Overview of Application

This client-server application is designed to perform currency conversions using socket communication. The client sends conversion requests to the server, specifying the type of conversion (either from USD to another currency or vice versa), the exchange rate, and the amount. The server processes the request, performs the calculation, and returns the result to the client. The application supports two types of conversion operations:

1. Converting from a foreign currency to USD
2. Converting from USD to a foreign currency

Client->Server Message Format

The client sends messages to the server in the following format:

1. operation: A string representing the conversion operation. It can be one of the following:
   - “converting to usd”: Convert from a foreign currency to USD.
   - “converting from usd”: Convert from USD to a foreign currency.
2. exchange_rate: A numeric value representing the conversion rate between the foreign currency and USD (e.g. the number of foreign currency units per USD).
3. amount: A numeric value representing the amount of currency to be converted.

Example message:
converting to usd
1.15
100
This message asks the server to convert 100 units of a foreign currency to USD using an exchange rate of 1.15 foreign currency units per USD.

Server->Client Message Format

The server responds to client requests with a single string containing the result of the conversion or an error message. The server processes the client message and sends back one of the following:
- The calculated result of the conversion, represented as a string.
- An error message if the input is invalid, such as division by zero or an unknown operation.

Example Output
#1
Client:
Client starting - connecting to server at IP 127.0.0.1 and port 65432
Enter the operation (converting to usd / converting from usd): converting to usd
Enter the exchange rate (other currency/usd): 7.09
Enter the amount of money: 50000
connection established, sending request 'converting to usd:7.09:50000'
Message sent, waiting for reply
Received reply: 7052.186177715092

Server:

server starting - listening for connections at IP 127.0.0.1 and port 65432
Connected established with ('127.0.0.1', 53300)
Received client message: 'converting to usd:7.09:50000' [28 bytes]
sending result message '7052.186177715092' back to client

#2
Client:
Client starting - connecting to server at IP 127.0.0.1 and port 65432
Enter the operation (converting to usd / converting from usd): converting from usd
Enter the exchange rate (other currency/usd): 7.09
Enter the amount of money: 10000
connection established, sending request 'converting from usd:7.09:10000'
Message sent, waiting for reply
Received reply: 70900.0

Server:
server starting - listening for connections at IP 127.0.0.1 and port 65432
Connected established with ('127.0.0.1', 53300)
Received client message: 'converting from usd:7.09:10000' [30 bytes]
sending result message '70900.0' back to client

Acknowledgments
This client-server communication system was implemented using Python's socket module. The design supports basic request-response interaction with string encoding for message transmission. Both client and server use simple error handling to manage invalid input gracefully.

```
[(base) liuzhirou@liuzhiroudeMacBook-Pro csc-249-p1-simple-rpc-app % python echo-]
client.py
Client starting - connecting to server at IP 127.0.0.1 and port 65432
Enter the operation (converting to usd / converting from usd): converting to usd
Enter the exchange rate (other currency/usd): 7.09
Enter the amount of money: 50000
connection established, sending request 'converting to usd:7.09:50000'
Message sent, waiting for reply
Received reply: 7052.186177715092
Enter the operation (converting to usd / converting from usd): converting from u
sd
Enter the exchange rate (other currency/usd): 7.09
Enter the amount of money: 10000
connection established, sending request 'converting from usd:7.09:10000'
Message sent, waiting for reply
Received reply: 70900.0
Enter the operation (converting to usd / converting from usd):
```

```
(base) liuzhirou@liuzhiroudeMacBook-Pro csc-249-p1-simple-rpc-app % python echo-
server.py
server starting - listening for connections at IP 127.0.0.1 and port 65432
Connected established with ('127.0.0.1', 53300)
Received client message: 'converting to usd:7.09:50000' [28 bytes]
sending result message '7052.186177715092' back to client
Received client message: 'converting from usd:7.09:10000' [30 bytes]
sending result message '70900.0' back to client
```