# Financial_AI_Agent_package_from_LlamaIndex

September 1, 2024

## 1 Install Libs

```
[ ]: !pip install llama-index-tools-finance -q
     !pip install llama-index -q
```

```
[3]: from llama_index.tools.finance import FinanceAgentToolSpec
```

The whole code in LlamaIndex repo:

https://github.com/run-llama/llama_index/tree/main/llama-index-integrations/tools/llama-index-tools-finance/llama_index/tools/finance

https://github.com/run-llama/llama_index/blob/main/llama-index-integrations/tools/llama-index-tools-finance/llama_index/tools/finance/base.py

```
[4]: FinanceAgentToolSpec
```

```
[4]: llama_index.tools.finance.base.FinanceAgentToolSpec
```

## 2 Specify API Keys

```
[6]: from google.colab import userdata
     POLYGON_API_KEY = userdata.get('POLYGON_API_KEY')
     FINNHUB_API_KEY = userdata.get('FINNHUB_API_KEY')
     ALPHA_VANTAGE_API_KEY = userdata.get('ALPHAVANTAGE_API_KEY')
     NEWS_API_KEY = userdata.get('NEWS_API_KEY')
     OPENAI_API_KEY = userdata.get('OPENAI_API_KEY')
```

## 3 Various Pre-Configured Tools

```
[13]: tool_spec = FinanceAgentToolSpec(
          POLYGON_API_KEY,
          FINNHUB_API_KEY,
          ALPHA_VANTAGE_API_KEY,
          NEWS_API_KEY
      )
```

```
[12]: tool_spec.spec_functions
```

```
[12]: ['find_similar_companies',
       'get_earnings_history',
       'get_stocks_with_upcoming_earnings',
       'get_current_gainer_stocks',
       'get_current_loser_stocks',
       'get_current_undervalued_growth_stocks',
       'get_current_technology_growth_stocks',
       'get_current_most_traded_stocks',
       'get_current_undervalued_large_cap_stocks',
       'get_current_aggressive_small_cap_stocks',
       'get_trending_finance_news',
       'get_google_trending_searches',
       'get_google_trends_for_query',
       'get_latest_news_for_stock',
       'get_current_stock_price_info']
```

## 4 Create an Agent:

```python
[15]: from llama_index.agent.openai import OpenAIAgent
      from llama_index.llms.openai import OpenAI
```

```python
[16]: GPT_MODEL_NAME = "gpt-4o-mini"

      def create_agent(
          polygon_api_key: str,
          finnhub_api_key: str,
          alpha_vantage_api_key: str,
          newsapi_api_key: str,
          openai_api_key: str,
      ) -> OpenAIAgent:
          tool_spec = FinanceAgentToolSpec(
              polygon_api_key,
              finnhub_api_key,
              alpha_vantage_api_key,
              newsapi_api_key,
          )
          llm = OpenAI(temperature=0, model=GPT_MODEL_NAME, api_key=openai_api_key)
          return OpenAIAgent.from_tools(
              tool_spec.to_tool_list(), llm=llm, verbose=True
          )

      agent = create_agent(
          POLYGON_API_KEY,
          FINNHUB_API_KEY,
```

```
    ALPHA_VANTAGE_API_KEY,
    NEWS_API_KEY,
    OPENAI_API_KEY,
)
```

## 5   Start Chatting

### 5.1   Stock Price

[17]: ```
response = agent.chat("What was the last closing price of amazon?")
```

```
Added user message to memory: What was the last closing price of amazon?
=== Calling Function ===
Calling function: get_current_stock_price_info with args:
{"stock_ticker_symbol":"AMZN"}
Got output: {'Current Price': 178.5, 'High Price of the day': 178.9, 'Low Price
of the day': 172.6, 'Open Price of the day': 172.74, 'Percentage change':
3.7067}
========================
```

### 5.2   Amazon latest news: ==>

This function "get_latest_news_for_stock" returns only NVIDIA news instead of Amazon:

[18]: ```
response = agent.chat("What are the latest news about AMZN?")
```

```
Added user message to memory: What are the latest news about AMZN?
=== Calling Function ===
Calling function: get_latest_news_for_stock with args: {"stock_id":"AMZN"}
Got output: ['Nvidia stock is sinking. Wall Street analysts say it's still a
buy']
========================
```

[25]: ```
response = agent.chat("I was asking news about Amazon and not NVIDIA.")
```

