6.2.0	pyh29332c3_4	conda-forge
bleach-with-css	6.2.0	h82add2a_4	conda-forge
blinker	1.9.0	pypi_0	pypi
blosc2	3.1.1	pypi_0	pypi
bottleneck	1.4.2	py311h57dcf0c_0	
brotli-python	1.0.9	py311h5da7b33_9	
bzip2	1.0.8	h2bbff1b_6	
ca-certificates	2025.1.31	h56e8100_0	conda-forge
cached-property	1.5.2	hd8ed1ab_1	conda-forge
cached_property	1.5.2	pyha770c72_1	conda-forge
cachetools	5.5.1	pypi_0	pypi
catboost	1.2.7	pypi_0	pypi
certifi	2025.1.31	pyhd8ed1ab_0	conda-forge
cffi	1.17.1	py311he736701_0	conda-forge
charset-normalizer	3.4.1	pyhd8ed1ab_0	conda-forge
click	8.1.8	pypi_0	pypi
cloudpickle	3.1.1	pypi_0	pypi
colorama	0.4.6	py311haa95532_0	
colorlog	6.9.0	pypi_0	pypi
comm	0.2.2	pyhd8ed1ab_1	conda-forge
contourpy	1.3.1	py311h214f63a_0	
curl-cffi	0.11.1	pypi_0	pypi
cycler	0.11.0	pyhd3eb1b0_0	
databricks-sdk	0.44.1	pypi_0	pypi
debugpy	1.8.12	py311hda3d55a_0	conda-forge
decorator	5.1.1	pyhd8ed1ab_1	conda-forge
defusedxml	0.7.1	pyhd8ed1ab_0	conda-forge
deprecated	1.2.18	pypi_0	pypi
distro	1.9.0	pypi_0	pypi
docker	7.1.0	pypi_0	pypi
empyirical-reloaded	0.5.11	pypi_0	pypi
et-xmlfile	2.0.0	pypi_0	pypi
exceptiongroup	1.2.2	pyhd8ed1ab_1	conda-forge
exchange-calendars	4.9	pypi_0	pypi
executing	2.2.0	pypi_0	pypi
ffn	1.1.2	pypi_0	pypi
finnhub-python	2.4.18	pyhd8ed1ab_0	conda-forge
flask	3.1.0	pypi_0	pypi

fonttools	4.55.3	py311h827c3e9_0	
fqdn	1.5.1	pyhd8ed1ab_1	conda-forge
freetype	2.12.1	ha860e81_0	
frozendict	2.4.6	py311he736701_0	conda-forge
frozenlist	1.5.0	py311h5082efb_1	conda-forge
future	1.0.0	pypi_0	pypi
gitdb	4.0.12	pypi_0	pypi
gitpython	3.1.44	pypi_0	pypi
google-auth	2.38.0	pypi_0	pypi
graphene	3.4.3	pypi_0	pypi
graphql-core	3.2.6	pypi_0	pypi
graphql-relay	3.2.0	pypi_0	pypi
greenlet	3.1.1	pypi_0	pypi
griffe	1.7.3	pypi_0	pypi
h11	0.14.0	pyhd8ed1ab_1	conda-forge
h2	4.2.0	pyhd8ed1ab_0	conda-forge
h5py	3.13.0	pypi_0	pypi
hpack	4.1.0	pyhd8ed1ab_0	conda-forge
html5lib	1.1	pyhd8ed1ab_2	conda-forge
httpcore	1.0.7	pyh29332c3_1	conda-forge
httpx	0.28.1	pyhd8ed1ab_0	conda-forge
httpx-sse	0.4.0	pypi_0	pypi
hyperframe	6.1.0	pyhd8ed1ab_0	conda-forge
hyperopt	0.2.7	pypi_0	pypi
icc_rt	2022.1.0	h6049295_2	
icu	73.1	h6c2663c_0	
idna	3.10	pyhd8ed1ab_1	conda-forge
importlib-metadata	8.5.0	pypi_0	pypi
importlib-resources	6.5.2	pyhd8ed1ab_0	conda-forge
intel-openmp	2023.1.0	h59b6b97_46320	
intervaltree	3.1.0	pypi_0	pypi
ipykernel	6.29.5	pyh4bbf305_0	conda-forge
ipython	8.32.0	pyh9ab4c32_0	conda-forge
iso3166	2.1.1	pypi_0	pypi
iso4217	1.12.20240625	pypi_0	pypi
isoduration	20.11.0	pyhd8ed1ab_1	conda-forge
itsdangerous	2.2.0	pypi_0	pypi
jedi	0.19.2	pyhd8ed1ab_1	conda-forge
jinja2	3.1.5	pyhd8ed1ab_0	conda-forge
jiter	0.9.0	pypi_0	pypi
joblib	1.4.2	py311haa95532_0	
jpeg	9e	h827c3e9_3	
json5	0.10.0	pyhd8ed1ab_1	conda-forge
jsonpointer	3.0.0	py311h1ea47a8_1	conda-forge
jsonschema	4.23.0	pyhd8ed1ab_1	conda-forge
jsonschema-specifications	2024.10.1	pyhd8ed1ab_1	conda-forge
jsonschema-with-format-nongpl	4.23.0	hd8ed1ab_1	conda-forge
jupyter-lsp	2.2.5	pyhd8ed1ab_1	conda-forge
jupyter_client	8.6.3	pyhd8ed1ab_1	conda-forge
jupyter_core	5.7.2	py311h1ea47a8_0	conda-forge
jupyter_events	0.12.0	pyh29332c3_0	conda-forge
jupyter_server	2.15.0	pyhd8ed1ab_0	conda-forge
jupyter_server_terminals	0.5.3	pyhd8ed1ab_1	conda-forge
jupyterlab	4.3.5	pyhd8ed1ab_0	conda-forge
jupyterlab_pygments	0.3.0	pyhd8ed1ab_2	conda-forge
jupyterlab_server	2.27.3	pyhd8ed1ab_1	conda-forge
kiwisolver	1.4.8	py311h5da7b33_0	
korean-lunar-calendar	0.3.1	pypi_0	pypi
krb5	1.20.1	h5b6d351_0	
lcms2	2.16	hb4a4139_0	

lerc	4.0.0	h5da7b33_0	
libblas	3.9.0	26_win64_mkl	conda-forge
libcbblas	3.9.0	26_win64_mkl	conda-forge
libclang	14.0.6	default_hb5a9fac_2	
libclang13	14.0.6	default_h8e68704_2	
libdeflate	1.22	h5bf469e_0	
libffi	3.4.4	hd77b12b_1	
libiconv	1.17	hcfcfb64_2	conda-forge
liblapack	3.9.0	26_win64_mkl	conda-forge
libpng	1.6.39	h8cc25b3_0	
libpq	17.2	h70ee33d_0	
libsodium	1.0.18	h8d14728_1	conda-forge
libsqlite	3.49.1	h67fdade_1	conda-forge
libta-lib	0.4.0	hcfcfb64_2	conda-forge
libtiff	4.5.1	h44ae7cf_1	
libwebp-base	1.3.2	h3d04722_1	
libxml2	2.13.5	h24da03e_0	
libxslt	1.1.41	h0739af5_0	
lightgbm	4.6.0	pypi_0	pypi
lru-dict	1.3.0	pypi_0	pypi
lxml	5.3.0	py311h395c83e_1	
lz4-c	1.9.4	h2bbff1b_1	
mako	1.3.9	pypi_0	pypi
markdown	3.7	pypi_0	pypi
markupsafe	3.0.2	py311h5082efb_1	conda-forge
matplotlib	3.10.0	py311haa95532_0	
matplotlib-base	3.10.0	py311he19b0ae_0	
matplotlib-inline	0.1.7	pyhd8ed1ab_1	conda-forge
mcp	1.8.1	pypi_0	pypi
mistune	3.1.2	pyhd8ed1ab_0	conda-forge
mkl	2023.1.0	h6b88ed4_46358	
mkl-service	2.4.0	py311h827c3e9_2	
mkl_fft	1.3.11	py311h827c3e9_0	
mkl_random	1.2.8	py311hea22821_0	
mlflow	2.20.2	pypi_0	pypi
mlflow-skinny	2.20.2	pypi_0	pypi
msgpack	1.1.0	pypi_0	pypi
multidict	6.1.0	py311h5082efb_1	conda-forge
multipledispatch	1.0.0	pypi_0	pypi
multitasking	0.0.9	pyhd8ed1ab_0	conda-forge
nbclient	0.10.2	pyhd8ed1ab_0	conda-forge
nbconvert-core	7.16.6	pyh29332c3_0	conda-forge
nbformat	5.10.4	pyhd8ed1ab_1	conda-forge
ndindex	1.9.2	pypi_0	pypi
nest-asyncio	1.6.0	pyhd8ed1ab_1	conda-forge
networkx	3.4.2	pypi_0	pypi
notebook	7.3.2	pyhd8ed1ab_0	conda-forge
notebook-shim	0.2.4	pyhd8ed1ab_1	conda-forge
numexpr	2.10.1	py311h4cd664f_0	
numpy	1.26.4	pypi_0	pypi
openai	1.78.1	pypi_0	pypi
openai-agents	0.0.14	pypi_0	pypi
openjpeg	2.5.2	hae555c5_0	
openpyxl	3.1.5	pypi_0	pypi
openssl	3.4.1	ha4e3fda_0	conda-forge
opentelemetry-api	1.30.0	pypi_0	pypi
opentelemetry-sdk	1.30.0	pypi_0	pypi
opentelemetry-semantic-conventions	0.51b0	pypi_0	pypi
optuna	4.2.1	pypi_0	pypi
outcome	1.3.0.post0	pypi_0	pypi

