# Assignment: Stock Trading and Automated Trading Readiness

## Section 1: Theoretical Knowledge

### Stock Market Basics

Explain what a stock is and how it is traded.
Describe the difference between a market order and a limit order.
What is the significance of the bid-ask spread?
For resources u can read Zerodha modules , or refer to investopedia.

### Technical Analysis

Define the following terms and explain their importance: Moving Averages, RSI, MACD, Bollinger Bands.
How can technical indicators be used to make trading decisions?
Resource:as of now , u can do the above task by reading zerodha module ,but  as we will move ahead u have to know more about indicators and stuff so for that there is one good book called
"**Technical Analysis of the Financial Markets: A Comprehensive Guide to Trading Methods and Applications**"

### Risk Management

Explain the concept of risk management in trading.
What is a stop-loss order, and how is it used?
Describe the importance of position sizing in trading.

### Algorithmic Trading

What is algorithmic trading, and how does it differ from manual trading?
Discuss the benefits and risks associated with algorithmic trading.
Explain the concept of backtesting and its importance in algorithmic trading.
Resource:Quantitative trading ernest chan"

## Section 2: Practical Tasks

### Data Analysis

Download historical stock price data for a company of your choice using an API (e.g., Alpha Vantage, Yahoo Finance).
Perform basic data cleaning and preprocessing on the downloaded data.
Calculate the 20-day and 50-day moving averages and plot them along with the stock price.

## Technical Indicators Implementation

Implement a function to calculate the Relative Strength Index (RSI).
Implement a function to calculate the Moving Average Convergence Divergence (MACD).
Create a combined plot showing the stock price, RSI, and MACD for the selected stock.

## Backtesting a Simple Strategy

Implement a simple moving average crossover strategy (e.g., buy when the 20-day MA crosses above the 50-day MA and sell when it crosses below).
Backtest this strategy on historical data and calculate the strategy's performance metrics (e.g., total return, Sharpe ratio).
Plot the equity curve of the strategy over time.

## Section 3: Coding Exercise
### Automated Trading Bot

Write a Python script to simulate an automated trading bot using the moving average crossover strategy.
The bot should:
Fetch real-time stock price data.
Calculate the necessary technical indicators.
Execute buy or sell orders based on the strategy.
Maintain a trading log of executed trades and their outcomes.
You will find the template code in the folder as 'template.py'. Check out the code.

## Section 4: Reflection and Reporting
Report Writing
Write a detailed report summarizing the steps you took in this assignment.
Discuss the results of your backtesting and any insights you gained.
Reflect on the challenges you faced and how you overcame them.
Submission Requirements
Submit your answers to the theoretical questions in a document.
Include all code and plots for the practical tasks and coding exercise.
Submit your report as a PDF.
Evaluation Criteria
Accuracy and completeness of theoretical answers.
Correctness and efficiency of the implemented functions.

Quality and clarity of data visualizations.
Performance of the backtested strategy.
Depth of analysis and reflection in the report.

Note:Whatever terms u find new in the   above document, GOOGLE IT, this assignment is mainly to cover basic concepts and code writing that will be used in our project. So do the assignment properly , make notes of whatever u learn in doing the above assignment , like about indicators or backtesting, signals..etc.

"The stock market is never obvious. It is designed to fool most of the people, most of the time."

— Jesse Livermore