```
Added user message to memory: I was asking news about Amazon and not NVIDIA.
=== Calling Function ===
Calling function: get_latest_news_for_stock with args: {"stock_id":"AMZN"}
Got output: ['Nvidia stock is sinking. Wall Street analysts say it's still a
buy']
========================
```

[26]: ```
response = agent.chat("I was asking news about Amazon and not NVIDIA. What are␣
  ↪the latest news about AMZN?")
```

```
Added user message to memory: I was asking news about Amazon and not NVIDIA.
What are the latest news about AMZN?
=== Calling Function ===
Calling function: get_latest_news_for_stock with args: {"stock_id":"AMZN"}
Got output: ['Nvidia stock is sinking. Wall Street analysts say it's still a
buy']
========================
```

To modify it: First you need to dig into the code and understand how it was built:

```python
[29]: from newsapi import NewsApiClient
      from collections import defaultdict
```

```python
[30]: newsapi = NewsApiClient(api_key=NEWS_API_KEY)
      cat_to_id = defaultdict(list)
      for source in newsapi.get_sources()["sources"]:
          cat_to_id[source["category"]].append(source["id"])
      business_sources = [
              "bloomberg",
              "business-insider",
              "financial-post",
              "fortune",
              "info-money",
              "the-wall-street-journal",
          ]
```

```python
[56]: for source in business_sources:
        assert source in cat_to_id["business"]
      cat_to_id["business"]
```

```
[56]: ['argaam',
       'australian-financial-review',
       'bloomberg',
       'business-insider',
       'business-insider-uk',
       'die-zeit',
       'financial-post',
       'fortune',
       'handelsblatt',
       'il-sole-24-ore',
       'info-money',
       'les-echos',
       'the-wall-street-journal',
       'wirtschafts-woche']
```

I modified the param "page" to "page_size" = 3 to get the first 3 articles

If you put in the query only "AMZN" (ticker) ==> You'll get NVIDIA news

4

If you put Amazon news ==> You'll get Amazon related news

```python
[57]: from datetime import datetime, timedelta
      start_date = (datetime.now() - timedelta(days=7)).strftime("%Y-%m-%d")
      end_date = datetime.now().strftime("%Y-%m-%d")

      articles = newsapi.get_everything(
              q="AMZN",
              sources=",".join(business_sources),
              from_param=start_date,
              to=end_date,
              language="en",
              sort_by="relevancy",
              page_size=3,
          )["articles"]
      articles
```

```
[57]: [{'source': {'id': 'fortune', 'name': 'Fortune'},
        'author': 'Will Daniel',
        'title': 'Nvidia stock is sinking. Wall Street analysts say it's still a buy',
        'description': "Despite concerns about margins and guidance, Wall Street is
      mostly convinced the 'AI revolution' is just getting started, and Nvidia remains
      a buy.",
        'url': 'https://fortune.com/2024/08/29/nvidia-stock-sinking-wall-street-
      analysts-still-buy/',
        'urlToImage': 'https://fortune.com/img-assets/wp-content/uploads/2024/08/Getty
      Images-2155386351-e1724940057818.jpg?resize=1200,600',
        'publishedAt': '2024-08-29T18:34:44Z',
        'content': 'Nvidia turned in yet another stellar earnings report this week,
      but with the chip giant priced for perfection amid the AI boom, the stock was
      still down more than 6% Thursday.\xa0The risk when a stock i… [+6630 chars]'}]
```

```python
[55]: from datetime import datetime, timedelta
      start_date = (datetime.now() - timedelta(days=7)).strftime("%Y-%m-%d")
      end_date = datetime.now().strftime("%Y-%m-%d")

      articles = newsapi.get_everything(
              q="Amazon news",
              sources=",".join(business_sources),
              from_param=start_date,
              to=end_date,
              language="en",
              sort_by="relevancy",
              page_size=3,
          )["articles"]
      articles
```