overrides	7.7.0	pyhd8ed1ab_1	conda-forge
packaging	24.2	py311haa95532_0	
pandas	2.2.3	py311h5da7b33_0	
pandas-datareader	0.10.0	pypi_0	pypi
pandas-market-calendars	4.6.1	pypi_0	pypi
pandocfilters	1.5.0	pyhd8ed1ab_0	conda-forge
parso	0.8.4	pyhd8ed1ab_1	conda-forge
patsy	1.0.1	py311haa95532_0	
peewee	3.17.3	pypi_0	pypi
pickleshare	0.7.5	pyhd8ed1ab_1004	conda-forge
pillow	11.1.0	py311h096bfc_0	
pip	25.0	py311haa95532_0	
pkgutil-resolve-name	1.3.10	pyhd8ed1ab_2	conda-forge
platformdirs	4.3.6	pyhd8ed1ab_1	conda-forge
plotly	5.24.1	py311h746a85d_0	
ply	3.11	py311haa95532_0	
prometheus_client	0.21.1	pyhd8ed1ab_0	conda-forge
prompt-toolkit	3.0.50	pyha770c72_0	conda-forge
propcache	0.2.1	py311h5082efb_1	conda-forge
protobuf	5.29.3	pypi_0	pypi
psutil	6.1.1	py311he736701_0	conda-forge
pure_eval	0.2.3	pyhd8ed1ab_1	conda-forge
py-cpuinfo	9.0.0	pypi_0	pypi
py4j	0.10.9.9	pypi_0	pypi
pyarrow	18.1.0	pypi_0	pypi
pyasn1	0.6.1	pypi_0	pypi
pyasn1-modules	0.4.1	pypi_0	pypi
pycparser	2.22	pyh29332c3_1	conda-forge
pydantic	2.10.6	pypi_0	pypi
pydantic-core	2.27.2	pypi_0	pypi
pydantic-settings	2.9.1	pypi_0	pypi
pyfolio-reloaded	0.9.8	pypi_0	pypi
pygments	2.19.1	pyhd8ed1ab_0	conda-forge
pyluach	2.2.0	pypi_0	pypi
pyparsing	3.2.0	py311haa95532_0	
pyqt	5.15.10	py311h5da7b33_1	
pyqt5-sip	12.13.0	py311h827c3e9_1	
pysocks	1.7.1	pyh09c184e_7	conda-forge
python	3.11.11	h4607a30_0	
python-dateutil	2.9.0post0	py311haa95532_2	
python-dotenv	1.1.0	pypi_0	pypi
python-fastjsonschema	2.21.1	pyhd8ed1ab_0	conda-forge
python-graphviz	0.20.3	pypi_0	pypi
python-interface	1.6.1	pypi_0	pypi
python-json-logger	2.0.7	pyhd8ed1ab_0	conda-forge
python-multipart	0.0.20	pypi_0	pypi
python-tzdata	2023.3	pyhd3eb1b0_0	
python_abi	3.11	2_cp311	conda-forge
pytrends	4.9.2	pypi_0	pypi
pytz	2024.1	py311haa95532_0	
pywin32	308	pypi_0	pypi
pywinpty	2.0.15	py311hda3d55a_0	conda-forge
pyyaml	6.0.2	py311h5082efb_2	conda-forge
pyzmq	24.0.1	py311h7b3f143_1	conda-forge
qt-main	5.15.2	h19c9488_12	
quantconnect-stubs	16998	pypi_0	pypi
referencing	0.36.2	pyh29332c3_0	conda-forge
requests	2.32.3	pyhd8ed1ab_1	conda-forge
rfc3339-validator	0.1.4	pyhd8ed1ab_1	conda-forge
rfc3986-validator	0.1.1	pyh9f0ad1d_0	conda-forge

rpds-py	0.22.3	py311h533ab2d_0	conda-forge
rsa	4.9	pypi_0	pypi
scikit-learn	1.6.1	py311h585ebfc_0	
scipy	1.15.1	py311h9f229c6_0	
seaborn	0.13.2	py311haa95532_1	
selenium	4.29.0	pypi_0	pypi
send2trash	1.8.3	pyh5737063_1	conda-forge
setuptools	75.8.0	py311haa95532_0	
sip	6.7.12	py311h5da7b33_1	
six	1.16.0	pyhd3eb1b0_1	
smmap	5.0.2	pypi_0	pypi
sniffio	1.3.1	pyhd8ed1ab_1	conda-forge
sortedcontainers	2.4.0	pypi_0	pypi
soupsieve	2.5	pyhd8ed1ab_1	conda-forge
sqlalchemy	2.0.38	pypi_0	pypi
sqlite	3.45.3	h2bbff1b_0	
sqlparse	0.5.3	pypi_0	pypi
sse-starlette	2.3.5	pypi_0	pypi
stack_data	0.6.3	pyhd8ed1ab_1	conda-forge
starlette	0.46.2	pypi_0	pypi
statsmodels	0.14.4	py311h827c3e9_0	
ta	0.11.0	pyhd8ed1ab_1	conda-forge
ta-lib	0.5.1	py311he736701_0	conda-forge
tables	3.10.2	pypi_0	pypi
tabulate	0.9.0	pypi_0	pypi
tbb	2021.8.0	h59b6b97_0	
tenacity	9.0.0	py311haa95532_0	
terminado	0.18.1	pyh5737063_0	conda-forge
threadpoolctl	3.5.0	py311h746a85d_0	
tinycss2	1.4.0	pyhd8ed1ab_0	conda-forge
tk	8.6.14	h0416ee5_0	
tomli	2.2.1	pyhd8ed1ab_1	conda-forge
toolz	1.0.0	pypi_0	pypi
tornado	6.4.2	py311h827c3e9_0	
tqdm	4.67.1	py311h746a85d_0	
traitlets	5.14.3	pyhd8ed1ab_1	conda-forge
trio	0.29.0	pypi_0	pypi
trio-websocket	0.12.2	pypi_0	pypi
types-python-dateutil	2.9.0.20241206	pyhd8ed1ab_0	conda-forge
types-requests	2.32.0.20250515	pypi_0	pypi
typing-extensions	4.12.2	hd8ed1ab_1	conda-forge
typing-inspection	0.4.0	pypi_0	pypi
typing_extensions	4.12.2	pyha770c72_1	conda-forge
typing_utils	0.1.0	pyhd8ed1ab_1	conda-forge
tzdata	2025a	h04d1e81_0	
ucrt	10.0.22621.0	h57928b3_1	conda-forge
unicodedata2	15.1.0	py311h827c3e9_1	
uri-template	1.3.0	pyhd8ed1ab_1	conda-forge
urllib3	2.3.0	pyhd8ed1ab_0	conda-forge
uvicorn	0.34.2	pypi_0	pypi
vc	14.42	haa95532_4	
vc14_runtime	14.42.34433	h6356254_24	conda-forge
vs2015_runtime	14.42.34433	hfef2bbc_24	conda-forge
waitress	3.0.2	pypi_0	pypi
wcwidth	0.2.13	pyhd8ed1ab_1	conda-forge
webcolors	24.11.1	pyhd8ed1ab_0	conda-forge
webencodings	0.5.1	pyhd8ed1ab_3	conda-forge
websocket-client	1.8.0	pyhd8ed1ab_1	conda-forge
websockets	15.0.1	pypi_0	pypi
werkzeug	3.1.3	pypi_0	pypi

wheel	0.45.1	py311haa95532_0	
win_inet_pton	1.1.0	pyh7428d3b_8	conda-forge
winpty	0.4.3	4	conda-forge
wrapt	1.17.2	pypi_0	pypi
wsproto	1.2.0	pypi_0	pypi
xgboost	2.1.4	pypi_0	pypi
xz	5.6.4	h4754444_1	
yaml	0.2.5	h8ffe710_2	conda-forge
yaml	1.18.3	py311h5082efb_1	conda-forge
yfinance	0.2.61	pypi_0	pypi
zeromq	4.3.4	h0e60522_1	conda-forge
zipline-reloaded	3.1	pypi_0	pypi
zipp	3.21.0	pyhd8ed1ab_1	conda-forge
zlib	1.2.13	h8cc25b3_1	
zstandard	0.23.0	py311h53056dc_1	conda-forge
zstd	1.5.6	h8880b57_0	

Both `OpenAI` and `FMP (Financial Modeling PREP)` APIs have a free-trial for new users for a limited amount of time and data. For more information click in the next links:

- [OpenAI](#)
- [FMP](#)

Sign-up to `FMP` and `OpenAI` to obtain an API key. Once this is done, login with your API keys changing the `path` variable provided below.

```
In [3]: ## Retrieve API Keys and start OpenAI session

# retrieve keys:
key_file_name = 'config.ini'
path = r'C:\Users\Carlo\OneDrive\Desktop\SSH_KEYS' # use your path to where you
config = configparser.ConfigParser()
config.read(path+'\\'+key_file_name)
api_key = config['openai']['api_key']
os.environ["OPENAI_API_KEY"] = api_key # required by OpenAI agents
fmp_key = config['financialmodelingprep']['api_key']
warnings.filterwarnings('ignore')
```

Please beware `config.ini` has to contain your own API keys obtained from signing up on `OpenAI` and `FMP` using the next format:

```
[openai]
api_key = sk-fsdlfkmsdlkfmsmfmldkmfmsdlfmlksd
```

```
[financialmodelingprep]
api_key = lkj4lkj2lk4jlkjl23j4l2kjlklkj32
```

This can be easily achieved with a text editor such as `Notepad`.

