**LLM Course Project Report**

**Group 3 : Competitive Market Intelligence Agent**

**Overview**

This project focuses on building a multi-agent workflow for a market intelligence agent which provides a comprehensive business report including financials and sentiment analysis for a list of companies in a particular industry over a specified time period.

The project uses 4 agents :

* Supervisor Agent : Parses the input query and orchestrates the analysis workflow.
* Sentiment Analysis Agent : Monitors real-time news of companies and industry with sentiment analysis.
* Financial Analysis Agent : Obtains and analyses the metrics of companies in a particular industry. It also generates visualizations of the financial data.
* Summarizer Agent : Responsible for consolidating all data collected by other agents and their responses to generate a comprehensive and unified answer for the user.

The workflow is as follows :-

The supervisor agent receives the input user query and parses it to retrieve the list of companies, industry and time period of analysis. It then passes control to the financial analysis agent which retrieves a comprehensive list of metrics for the specified companies. It analyzes these metrics and stores the analysis in a file. Then the control is passed to the sentiment analysis agent which retrieves news articles and other financial and sentiment data pertaining to the industry. It analyzes the received information and stores the analysis in another file. The control is passed on to the summarizer agent which summarizes the financial analysis and sentiment analysis stored in the 2 files and generates a comprehensive business intelligence report. The report is displayed on a web application using streamlit and can also be downloaded as a PDF.

**Evaluation**

For evaluation, we generated seven business intelligence reports. The agent is able to generate well-formatted reports that are detailed and accurate. The reports were generated for seven different industries and the agent generated insightful reports irrespective of the industry in question. The agent also generates a financial analysis report, a sentiment analysis report and 2 visualizations. The financial analysis report provides an executive summary, generates tables for comparative analysis and performs a SWOT analysis on the list of companies. These are accurate and in-line with the retrieved financial data. We tested our data on 3 different time periods of analysis (1 Week, 1 Quarter(120 days) and 1 Year). After reading through our reports and cross checking with metrics and news articles from other sites, we conclude the accuracy and detail is slightly higher for longer time periods for sentiment analysis since more news articles are sent for sentiment analysis. The financial analysis however remains roughly the same since we retrieve long term financial metrics from our API calls (There is no option to specify time period in the API call). The sentiment analysis agent provides a brief yet accurate sentiment analysis of the different companies. However due to the API under use, we are not able to retrieve news articles of high quality and hence the sentiment analysis is a little bit on the weaker side. However supplementing the sentiment analyzer with metrics from the financial analysis agent helps fine-tune the content generated. Exploring other paid API for sentiment analysis could be a viable option for better quality articles. Due to API restrictions for a free account, the agent is only allowed around 25 requests per day which limits the number of companies that can be analysed in a day since each company incurs multiple API calls for retrieving different kinds of data. This restricts the number of companies that can be analysed in a day. Also, under the free option, we can only retrieve data for 87 companies (pertaining to different industries) using API calls. Enabling the paid option will give us access to a lot more companies (both NASDAQ listed and unlisted companies) which would make our agent more versatile.

In summary, we believe that using the free resources in our hand, we have built a capable agent that can perform detailed financial and sentiment analysis and summarize the results with visualizations to provide a comprehensive market intelligence report that one can use to make informed investing decisions.