[55]: [{'source': {'id': 'business-insider', 'name': 'Business Insider'},
       'author': 'Tom Carter',
       'title': 'So, now we know what TV shows Lauren Sánchez and Jeff Bezos binge in
    their spare time',
       'description': "Lauren Sánchez opened up about her and Jeff Bezos' favorite TV
    shows in an interview with People magazine.",
       'url': 'https://www.businessinsider.com/jeff-bezos-lauren-sanchez-share-
    favorite-tv-shows-baby-reindeer-2024-8',
       'urlToImage':
    'https://i.insider.com/66d19cdd1d8d2deb96b79669?width=1200&format=jpeg',
       'publishedAt': '2024-08-30T10:49:06Z',
       'content': "Jeff Bezos and Lauren Sánchez.DREW ANGERER/AFP via Getty
    Images\r\n<ul><li>Lauren Sánchez opened up about her and Jeff Bezos' favorite TV
    shows in an interview with People magazine.</li><li>Sánchez sai… [+1654
    chars]"},
      {'source': {'id': 'business-insider', 'name': 'Business Insider'},
       'author': 'Dan DeFrancesco',
       'title': "The wealthy's new favorite sport is coming for pickleball's crown",
       'description': 'Padel has gained steam this year as a more active alternative
    to the widely popular pickleball.',
       'url': 'https://www.businessinsider.com/padel-rising-sport-wealthy-pickleball-
    competitor-2024-8',
       'urlToImage':
    'https://i.insider.com/66cc7fd71aa2ac29ee340a1b?width=1200&format=jpeg',
       'publishedAt': '2024-08-26T13:17:40Z',
       'content': "Jordan Hart/BI\r\n<ul><li>This post originally appeared in the
    Insider Today newsletter.</li><li>You can sign up for Business Insider's daily
    newsletter here.</li></ul>Welcome back! The summer slowdown… [+8225 chars]"},
      {'source': {'id': 'business-insider', 'name': 'Business Insider'},
       'author': 'Lindsay Dodgson',
       'title': "MrBeast is in a tough spot. But PR experts say an aggressive 'super
    lawyer' isn't the fix he needs.",
       'description': "Crisis management experts say MrBeast going after his critics
    will only further erode trust with his fans, and he's better off admitting any
    mistakes.",
       'url': 'https://www.businessinsider.com/mrbeast-jimmy-donaldson-hiring-
    celebrity-lawyer-wont-help-reputation-experts-2024-8',
       'urlToImage':
    'https://i.insider.com/66cf0e591aa2ac29ee34e3b4?width=1200&format=jpeg',
       'publishedAt': '2024-08-29T13:07:01Z',
       'content': 'Jimmy "MrBeast" Donaldson has hired a lawyer to fight back against
    public critics.Don Arnold/Getty Images\r\n<ul><li>MrBeast has faced backlash
    over people in his circle and conditions on his gameshow.… [+7182 chars]'}]

## 5.3 Trending News

From seekingalpha

```
[62]: response = agent.chat("What are the top 10 trending news?")
```

Added user message to memory: What are the top 10 trending news?
=== Calling Function ===
Calling function: get_trending_finance_news with args: {}
Got output: ['Earnings week ahead: Zscaler, DocuSign, NIO, Broadcom and more',
'Catalyst Watch: August Jobs Report, Intel event, Broadcom earnings, and Costco
sales', 'Intel resolves R2 litigation', 'Heavily shorted stocks are not always
in distress, S3 Partners analysis says', 'Airlines poised to regain altitude
after a tough month', 'Electric vehicle adoption: A disappointment or still on
track to reach a critical mass?', 'Netflix works to improve reality-TV dubbing
to lure more subscribers', 'Macau casino revenue shines in August; dividends
come back into play', 'Notable analyst calls this week: Nvidia, Barrick Gold and
Dollar General among top picks', "CrowdStrike's results prove the worst is
behind it. It's time to buy the stock: HSBC"]
=======================

# 6    Eearnings

It provides the earning history of a ticker:

```
[31]: response = agent.chat("What are the earnings of AMZN on 2024?")
```

Added user message to memory: What are the earnings of AMZN on 2024?
=== Calling Function ===
Calling function: get_earnings_history with args: {"symbol": "AMZN"}
Got output:     Fiscal Date Ending Reported Date Reported EPS Estimated EPS
Surprise  \
0            2024-06-30     2024-08-01         1.26          1.03     0.23
1            2024-03-31     2024-04-30         0.98          0.82     0.16
2            2023-12-31     2024-02-01            1           0.8      0.2
3            2023-09-30     2023-10-26         0.94          0.58     0.36
4            2023-06-30     2023-08-03         0.65          0.35      0.3
..                  ...            ...          ...           ...      ...
104          1998-06-30     1998-07-22        -0.07         -0.07        0
105          1998-03-31     1998-04-27        -0.03         -0.04     0.01
106          1997-12-31     1998-01-22        -0.03         -0.04     0.01
107          1997-09-30     1997-10-27        -0.03         -0.03        0
108          1997-06-30     1997-07-10        -0.02         -0.03     0.01

     Surprise Percentage
0                22.3301
1                19.5122
2                     25
3                 62.069
4                85.7143
```

```
..                    …
104                   0
105                  25
106                  25
107                   0
108             33.3333