You can check available models for agents in the next cell:

```
In [11]: # LLMs models available for the Agent in OpenAI
models = openai.models.list()
for model in models.to_dict()['data']:
    print(model['id'])
```


gpt-4o-realtime-preview-2024-12-17
gpt-4o-audio-preview-2024-12-17
gpt-4-1106-preview
dall-e-3
dall-e-2
gpt-4o-audio-preview-2024-10-01
gpt-4-turbo-preview
text-embedding-3-small
babbage-002
gpt-4
text-embedding-ada-002
chatgpt-4o-latest
gpt-4o-mini-audio-preview
gpt-4o-audio-preview
o1-preview-2024-09-12
gpt-4o-mini-realtime-preview
gpt-4o-mini-realtime-preview-2024-12-17
gpt-4.1-nano
gpt-3.5-turbo-instruct-0914
gpt-4o-mini-search-preview
gpt-4.1-nano-2025-04-14
gpt-3.5-turbo-16k
gpt-4o-realtime-preview
davinci-002
gpt-3.5-turbo-1106
gpt-4o-search-preview
gpt-3.5-turbo-instruct
gpt-3.5-turbo
o3-mini-2025-01-31
gpt-4o-mini-search-preview-2025-03-11
gpt-4-0125-preview
gpt-4o-2024-11-20
gpt-4o-2024-05-13
text-embedding-3-large
o1-2024-12-17
o1
o1-preview
gpt-4-0613
o1-mini
gpt-4o-mini-tts
o1-pro
gpt-4o-transcribe
gpt-4.5-preview
o1-pro-2025-03-19
gpt-4.5-preview-2025-02-27
gpt-4o-search-preview-2025-03-11
omni-moderation-2024-09-26
gpt-image-1
o1-mini-2024-09-12
tts-1-hd
gpt-4o
tts-1-hd-1106
gpt-4o-2024-08-06
gpt-4o-mini-2024-07-18
gpt-4.1-mini
gpt-4o-mini
gpt-4o-mini-audio-preview-2024-12-17
gpt-3.5-turbo-0125
gpt-4-turbo
tts-1

```

gpt-4-turbo-2024-04-09
tts-1-1106
gpt-4o-realtime-preview-2024-10-01
gpt-4o-mini-transcribe
gpt-4.1-mini-2025-04-14
o3-mini
gpt-4.1
whisper-1
gpt-4.1-2025-04-14
omni-moderation-latest
o4-mini-2025-04-16
o4-mini
codex-mini-latest

```

OpenAI SDK allows to use third party models as well so you can check [this link](#) if you are interested.

2. Single Agent Intro

OpenAI has recently launched a powerful new OpenAI Agents SDK designed to help developers build and manage multi-agent workflows, significantly advancing beyond last year's experimental Swarm SDK. This updated toolkit introduces several key features:

- **Agents:** Easily configurable language models with clear instructions and integrated tools, including web search, file search, and system access.
- **Handoffs:** Seamless control transfer between agents. Unlike Swarm, which required manual method definitions, this SDK enables intelligent, automated transitions.
- **Guardrails:** Customizable input and output validation to ensure safety and reliability across agent interactions.
- **Tracing & Observability:** Visual tools for debugging and performance tuning. The OpenAI Dashboard provides detailed logs and execution traces, giving a transparent view of agent calls and intermediate outputs.

To install OpenAI agent-specific library:

```
pip install openai-agents
```

A Single Agent system configured with:

- `instructions` : also known as a developer message or system prompt.
- `model` : which LLM to use, and optional `model_settings` to configure model tuning parameters like temperature, top_p, etc.
- `tools` : Tools that the agent can use to achieve its tasks.

We are going to create a very basic trading assistant agent to help us:

In [104...

```

# 1. Define Tools

@function_tool
def get_stock_company_info(symbol: str) -> dict:
    """
    Fetch company's basic information such as price, CEO name, description, sect

```

```

Returns dictionary with values for the next fields:
'symbol', 'price', 'beta', 'volAvg', 'mktCap', 'lastDiv', 'range',
'changes', 'companyName', 'currency', 'cik', 'isin', 'cusip', 'exchange'
'exchangeShortName', 'industry', 'website', 'description', 'ceo', 'secto
'country', 'fullTimeEmployees', 'phone', 'address', 'city', 'state', 'zi
'dcfDiff', 'dcf', 'image', 'ipoDate', 'defaultImage', 'isEtf', 'isActive
"""
url = f"https://financialmodelingprep.com/api/v3/profile/{symbol}?apikey={fir
try:
    response = requests.get(url)
    info = response.json()[0]
    return {
        "symbol": symbol.upper(),
        "price": info['price'],
        "beta": info['beta'],
        "description": info['description'],
        "sector": info['sector'],
        "industry": info['industry'],
        "dcf_valuation": info['dcf']
    }
except (IndexError, KeyError):
    return {"error": f"Could not fetch financials for symbol: {symbol}"}

@function_tool
def get_stock_technical(symbol:str) -> dict:
    """
    Fetches last price, 50d SMA, 200d SMA, RSI and 6-month ROC using yfinance an
    """
    try:
        # Fetch 1 year of daily price data
        df = yf.download(symbol, period="1y", interval="1d", progress=False)

        # Check data validity
        if df.empty or 'Close' not in df.columns:
            return {"error": f"No valid data for symbol: {symbol}"}

        close_series = df['Close'].dropna()
        close_np = close_series.to_numpy(dtype='float64').flatten() # Ensure TAL

        # Ensure enough data
        if len(close_series) < 200:
            return {"error": f"Not enough data to compute indicators for {symbol}"}

        # Compute indicators
        sma_50 = talib.SMA(close_np, timeperiod=50)
        sma_200 = talib.SMA(close_np, timeperiod=200)
        rsi = talib.RSI(close_np, timeperiod=14)

        # Extract the most recent values
        latest_sma_50 = sma_50[-1]
        latest_sma_200 = sma_200[-1]
        latest_rsi = rsi[-1]
        last_price = close_np[-1]
        roc_6m = close_np[-1]/close_np[-21*6] - 1 # 6-month price momentum

        # Check for NaNs
        if np.isnan(latest_sma_50) or np.isnan(latest_sma_200) or np.isnan(lates
            return {"error": f"Indicator values not ready – possible NaNs at the

```

```

    return {
        "symbol": symbol.upper(),
        "last_price": round(last_price, 2),
        "SMA_50d": round(latest_sma_50, 2),
        "SMA_200d": round(latest_sma_200, 2),
        "RSI": round(latest_rsi, 2),
        "6_month_price_momentum": round(roc_6m, 2)
    }

except Exception as e:
    return {"error": f"Unhandled error for symbol {symbol}: {str(e)}"}

```

```

In [ ]: # 2. Define Basic Agent
trading_assistant = Agent(
    name="trading_assistant",
    instructions="""
You are a stock trading assistant. You should act like a quantitative trading as

Your responsibilities are:
- Retrieve and summarize key information about a company's stock using only the
- Provide concise, relevant trading insights based strictly on the retrieved data
- Provide BUY, SELL, or HOLD recommendation if requested.

Rules:
- Always use tools to obtain real-time data or the provided input data. Do not guess
- Do not include disclaimers or additional context unless explicitly requested.
- Keep your output concise and focused – avoid verbosity, off-topic elaboration.
- If a tool fails or returns no data, clearly state this and do not make assumptions

Example response formats:
Query: What is the valuation of XYZ?
Response: "XYZ is currently trading at $125. Its DCF is $225, indicating significant undervaluation."
Query: What is the situation of ticker XYZ? (XYZ ticker incorrect)
Response: "Unable to retrieve data for ticker 'XYZ'. Please check the symbol and try again."
Query: What is your policy on EU GDPR regulation?
Response: "Unable to answer non-investment questions."

""",
    tools=[
        get_stock_company_info,
        get_stock_technical
    ],
    model = "gpt-4o" # "gpt-4o-mini" for smaller model or any other available supported model
)

```

```

In [ ]: # 3 Simulate Feed: this code simulates users (e.g. human analysts) using concurrent queries

async def main():
    output = [] # store each query answer
    queries = [
        "What's the price trend of NVDA?", # investment question
        "What's your view on BTC?", # crypto question
        "What's the valuation of Nvidia?", # investment question
        "What are the implications of EU GDPR for an asset manager?", # regulatory question
        "What's the market sensitivity of NVDA?", # investment question
        "What is a better investment NVDA or AMD?", # investment question
        "What is life?" # non-investment question
    ]
    for i, query in enumerate(queries):
        print(f'Q_{i+1}: {query}')
        result = await Runner.run(trading_assistant, query)

```

```
print(f'A:{result.final_output}')
output.append(result)
print("\n", 175*"-","\n")
return queries, output
```

In [107...

```
# 4 . Execute Workflow Simulation:
try:
    queries, result_list = await main()
except RuntimeError:
    asyncio.run(main())
```

Q_1: What's the price trend of NVDA?

A:NVIDIA Corporation (NVDA) is currently trading at \$135.57. Here's a brief analysis of its price trend:

- **50-day SMA**: \$113.13
- **200-day SMA**: \$125.57
- **RSI**: 73.04 (Overbought)
- **6-month Price Momentum**: -0.08

****Insights:****

- The stock is trading above both its 50-day and 200-day SMAs, indicating a near-term uptrend.
- The RSI of 73.04 suggests that the stock may be overbought, which could lead to a potential price correction or consolidation.
- The 6-month price momentum indicates a very slight negative trend over this period.

Strategically, the stock is trading slightly below its DCF valuation of \$144.72, which might suggest potential undervaluation in the long term.

