SCHOOL OF COMPUTING
Faculty of Engineering

Project Proposal Form MCST1043
Sem: 2 Session: 2024/25

SECTION A: Project Information.

Program Name:	**Masters of Science (Data Science)**
Subject Name:	**Project 1 (MCST1043)**
Student Name:	Nur Aina Farraain Binti Zahanizam
Metric Number:	MCS241053
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Project Title:	Stock Price Forecasting Using News Sentiment and Deep Learning: Evidence from the Malaysian Banking Sector
Supervisor 1:	
Supervisor 2 / Industry Advisor(if any):	

SECTION B: Project Proposal

Introduction:

The stock market has always been a barometer of economic sentiment, with prices responding not only to financial indicators but also to the emotional reactions of investors. In recent years, sentiment analysis has become a valuable tool in understanding these reactions, especially as news headlines continue to influence market behavior. This project focuses on combining sentiment analysis with deep learning techniques to predict the stock prices of CIMB and Maybank—two of the most prominent banks in Malaysia. By using headlines from financial news sources and applying models like LSTM, GRU, and ACNN-LSTM, this project aims to improve forecasting accuracy and support better decision-making for investors and analysts.

Problem Background:

Stock prices are affected by a variety of factors, ranging from historical price movements to global economic trends and media coverage. For banks like CIMB and Maybank, financial news often triggers immediate market responses. Traditional forecasting methods, however, may fall short in capturing the nuances of investor sentiment embedded in news articles. Sentiment analysis, particularly when powered by deep learning, offers a way to bridge this gap. Yet, in the Malaysian context, there has been limited research integrating sentiment-based models for stock prediction—especially focused on local banking institutions.

Problem Statement:

Despite advances in machine learning and natural language processing, accurate stock prediction remains a complex challenge due to market volatility and external unstructured factors such as news sentiment. Existing models often fail to reflect real-time investor reactions captured in news headlines. This project aims to solve this by developing deep learning models that incorporate sentiment scores extracted from financial news to predict the next-day stock prices of CIMB and Maybank. By doing so, the project addresses the gap in localized sentiment-based forecasting in Malaysia's banking sector.

Aim of the Project:

To develop and evaluate sentiment-driven deep learning models (LSTM, GRU, ACNN-LSTM) to predict the next-day stock prices of CIMB and Maybank based on financial news headlines.

Objectives of the Project:

1. To perform sentiment analysis on news headlines related to CIMB and Maybank
2. To analyze the correlation between sentiment scores and the next closing prices of CIMB and Maybank
3. To develop and evaluate deep learning models (LSTM, GRU, and ACNN-LSTM) for stock price forecasting

Scopes of the Project:

1. The project will focus on financial news and stock price data from 2019 to 2025 for CIMB and Maybank only
2. Sentiment scores will be derived from headlines sourced from major Malaysian financial news portals
3. The project does not cover real-time market prediction or other banking sectors outside CIMB and Maybank

Expected Contribution of the Project:

1. A sentiment-based deep learning model capable of predicting the next-day stock prices of selected Malaysian banks
2. A structured dataset aligning news sentiment with historical stock data for research and educational purposes
3. A localized case study demonstrating the effectiveness of sentiment analysis in the Malaysian financial market

Project Requirements:

Software:
- Python
- Jupyter Notebook
- Keras
- TensorFlow
- Selenium
- BeautifulSoup
- Yfinance
- NLTK (VADER)

Hardware:
- CPU: at least an Intel i5 (or equivalent)
- RAM: At least 8 GB (16 GB recommended for large datasets)
- Storage: Minimum of 50GB of free space
- GPU: Use it for training complex ML models

Technology/Technique/ Methodology/Algorithm:
- Web scraping
- Sentiment analysis (VADER)
- Deep learning (LSTM, GRU, ACNN-LSTM)
- Time series forecasting
- Evaluation metrics: MSE, RMSE, MAE

Type of Project (Focusing on Data Science):

[✓] Data Preparation and Modeling

[✓] Data Analysis and Visualization

[ ] Business Intelligence and Analytics

[✓] Machine Learning and Prediction

[✓] Data Science Application in Business Domain

Status of Project:

[✓] New

[ ] Continued

If continued, what is the previous title?

SECTION C: Declaration

I declare that this project is proposed by:

[✓] Myself

[ ] Supervisor/Industry Advisor ( )

Student Name: Nur Aina Farraain Binti Zahanizam

17th April 2025

Signature **Date**

SECTION D: Supervisor Acknowledgement

The Supervisor(s) shall complete this section.

I/We agree to become the supervisor(s) for this student under aforesaid proposed title.

Name of Supervisor 1:

Signature **Date**

Name of Supervisor 2 (if any):

Signature **Date**

SECTION E: Evaluation Panel Approval

The Evaluator(s) shall complete this section.

Result:

[ ] FULL APPROVAL

[ ] CONDITIONAL APPROVAL (Minor)

[ ] CONDITIONAL APPROVAL (Major)*

[ ] FAIL*

***** Student has to submit new proposal form considering the evaluators' comments.

Comments:

Name of Evaluator 1: .....

	Signature	Date

Name of Evaluator 2:

	Signature	Date