[109 rows x 6 columns]
========================

=== Calling Function ===
Calling function: get_earnings_history with args: {"symbol": "AMZN"}
Got output:     Fiscal Date Ending Reported Date Reported EPS Estimated EPS
Surprise  \
0              2024-06-30    2024-08-01         1.26          1.03      0.23
1              2024-03-31    2024-04-30         0.98          0.82      0.16
2              2023-12-31    2024-02-01            1           0.8       0.2
3              2023-09-30    2023-10-26         0.94          0.58      0.36
4              2023-06-30    2023-08-03         0.65          0.35       0.3
..                    …             …            …             …         …
104            1998-06-30    1998-07-22        -0.07         -0.07         0
105            1998-03-31    1998-04-27        -0.03         -0.04      0.01
106            1997-12-31    1998-01-22        -0.03         -0.04      0.01
107            1997-09-30    1997-10-27        -0.03         -0.03         0
108            1997-06-30    1997-07-10        -0.02         -0.03      0.01

     Surprise Percentage
0               22.3301
1               19.5122
2                    25
3                62.069
4               85.7143
..                    …
104                   0
105                  25
106                  25
107                   0
108             33.3333

[109 rows x 6 columns]
========================
```

It didn't succeed to call the estimated ones "get_latest_earning_estimate"

```
[67]: response = agent.chat("What are the latest actual and estimated earning of AMZN?
      ↪")
```

```
Added user message to memory: What are the latest actual and estimated earning
of AMZN?
=== Calling Function ===
Calling function: get_earnings_history with args: {"symbol":"AMZN"}
Got output:      Fiscal Date Ending Reported Date Reported EPS Estimated EPS
Surprise  \
0               2024-06-30    2024-08-01         1.26          1.03      0.23
1               2024-03-31    2024-04-30         0.98          0.82      0.16
2               2023-12-31    2024-02-01            1           0.8       0.2
3               2023-09-30    2023-10-26         0.94          0.58      0.36
4               2023-06-30    2023-08-03         0.65          0.35       0.3
..                     …             …            …             …         …
104             1998-06-30    1998-07-22        -0.07         -0.07         0
105             1998-03-31    1998-04-27        -0.03         -0.04      0.01
106             1997-12-31    1998-01-22        -0.03         -0.04      0.01
107             1997-09-30    1997-10-27        -0.03         -0.03         0
108             1997-06-30    1997-07-10        -0.02         -0.03      0.01

     Surprise Percentage
0              22.3301
1              19.5122
2                   25
3               62.069
4              85.7143
..                   …
104                  0
105                 25
106                 25
107                  0
108             33.3333

[109 rows x 6 columns]
=========================
```

# 7 Similar companies

```
[34]:  response = agent.chat("What are the similar companies of AMZN?")
```

```
Added user message to memory: What are the similar companies of AMZN?
=== Calling Function ===
Calling function: find_similar_companies with args: {"symbol":"AMZN"}
Got output: ['AMZN', 'CPNG', 'EBAY', 'ETSY', 'DDS', 'OLLI', 'M', 'JWN', 'KSS',
'SVV']
=========================
```

## 7.1 Growth Stocks

"get_current_technology_growth_stocks" didn't succed to get data ==> one needs to modify it
...It uses yfinance url

```
[69]: response = agent.chat("What are the growth stocks in technology sector in US␣
      ↪market?")
```

```
Added user message to memory: What are the growth stocks in technology sector in
US market?
=== Calling Function ===
Calling function: get_current_technology_growth_stocks with args: {}

/usr/local/lib/python3.10/dist-packages/llama_index/tools/finance/util.py:29:
FutureWarning: Passing literal html to 'read_html' is deprecated and will be
removed in a future version. To read from a literal string, wrap it in a
'StringIO' object.
  return pd.read_html(html_clean, header=header)

Got output:                                                          0
0  Will be right back…  Thank you for your pati…
========================
```

```
[55]: response = agent.chat("What are the US stocks gainers?")
```

```
Added user message to memory: What are the US stocks gainers?
=== Calling Function ===
Calling function: get_current_gainer_stocks with args: {}

/usr/local/lib/python3.10/dist-packages/llama_index/tools/finance/util.py:29:
FutureWarning: Passing literal html to 'read_html' is deprecated and will be
removed in a future version. To read from a literal string, wrap it in a
'StringIO' object.
  return pd.read_html(html_clean, header=header)

Got output:                                                          0
0  Will be right back…  Thank you for your pati…
========================
```

# 8   Key Takeways

Overall, this agent is a good starting point if you want to build one.

You can draw inspiration from the work done here to improve and customize it for your own use
case.

You can also use another LLM as AI Agent like Claude 3.5 Sonnet.