Q_2: What's your view on BTC?

A:I don't have tools to provide information on cryptocurrencies like Bitcoin. You might want to check financial news sites or cryptocurrency exchanges for real-time data and analysis.

Q_3: What's the valuation of Nvidia?

A:Nvidia (NVDA) is currently trading at \$135.57. The Discounted Cash Flow (DCF) valuation is approximately \$144.72, suggesting that the stock is slightly undervalued.

****Technical Indicators:****

- 50-Day SMA: \$113.13
- 200-Day SMA: \$125.57
- RSI: 73.04 (Indicating overbought conditions)
- 6-Month Price Momentum: -0.08

Given the technical and valuation metrics, Nvidia appears slightly undervalued with overbought conditions according to RSI. Adjustments based on market trends and RSI behavior may be considered for trading strategy.

Q_4: What are the implications of EU GDPR for an asset manager?

A:"Unable to answer non-investment questions."

Q_5: What's the market sensitivity of NVDA?

A:NVIDIA Corporation (NVDA) is trading at \$135.57. Here's a summary of its market sensitivity:

- **Beta**: 2.114, indicating higher volatility compared to the market.
- **RSI**: 73.04, suggesting the stock is currently overbought.
- **50-day SMA**: \$113.13
- **200-day SMA**: \$125.57
- **6-month Price Momentum (ROC)**: -0.08, showing a slight downward trend in price momentum.
- **DCF Valuation**: \$144.72, indicating potential undervaluation relative to its intrinsic value.

Overall, NVDA is characterized by high market sensitivity and current overbought conditions.

Q_6: What is a better investment NVDA or AMD?

A:### NVIDIA Corporation (NVDA)

- **Current Price**: \$135.57
- **DCF Valuation**: \$144.72
- **50-day SMA**: \$113.13
- **200-day SMA**: \$125.57
- **RSI**: 73.04 (Overbought)
- **6-Month Price Momentum**: -0.08
- **Beta**: 2.114

Company Overview: NVIDIA is a leader in graphics processing units (GPUs) and AI solutions. It operates in gaming, data centers, automotive, and more.

Advanced Micro Devices, Inc. (AMD)

- **Current Price**: \$114.74
- **DCF Valuation**: \$53.97
- **50-day SMA**: \$99.84
- **200-day SMA**: \$126.92
- **RSI**: 65.28
- **6-Month Price Momentum**: -0.17
- **Beta**: 1.968

Company Overview: AMD focuses on x86 microprocessors, GPUs, and developing technology for game consoles and embedded systems.

Investment Insights:

- **NVDA** is trading above both its 50-day and 200-day SMAs, indicating a strong upward trend. However, its RSI suggests it may be overbought.
- **AMD** is under its 200-day SMA, and slightly above the 50-day SMA. The RSI indicates it's approaching the overbought territory.

Recommendation:

- **NVDA** appears fundamentally overvalued with a potential short-term price correction due to its RSI level.
- **AMD** appears overvalued based on DCF, and it is also nearing the overbought range.

Given these data points, if you favor momentum and technical upward trends, NVDA may currently present a stronger case. However, be mindful of the overbought RSI, signaling caution.

Q_7: What is life?

A:"Unable to answer non-investment questions."


```
In [109... for i, result in enumerate(result_list):  
             print(f'Q_{i+1}: {queries[i]}')  
             print(result.final_output)  
             print("\n", 175*"-", "\n")
```


Q_1: What's the price trend of NVDA?

NVIDIA Corporation (NVDA) is currently trading at \$135.57. Here's a brief analysis of its price trend:

- **50-day SMA**: \$113.13
- **200-day SMA**: \$125.57
- **RSI**: 73.04 (Overbought)
- **6-month Price Momentum**: -0.08

****Insights:****

- The stock is trading above both its 50-day and 200-day SMAs, indicating a near-term uptrend.
- The RSI of 73.04 suggests that the stock may be overbought, which could lead to a potential price correction or consolidation.
- The 6-month price momentum indicates a very slight negative trend over this period.

Strategically, the stock is trading slightly below its DCF valuation of \$144.72, which might suggest potential undervaluation in the long term.

Q_2: What's your view on BTC?

I don't have tools to provide information on cryptocurrencies like Bitcoin. You might want to check financial news sites or cryptocurrency exchanges for real-time data and analysis.

Q_3: What's the valuation of Nvidia?

Nvidia (NVDA) is currently trading at \$135.57. The Discounted Cash Flow (DCF) valuation is approximately \$144.72, suggesting that the stock is slightly undervalued.

****Technical Indicators:****

- 50-Day SMA: \$113.13
- 200-Day SMA: \$125.57
- RSI: 73.04 (Indicating overbought conditions)
- 6-Month Price Momentum: -0.08

Given the technical and valuation metrics, Nvidia appears slightly undervalued with overbought conditions according to RSI. Adjustments based on market trends and RSI behavior may be considered for trading strategy.

Q_4: What are the implications of EU GDPR for an asset manager?

"Unable to answer non-investment questions."

Q_5: What's the market sensitivity of NVDA?

NVIDIA Corporation (NVDA) is trading at \$135.57. Here's a summary of its market sensitivity:

- **Beta**: 2.114, indicating higher volatility compared to the market.
- **RSI**: 73.04, suggesting the stock is currently overbought.
- **50-day SMA**: \$113.13
- **200-day SMA**: \$125.57
- **6-month Price Momentum (ROC)**: -0.08, showing a slight downward trend in price momentum.
- **DCF Valuation**: \$144.72, indicating potential undervaluation relative to its intrinsic value.

Overall, NVDA is characterized by high market sensitivity and current overbought conditions.

Q_6: What is a better investment NVDA or AMD?

NVIDIA Corporation (NVDA)

- **Current Price**: \$135.57
- **DCF Valuation**: \$144.72
- **50-day SMA**: \$113.13
- **200-day SMA**: \$125.57
- **RSI**: 73.04 (Overbought)
- **6-Month Price Momentum**: -0.08
- **Beta**: 2.114

Company Overview: NVIDIA is a leader in graphics processing units (GPUs) and AI solutions. It operates in gaming, data centers, automotive, and more.

Advanced Micro Devices, Inc. (AMD)

- **Current Price**: \$114.74
- **DCF Valuation**: \$53.97
- **50-day SMA**: \$99.84
- **200-day SMA**: \$126.92
- **RSI**: 65.28
- **6-Month Price Momentum**: -0.17
- **Beta**: 1.968

Company Overview: AMD focuses on x86 microprocessors, GPUs, and developing technology for game consoles and embedded systems.

Investment Insights:

- **NVDA** is trading above both its 50-day and 200-day SMAs, indicating a strong upward trend. However, its RSI suggests it may be overbought.
- **AMD** is under its 200-day SMA, and slightly above the 50-day SMA. The RSI indicates it's approaching the overbought territory.

Recommendation:

- **NVDA** appears fundamentally overvalued with a potential short-term price correction due to its RSI level.
- **AMD** appears overvalued based on DCF, and it is also nearing the overbought range.

Given these data points, if you favor momentum and technical upward trends, NVDA may currently present a stronger case. However, be mindful of the overbought RSI, signaling caution.

 Q_7: What is life?

"Unable to answer non-investment questions."

The answers are far from perfect but it's a good start.

We can dig each answer result object further for more information:

```
In [110... for i, result in enumerate(result_list):
    print(f'Q1_{i+1}: {queries[i]}')
    print("\n", 175*"#", "\n")
    for item in result.new_items[:]:
        if type(item) == items.HandoffCallItem:
            print("HandoffCallItem")
            print(item.agent.name)
            print(item.agent.instructions)
            print(item.raw_item.name)
        if type(item) == items.MessageOutputItem:
            print("MessageOutputItem")
            print(item.raw_item.content[0].text)
        if type(item) == items.ToolCallItem:
            print("ToolCallItem")
            print(item.agent.name)
        if type(item) == items.ToolCallOutputItem or type(item) == items.Handoff
            print("ToolCallOutputItem or HandoffOutputItem")
            print(item.raw_item['output'])
    print("\n", 175*"-", "\n")
```

Q1_1: What's the price trend of NVDA?

```
#####  
#####  
#####
```

ToolCallItem
trading_assistant

```
-----  
-----  
-----
```

ToolCallItem
trading_assistant

```
-----  
-----  
-----
```

ToolCallOutputItem or HandoffOutputItem
{'symbol': 'NVDA', 'last_price': 135.57, 'SMA_50d': 113.13, 'SMA_200d': 125.57,
'RSI': 73.04, '6_month_price_momentum': -0.08}

```
-----  
-----  
-----
```

ToolCallOutputItem or HandoffOutputItem
{'symbol': 'NVDA', 'price': 135.57, 'beta': 2.114, 'description': "NVIDIA Corporation provides graphics, and compute and networking solutions in the United States, Taiwan, China, and internationally. The company's Graphics segment offers GeForce GPUs for gaming and PCs, the GeForce NOW game streaming service and related infrastructure, and solutions for gaming platforms; Quadro/NVIDIA RTX GPUs for enterprise workstation graphics; vGPU software for cloud-based visual and virtual computing; automotive platforms for infotainment systems; and Omniverse software for building 3D designs and virtual worlds. Its Compute & Networking segment provides Data Center platforms and systems for AI, HPC, and accelerated computing; Mellanox networking and interconnect solutions; automotive AI Cockpit, autonomous driving development agreements, and autonomous vehicle solutions; cryptocurrency mining processors; Jetson for robotics and other embedded platforms; and NVIDIA AI Enterprise and other software. The company's products are used in gaming, professional visualization, datacenter, and automotive markets. NVIDIA Corporation sells its products to original equipment manufacturers, original device manufacturers, system builders, add-in board manufacturers, retailers/distributors, independent software vendors, Internet and cloud service providers, automotive manufacturers and tier-1 automotive suppliers, mapping companies, start-ups, and other ecosystem participants. It has a strategic collaboration with Kroger Co. NVIDIA Corporation was incorporated in 1993 and is headquartered in Santa Clara, California.", 'sector': 'Technology', 'industry': 'Semiconductors', 'dcf_valuation': 144.72005260473833}

```
-----  
-----  
-----
```

MessageOutputItem
NVIDIA Corporation (NVDA) is currently trading at \$135.57. Here's a brief analysis of its price trend:

- **50-day SMA**: \$113.13
- **200-day SMA**: \$125.57
- **RSI**: 73.04 (Overbought)
- **6-month Price Momentum**: -0.08

****Insights:****

- The stock is trading above both its 50-day and 200-day SMAs, indicating a near-term uptrend.
- The RSI of 73.04 suggests that the stock may be overbought, which could lead to a potential price correction or consolidation.
- The 6-month price momentum indicates a very slight negative trend over this period.

