CMPE 472 – Computer Networks
Programming Assignment 1

Topic: Mini Stock Market Prediction

In this assignment, you will create a mini application that acts as a "Stock Market Prediction" using socket programming. The server will randomly pick a stock from the given Excel file and the client will try to guess the stock price within a certain tolerance range. You can choose any development environment (e.g. PyCharm, Visual Studio Code, etc.).
Our goal is to create a connection between a server and client on the same machine (localhost) and enable communication through sockets.

The requirements are as follows:

- Which port the server and local communicate on. Give the output of this.
- The server must listen to the client on port 8888.
- And below you can see the general code blocks you need to use for all this. Code the methods as needed.

server.py

```
def handle_request(client_connection):
        # This method should process the client's guess
        # and respond with the appropriate message based on the guess accuracy
def serve_forever():
        # In this method, load the stock data, randomly select a stock,
        # and wait for the client to guess the price of the chosen stock.
if __name__ == '__main__':
    serve_forever()
```

1. Load the stock data from the attached Excel file (stock.xlsx) on the server side. This file contains stock symbols, their current prices, and other related information.
2. The server should randomly select a stock from the Excel file and send a message to the client, asking for a price prediction.

3. Validate the client's prediction:

    I. If the prediction falls within a 5% tolerance range of the actual stock price, the server should respond with a success message.

    II. If the guess is too high or too low, provide a hint ("Higher" or "Lower").

    III. If the client makes three incorrect predictions, the server should send the correct price and wait for a new client connection.

    IV. If the client sends the command "END", both the client and server should terminate the connection.

client.py

```
def main():
    # Connect to the server, receive the stock information,
    # prompt the user for a price prediction, and send it to the server
if __name__ == '__main__':
    main ()
```

1. The client should connect to the server and receive the stock information (e.g., "Predict the price for AKBNK").
2. The client will then enter a predicted price and send it to the server.
3. After each guess, the client receives feedback from the server based on the accuracy of the prediction.
    I. If the prediction is correct within the 5% tolerance, the client will receive a success message.
    II. If the guess is incorrect three times, the game will end, and the correct price will be shown.
    III. If the client enters "END", the connection between the client and server should close, and both programs should terminate.

What to Hand in

You will hand in the a zip (or rar) file. The zip file you deliver will contain server (server.py), client (client.py) code files and a pdf file.

A report (PDF) explaining your code with screenshots. The report should include a cover page and a table of contents, and it should be carefully prepared. Points will be deducted for poorly organized reports. And it should be carefully prepared. Points will be deducted for assignments that are not carefully prepared.