

**NATIONAL UNIVERSITY OF COMPUTER AND  
EMERGING SCIENCES  
PROGRAM: SOFTWARE ENGINEERING**



***APPLIED ARTIFICIAL INTELLIGENCE***

**Project Proposal**

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# Title:

Multi-Agent Stock Trading System

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## Introduction

The stock market is a dynamic and complex environment influenced by countless factors. Traditional trading strategies often fall short in adapting to rapid changes in market conditions. As a result, artificial intelligence has gained significant traction in financial forecasting and decision making.

## Purpose

The purpose of this project is to develop a **Multi Agent Stock Trading System** that leverages multiple AI techniques to analyze market data, predict movements, and simulate intelligent trading behaviors. Our motivation lies in exploring how diverse AI strategies can work together to form a more adaptive and effective decision making system.

By combining **Naive Bayes classification**, **K-Mean clustering**, and a **multi agent framework**, we aim to simulate a more robust trading environment where each agent contributes a specialized skill to the overall strategy

## Solution

Our proposed solution is to divide the system into three key components:

- A **Naive Bayes agent** to forecast market trends,
- A **clustering agent** to analyze and group similar stocks or market conditions,
- And a **coordinating agent/environment** to manage their interaction and evaluate performance.

This multi-agent system will not only showcase the power of individual AI models but also demonstrate the strength of collaborative intelligence in complex domains like finance.

# Objectives

- Use **Naive Bayes classification** to predict stock market movements (up/down) based on historical features.
- Apply **K-Mean clustering** to group similar stocks or market conditions, helping agents diversify strategies.
- Design a **multi agent environment** where agents share information, make autonomous trading decisions, and are evaluated based on predefined performance metrics.

# Tools and Technologies

- Python (scikit-learn, pandas, matplotlib, numpy, yfinance)
- Jupyter Notebooks

# Expected Outcomes

- A working prototype
- Performance evaluation comparing agent strategies
- A final report with analysis, visuals, and reflections on AI techniques used