Strategically, the stock is trading slightly below its DCF valuation of \$144.72, which might suggest potential undervaluation in the long term.

Q1_2: What's your view on BTC?

#####

MessageOutputItem

I don't have tools to provide information on cryptocurrencies like Bitcoin. You might want to check financial news sites or cryptocurrency exchanges for real-time data and analysis.

Q1_3: What's the valuation of Nvidia?

#####

ToolCallItem

trading_assistant

ToolCallItem

trading_assistant

ToolCallOutputItem or HandoffOutputItem

{'symbol': 'NVDA', 'price': 135.57, 'beta': 2.114, 'description': "NVIDIA Corporation provides graphics, and compute and networking solutions in the United States, Taiwan, China, and internationally. The company's Graphics segment offers GeForce

orce GPUs for gaming and PCs, the GeForce NOW game streaming service and related infrastructure, and solutions for gaming platforms; Quadro/NVIDIA RTX GPUs for enterprise workstation graphics; vGPU software for cloud-based visual and virtual computing; automotive platforms for infotainment systems; and Omniverse software for building 3D designs and virtual worlds. Its Compute & Networking segment provides Data Center platforms and systems for AI, HPC, and accelerated computing; Mellanox networking and interconnect solutions; automotive AI Cockpit, autonomous driving development agreements, and autonomous vehicle solutions; cryptocurrency mining processors; Jetson for robotics and other embedded platforms; and NVIDIA AI Enterprise and other software. The company's products are used in gaming, professional visualization, datacenter, and automotive markets. NVIDIA Corporation sells its products to original equipment manufacturers, original device manufacturers, system builders, add-in board manufacturers, retailers/distributors, independent software vendors, Internet and cloud service providers, automotive manufacturers and tier-1 automotive suppliers, mapping companies, start-ups, and other ecosystem participants. It has a strategic collaboration with Kroger Co. NVIDIA Corporation was incorporated in 1993 and is headquartered in Santa Clara, California.", 'sector': 'Technology', 'industry': 'Semiconductors', 'dcf_valuation': 144.72005260473833}

ToolCallOutputItem or HandoffOutputItem

```
{'symbol': 'NVDA', 'last_price': 135.57, 'SMA_50d': 113.13, 'SMA_200d': 125.57, 'RSI': 73.04, '6_month_price_momentum': -0.08}
```


MessageOutputItem

Nvidia (NVDA) is currently trading at \$135.57. The Discounted Cash Flow (DCF) valuation is approximately \$144.72, suggesting that the stock is slightly undervalued.

****Technical Indicators:****

- 50-Day SMA: \$113.13
- 200-Day SMA: \$125.57
- RSI: 73.04 (Indicating overbought conditions)
- 6-Month Price Momentum: -0.08

Given the technical and valuation metrics, Nvidia appears slightly undervalued with overbought conditions according to RSI. Adjustments based on market trends and RSI behavior may be considered for trading strategy.

Q1_4: What are the implications of EU GDPR for an asset manager?

#####

MessageOutputItem

"Unable to answer non-investment questions."

Q1_5: What's the market sensitivity of NVDA?

#####

ToolCallItem
trading_assistant

ToolCallItem
trading_assistant

ToolCallOutputItem or HandoffOutputItem
{'symbol': 'NVDA', 'last_price': 135.57, 'SMA_50d': 113.13, 'SMA_200d': 125.57,
'RSI': 73.04, '6_month_price_momentum': -0.08}

ToolCallOutputItem or HandoffOutputItem
{'symbol': 'NVDA', 'price': 135.57, 'beta': 2.114, 'description': "NVIDIA Corpora
tion provides graphics, and compute and networking solutions in the United State
s, Taiwan, China, and internationally. The company's Graphics segment offers GeFo
rce GPUs for gaming and PCs, the GeForce NOW game streaming service and related i
nfrastructure, and solutions for gaming platforms; Quadro/NVIDIA RTX GPUs for ent
erprise workstation graphics; vGPU software for cloud-based visual and virtual co
mputing; automotive platforms for infotainment systems; and Omniverse software fo
r building 3D designs and virtual worlds. Its Compute & Networking segment provid
es Data Center platforms and systems for AI, HPC, and accelerated computing; Mell
anox networking and interconnect solutions; automotive AI Cockpit, autonomous dri
ving development agreements, and autonomous vehicle solutions; cryptocurrency min
ing processors; Jetson for robotics and other embedded platforms; and NVIDIA AI E
nterprise and other software. The company's products are used in gaming, professi
onal visualization, datacenter, and automotive markets. NVIDIA Corporation sells
its products to original equipment manufacturers, original device manufacturers,
system builders, add-in board manufacturers, retailers/distributors, independent
software vendors, Internet and cloud service providers, automotive manufacturers
and tier-1 automotive suppliers, mapping companies, start-ups, and other ecosyste
m participants. It has a strategic collaboration with Kroger Co. NVIDIA Corporati
on was incorporated in 1993 and is headquartered in Santa Clara, California.", 's
ector': 'Technology', 'industry': 'Semiconductors', 'dcf_valuation': 144.72005260
473833}

MessageOutputItem

NVIDIA Corporation (NVDA) is trading at \$135.57. Here's a summary of its market sensitivity:

- **Beta**: 2.114, indicating higher volatility compared to the market.
- **RSI**: 73.04, suggesting the stock is currently overbought.
- **50-day SMA**: \$113.13
- **200-day SMA**: \$125.57
- **6-month Price Momentum (ROC)**: -0.08, showing a slight downward trend in price momentum.
- **DCF Valuation**: \$144.72, indicating potential undervaluation relative to its intrinsic value.

Overall, NVDA is characterized by high market sensitivity and current overbought conditions.

Q1_6: What is a better investment NVDA or AMD?

#####

ToolCallItem

trading_assistant

ToolCallItem

trading_assistant

ToolCallItem

trading_assistant

ToolCallItem

trading_assistant

ToolCallOutputItem or HandoffOutputItem

{'symbol': 'NVDA', 'price': 135.57, 'beta': 2.114, 'description': "NVIDIA Corporation provides graphics, and compute and networking solutions in the United States, Taiwan, China, and internationally. The company's Graphics segment offers GeForce GPUs for gaming and PCs, the GeForce NOW game streaming service and related infrastructure, and solutions for gaming platforms; Quadro/NVIDIA RTX GPUs for enterprise and professional markets; Omniverse software for building and operating 3D content; and AI computing solutions for enterprises."}

enterprise workstation graphics; vGPU software for cloud-based visual and virtual computing; automotive platforms for infotainment systems; and Omniverse software for building 3D designs and virtual worlds. Its Compute & Networking segment provides Data Center platforms and systems for AI, HPC, and accelerated computing; Mellanox networking and interconnect solutions; automotive AI Cockpit, autonomous driving development agreements, and autonomous vehicle solutions; cryptocurrency mining processors; Jetson for robotics and other embedded platforms; and NVIDIA AI Enterprise and other software. The company's products are used in gaming, professional visualization, datacenter, and automotive markets. NVIDIA Corporation sells its products to original equipment manufacturers, original device manufacturers, system builders, add-in board manufacturers, retailers/distributors, independent software vendors, Internet and cloud service providers, automotive manufacturers and tier-1 automotive suppliers, mapping companies, start-ups, and other ecosystem participants. It has a strategic collaboration with Kroger Co. NVIDIA Corporation was incorporated in 1993 and is headquartered in Santa Clara, California.", 'sector': 'Technology', 'industry': 'Semiconductors', 'dcf_valuation': 144.72005260473833}

ToolCallOutputItem or HandoffOutputItem

{'symbol': 'AMD', 'price': 114.74, 'beta': 1.968, 'description': 'Advanced Micro Devices, Inc. operates as a semiconductor company worldwide. The company operates in two segments, Computing and Graphics; and Enterprise, Embedded and Semi-Custom. Its products include x86 microprocessors as an accelerated processing unit, chipsets, discrete and integrated graphics processing units (GPUs), data center and professional GPUs, and development services; and server and embedded processors, and semi-custom System-on-Chip (SoC) products, development services, and technology for game consoles. The company provides processors for desktop and notebook personal computers under the AMD Ryzen, AMD Ryzen PRO, Ryzen Threadripper, Ryzen Threadripper PRO, AMD Athlon, AMD Athlon PRO, AMD FX, AMD A-Series, and AMD PRO A-Series processors brands; discrete GPUs for desktop and notebook PCs under the AMD Radeon graphics, AMD Embedded Radeon graphics brands; and professional graphics products under the AMD Radeon Pro and AMD FirePro graphics brands. It also offers Radeon Instinct, Radeon PRO V-series, and AMD Instinct accelerators for servers; chipsets under the AMD trademark; microprocessors for servers under the AMD EPYC; embedded processor solutions under the AMD Athlon, AMD Geode, AMD Ryzen, AMD EPYC, AMD R-Series, and G-Series processors brands; and customer-specific solutions based on AMD CPU, GPU, and multi-media technologies, as well as semi-custom SoC products. It serves original equipment manufacturers, public cloud service providers, original design manufacturers, system integrators, independent distributors, online retailers, and add-in-board manufacturers through its direct sales force, independent distributors, and sales representatives. The company was incorporated in 1969 and is headquartered in Santa Clara, California.', 'sector': 'Technology', 'industry': 'Semiconductors', 'dcf_valuation': 53.96580831266909}

ToolCallOutputItem or HandoffOutputItem

{'symbol': 'NVDA', 'last_price': 135.57, 'SMA_50d': 113.13, 'SMA_200d': 125.57, 'RSI': 73.04, '6_month_price_momentum': -0.08}

ToolCallOutputItem or HandoffOutputItem

```
{'symbol': 'AMD', 'last_price': 114.74, 'SMA_50d': 99.84, 'SMA_200d': 126.92, 'RSI': 65.28, '6_month_price_momentum': -0.17}
```


MessageOutputItem

NVIDIA Corporation (NVDA)

- **Current Price:** \$135.57
- **DCF Valuation:** \$144.72
- **50-day SMA:** \$113.13
- **200-day SMA:** \$125.57
- **RSI:** 73.04 (Overbought)
- **6-Month Price Momentum:** -0.08
- **Beta:** 2.114

Company Overview: NVIDIA is a leader in graphics processing units (GPUs) and AI solutions. It operates in gaming, data centers, automotive, and more.

Advanced Micro Devices, Inc. (AMD)

- **Current Price:** \$114.74
- **DCF Valuation:** \$53.97
- **50-day SMA:** \$99.84
- **200-day SMA:** \$126.92
- **RSI:** 65.28
- **6-Month Price Momentum:** -0.17
- **Beta:** 1.968

Company Overview: AMD focuses on x86 microprocessors, GPUs, and developing technology for game consoles and embedded systems.

Investment Insights:

- **NVDA** is trading above both its 50-day and 200-day SMAs, indicating a strong upward trend. However, its RSI suggests it may be overbought.
- **AMD** is under its 200-day SMA, and slightly above the 50-day SMA. The RSI indicates it's approaching the overbought territory.

Recommendation:

- **NVDA** appears fundamentally overvalued with a potential short-term price correction due to its RSI level.
- **AMD** appears overvalued based on DCF, and it is also nearing the overbought range.

Given these data points, if you favor momentum and technical upward trends, NVDA may currently present a stronger case. However, be mindful of the overbought RSI, signaling caution.

Q1_7: What is life?

#####

MessageOutputItem

"Unable to answer non-investment questions."

The last example is simulating a live feed between humans and our agent, yet we can also launch a live bot with our Agent as well:

```
In [51]: # Create Agent Boot
async def agent_bot():
    print("Hi! I'm your stock trading Assistant. Ask me about any stock. Type 'e'")
    while True:
        user_input = input("\nYou: ")
        if user_input.lower() in ["exit", "quit"]:
            print("Assistant: The discussion is terminated.")
            break
        result = await Runner.run(trading_assistant, user_input)
        print(f'User Q: {user_input}')
        print(f"Assistant: {result.final_output}")
```

Once you launch the bot executing the cell below, an interactive window should appear in your IDE (VSCode, Sublime, Pycharm, etc) to interact with it:

```
In [53]: # A) this only runs in py scripts, not in notebooks:
# if __name__ == "__main__":
#     asyncio.run(agent_bot())

# B) this should work in scripts and notebooks
try:
    await agent_bot()
except RuntimeError:
    asyncio.run(agent_bot())
```

Hi! I'm your stock trading Assistant. Ask me about any stock. Type 'exit' to quit.

User Q: What is your view on MSFT

Assistant: Microsoft Corporation (MSFT) is currently trading at \$458.87.

Technical Indicators:

- **50-day SMA**: \$396.79
- **200-day SMA**: \$413.23
- **RSI**: 78.47 (Overbought)
- **6-Month Price Momentum**: +8%

Valuation:

- **Discounted Cash Flow (DCF) Valuation**: \$353.95

Sector and Industry:

- **Sector**: Technology
- **Industry**: Software - Infrastructure

Summary:

Microsoft shares are trading significantly above both the 50-day and 200-day SMAs, signaling a strong uptrend. The RSI at 78.47 suggests that the stock is in overbought territory, which might indicate potential for a pullback. The current price exceeds the discounted cash flow valuation, suggesting it may be overvalued at present levels.

Recommendation:

Based on the above indicators, consider a **HOLD** strategy if you currently own the stock but be cautious of potential corrections. Wait for a potential pullback before making additional buy entries if you are looking to invest.

User Q: What is your view on GenAI regulation?

Assistant: "Unable to answer non-investment questions."

User Q: What are the problems with UNH?

Assistant: UnitedHealth Group Incorporated (UNH) is facing several technical challenges:

1. **Current Price**: \$315.89
2. **50-day SMA**: \$464.57 (Current price is significantly below this moving average)
3. **200-day SMA**: \$530.16 (Current price is also significantly below this longer-term moving average)
4. **RSI (Relative Strength Index)**: 28.94, indicating the stock is currently oversold.
5. **6-month Price Momentum**: -0.46, suggesting downward pressure over the past six months.

These indicators suggest potential weakness in the stock's current momentum and technical outlook. Consider further analysis to understand underlying issues regarding the company or market sentiment.

User Q: answer

Assistant: Please provide the specific stock ticker symbol or company information you need insights on.

Assistant: The discussion is terminated.

As highlighted above, the Agent is able to:

- Use tools to effectively retrieve stock information such as technical indicator and valuation.
- Able to not answer when the question is out of the investment topic e.g. regulation question.

- Unable to deal with context beyond the tools since it's not able to identify structural issues in `UNH` ticker despite the news [over the last months](#). That said, the good news is that it does not allucinate creating stories.

It's good news that the model does not hallucinate making up things about `UNH`, which minimizes hallucination risk. That said, the Agent is limited to a sandbox and needs to be empowered with more data retrieval tools to be able to read news.

To review what happened during your agent run, navigate to the [Trace viewer in the OpenAI Dashboard](#) to view traces of your agent runs.

3. Multi Agent System Intro

This section introduces a Multi-agent system where a specialized-agent is used a handoff for legal and regulatory questions. In addition, `guardrails`, output type and `run_config` are also introduced.

In [111...

```
import asyncio
import requests
import yfinance as yf
import numpy as np
import pandas as pd
import talib
from agents import (Agent, Runner, FunctionTool, InputGuardrail, GuardrailFunction,
                    handoff, InputGuardrailTripwireTriggered, RunConfig, ModelS
from agents.exceptions import InputGuardrailTripwireTriggered
from agents.extensions import handoff_filters
from pydantic import BaseModel

# ---- 1. Define Tools ----

@function_tool
def get_stock_company_info(symbol: str) -> dict:
    """
    Fetch company's basic information such as price, CEO name, description, sect

    Returns dictionary with values for the next fields:
    'symbol', 'price', 'beta', 'volAvg', 'mktCap', 'lastDiv', 'range',
    'changes', 'companyName', 'currency', 'cik', 'isin', 'cusip', 'exchange'
    'exchangeShortName', 'industry', 'website', 'description', 'ceo', 'secto
    'country', 'fullTimeEmployees', 'phone', 'address', 'city', 'state', 'zi
    'dcfDiff', 'dcf', 'image', 'ipoDate', 'defaultImage', 'isEtf', 'isActive
    """
    url = f"https://financialmodelingprep.com/api/v3/profile/{symbol}?apikey={fr
    try:
        response = requests.get(url)
        info = response.json()[0]
        return {
            "symbol": symbol.upper(),
            "price": info['price'],
            "beta": info['beta'],
            "description": info['description'],
            "sector": info['sector'],
            "industry": info['industry'],
```

```

        "dcf_valuation": info['dcf']
    }
except (IndexError, KeyError):
    return {"error": f"Could not fetch financials for symbol: {symbol}"}

@function_tool
def get_stock_technical(symbol:str) -> dict:
    """
    Fetches last price, 50d SMA, 200d SMA, RSI and 6-month ROC using yfinance and talib
    """
    try:
        # Fetch 1 year of daily price data
        df = yf.download(symbol, period="1y", interval="1d", progress=False)

        # Check data validity
        if df.empty or 'Close' not in df.columns:
            return {"error": f"No valid data for symbol: {symbol}"}

        close_series = df['Close'].dropna()
        close_np = close_series.to_numpy(dtype='float64').flatten() # Ensure TALIB compatible

        # Ensure enough data
        if len(close_series) < 200:
            return {"error": f"Not enough data to compute indicators for {symbol}"}

        # Compute indicators
        sma_50 = talib.SMA(close_np, timeperiod=50)
        sma_200 = talib.SMA(close_np, timeperiod=200)
        rsi = talib.RSI(close_np, timeperiod=14)

        # Extract the most recent values
        latest_sma_50 = sma_50[-1]
        latest_sma_200 = sma_200[-1]
        latest_rsi = rsi[-1]
        last_price = close_np[-1]
        roc_6m = close_np[-1]/close_np[-21*6] - 1 # 6-month price momentum

        # Check for NaNs
        if np.isnan(latest_sma_50) or np.isnan(latest_sma_200) or np.isnan(latest_rsi):
            return {"error": f"Indicator values not ready – possible NaNs at the end of the period"}

        return {
            "symbol": symbol.upper(),
            "last_price": round(last_price, 2),
            "SMA_50d": round(latest_sma_50, 2),
            "SMA_200d": round(latest_sma_200, 2),
            "RSI": round(latest_rsi, 2),
            "6_month_price_momentum": round(roc_6m, 2)
        }

    except Exception as e:
        return {"error": f"Unhandled error for symbol {symbol}: {str(e)}"}

# ---- 2. Guardrail: block crypto and invalid symbols ----

class GuardrailOutput(BaseModel):
    allow: bool
    reason: str

crypto_keywords = {"bitcoin", "btc", "eth", "ethereum", "crypto", "doge", "solan

```

```

async def reject_invalid_tickers(ctx, agent, input_data):
    input_text = input_data.lower()
    if any(word in input_text for word in crypto_keywords):
        return GuardrailFunctionOutput(
            output_info=GuardrailOutput(allow=False, reason="Crypto queries are
            tripwire_triggered=True
        )
    return GuardrailFunctionOutput(
        output_info=GuardrailOutput(allow=True, reason="OK"),
        tripwire_triggered=False
    )

# ---- 3. Compliance Agent ----

compliance_agent = Agent(
    name="Compliance Agent",
    instructions="You respond to questions that require regulatory caution. Do not
)

compliance_handoff = handoff(
    agent=compliance_agent,
    input_filter=handoff_filters.remove_all_tools # erase any previous chat info
)

# ---- 4. Trading Assistant Agent ----

trading_assistant = Agent(
    name="trading_assistant",
    instructions="""
You are a stock trading assistant. You should act like a quantitative trading as

Your Responsibilities:
- Use tools to fetch and summarize company stock data.
- Report results concisely, in markdown tables where appropriate.
- Only use retrieved data – never guess.
- Escalate to Compliance Agent if the question requests legal or regulatory advice.
- Provide BUY, SELL, or HOLD recommendation if requested.

You must follow the next rules and constraints:
- Always use tools to obtain real-time data or the provided input data. Do not guess.
- Do not include disclaimers or additional context unless explicitly requested.
- Keep your output concise and focused – avoid verbosity, off-topic elaboration.
- If a tool fails or returns no data, clearly state this and do not make assumptions.
- Do not provide any answer to those queries that are non-investment related.

You must use markdown format:
- Use bold for headers
- Use code formatting for ticker symbols
- Use tables for numeric indicators (price, RSI, SMAs)

""",
    tools=[get_stock_company_info, get_stock_technical],
    input_guardrails=[InputGuardrail(guardrail_function=reject_invalid_tickers)],
    handoffs=[compliance_handoff],
    handoff_description="Compliance_agent"
)

```

```

# ---- 5. Workflow Simulation
config = RunConfig(
    model_settings=ModelSettings(
        temperature=0.2          # Lower temp = more focused, less randomness in
    )
)
async def main():
    output = [] # store each query answer
    queries = ["What's the price trend of NVDA?",
               "What's your view on BTC?", # crypto question
               "What's the valuation of Nvidia?",
               "What are the implications of EU GDPR for an asset manager?", # reg
               "What's the market sensitivity of NVDA aka beta?", # investment ques
               "What is a better investment NVDA or AMD?", # investment question
               "What is life?"] # non-investment question
    for i, query in enumerate(queries):
        try:
            print(f'Q_{i+1}: {query}')
            result = await Runner.run(trading_assistant, query, run_config=config)
            print(f'A:{result.final_output}')
            output.append(result)
        except InputGuardrailTripwireTriggered as e:
            reason = e.guardrail_result.output.output_info.reason
            print(f"Guardrail blocked input: {reason}")
            continue
        except Exception as e:
            print(f"Unexpected error: {str(e)}")
            continue
    print("\n", 175*" ", "\n")
    return queries, output

```

```

In [112... # Execute Workflow Simulation:
try:
    queries, result_list = await main()
except RuntimeError:
    asyncio.run(main())

```


Q_1: What's the price trend of NVDA?

A:**NVDA Price Trend**

Indicator	Value
Last Price	\$135.57
50-Day SMA	\$113.13
200-Day SMA	\$125.57
RSI	73.04
6-Month Price Momentum	-0.08

- **Trend Analysis**:

- The current price is above both the 50-day and 200-day SMAs, indicating a potential upward trend.
- The RSI is above 70, suggesting the stock may be overbought.
- The 6-month price momentum is slightly negative, indicating a recent decline in price momentum.

Q_2: What's your view on BTC?

Guardrail blocked input: Crypto queries are not supported.

Q_3: What's the valuation of Nvidia?

A:**Nvidia Corporation (`NVDA`) Valuation**

- **Current Price:** \$135.57
- **DCF Valuation:** \$144.72

Company Overview:

NVIDIA Corporation provides graphics, compute, and networking solutions globally. It operates in two segments:

- **Graphics:** Includes GeForce GPUs for gaming and PCs, Quadro/NVIDIA RTX GPUs for enterprise workstation graphics, and more.
- **Compute & Networking:** Offers Data Center platforms, Mellanox networking solutions, and automotive AI solutions.

Sector: Technology

Industry: Semiconductors

NVIDIA is headquartered in Santa Clara, California, and was incorporated in 1993.

Q_4: What are the implications of EU GDPR for an asset manager?

A:The EU General Data Protection Regulation (GDPR) has significant implications for asset managers, primarily concerning how they handle personal data. Here are some key considerations:

1. **Data Protection Principles:** Asset managers must adhere to principles such as lawfulness, fairness, transparency, purpose limitation, data minimization, accuracy, storage limitation, integrity, and confidentiality.
2. **Lawful Basis for Processing:** They need to establish a lawful basis for processing personal data, such as consent, contract necessity, legal obligation, vital interests, public task, or legitimate interests.

3. **Data Subject Rights**: Asset managers must facilitate and respect data subject rights, including the right to access, rectification, erasure, restriction of processing, data portability, and objection.
4. **Data Protection Officer (DPO)**: Depending on the scale and nature of data processing, appointing a DPO might be necessary to oversee compliance.
5. **Data Breach Notification**: They are required to report certain types of data breaches to the relevant supervisory authority within 72 hours and, in some cases, to the affected individuals.
6. **Data Processing Agreements**: Contracts with third-party processors must include specific terms to ensure GDPR compliance.
7. **International Data Transfers**: Transfers of personal data outside the EU must comply with GDPR requirements, using mechanisms like Standard Contractual Clauses or adequacy decisions.
8. **Privacy by Design and Default**: Implementing appropriate technical and organizational measures to ensure data protection principles are integrated into processing activities.
9. **Accountability and Governance**: Asset managers must demonstrate compliance through documentation, policies, and regular audits.
10. **Penalties**: Non-compliance can result in significant fines, up to €20 million or 4% of annual global turnover, whichever is higher.

Asset managers should conduct thorough assessments and implement robust data protection strategies to ensure compliance with GDPR.

Q_5: What's the market sensitivity of NVDA aka beta?

A:**Market Sensitivity of NVIDIA (`NVDA`)**

- **Beta:** 2.114

This indicates that NVIDIA's stock is more volatile than the market. A beta greater than 1 suggests that the stock tends to move more than the market.

Q_6: What is a better investment NVDA or AMD?

A:**Investment Comparison: NVIDIA (`NVDA`) vs. AMD (`AMD`)**

Company Overview

- **NVIDIA (`NVDA`)**
 - **Sector:** Technology
 - **Industry:** Semiconductors
 - **Description:** Provides graphics, compute, and networking solutions.
 - **DCF Valuation:** \$144.72
- **AMD (`AMD`)**
 - **Sector:** Technology

- **Industry:** Semiconductors
- **Description:** Operates as a semiconductor company with a focus on microprocessors and GPUs.
- **DCF Valuation:** \$53.97

Technical Indicators

Indicator	NVIDIA (NVDA)	AMD (AMD)
Last Price	\$135.57	\$114.74
50-Day SMA	\$113.13	\$99.84
200-Day SMA	\$125.57	\$126.92
RSI	73.04	65.28
6-Month ROC	-0.08	-0.17

Analysis

- **NVIDIA (NVDA)** is trading above both its 50-day and 200-day SMAs, indicating a strong upward trend. The RSI of 73.04 suggests it is overbought.
- **AMD (AMD)** is trading above its 50-day SMA but below its 200-day SMA, indicating mixed signals. The RSI of 65.28 suggests it is approaching overbought territory.

Recommendation

- **NVIDIA (NVDA)**: HOLD, as it is overbought but showing strong momentum.
- **AMD (AMD)**: HOLD, as it is approaching overbought levels with mixed trend signals.

Both companies are strong players in the semiconductor industry, but current technical indicators suggest caution due to overbought conditions.

Q_7: What is life?

A:I'm here to assist with stock trading information. If you have questions about stocks or investments, feel free to ask!

Reproducing output:

```
In [114... for i, result in enumerate(result_list):
    print(f'Q_{i+1}: {queries[i]}')
    print(result.final_output)
    print("\n", 175*"-","n")
```

Q_1: What's the price trend of NVDA?

****NVDA Price Trend****

Indicator	Value
Last Price	\$135.57
50-Day SMA	\$113.13
200-Day SMA	\$125.57
RSI	73.04
6-Month Price Momentum	-0.08

- ****Trend Analysis****:

- The current price is above both the 50-day and 200-day SMAs, indicating a potential upward trend.
- The RSI is above 70, suggesting the stock may be overbought.
- The 6-month price momentum is slightly negative, indicating a recent decline in price momentum.

Q_2: What's your view on BTC?

****Nvidia Corporation (`NVDA`) Valuation****

- ****Current Price:**** \$135.57
- ****DCF Valuation:**** \$144.72

****Company Overview:****

NVIDIA Corporation provides graphics, compute, and networking solutions globally. It operates in two segments:

- ****Graphics:**** Includes GeForce GPUs for gaming and PCs, Quadro/NVIDIA RTX GPUs for enterprise workstation graphics, and more.
- ****Compute & Networking:**** Offers Data Center platforms, Mellanox networking solutions, and automotive AI solutions.

****Sector:**** Technology

****Industry:**** Semiconductors

NVIDIA is headquartered in Santa Clara, California, and was incorporated in 1993.

Q_3: What's the valuation of Nvidia?

The EU General Data Protection Regulation (GDPR) has significant implications for asset managers, primarily concerning how they handle personal data. Here are some key considerations:

1. ****Data Protection Principles****: Asset managers must adhere to principles such as lawfulness, fairness, transparency, purpose limitation, data minimization, accuracy, storage limitation, integrity, and confidentiality.
2. ****Lawful Basis for Processing****: They need to establish a lawful basis for processing personal data, such as consent, contract necessity, legal obligation, vital interests, public task, or legitimate interests.
3. ****Data Subject Rights****: Asset managers must facilitate and respect data subjects' rights.

ct rights, including the right to access, rectification, erasure, restriction of processing, data portability, and objection.

4. **Data Protection Officer (DPO)**: Depending on the scale and nature of data processing, appointing a DPO might be necessary to oversee compliance.

5. **Data Breach Notification**: They are required to report certain types of data breaches to the relevant supervisory authority within 72 hours and, in some cases, to the affected individuals.

6. **Data Processing Agreements**: Contracts with third-party processors must include specific terms to ensure GDPR compliance.

7. **International Data Transfers**: Transfers of personal data outside the EU must comply with GDPR requirements, using mechanisms like Standard Contractual Clauses or adequacy decisions.

8. **Privacy by Design and Default**: Implementing appropriate technical and organizational measures to ensure data protection principles are integrated into processing activities.

9. **Accountability and Governance**: Asset managers must demonstrate compliance through documentation, policies, and regular audits.

10. **Penalties**: Non-compliance can result in significant fines, up to €20 million or 4% of annual global turnover, whichever is higher.

Asset managers should conduct thorough assessments and implement robust data protection strategies to ensure compliance with GDPR.

Q_4: What are the implications of EU GDPR for an asset manager?

Market Sensitivity of NVIDIA (`NVDA`)

- **Beta:** 2.114

This indicates that NVIDIA's stock is more volatile than the market. A beta greater than 1 suggests that the stock tends to move more than the market.

Q_5: What's the market sensitivity of NVDA aka beta?

Investment Comparison: NVIDIA (`NVDA`) vs. AMD (`AMD`)

Company Overview

- **NVIDIA (`NVDA`)**

- **Sector:** Technology

- **Industry:** Semiconductors

- **Description:** Provides graphics, compute, and networking solutions.

- **DCF Valuation:** \$144.72

- **AMD (`AMD`)**

- **Sector:** Technology

- **Industry:** Semiconductors

- **Description:** Operates as a semiconductor company with a focus on micropro

processors and GPUs.

- **DCF Valuation:** \$53.97

Technical Indicators

Indicator	NVIDIA (NVDA)	AMD (AMD)
Last Price	\$135.57	\$114.74
50-Day SMA	\$113.13	\$99.84
200-Day SMA	\$125.57	\$126.92
RSI	73.04	65.28
6-Month ROC	-0.08	-0.17

Analysis

- **NVIDIA (NVDA)** is trading above both its 50-day and 200-day SMAs, indicating a strong upward trend. The RSI of 73.04 suggests it is overbought.

- **AMD (AMD)** is trading above its 50-day SMA but below its 200-day SMA, indicating mixed signals. The RSI of 65.28 suggests it is approaching overbought territory.

Recommendation

- **NVIDIA (NVDA):** HOLD, as it is overbought but showing strong momentum.

- **AMD (AMD):** HOLD, as it is approaching overbought levels with mixed trend signals.

Both companies are strong players in the semiconductor industry, but current technical indicators suggest caution due to overbought conditions.

Q_6: What is a better investment NVDA or AMD?

I'm here to assist with stock trading information. If you have questions about stocks or investments, feel free to ask!

Once again, the output is not perfect but starts to resemble to desired outputs.

We can check if the queries are able to trigger the different flags (btc, compliance, etc) using [OpenAI dashboard](#)

A more complex Agent system could be using a Compliance Agent using a fine-tuned compliance-specific model that allows to provide a very specific answer customizable to each organization needs.

Remember we can also trigger this Agent system using a chat bot interactive system:

In [102...

```
async def agent_bot():
    print("Hi! I'm your stock trading Assistant. Ask me about any stock. Type 'e' to exit.")
    while True:
        user_input = input("\nYou: ")
        if user_input.lower() in ["exit", "quit"]:
            print("Assistant: The discussion is terminated.")
```

```
        break
    try:
        result = await Runner.run(trading_assistant, user_input, run_config=
        print(f'Query: {user_input}')
        print(f"Assistant:\n{result.final_output}")
    except InputGuardrailTripwireTriggered as e:
        reason = e.guardrail_result.output.output_info.reason
        print(f"Guardrail blocked input: {reason}")
        continue
    except Exception as e:
        print(f"Unexpected error: {str(e)}")
        continue
```

In [103...

```
# A) this only runs in py scripts, not in notebooks:
# if __name__ == "__main__":
#     asyncio.run(agent_bot())

# B) this should work in scripts and notebooks
try:
    await agent_bot()
except RuntimeError:
    asyncio.run(agent_bot())
```

Hi! I'm your stock trading Assistant. Ask me about any stock. Type 'exit' to quit.

Query: What is your view on politics?

Assistant:

I'm here to assist with stock trading and investment-related queries. If you have any questions about stocks or financial data, feel free to ask!

Query: answer

Assistant:

Please provide a specific query or request related to stock trading or company data, and I'll be happy to assist you.

Query: What is your view on MSFT?

Assistant:

****Microsoft Corporation (`MSFT`) Overview****

- ****Sector****: Technology
- ****Industry****: Software - Infrastructure
- ****Description****: Microsoft develops and supports software, services, devices, and solutions worldwide, with segments in Productivity and Business Processes, Intelligent Cloud, and More Personal Computing.

****Technical Indicators****

Indicator	Value
-----	-----
Last Price	\$458.87
50-Day SMA	\$396.79
200-Day SMA	\$413.23
RSI	78.47
6-Month Momentum	0.08

****Valuation****

- ****DCF Valuation****: \$353.95

****Analysis****

- The current price of `MSFT` is significantly above both the 50-day and 200-day SMAs, indicating a strong upward trend.
- The RSI is at 78.47, suggesting that the stock is in overbought territory.
- The DCF valuation is below the current market price, which may indicate that the stock is overvalued based on discounted cash flow analysis.

****Recommendation****

Given the technical indicators and valuation, the stock appears to be overbought and potentially overvalued. A ****SELL**** recommendation might be appropriate if you are looking to capitalize on current gains, but consider your investment strategy and risk tolerance.

Query: answer

Assistant:

Could you please specify the stock symbol or the information you need?

Query: What are the implications of EU GDPR for wealth managers?

Assistant:

The EU General Data Protection Regulation (GDPR) has significant implications for wealth managers, primarily concerning how they handle personal data. Here are some key points:

1. ****Data Protection Principles****: Wealth managers must adhere to principles such as lawfulness, fairness, transparency, purpose limitation, data minimization, accuracy, storage limitation, integrity, and confidentiality.

2. ****Consent****: They need to obtain clear and explicit consent from clients for data processing, ensuring that clients understand what their data will be used for.
3. ****Data Subject Rights****: Clients have enhanced rights, including access to their data, the right to rectification, erasure (right to be forgotten), and data portability.
4. ****Data Breach Notification****: Wealth managers are required to report certain types of data breaches to the relevant supervisory authority within 72 hours and, in some cases, to the affected individuals.
5. ****Data Protection Officer (DPO)****: Depending on the scale and nature of data processing, they may need to appoint a DPO to oversee compliance.
6. ****Impact Assessments****: They must conduct Data Protection Impact Assessments (DPIAs) for high-risk processing activities.
7. ****Third-party Management****: Wealth managers must ensure that any third-party service providers comply with GDPR standards.
8. ****Record Keeping****: They need to maintain detailed records of data processing activities.
9. ****International Transfers****: Transfers of personal data outside the EU must comply with GDPR requirements, often requiring additional safeguards.

Non-compliance can result in significant fines, making it crucial for wealth managers to integrate GDPR requirements into their operations and client interactions.

Query:

Assistant:

Hello! How can I assist you with stock trading today?

Assistant: The discussion is terminated.

4. Learning Resources

You can continue learning about Agents with the following resources:

- [Citi – Agentic AI Report](#)
- [OpenAI SDK Agents Intro & Documentation](#)
- [Free Course - AI Agents with LangGraph](#)
- [Free Course - Multi-Agents Systems with CrewAI](#)
- [Book - Building Agentic AI Systems. Biswas, Talukdar, 2025](#)